

Block

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RECOVERY AND RECONSTRUCTION

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**Disaster Psycho-social Care and Socio-economic
Rehabilitation**

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BLOCK INTRODUCTION

The Block on “Recovery and Reconstruction” is the last block in MSWE-003. It has four units.

The **first unit** on ‘Damage and Loss Assessment’ gives the learner a comprehensive understanding about the various concepts associated with damage and loss assessment for disasters. You will also be able to examine the relevance of a common damage assessment format.

In the **second unit** on ‘Recovery Planning’ the process of disaster recovery planning is discussed. An elaborate discussion is also presented in this unit on the factors, components and characteristics of disaster recovery plan.

The **third unit** namely, ‘Physical Recovery and Reconstruction’ deliberates on the concept of disaster management cycle. It also throws light on the components of disaster recovery. After reading this Unit, you will be able to explain the principles and approaches for post-disaster recovery and analyze the linkages between physical recovery and development.

In the **fourth unit** on ‘Disaster Psycho-social Care and Socio-economic Rehabilitation’ you will learn about the concept of psycho-social support and mental health services. You will also learn about the concept of community based disaster psycho-social care model followed in India.

After going through this block you will have an understanding about the various aspects of Recovery and Reconstruction in Disaster Management.

UNIT 1 DAMAGE AND LOSS ASSESSMENT

Structure

- 1.0 Objectives
- 1.1 Introduction
- 1.2 Conceptual Framework of Damage and Loss Assessment
- 1.3 Assessment Process and Methodology
- 1.4 Damage and Loss Assessment of Social Sectors
- 1.5 Assessment of Infrastructure Sector
- 1.6 Assessment for Economy and Environment
- 1.7 Assessing Damage to Women and Vulnerable Groups
- 1.8 Let Us Sum Up
- 1.9 Further Readings and References

1.0 OBJECTIVES

After a disaster occurs, assessing the extent of damage becomes crucial for mobilizing the response. This section brings in a systematic learning about the process of disaster assessment and its relevance in the recovery and rehabilitation process. It introduces the concept of direct and the indirect effect of disasters (damage and loss assessment). After studying this Unit, you will be able to:

- explain the concepts associated with damage and loss assessment for disasters;
- examine the relevance of a common damage assessment format;
- discuss an assessment framework in the infrastructure, social and economic sectors according to the Economic Commission for the Latin America and the Caribbean (ECLAC) method; and
- explore damage and loss assessment considerations for environment and the more vulnerable groups in a disaster situation according to the ECLAC method.

1.1 INTRODUCTION

Damage assessment is the first activity after a disaster. Even the very basic response is based on the preliminary assessment of the extent of devastation. Assessment of damages for post-disaster response is vital to understand the nature and extent of impact on human lives and their living conditions. Proper assessment is essential for not only response but also future mitigation measures. Assessment comprises of not only a short-term or rapid process to identify immediate needs, a detailed estimation is also the first step for longer term reconstruction and recovery activities. It is also important that the response and recovery activities are planned with the objective of reducing vulnerabilities in the future. The following section will explain the concepts associated with damage and loss assessments.

1.2 CONCEPTUAL FRAMEWORK OF DAMAGE AND LOSS ASSESSMENT

Post disaster activities initiated after a disaster has struck an area are generally divided into the following broad stages:

- i) Emergency
- ii) Rehabilitation and recovery (also called transition)
- iii) Reconstruction

The emergency stage refers to the period of assistance, when earnest measures are taken to save lives and provide essential supplies to the most affected people. It includes activities like search and rescue, evacuation, provision of temporary shelters, first aid, emergency medical care and protection, preliminary repairs to essential infrastructure and transportation and communication routes, rapid assessment and recording of damage to public and private property. The duration of this phase is brief, depending on the magnitude of the disaster.

The rehabilitation or transition phase refer to the activities required to restore normalcy to the affected areas and population and may include temporary repairs to housing and transport, trauma counseling, facilitating livelihood options through grants and loans etc.

Finally the reconstruction stage includes activities designed to “rearrange the affected physical space and environment and enable the allocation of resources in accordance with the new social priorities arising from the effects of the disaster” (ECLAC, 2003).

Natural disasters like floods, earthquakes, cyclones etc have not merely immediate impact on the affected area and population, but also cause long-term after effects that evolves slowly or emerge after the disaster has occurred. Pest infestations due to disasters or food scarcity due to crop loss in calamities are instances of such after effects. A comprehensive damage assessment therefore should incorporate the physical, socio-economic and environmental impact at the time the disaster occurs as well as its aftermath across social sectors and areas.

Post-disaster assessments can be broadly divided into two parts viz. **situation assessment** and **needs assessment**. Situation assessment focuses on the situation on the ground, depicting the magnitude and impact of the disaster on the affected population and infrastructure. Needs assessment articulates the level and type of assistance required for the population affected by the disaster and focuses on “what needs to be done” for relief, reconstruction and rehabilitation. The assessment process therefore covers the nature and extent of a disaster, priority needs of the affected community, particularly of the affected people.

Situation assessments technically comprise of **Damage and Loss assessments**, which, combined with Needs Assessment signify interlinked activities of post disaster. The purpose and significance of each should be understood. While damage and loss assessments provide broad information about the impact of disaster on people, infrastructure and the economy, needs assessment helps to understand the type of assistance required for the affected population. Each of them is important to initiate design and management of reconstruction programs.

In a nutshell, Damage Assessment is the process of determining the location, nature and severity of damage sustained by the community/ country in a disaster situation. It includes estimating the amount of loss and the resulting impacts of those losses on the affected individuals and communities. The ultimate aim of the assessment methodology is to measure in monetary terms, the impact of society, economy,

and environment of the affected country or region (ECLAC, 2003). Obtaining timely and accurate damage information is the key to identifying the needs of communities affected by a disaster and taking informed decisions on resource deployment

Box 1.1

Damage refers to the impact on lives and the physical assets affected in a disaster. It assesses direct costs like buildings, livelihood, agriculture and animal husbandry, services (educational, health and recreational facilities), infrastructure and utilities (water supply, roads, sewerage, bridges, electricity, telecommunication, etc.)

Losses refer to the changes in economic flows caused by disaster. It assesses direct income loss and indirect losses, which are costs related to changes in production, operation, delays, etc due to the disaster. Losses continue to occur until the desired reconstruction process is complete.

Needs Assessment

Needs assessment determines the level and types of assistance required by the affected population, their priorities, and their preferred strategies to meet these priorities. Common needs include, shelter, livelihood, personal needs (of the injured, handicapped, orphaned, and those suffering from post-disaster trauma), and need for services (water supply and sanitation, electricity, schools, health centers, etc.).

Source: *Guide to participatory reconstruction, Environmental Planning Collaborative, 2003*

The Federal Emergency Management Agency (FEMA), the nodal agency of the United States defines damage assessment as *“The process used to appraise or determine the number of injuries and deaths, damage to public and private property, and the status of key facilities and services such as hospitals and other health care facilities, fire and police stations, communications networks, water and sanitation systems, utilities, and transportation networks resulting from a man-made or natural disaster.”*

Objectives of Assessment

The objectives for assessment are to:

- Determine the effect of disaster
- Guide relief operations
- Assess the reconstruction needs
- Provide an appropriate framework for recovery and rehabilitation
- Define financing required for rehabilitation
- Monitor the rehabilitation process
- Define mitigation measures and strategy

A clear procedure and protocol of damage assessment is imperative in order to ensure that the system is:

- *Transparent* - so that the assessment procedures can be followed easily;
- *Consistent and standardized* - to enable meaningful comparisons;
- *Replicable* - to enable the assessments to be checked

Recovery and Reconstruction

- *Based on economic principles* - so that assessed losses represent properly the real losses to the economy.
- *Documented* in such a way that the approach can be easily checked or modified in the light of new information. This also ensures *transparency* and *accountability*.

Assessment of needs and resources is required in all types of disasters, whatever the cause and whatever the speed of onset. Assessment will be needed during all the identifiable **phases** of a disaster, from the start of emergency life-saving, through the period of stabilization and rehabilitation and into the long-term recovery, reconstruction and return to normalcy. The focus of assessment and the strategies for data collection and interpretation will need to change as the response evolves.

EPIISODES AND ACTIVITIES IN RELATION TO THE RISKS AND OCCURENCE OF SUDDEN DISASTERS

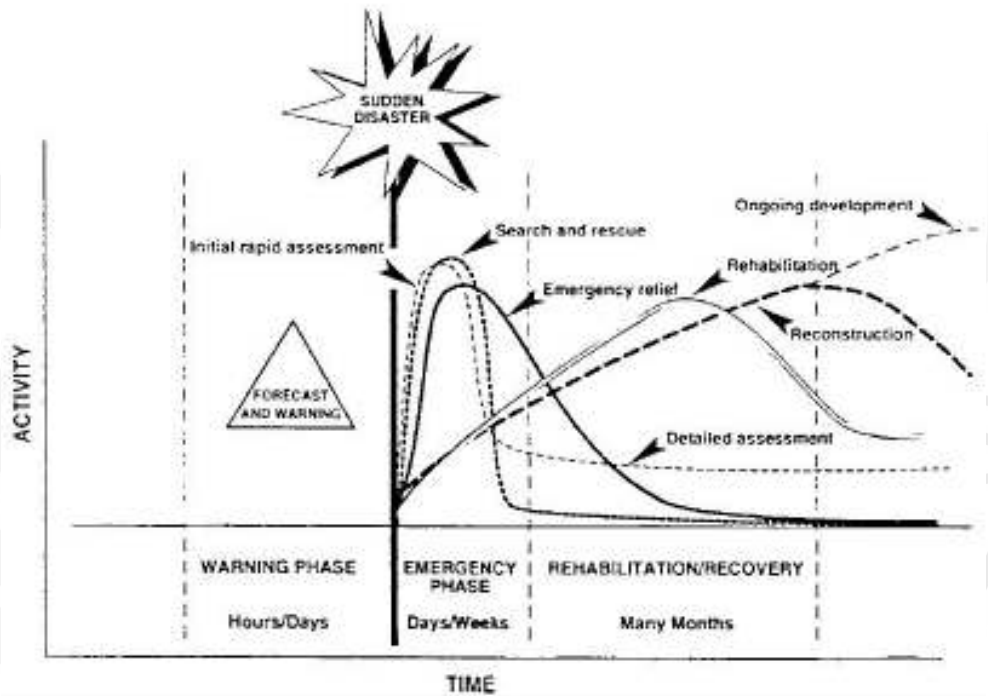


Fig. 1

Check Your Progress I

Note: Use the space provided for your answer

- 1) Do you think damage assessment is important for managing disasters? Why?

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- 2) What are the stages of post-disaster management? Name the major activities in each stage.

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3) Define damage assessment and list the objectives of assessment.

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1.3 ASSESSMENT PROCESS AND METHODOLOGY

For assessment to be effective, the process needs to provide an objective view of not only the extent and type of damage but also identify secondary threats like epidemics, resource availability and the local coping capacity. Finally the assessment process should make recommendations to inform and guide the actions, interventions and resources needed to facilitate long-term rehabilitation and development.

Damage assessment is usually conducted at two stages of a disaster:

A preliminary or rapid assessment is conducted immediately after a disaster. It is an initial exercise to guide relief operations. Initial needs assessment concentrates on immediate life saving and relief measures.

At a later stage, *a detailed assessment* is conducted for planning and implementing reconstruction programs. It determines specific information related to nature, location, extent of loss, and the resulting needs of the affected people. It helps in determining compensation for repair, retrofitting or reconstruction. The detailed assessment is a multi-sectoral exercise conducted at the end of the emergency phase, depending on the accessibility and status of immediate needs. For example, the post-tsunami assessments report prepared by the World Bank, ADB and UN system lists the following sectors, housing, health and education, agriculture and livestock, fisheries, livelihoods (micro enterprises and others), rural and municipal infrastructure, transportation, coastal protection and hazard risk management for India.

It is important that the assessment process and tools are “transparent, flexible, adaptable, credible, inclusive and participatory.”

The assessment process needs to be planned step-by-step and managed accordingly. The sequence of activities which form a part of the process may be classified as:

- Identification of information needs and sources of reliable data
- Data collection
- Data analysis and interpretation
- Reporting of conclusions, forecast etc to planners and policy makers, who are the end users of the report.

(Source: UNDP)

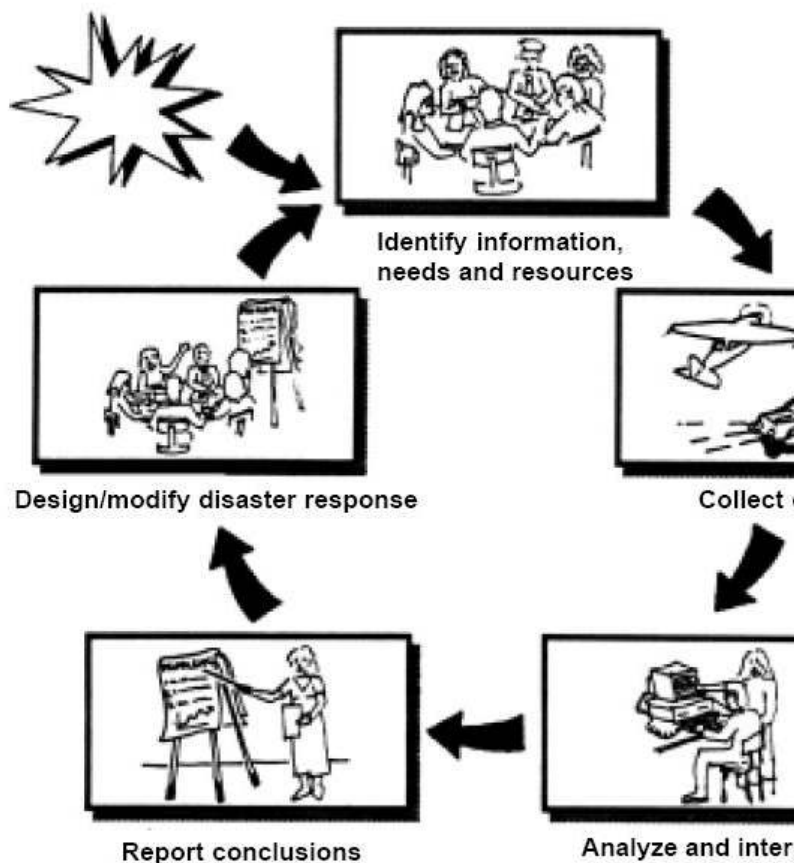
Guiding Principles

The internationally followed are the following¹:

- **Needs and local priorities** - political, religious, etc.
- **Subsidiarity** - design government for each
- **Consultation** - empower own decisions during
- **Communication and access** - access to information, procedures, and regulatory authorities;
- **Vulnerability** - reduce approach;
- **Coordination** - ensure no overlap in activities.



THE ASSESSMENT PROCESS



¹ Sri Lanka 2005 Post-Tsunami Recovery Program Preliminary Damage and Needs Assessment, ADB, JBIC & WB, January 2005

Various formats of assessment are used according to the system prevalent where the disaster has occurred. However, recent assessments undertaken are generally based on the standard internationally accepted methodology developed by the United Nations Economic Commission for Latin America and the Caribbean (ECLAC). The assessment format described in the subsequent sections draws from the ECLAC method. This methodology uses a stock and flow analysis that evaluates effect on:

- Physical assets that will have to be repaired, restored, replaced or discounted in the future
- Income flows that will not be realized until the asset is repaired or rebuilt.
- Performance of the economy in terms of the macro-economic aggregates

For ease of computation, ECLAC uses the following terms:

- 1) **Direct damages** - are inflicted on immovable assets and on stock which include goods under process, raw materials, spare parts, finished products in stock etc. This category comprises of all the damages that occurred right at the time of disaster. Primarily, it includes the total or partial destruction of buildings, infrastructure (bridges, roads etc), installations (power lines, water supply system) machinery, equipment, means of transportation (rail coaches, buses etc), furniture, damage to farmland (including destruction of crops ready for harvest), irrigation works and the like.
- 2) **Indirect Losses** - refers to the flows of goods and services that will not be provided till the time reconstruction of the asset is completed. The indirect losses result from a direct damage to production capacity and social and economic infrastructure. It also includes increases in the current costs of production or service. The following components are generally considered for computing indirect losses:
 - i) Higher operational costs due to destruction of infrastructure and losses to production and income. For example losses due to unsold perishable items or damaged goods.
 - ii) Diminished production or service due to interruptions caused by the calamity.
 - iii) Additional costs incurred for reconstruction or starting the production or service afresh.
 - iv) Increased costs due to budgetary reorientation.
 - v) Income reduction.
 - vi) Costs incurred by all parties involved in attending to the affected population to provide emergency relief etc.
 - vii) Additional costs related to new situations arising from a disaster like public awareness campaigns to prevent epidemics etc.
 - viii) Lost income or production due to the “linkage” effects for example destruction of a factory affects the income of suppliers including ancillary and subsidiary industries.
 - ix) Any other side effect like traffic congestion cost, pollution cost etc.
- 3) **Macroeconomic Effects**- reflect the impact of the disaster in the performance of the main economic variables in the affected country. The important

macroeconomic effects are those that impact the economic health of the country in terms of Gross Domestic Product, trade balance, indebtedness and public finance, monetary reserves and gross investment. While the magnitude of a disaster determines the time frame for macroeconomic estimates, normally the remainder of the year in which the disaster occurs is considered for “short-term” plus the next one or two years for “medium-term” calculations. Frequently used indicators for estimating the macro-economic effects are:

- i) **Gross Domestic Product (GDP)** - Used to estimate the disaster induced losses at constant prices in the production of goods and services in the recovery period, including the time needed to recoup lost capacity.
- ii) **Gross Investment** - reflects the suspension or deferral of ongoing development projects due to the disaster. In the following year, however, gross investment will increase as reconstruction activity gets underway.
- iii) **Balance of Payments** - are affected by disasters in terms of decline in exports, increase in imports for the recovery and reconstruction period, relief donations in cash or kind, reinsurance payments from abroad and reductions in foreign debt servicing options. The estimation is based on the medium and long-term external financing requirement for reconstruction and the external aid or loans required for recovering from the deterioration of monetary reserves.
- iv) **Public Finances** - refers to the estimation of shortfall in government revenues, increased current spending for relief and rehabilitation and increased current spending for relief and rehabilitation due to the disaster.
- v) **Prices and Inflation** - refers to the estimation of increased prices due to shortfall of goods and services after a disaster.
- vi) **Employment** - refers to the overall effects of the employment scenario in all sectors due to destruction of production capacity on the one hand and increased demand for skilled reconstruction personnel on the other.

Sources of Information

In the immediate aftermath of a disaster, most information channels are blocked, so detailed information availability is low. The assessment specialist therefore has to gather information from various sources to reach an objective view of the damage and loss accrued. The primary sources of information are:

- i) **Strategic Sources** - Data collected from a network of social organizations, both national and international, research agencies etc.
- ii) **Media Reports** - can help in understanding the geographical extent of the disaster, locating data sources and getting an independent analysis of the event
- iii) **Maps** - essential aid of the details of the affected area
- iv) **Reconnaissance Missions** - to ensure filling of data gaps and getting a feel of the data requirements
- v) **Surveys** - field level surveys are important for overall assessment
- vi) **Secondary Data Analysis** - like population, housing census, age-sex distribution to understand pre-disaster situation and normal trends of growth, employment etc.
- vii) **Interpersonal Communications** - with professionals and community members if possible
- viii) **Remote sensing data** - for overall damage scenario.

Check Your Progress II

Note: Use the space provided for your answer

1) In how many stages is damage assessment generally conducted? Describe them.

.....

2) Describe the sequences of activities in the process of damage assessment.

.....

3) Discuss the main features of the ECLAC methodology for assessment.

.....

1.4 DAMAGE AND LOSS ASSESSMENT OF SOCIAL SECTORS

The social sector damage comprises of human loss, damage to housing and human settlements and loss to sectors like education, health and culture. Though it is generally agreed that the social sector losses are “intangible” like trauma after loss of family and livelihood, lack of motivation etc and cannot be computed, those pertaining to human loss, asset loss and loss to society will always remain significant effects of disasters.

D) Affected Population

The loss of human lives is the greatest loss that an affected region has to bear and has far-reaching implications on the society. Risk to human lives during a disaster varies according to age, gender, social factors etc. Poverty and social imbalances also contribute to the risk. A quantitative assessment of the size and characteristics of the affected population is the central part of the assessment process. An objective estimation of the affected population is essential for obtaining a correct overview of the disaster and losses in each sector. The humanitarian response is designed according to the needs of the affected population and provides reference point against which all the consistency of other estimates can be benchmarked.

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Disaster assessments must begin with demarcation of the affected area, immediately followed by the size and characteristics of the population affected. The data most often used for such estimates are the recent population and housing census. If recent data is not available, appropriate projections should be made or available data analyzed to determine whether there has been a large influx or decline of population during the inter-census period. Affected population is classified into primary, secondary and tertiary to establish a link between direct damages and indirect losses.

Primary affected population - includes people affected by direct impact of the disaster and consists of the dead, injured and disabled and also those who suffered material losses as a direct and immediate consequence of the disaster. The primary affected people were present in the affected area during the time of the disaster.

Secondary and tertiary affected population - This is the population that suffers from the disaster's indirect effects. The secondary affected population resides within or near the boundaries of the affected area while the tertiary affected population resides far away from the disaster site.

Direct and indirect effects of disasters are reflected in mortality, morbidity, migration etc. While mortality refers to the deaths as a consequence of a disaster, morbidity may arise due to epidemics or infectious diseases in a relief shelter, which may result in some deaths later. The demographic scenario may change due to migration also as loss of land, property or livelihood may lead to population displacement. In addition the data needs to be disaggregated into age-sex categories so that the effects on the elderly, children, women and more vulnerable are not overlooked. A large impact on these groups may extensively modify the prevailing demographic structure of the affected region.

The computation of demographic losses therefore needs to cover not only the dead and injured, but also the diseased, weak and displaced due to a disaster.

II) Housing and Human Settlements

Housing is often not only a shelter for families but a setting for an economic enterprise as well. Calamities can cause varying degrees of damage depending on various factors like quality of construction, materials used, construction technology, type of dwelling, location etc. Restoration of respectable habitat to the affected population is one of the most crucial activities; it is also important that the reconstructed and restored houses are risk resistant. To ensure risk reduction of vulnerable construction in the post-disaster phase, an assessment of the type and extent of housing damage is required.

The geographic location of the settlement is the first assessment information required to understand its setting with respect to landforms and proximity to natural features like lakes, rivers etc. It should then describe the typology (urban or rural), ownership and functional usage of each dwelling unit. Dwelling units that house small or medium scale industries have greater implications on the economy and livelihoods during disasters.

Direct damage in this sector refers to damage or destruction to housing, domestic furniture and equipment, public buildings and urban infrastructure. Damage to buildings is classified as:

- Completely destroyed buildings or those beyond repair.
- Partially destroyed buildings with possibility of repair.
- Unaffected buildings or those with only minor damage.

The basic components of assessment in this sector are based on:

- i) *Buildings* - The possible damage is to structural and non-structural elements. Structural elements consist of beams, joints, columns, panels, load bearing walls, foundations etc. Non structural elements include partition walls, internal installations, false ceilings, windows, cladding etc. The most severe damage is generally structural in nature and may require complete demolition of the building while non-structural damage is more visible but easy to repair.
- ii) *Furnishings* - refers to furniture, utensils, clothing, domestic appliances and equipment that need to be repaired or replaced.
- iii) *Equipment* - In addition to the usual fittings like sanitary and electrical devices (which are calculated in furnishings), some buildings may have air-conditioning systems, water pumps, elevators, security and recreation systems which get damaged in a disaster.
- iv) *Public buildings* - need to be estimated separately due to the specific functions performed by them and livelihood of employees in each. The housing and human settlements specialist must also estimate damage to public spaces like parks, green zones etc.
- v) *Other direct damages* - refers to the damages of household connections to public utilities like water and sanitation services, electricity and gas lines.

The indirect losses are estimated on the basis of:

- i) *Cost of reconstruction related demolition and debris removal* - where some portions of damaged buildings may have to be demolished before reconstruction. This depends largely on the type of material used for construction
- ii) *Cost of reducing vulnerability* - in terms of soil stabilization, strengthening of the building during reconstruction to reduce the risk of damage in the next disaster.
- iii) *Relocation costs* - if reconstruction on the same site is not possible (due to drainage problems, changing river courses etc), the cost of relocation in terms of cost of land, provision of basic services, title deeds, transportation of household assets has to be estimated.
- iv) *Temporary housing* - refers to costs accrued during the period of reconstruction and repair of damaged units.

III) Education and Culture

This sector assesses the damage to the sector's infrastructure, equipment and general functioning. It is important to ascertain the loss to the education sector, as delay in reconstruction and repair can have far-reaching repercussions and psychological effects among the affected population while resuming the system early has a positive influence on social rehabilitation.

The **direct damage** refers to destruction and damage to buildings, furniture and equipment and materials, works or volumes of a cultural nature stored in heritage buildings. Damage assessment would depend on:

- i) **Classification of buildings** - Buildings are classified according to their functional usage as
 - a) *Teaching Premises* - includes the damage to buildings, laboratories and equipment and recreational spaces within the premise
 - b) *Cultural Heritage buildings* - may be public historic buildings like museums or archaeological sites, state collections of historic value or even private heritage collections that have suffered damage in disasters. As

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there are no standards for assessment, each building and its collections or equipment has to be assessed individually.

- c) *Sports facilities* - like gymnasiums, stadiums and other sports facilities damaged in a disaster.

The **indirect losses** in this sector include:

- i) *Damage due to temporary use of educational institutions and cultural premises as relief shelters* - Stadium, schools etc are used as relief shelters and suffer damage as they are not designed to house a large number of people for a long period. The cost of repair of these facilities and equipment therein has to be assessed as indirect losses.
- ii) *Demolition and removal of debris* - Due to the diverse locations and variety of construction materials used, this cost is estimated based on volume of material to be removed and the unit cost of removal or transportation for each establishment.
- iii) *Temporary rents and leases* - refers to the rent paid due to the establishment running from a different location where repair or reconstruction has taken place.
- iv) *Vulnerability reduction* - refers to the cost of strengthening or retrofitting the existing building
- v) *Relocation* - accrues only when the building has to be shifted to a new site
- vi) *Loss of income* - is the income that will not be received by teachers and staff of the educational or cultural institution while repair or reconstruction is under way.

Table 1: A Typical Damage assessment chart for Education and Cultural sector (in Rs crores/US\$ millions)

Item	Damage			Sector		Cost of reconstruction	Imported Component
	Direct	Indirect	Total	Public	Private		
Public Schools							
National University							
Private schools							
Sports Complex							
Cultural Heritage							
Houses of Culture							
Town Halls							
House in historic centres							

IV) Health Sector

All disasters have an impact on the health sector, either due to the large number of people dead or injured, damage to the health care network and preventive measures for complex emergencies (epidemics) for the affected population. The impact on this sector is both short-term and long-term.

The **direct damages** include the following:

- i) *Health infrastructure* like hospitals, health centres, clinics, blood banks, health sector offices which may suffer structural and non-structural damage.
- ii) *Furniture and equipment* - like medical and surgical equipment, non-medical equipment (computers, air-conditioning), furnitures etc.

The **indirect losses** include

- i) *Demolition and clean up costs* - refers to the demolition of unsafe buildings, removal of debris and land improvement.
- ii) *Disaster mitigation costs* - include the adoption of preventive measures in the structural and non-structural aspects or in organizational-administrative aspects for making the system resilient to future disasters.
- iii) *Cost of treating victims* - include costs related to additional medical examinations, hospitalization costs, long-term treatments, expenses for medicines, transportation of patients, cost of overtime of staff etc.
- iv) *Cost of public health and epidemiological interventions* - include the public health interventions necessary for preventing epidemics and other latent diseases. The costs include those of vector control, vaccination campaigns, epidemiological surveillance and food safety.
- v) *Increased cost of preferential healthcare for vulnerable groups* - costs of special interventions for single mothers, elderly and children under five.
- vi) *Additional indirect health operating costs* - include the costs of replacement of personnel, strengthening of infrastructure, mobile medical support, public information etc.
- vii) *Increased public and private costs owing to higher sickness rates*- includes the cost of treatment and additional services to be provided to the sick.

Table 2: A typical damage table for the health sector (in Rs crores/US\$ millions)

Item	Repair		Minor damage			
	Units	Avg cost per unit	Units	Avg cost per unit	Units	Avg cost per unit
Hospitals						
Clinics						
Health care stations						
Pharmacies						
Laboratories						
Medical equipment						
Non-medical equipment						
Furniture						
Other						
Total						

1.5 ASSESSMENT OF INFRASTRUCTURE SECTOR

Damage to infrastructure that provides basic amenities and services to the people are frequently damaged by disasters. Basic services like drinking water, electricity, roads etc, if affected not only create difficulties for the community but also pose problems for the relief workers in conducting search, rescue, evacuation etc. A quick assessment of the infrastructure damage would help in the repair and reconstruction process to begin early. Therefore infrastructure sector assessment is crucial in the damage and loss assessment process. In this section, the assessment procedures of energy and water and sanitation are described as examples for other services in the sector.

D) Energy

Energy is a crucial infrastructure that works on a wide network of generation, transmission and distribution facilities. Due to the extensive installations in this sector, the possible damage due to disasters is also immense. Energy sector can be assessed by electrical energy and oil energy. While direct damages to both the sectors refer to the immediate damage to infrastructure and inventories available in a disaster. Indirect losses refer to the costs of meeting the energy demand during the recovery period and loss of profit thereon.

A) Electrical Sector

Disasters have direct impact on three major components viz generation units, transmission lines and distribution grids and power distribution centres. The damages are calculated as follows:

- i) *Electricity Generation Plants* - refers to all the facilities attached to hydro-electric, geothermal or conventional power plants driven by steam, gas and gas turbines. The facilities would differ with each type of plant. The assessment should include the cost of repair or installation of equipment and machinery that deliver power to the generator, equipment used for processing of the energy and the buildings that house all generating equipment.
- ii) *Transmission and Distribution Systems* - includes transmission, sub-transmission and distribution lines and grids as well as all electrical sub-stations used for transmission of power from generation plants to final consumers.
- iii) *Energy Distribution Centres and other Works* - includes electricity measurement and dispatch centres with state-of-the art machinery and equipment and buildings for administrative offices.

Indirect losses in this sector include the additional cost of meeting the interim energy demands during the reconstruction period and also the net income lost to companies during this period. The method of calculation is explained below:

- i) *Temporary Electricity Supply* - The cost incurred for supplying electricity through other means will depend on the time required for rehabilitation, which in turn depends on the magnitude and extent of damage caused by the disaster. This involves estimating the temporary demand for electricity in all sectors (residential, industrial, commercial) and the operating costs on the basis of fuel requirements and cost of delivery through temporary arrangements.
- ii) *Other Indirect Losses* - include profits not received by the electricity utility during the rehabilitation period. This would be the difference between the net income during normal times and the income estimated in the disaster scenario.

B) Oil Sector

In a disaster, the oil sector sustains damages to its production, refining and distribution facilities. The direct damages in this sector are estimated on the basis of the following:

- i) *Production Facilities* - refers to structures, equipment and facilities, on-shore or off-shore, used on drill and operate the production wells. They include control rigs, deep drilling rigs, off-shore platforms and the network of pipelines and equipment for production.
- ii) *Oil Refineries* - includes all installations, processing towers, storage facilities and pipelines.
- iii) *Distribution Facilities* - Dedicated facilities for distribution and sale of the final product (gas and oil) and bituminous residues (used in road construction) are included in this sector
- iv) *Other Facilities* - includes the buildings used for administrative purposes.

Like the electricity sector, indirect losses include the additional cost of meeting the requirements for oil and oil derivatives during the rehabilitation period and the profit lost during this time. Specifically, it includes impact on:

- i) *Temporary Supply of Oil and Oil Derivatives* - cost of providing oil products through alternate means
- ii) *Other Indirect Losses* - implies the income loss to the sector during the rehabilitation period.

The damage and loss in these sectors are broken down into domestic and foreign currency for purposes of balance of payments and into public and private sector costs for purposes of national accounting. The energy sector assessment is intrinsically linked to environmental assessment due to incidences of oil spill, release of toxic substances etc.

II) Drinking Water & Sanitation

One of the most crucial social infrastructures, water and sanitation issues have great epidemiological implications during a disaster. Early restoration of this sector plays a role in avoiding spread of infections and epidemics in a post-disaster scenario and constitutes a public health priority. Assessment of this sector requires a multi-disciplinary and holistic approach among its component elements. The sector consists of three major sub-components viz drinking water supply systems, wastewater disposal systems solid waste collection and disposal systems. A brief overview of the damage and loss assessment is given below:

Direct Damages

- i) *Drinking Water Supply Systems:*
 - a) Damage to infrastructure and equipment (urban and rural) with respect to type of repair or materials required, unit construction prices at replacement value and cost of repairs.
 - b) Loss of stocks (chemicals, stored water, spare parts and other assets)
- ii) *Wastewater Disposal Systems:*
 - a) Damage to infrastructure and equipment (urban and rural)
 - b) Loss of stocks (chemicals, spare parts equipment etc)

Recovery and Reconstruction

iii) *Solid Waste disposal systems:*

- a) Damage to infrastructure and equipment
- b) Damage to access routes to facilities and dumps
- c) Impact of waste disposal dumps

Indirect Losses

i) *Drinking Water Supply Systems:*

- a) Rehabilitation activities like distribution through tankers, purchase of equipment, overtime to tanker drivers etc.
- b) Reduction in potable water output due to damage or contamination at source.
- c) Reduction in operational costs due to partial functioning of the system.
- d) Increase in potable water production costs.
- e) Losses due to income not received.
- f) Insurance coverage.

ii) *Wastewater Disposal Systems:*

- a) Rehabilitation activities (network inspection, repairs etc).
- b) Reduction in treatment capacity.
- c) Increase in wastewater treatment costs.
- d) Losses due to income not received.
- e) Insurance coverage.

iii) *Solid Waste Disposal Systems:*

- a) Losses due to income not received.
- b) Decrease in solid waste collection and disposal.
- c) Insurance costs.

In a larger macro-economic perspective, damage to water and sanitation facilities may result in diversion of funds from existing or planned projects to disaster rehabilitation activities and an adverse balance of payments scenario with reduced export and increased imports, decline in public finance etc.

Check Your Progress III

Note: Use the space provided for your answer

1) How would you assess the affected population in a disaster?

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2) Describe the direct and indirect losses in the health sector.

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1.6 ASSESSMENT FOR ECONOMY AND ENVIRONMENT

The well-being of a society and its quality of life is dependent to a large extent on the economy and environment. While the economy has a direct bearing on the economic well-being and social status of the people, the state of environment affects the overall quality of life. The economic sector primarily consists of agriculture, manufacturing and commerce and service sectors. In this section, the agriculture sector is covered as an example of the production sectors.

A) Agriculture

The agriculture sector is most affected by hydro-meteorological disasters like floods, storms, cyclones, droughts etc. Hazards of geological origin like earthquakes and landslides have a localized direct impact, but far-reaching indirect impacts like food shortage or damage to storage facilities. The products of the agriculture sector are processed and sold by the commerce sector, so the assessment specialist for agriculture should work closely with that of the latter.

The direct damages to agriculture refer to losses of capital assets. They can be classified as:

- i) *Damage/Loss of agricultural fields* - refers to the loss of fertility of the field, which may take a long time to recover. This is done by assigning a value to what the land would have produced in 10 years based on its average productivity per hectare.
- ii) *Damage to agricultural infrastructure and equipment* - refers to infrastructure like irrigation and drainage channels, storage areas, chicken coops, aquaculture pools etc that are damaged or destroyed and farming equipment used.
- iii) *Production losses* - includes the crops ready to be harvested that were destroyed. If the disaster occurs when the crops were still growing, only losses to labour and inputs need to be accounted for.
- iv) *Losses of stock* - includes already harvested produce, if any, livestock, stock of seeds or other inputs.

Indirect losses in agriculture sector refer to the losses due to decrease in production through the recovery period and the cost of the mitigation efforts to prevent such damage in future. Estimated time for recovery and re-establishment of production and supply chain are critical factors in assessing the indirect losses. An intrinsic feature of the agriculture sector in developing economies is the “backyard economies” carried out by women as a source of subsistence purposes or for additional income generation. Though run with minimum investment, these activities provide for food needs of many households. The losses in such activities are total in a disaster and recovery is difficult. Related impacts like loss of employment, adverse food and export balances, output and prices are indicators of loss. The following framework can provide an overview of the damages in this sector.

Table 3: Overview of the damages in Agriculture Sector

Aspects likely to be damaged	Agriculture	Fisheries
Source/Assets	<ul style="list-style-type: none"> ● Loss of farmland due to erosion, salinity or sedimentation. ● Loss of livestock. 	<ul style="list-style-type: none"> ● Rivers, ponds and lakes due to environmental degradation, pollution, changing river courses or any other cause.
Tools, equipment and infrastructure	<ul style="list-style-type: none"> ● Infrastructure and tools such as ploughs, carts, tractors, storage sheds etc. ● Damage to irrigation structures like check dams, canals etc. 	<ul style="list-style-type: none"> ● Boats and nets ● Fisheries and aquaculture infrastructure (fishing ports, cold storages etc).
Inputs & products	<ul style="list-style-type: none"> ● Seeds, fertilizers for subsistence crops and cash crops. ● Harvested crops. 	<ul style="list-style-type: none"> ● Catch/ production of fish, prawns etc.
Access to inputs & resources	<ul style="list-style-type: none"> ● Availability of resources, skills and knowledge for replacement and repairs. ● Capacity to procure. 	<ul style="list-style-type: none"> ● Availability of resources, skills and knowledge for replacement and repairs. ● Capacity to procure.
Employment & Income	<ul style="list-style-type: none"> ● Loss of income due to temporary paralysis of activities. <ul style="list-style-type: none"> — for both men and women engaged in the economic activity. — for different types of ownership like single farmer, cooperatives, self-help groups etc. 	

B) Environment

The environment has a critical effect on the like of the communities. While environment is an asset, providing resources like food, water, energy, it also provides services like dilution and transformation of waste, carbon sequestration, maintenance of water cycle etc. While extreme events are a part of the ecosystem process, the interaction between ecosystem and human systems result in various environmental changes, which may have adverse impacts on the human society. Damage to environment due to disasters can be direct, through loss of soil cover, deforestation etc or indirect, through increased pollution, habitat or biodiversity loss etc.

Assessment of environmental damage consists of estimating the changes brought about by the disaster to the ecosystem. The following table gives an idea of the range of services provided by various ecosystems.

Table 4: Range of services provided by various ecosystems

Ecosystem	Goods	Services
Agro-ecosystem	<ul style="list-style-type: none"> – Food & Fibre crops – Crop genetic resources 	<ul style="list-style-type: none"> – Maintain Watershed functions (infiltration, soil protection,) – Provide habitat for birds, pollinators, soil organisms – Build soil organic matter – Sequester atmospheric carbon
Forest ecosystem	<ul style="list-style-type: none"> – Fuel wood & Fodder – Timber – Drinking & Irrigation water – Non-Timber Products (honey, herbs etc) – Genetic Resources 	<ul style="list-style-type: none"> – Remove air pollutants – Emit oxygen – Cycle nutrients – Maintain watershed functions (soil stabilization) – Maintain biodiversity – Sequester atmospheric carbon – Moderate weather extremes and impacts – Generate soil – Provide for aesthetic enjoyment and recreation
Freshwater ecosystem	<ul style="list-style-type: none"> – Drinking and irrigation water – Fish – Hydro-electricity – Genetic Resources 	<ul style="list-style-type: none"> – Buffer water flow (control timing and volume) – Dilute and carry away wastes – Cycle nutrients – Maintain biodiversity – Provide aquatic habitat – Provide transportation corridor – Provide for aesthetic enjoyment and recreation
Grassland ecosystems	<ul style="list-style-type: none"> – Livestock (meat, leather etc) – Water for human consumption and irrigation – Genetic resources 	<ul style="list-style-type: none"> – Maintain array of watershed functions – Cycle nutrients – Remove air pollutants and emit oxygen – Maintain biodiversity – Sequester atmospheric carbon – Generate soil – Provide for aesthetic enjoyment and recreation

Ecosystem	Goods	Services
Coastal ecosystem	<ul style="list-style-type: none"> – Fish and shellfish – Fishmeal – Sea-weeds (for food and industrial use) – Genetic resources 	<ul style="list-style-type: none"> – Moderate storm impacts – Provide wildlife habitat – Maintain biodiversity – Dilute wastes – Provide harbours and transportation routes – Provide for aesthetic enjoyment and recreation

In post-disaster assessment, the changes in the goods and services need to be checked. The apparent changes should be assessed in terms of:

- i) *Unusual landform/geomorphic changes* - may occur after earthquakes, landslides, volcanic eruptions.
- ii) *Changes in natural drainage* - caused due to changes in river courses or drainage systems which may have a long-term impact on the ground and surface water reserves.
- iii) *Soil degradation* - soil erosion after floods, salinity after tsunami or seawater ingress or silting can lead to long-term impacts on the productivity, which in turn affects the farming community. Impacts on common property resources like grazing land affects the livestock and related sectors.
- iv) *Destruction of trees* - Disasters like cyclones, tsunamis, floods etc cause large-scale destruction of tree cover, affecting the community. There is need to know the species, number and location of such damage.
- v) *Water contamination* - contamination of water bodies and sources have serious implications on the health of the affected community
- vi) *Loss of unique plant/animal species and their habitat* - Loss of habitat due to a disaster can result in loss of biodiversity.

The environmental damages have to be assessed in a participatory manner so that the local knowledge, context and dependencies with relation to the environment are incorporated without any bias.

1.7 ASSESSING DAMAGE TO WOMEN AND VULNERABLE GROUPS

Disasters often have a differential impact on women primarily due to the socially sanctioned gender stereotyping, which identify them as victims. It is increasingly accepted that development would not be sustainable unless more vulnerable groups like women, children, aged etc are incorporated into the system and their special needs met. It is also accepted that the needs of these more vulnerable groups have to be incorporated within each sector of assessment, rather than a separate assessment format. For example, the housing and settlement sector needs to take into account the needs of these vulnerable groups within its framework. This should be encouraged to build capacity of the most vulnerable groups, favour gender equity and empower the marginalized.

Though women are looked upon as care-givers and their activities unpaid and given a much lower status than men, they contribute to the household income through a variety of “backyard” or informal sector activities. As a consequence of

disasters, the women face complete destruction of their activities. Not only do they face direct damages like loss of house or means of production, they also sustain high opportunity costs because they lose income because of the time spent in emergency related activities and increased amount of unpaid reproductive work.

The impact of disasters on women can be assessed through the following:

- i) *Activity profile* – changes in activities post-disaster for eg, time taken for collection of water or firewood.
- ii) *Access and control profile* – refers to access to resources and opportunities like education, income etc. This analysis helps identification of the impediments for equitable participation.
- iii) *Analysis of influencing factors* – Changes in family headship, family income etc have a bearing on the socio-economic status of women and their coping capacities. For example both the access and control profile and activity profile may change with a woman becoming the head of the household.
- iv) *Needs and priorities* – On the basis of the analysis the specific needs of women should be incorporated in the rehabilitation mechanism.

Check Your Progress IV

Note: Use the space provided for your answer

1) Why is it necessary to estimate damage and loss to the environment?

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2) What factors govern assessment of the impact of disasters on women?

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1.8 LET US SUM UP

In this unit, we have learnt that damage and loss assessment is a post-disaster activity that informs the ensuing reconstruction and rehabilitation process. Though various methodologies are available for assessing damage and loss, the ECLAC method is the most widely accepted tool that estimates the cost of repair and reconstruction of damaged assets and the loss in income flows that will not be realized until the asset is repaired or replaced. Assessment is done for social, infrastructure and productive sectors based on the stock and flow analysis.

1.9 FURTHER READINGS AND REFERENCES

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UNIT 2 RECOVERY PLANNING

Structure

- 2.0 Objectives
- 2.1 Introduction
- 2.2 Disaster Recovery Planning: A unique Windows of Opportunity
- 2.3 Conceptualizing Disaster Recovery
- 2.4 Factors Affecting Recovery
- 2.5 Disaster Recovery Plan
- 2.6 Pre- Disaster Recovery Planning Process
- 2.7 Post- Disaster Recovery Process
- 2.8 Let Us Sum Up
- 2.9 Further Readings and References

2.0 OBJECTIVES

This unit covers the process of disaster recovery planning. It implies that much of what will happen in an emergency or negative impacts of a disaster can be reduced through prudent pre and post-disaster recovery planning. This knowledge allows individuals and communities to anticipate the types of disasters that are likely to affect them, and to think of ways to reduce the impact, or prevent disasters altogether.

By the end of this unit, you should be able to:

- describe the process of disaster recovery planning;
- understand the factors affecting disaster recovery process;
- specify components and characteristics of disaster recovery plan; and
- analyze the linkage between disaster and development.

2.1 INTRODUCTION

In the case of most natural disasters, history is filled with examples of communities which are rebuilt in the same places, in the same manner as previously, only to suffer the same perils when disasters recur. One of the earliest messages that emerge from modern disaster recovery research is that public decisions taken in the heat of the emergency period immediately following a disaster often compromise significant opportunities to rebuild a safer community for the future. Disaster victims have an inherent desire to rebuild rapidly and return to normal - to the way things were before the disaster. Pressure to restore normalcy can be so strong that safety, hazard mitigation, and community improvement goals can be compromised or abandoned.

For many years, disasters have been treated as separate events, and relief has tended to ignore the implications of disaster for social and economic development society. The most basic issue in disaster is its impact on the poor. It is not an accident that, when a natural disaster strikes, some sections of society suffer disproportionate losses. The socio-political, economic and ecological context defines the vulnerability of different groups of people to negative impacts from natural and man-made

disaster. The social position and importance of different ethnic, caste, and gender groups in society determines entitlements and actual access to resources, support and services. Until recently the connection between disaster and development was not recognized. Disaster was not seen as providing an opportunity to aid development.

2.2 DISASTER RECOVERY PLANNING: A UNIQUE WINDOWS OF OPPORTUNITY

Disaster often highlights the inherent weakness in a society and often forces a reappraisal of its development path. In a sense, the aftermath of a disaster can provide a unique window of opportunity to assess the socio-economic vulnerabilities that contributed to the disaster in a society. For instance, disaster experience gives opportunities to identify fault lines in the development policies: the mistakes of past development policies and strategies, which resulted in increased risks. The disaster experience may also helps to develop a new awareness of risk. It may facilitate generation of a new knowledge, which is in turn expected to bring various stakeholders together around a shared awareness of the nature of risk. In addition, disaster recovery is a phase which expose institutional weaknesses: the corruption, lack of human resources and weak institutional structures that allowed high risk planning land use and discouraged appropriate monitoring before the disaster have been exposed. In a nut shell, it can be said that critical decisions, that previously unaddressed, can no longer be ignored and choice must be made during disaster recovery planning.

It is observed that most often there is a period- window of opportunity- to incorporate a planning framework into the disaster recovery effort. It is also an ideal time to raise awareness and to re-examine socio-economic vulnerability patterns and to plan for the future disasters.

2.3 CONCEPTUALIZING DISASTER RECOVERY

Disaster may be defined as an event that causes a temporary break in the normal life of a community. The time between the disaster occurrence and the point at which normal activities are re-established is considered the recovery time. The goal of both governmental and non-governmental agencies is to reduce this time.

Total recovery from a disaster is measured in four ways: (1) emotional recovery of the victims; (2) economic recovery, including replacement of the income lost, the restoration of jobs and/or the means of production, and restoration of the markets; (3) replacement of physical losses, which includes replacement of personal belongings, the home, and in some cases, the replacement of land; and (4) replacement of opportunity. In order to develop appropriate responses to shorten recovery time, it is necessary to understand what factors can affect time of recovery and the different effect of different strategies.

2.4 FACTORS AFFECTING RECOVERY

The aftermath of a natural disaster can be an extremely demanding period for public officials seeking to restore normalcy to the community and to rebuild. There are many factors that control the amount of time between the disaster and a return to normal.

- 1) **Risk of secondary disasters:** Many hazards are accompanied by second events. For example, an earthquake can be followed by a series of secondary tremors.

These may last for only a few days or for as long as several months. Some tremors may even be stronger than the original earthquake. Survivors may be reluctant to begin reconstruction or even salvage materials from the rubble until the threat of a secondary disaster has passed.

- 2) **Uncertainty regarding possible relocation:** Most often, the victims are uncertain as to whether or not they can safely remain at their previous home site or at the place they had moved to after the disaster. They will hesitate to engage in long-term activities. Uncertainty about relocation can be caused both by a reluctance to occupy a site that was vulnerable in the disaster and by uncertainty about government intentions regarding relocation or resettlement.
- 3) **Delayed materials:** The speed with which recovery begins depends on the availability of tools and materials. In almost every disaster, there are adequate resources for rebuilding either in the community or in the surrounding region. Access to these materials, however, may be reduced by official actions, such as evacuation. In those cases where materials are not available, reconstruction will be delayed pending arrival of adequate supply the necessary materials.
- 4) **Expert advice:** One of the major problems following a disaster whose advice to follow. At all levels of the disaster-affected community—from the government's relief officials to the field directors of voluntary agencies, down to the local inhabitants themselves - people are constantly bombarded with information, much of it conflicting. Persons at all levels of the disaster relief system, and especially those with no previous disaster training or experience, are constantly faced with the dilemma of interpreting the information and deciding on its relevance to their situation. This advice may not be suited to the local situation: it could be too highly technical; it may not be cost-effective; or it may not be culturally acceptable. Often the people offering the advice are not qualified to give it. Motivated but inexperienced volunteers provide most of the labor for relief operations. While the advice they give is often based on the best of intentions, it usually comes from preconceived ideas as to what a relief operation should be, not from training or experience. Thus conflicts of opinion are bound to arise. The problem of conflicting expertise and advice can be overcome only through adequate pre-disaster planning and training of relief personnel at all decision-making levels within the relief structure.
- 5) **Inflation and market instability:** In situations where material is available, recovery time is influenced by its cost. If prices are not controlled and high inflation occurs, recovery time will increase. Similarly, an unstable market affected by speculation or hoarding will prolong reconstruction, as will excessive customs delays in cases where building materials must be imported. To be effective, prices must be controlled in all parts of the market.
- 6) **Land tenure problems:** Politically sensitive and among the most difficult factors to address are land ownership, land distribution, and legal land reform. After a disaster, these issues are often further complicated by such questions as: Should victims be assisted to rebuild on land that is not their own? Where landless people should be resettled? Who will provide the land?
- 7) **Public rejection of plans:** Often in the rush to provide assistance, agencies will undertake programs without considering their acceptability to the victims. There are numerous examples of victims rejecting aid offered by interveners, both governmental and non-governmental. The reason may be that the aid is culturally unacceptable or unaffordable. Whatever the reasons, time and effort, not to mention the expense, will be lost, and the intervener will have to begin again. The time lost is an extension of recovery time.

- 8) **Surveys:** While surveys can be valuable aids to planning emergency or reconstruction actions, if they are properly planned and develop relevant information. However, in some cases, actions have been delayed until surveys are completed. The problem is not that surveys are not needed, but rather the type of data that is most appropriate and the method that should be used to obtain it. The loss of this time can mean loss of resources and commitment that would be invaluable in reconstruction.
- 9) **Irrelevant aid:** The arrival of massive amounts of useless relief goods, untrained personnel and volunteers, and untrained officials all add second strategy, but it does require an understanding of disasters. Typical actions are provision of building materials for use in temporary shelters that can later be incorporated into permanent housing; the normal economic systems; and setting up work programs for victims that not only provide resources but also accomplish reconstruction objectives.
- 10) **Bureaucracy:** Disaster response requires a streamlined decision- making process, flexible standard operating procedures, and good internal communications.

In short, to accelerate the recovery process, agencies must provide or restore the infrastructures of a community, provide the materials required, and make opportunities for the victims.

2.5 DISASTER RECOVERY PLAN

The breakdowns and disruptions to a community's social fabric and infrastructure, caused by a major disaster, can be addressed by collective problem solving and planning, through the long-term community recovery process. This process enables the community to come together-as a whole-to make post-disaster decisions and prepare for long-term community recovery needs. Through this process, the community is empowered to do more than simply react, and the recovery from a tragic disaster becomes an opportunity. The result of the process is often a plan, strategy, or framework where the community can rally behind goals, objectives, and initiatives that move them toward their recovery vision.

A well-organized plan rooted in accurate factual detail can make the disaster recovery process manageable. By planning each activity before a disaster, an agency can examine potential hazards and risks thoroughly and make rational decisions without the added pressures of a disaster. While emergency response plans usually address immediate actions such as search and rescue or evacuation, recovery plans can be expanded to provide guidance to structure activities in the transition and reconstruction phases. Plans for these phases should include development of broad objectives and provide a policy framework under which all agencies can operate. An ideal disaster recovery plan will have following features:

- 1) **Clarity of policy and direction:** One of the most important tasks for those in positions of authority is to provide a clear picture of goals and objectives; the means by which they are to be attained, and the "rules" that govern post-disaster actions. On the basis of these policies and standards, relief and reconstruction assistance can be provided in an equitable manner and delays resulting from indecision can be reduced. Such policies and directions are best developed before a disaster.
- 2) **Leadership:** Leadership is obviously an important factor in the response to a disaster. Choosing the right leadership for the task force itself will vary with the circumstances and may depend heavily on personal characteristics of potential candidates for this role. Because a disaster often involves a good

deal of reliance on outside assistance, a clear choice of leadership for managing long-term recovery and reconstruction also provides a central point of contact, information, and accountability for the outside world. This, in turn, increases the community's ability to marshal the external resources it needs.

- 3) **Guidelines for communication:** There is a need for good communications during all phases of a disaster. The emphasis, however, should not be on improving the means of communication (that is, radios and other electronic communications equipment), but on improving the flow of information and the type of information communicated. Good communication is the art of knowing what type of information to send; how to prepare it in such a way that it is relevant to the needs of those receiving it; and communicating with the right people.
- 4) **Technical accuracy:** The plan for post-disaster recovery and reconstruction must tap broad combination of resources and expertise in order to reflect the complex realities. In any post-disaster program, there are always questions that need to be answered by competent technical personnel. This information must be available and presented in such a way that it will be comprehensible to those who are working at each level of the program. Formation of an interdisciplinary reconstruction planning task force is the best way to guide the process of constructing the plan. Organizing appropriate representation on the task force is as important aspect of interdisciplinary planning effort. Two questions are worth to consider at this point: whose participation is essential in guaranteeing technical accuracy and thoroughness for the plan? and whose participation and support will enhance its social acceptability?

Those involved in mitigation activities will bring to the process their professional knowledge of the structural implications of attempting to minimize or eliminate dangers to life and property from natural hazards. These players include planners, environmental specialists, and building inspectors. In soliciting building public support and to ensure social acceptability for the plan, it is wise to involve non-governmental representatives in the task force. Non-profit service delivery agencies often have a major stake in the plan, considering the resources they often are called upon to deploy in the aftermath of a disaster.

Civil society organizations representing the most hazard-prone areas of the community may be better able to implement the plan if they have been part of the process and learned along the way what stakes are involved in ensuring the plan's success. For instance, Local business organizations can play a major role not only in developing a consensus on the recovery plan among the local business community but in providing important perspectives on the challenges involved in facilitating economic recovery. Religious institutions often provide volunteers, shelter, and food in disaster situations and probably deserve a role in helping devise the means of reducing the severity of the crisis beforehand. All of these constituents of the community have played a role in some task force somewhere, but the right mixture for any one community will depend on its history, local politics, the nature and extent of its natural hazards, and the resources needed.

- 6) **Sources of Resource mobilization:** Post-disaster programs are dependent upon an adequate flow of cash. Because the costs of purchasing materials on a large scale will be fairly high, and financial institutions are themselves likely to be disrupted, agencies may experience difficulty arranging credit, and many items or services will have to be purchased with cash: Agencies can anticipate these problems and develop mechanisms to avoid lengthy delays.

Check Your Progress I

Note: Use the space provided for your answer.

1) What are the important features of a disaster recovery plan?

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2) What is the main factors affecting disaster recovery process?

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2.6 PRE-DISASTER RECOVERY PLANNING PROCESS

A common misconception of recovery is that it begins when the disaster response ends. Long term recovery starts on Day 1 post-disaster; however, it is true that governments often focus on response operations, and on stabilizing the situation, can often times be overwhelmed by the enormity and complexity of the recovery challenges at hand.

The starting point of the planning process must be an identification of the hazards facing the community and the risks they pose to life and property. Hazard identification and risk assessment can said to be the cornerstones of mitigation. Before discussing the process, some key terms needs to be discussed. These are **hazard identification**, vulnerability assessment, and risk assessment. The term hazard identification refers to the process of “defining and describing a hazard, including its physical characteristics, magnitude and severity, probability and frequency, causative factors, and locations/areas affected.” **“Assessing vulnerability”** means taking stock of the degree to which human life and property are exposed to damage from that hazard; in other words, how much damage and loss of life could the community conceivably suffer? This is differentiated from risk assessment, which focuses on probabilities and is described as a process for “evaluating risk associated with a specific hazard and defined in terms of probability and frequency of occurrence, magnitude and severity, exposure, and consequences.”

Hazard Identification and Risk Assessment

The first step in hazard identification and risk assessment involves mapping the known natural hazards, a procedure that will vary with the nature of the disaster. Regardless of these variances, the first step is to document all of them and identify as accurately as possible the areas potentially affected by them.

The second step in hazard identification and risk assessment is to develop an inventory, to the extent possible, of the built environment that potentially would

be affected by these hazards. This inventory not only will indicate the extent of possible damage from the hazard but will also serve as a rough indicator of the threat to human life because people tend to be where transportation or buildings are, and the total or partial collapse of structures or parts of structures is a primary cause of death and injury in a disaster. This potential damage to life and property is what constitutes vulnerability, and the likelihood of that damage-quantifying the probabilities-is what constitutes risk. A flood in an unpopulated and unbuilt area, for example, poses little or no risk. On the other hand, the risk posed by even a modest earthquake in a metropolitan city can be quite high.

Because predicting the future is strictly a matter of probabilities, the only certain data come from past experience. Thus, planners documenting risk must include in their reports the history of previous natural hazards events, their magnitudes, and an inventory of the human and property damages that occurred. Those magnitudes should be expressed numerically, in a statistical or other mathematical measure, such as the Richter scale (earthquakes), Saffir-Simpson scale (hurricanes), Fujita scale (tornadoes), or flood probabilities (for example, an x-year flood). It is important to build into the process, preferably with the use of computerized databases and Geographical Information System (GIS), a pre-disaster inventory of vulnerable structures and to use this information to evaluate building performance on a geographic basis.

Developing Community Consensus on Disaster Recovery Planning

Developing community consensus is an important aspect of recovery planning. A plan for post-disaster recovery and reconstruction is unlikely to succeed unless it enjoys broad and knowledgeable support both from the public and the government. The challenging question is how to build and maintain that consensus and support. The process of building consensus has two stages. The first involves building consensus around the very need for a plan in the first place. Planners will likely find a need to build public acceptance of the value of planning for post-disaster reconstruction, particularly where the risk is perceived as distant or infrequent. Gaining acceptance of the need to address natural hazards serves as the prelude to the second stage, that of developing a plan and building consensus around its goals and policies. At this point, the planning process is accepted, and the debate is over the specific goals that will emerge and the means of realizing them.

In addition, the recovery plan should contain reasonably extensive and effective opportunities for public input and comment before it is adopted, and those opportunities should allow for meaningful public education in the bargain. Because the plan will need both to be updated periodically and to undergo revisions in the aftermath of actual disasters, it is important to include provisions for ensuring continued public education and input on the plan's goals and purposes.

Institutionalizing Recovery Planning

Some of the important questions that need to be considered during the recovering planning are who will coordinate the process and oversee compliance with the intent of the post-disaster plan? There is no single answer to this question, but there are several possibilities that have worked or can work, depending on local traditions, local government structure, and other factors that may influence this decision, such as the nature of the jurisdiction.

Developing a set of guidelines/operational policy is another important aspect in the process of institutionalization of recovery planning. It involves establishing a line of reporting and designating responsibility for implementing recovery and reconstruction. The process of disaster recovery will proceed more smoothly if a post-disaster plan already has established the mechanisms and timelines for various agency representatives to perform their assigned tasks and to report to the lead agency in order to keep the recovery process well-coordinated.

Evaluating and Updating the Post-disaster Plan

One final issue must be considered in completing the inventory of post-disaster plan elements-that of keeping it current. Plans that age without periodic revision become largely irrelevant, but it is not hard to build into a plan provisions for revisiting the issues addressed and updating the elements in light of new experience. Including a program for periodic review and revision also allows a community to measure its progress and ensure implementation of those actions it decided to address in the pre-disaster period. With the widespread and growing use of various types of community and sustainable development indicators, planners have the opportunity to use this process in the post-disaster plan to incorporate into those indicators measurements of the community's progress toward a more disaster-resistant future.

It does little good to learn valuable new lessons about natural hazards affecting the community if none of them are put to use. It is essential to prepare in the post-disaster plan a means for incorporating those lessons as rapidly as possible into the development regulations that will guide the reconstruction process. This may be, however, one of the most challenging elements of the entire plan precisely because it takes time to study, identify, and analyze new hazards information from a disaster, and even more time to craft regulations in response to them. It is often not possible for all rebuilding to await such analysis. But the plan should contain policy statements indicating clearly, before the disaster occurs, that the most hazardous areas will not necessarily be rebuilt. While it is likely to be impossible to apply these lessons to all post-disaster reconstruction, it is better to apply it where possible than not at all. Providing for some process of review and revision that will allow this to happen is an astute move for any local government.

Check Your Progress II

Note: Use the space provided for your answer.

- 1) What are the steps in hazard identification and risk assessment?

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- 2) What are the important aspects of pre-disaster recovery plan?

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2.7 POST-DISASTER RECOVERY PROCESS

No community can reasonably ratchet up the size of its staff or its stockpile of equipment to meet all the contingencies that might occur in a disaster. The sensible approach is to identify these potential shortcomings and remedy them through mutual aids that allow the community to call upon outside resources when they are needed. The post-disaster plan offers an opportunity for community self-assessment to determine where potential deficiencies in resources and personnel

might surface following a disaster. The post recovery planning process involves following aspects:

Temporary shelter: Providing the temporary shelter to victims is a part and a function of emergency response, but recovery planners should play a vital role by identifying appropriate sites in advance. Emergency shelter sites generally revert to their original uses, such as schools and community centers, after the recovery period, but other forms of temporary housing, including manufactured housing, can and often do become more permanent than may have originally been envisioned. Planners can help to ensure during the pre-disaster period that, if this happens, the sites identified for such housing are zoned appropriately.

Assessment of building conditions and overall damages: The Preliminary Damage Assessment (PDA) is an ongoing task that may take different forms at different stages of response and recovery, starting with a minimal survey, involving observations from passing vehicles by, police, and emergency management personnel, to more detailed and in-person surveys by building inspectors. The function of damage assessment should be included and addressed as an element in a post-disaster plan regardless of the magnitude of the disaster as a matter of clarifying lines of responsibility.

Restoration of utility services: Restoring utility services is an essential prerequisite for beginning economic recovery and for restoring some measure of comfort to those whose routines have been disrupted. It is a matter of public safety, as well, for local firefighting ability is at stake when electrically operated water pumps no longer work. It can also be a matter of life and death for home-bound elderly people, the disabled, and others.

Establishment of reconstruction priorities: Public facilities often suffer as much damage as private property in a disaster. Civic buildings, fire and police stations, hospitals, and schools have all suffered damage or destruction in major disasters. One critical function of a post-disaster plan is to establish the community's priorities concerning reconstruction of these facilities, given the obvious fact that limited resources and personnel may not allow simultaneous rebuilding of everything.

Financial assistance: Knowing where to access financial assistance both for restoration of business activity and for residential reconstruction allows for a more smoothly functioning process of recovery and reconstruction. This is the primary reason why the effective use of disaster assistance was identified as a policy objective of the plan. People are deeply concerned about money in the recovery period following a disaster.

Re-occupancy standards and permitting: Post-disaster conditions can pose a bewildering variety of threats to public health and safety, many of them lurking in residential buildings and in workplaces. The safety of residential buildings is particularly crucial because of their round-the-clock occupancy. When and under what conditions may people reoccupy partially damaged structures? Clearly, the goal is to rehouse people as soon as this can be done safely. The plan needs to establish how the work involved in performing this task can be done expeditiously and the standards that will be applied for interim reoccupancy of damaged structures. These policies need to be established in the pre-disaster period, though the implementation will flow out of the information generated through the damage assessment process.

Land Use planning: Of the various categories of elements in the post-disaster plan, this section is the most crucial. The overall intent is to provide for the means of learning valuable new land-use lessons from the disaster, to enable the disaster prone areas to incorporate them consistently into its mitigation plans and to amend its post-disaster plan as needed, and thus to minimize future risk by fostering a

culture of adaptation to new information. This is, in other words, the primary feedback loop. More specifically, the appropriate amendments would tend to focus on updating priorities for changes in land uses or properties for acquisition or various forms of hazard mitigation.

Replanning of stricken areas: Replanning uses the new lessons about local hazards to reshape the community’s long-term vision. This function ought to be addressed in two stages: *pre-disaster and post-disaster*. The *pre-disaster* portion of this element would entail the identification of areas that may not be rebuilt after a disaster, accompanied by options for how those areas may be treated during the post-disaster period. The post-disaster aspect would consist of a review and analysis of these same areas to determine the most appropriate resolution of the planning problems they present.

Coordination with non-profit relief services: The first step in direction is to establish an effective inventory of those non-profit entities that are likely to respond to or be involved with the community in the event of a disaster. For the most part, planners will not deal directly with such services unless they are involved with long-term reconstruction. It is nonetheless valuable to be aware of their role and the external resources they may bring to the community.

Transportation: Disaster victims suffer disconnection with the outside world almost entirely in one of two ways: *loss of communications and loss of transportation*. Disruption of the latter can take a wide variety of forms, as all modes are vulnerable depending on the circumstances. A thorough plan for regional coordination of the restoration of transportation access needs to consider air, water, rail, and street and highway issues.

Coordinated media contact for accuracy and consistency: Natural disasters offer wonderful opportunities for officials at all levels to garner media attention. The cacophony that is sure to result when everyone is allowed to do so is best avoided with a clear plan of action for directing media questions to a single designated source through whom information from other participants can be channeled. Officials drafting post-disaster plans should anticipate different levels of emergencies and consider what might be appropriate based on the geographic extent and magnitude of the disaster. In disaster field offices, both federal and state media representatives are often co-located to facilitate such coordination.

Check Your Progress III

Note: Use the space provided for your answer.

- 1) Describe the important aspect of post-disaster recovery planning.

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- 2) ‘Disaster is a unique windows of opportunity to development process’ Critically analyze the statement.

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2.8 LET US SUM UP

The recovery focus of most communities is to rebuild themselves so as to become safer and stronger than before the disaster. It is important for planners to remember that the first day of the post-disaster period is also the first day of the pre-disaster planning period that should precede the next event. When that lesson permeates the community's thinking, the identification of new lessons can serve as a powerful driver for all elements in the post-disaster plan, most particularly including the process of reevaluating and updating the plan after each disaster and modifying appropriate linkages with the local comprehensive plan as well. Thus, the progression from identifying new lessons to their incorporation into an amended plan should be seen not as a sequence of planning steps, but instead as a closed loop that leads to steady improvements in shaping a more disaster-resistant community. The most explicit way to remind the entire community of the need for reassessment is to include in the plan itself a discussion of planners' intent to revisit the hazard identification section of the plan after any disaster in order to incorporate new lessons.

2.9 FURTHER READINGS AND REFERENCES

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UNIT 3 PHYSICAL RECOVERY AND RECONSTRUCTION

Structure

- 3.0 Objectives
- 3.1 Introduction
- 3.2 Concept of Disaster Management Cycle
- 3.3 Components of Recovery
- 3.4 Transition of Housing Recovery after a Major Disaster
- 3.5 Principles and Approaches for Post-disaster Recovery
- 3.6 Linkages between Physical Recovery and Development
- 3.7 Gujarat Earthquake Reconstruction Programme – A Case Study
- 3.8 Let Us Sum Up
- 3.9 Further Readings and References

3.0 OBJECTIVES

By the end of this unit, you should be able to:

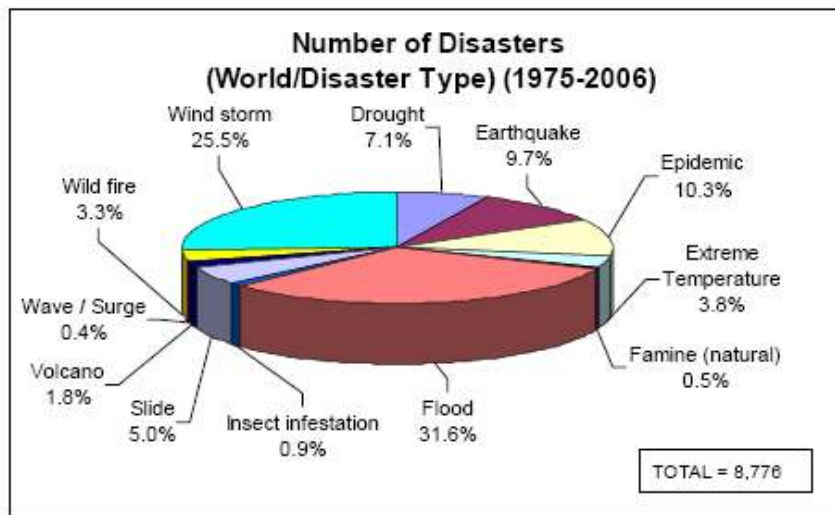
- understand the concept of disaster management cycle;
- specify the components of disaster recovery;
- explain the principles and approaches for post-disaster recovery; and
- analyze the linkages between physical recovery and development.

3.1 INTRODUCTION

Disasters continue to strike unabated and are perceived to be on the increase in their magnitude, complexity, frequency and economic impact. The unique geophysical climatic setting, unplanned development activities, development of exposed areas and population explosion of the Indian sub-continent make this region highly vulnerable to all types of natural disasters. Each disaster is a unique experience in terms of destruction, panic and fear among the population, which requires tremendous efforts to bring back normalcy.

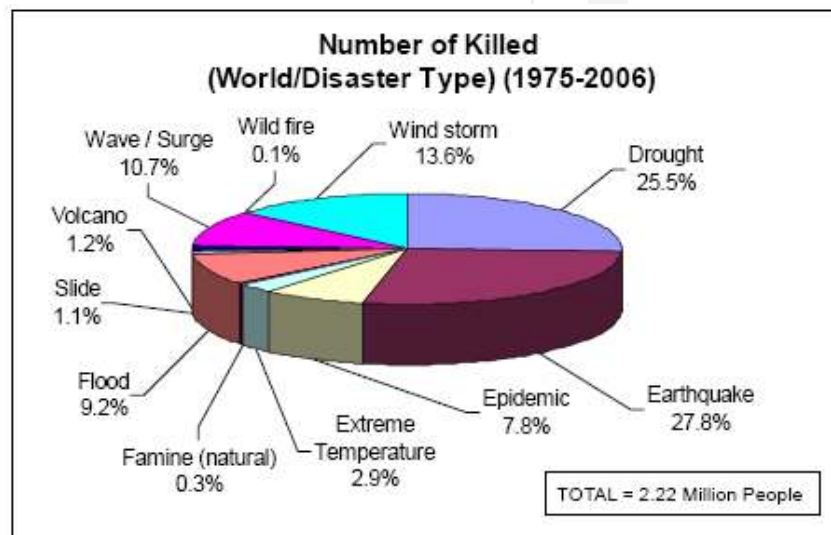
Based on the data over a period of 1975-2006 from CRED-EMDAT, most frequent type of disaster affecting the world is floods (31.6%) followed by wind storm/cyclones (25.5%) and earthquakes (9.7%) (Figure 1.1). However, it can be summarized that the earthquakes are the major killer of people at global level (27.8%) followed by droughts (25.5%) and wind storm/cyclones (13.6%).

As far the Asian region is concerned, it is severely disaster-prone and vulnerable to both hydro-meteorological and geophysical disasters. Major disasters affecting the region are floods, cyclones and wind storms, earthquakes, landslides and epidemics. In this region about 73% of the disasters consisted of floods, cyclones and wind storms, followed by earthquakes (9%), landslides (8%) and epidemics (4%). Besides India, floods are very common in China and Bangladesh, contributing high death toll. It is to highlight that the majority of economic losses are sustained due to adverse impact of cyclones, windstorms and earthquakes on the built environment. It may be noted from the figure 1.3 that during 2006, earthquakes and tsunami in Indonesia caused considerable human and property losses (about 41%) in Asia, followed by floods, wind storms and landslides.



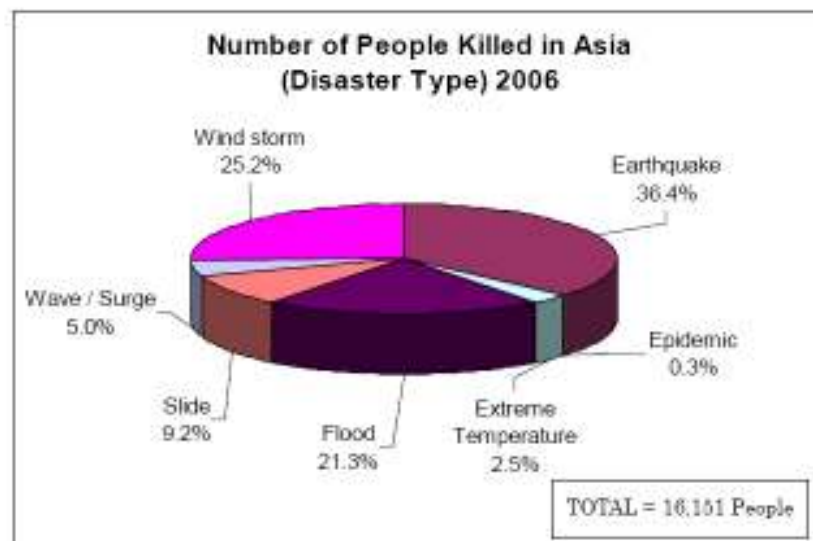
Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2006

Fig. 3.1: Proportion of Disasters Worldwide by Type, 1975-2006



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2006

Fig. 3.2: Proportion of People Killed Worldwide by Type of Disaster, 1975-2006



Source: CRED-EMDAT, Université Catholique de Louvain, Brussels, Belgium, 2006

Fig. 3.3: Proportion of People Killed in Asia by Disaster Type, 2006

Many parts of the country are susceptible to different types of hazards; when these hazards combine with vulnerable conditions due to inadequate development and socio-economic disparity, a situation like disaster is created. India as a country keeps on facing disasters of varying magnitude which, sometimes result in large number of deaths and severe property damage. Key hazards prevalent in the country as well as some of the major disasters with their frequency are listed in the following table:

Table 3.1: Hazard Prone Areas with Major Natural Disasters in India during 1990 - 2007

Hazard	Areas proneness	Recent major disasters
Cyclones	Coastal States particularly in the East Coast and Gujarat are vulnerable to cyclones	<ul style="list-style-type: none"> ● Andhra Pradesh (1990) ● Andhra Pradesh (1996) ● Gujarat (1998) ● Orissa (1999)
Floods	North, north eastern, coastal states are prone to high floods. About 8 percent land mass of the country is vulnerable to floods	<ul style="list-style-type: none"> ● Every year with varying intensity
Earthquakes	Northeastern states, Himachal Pradesh, Jammu and Kashmir, Uttarakhand, Gujarat and Andaman & Nicobar Islands are highly prone to earthquakes. About 59 per cent of total area is in Seismic Zones III, IV & V.	<ul style="list-style-type: none"> ● Uttarkashi, M6.6 (1991) ● Latur, M6.3 (1993) ● Jabalpur, M6.0 (1997) ● Chamoli, M6.8 (1999) ● Bhuj, M6.9 (2001) ● Kashmir M7.4 (2005)
Landslides	Sub- Himalayan and Western Ghats are vulnerable to landslides	<ul style="list-style-type: none"> ● Frequency - infrequent
Drought	Arid and semi arid areas of the country are prone to droughts. About 65 per cent of net sown area is vulnerable to drought	<ul style="list-style-type: none"> ● Frequency - every 2/3 year at national level
Others	country is prone to other types of natural hazards like tsunami, avalanches, cloud burst etc.	<ul style="list-style-type: none"> ● Tsunami 2004 (Frequency - rare) ● Avalanches (Frequency - infrequent)

Source: Compiled from different sources

Another important characteristic of disasters in India is that various states are prone to multi-hazards. There are situations when the same state is affected by different types of disasters in a same season or a year. For examples; in 2009 summer the northern parts of Karnataka state were facing severe drought like conditions while in the monsoon season the same area faced unprecedented floods. Similarly, states like Bihar, West Bengal, Assam and Orissa etc. are prone to multi-hazards. When the disasters strike any part of the country, it results in huge socio-economic losses. In recent years, losses in the Orissa Cyclone in 1999, and later, the Gujarat Earthquake in 2001 alone amount to huge economic losses.

Natural hazards like earthquake, cyclone, flood etc. become disasters when these phenomenon causes destruction to the built environment resulting in huge devastation due to poor construction practices. To overcome disaster like situations, there is always a need to start a comprehensive response and recovery programme at national level. There are several disasters which are known for excellent post disaster recovery programmes and got appreciation at national and international level. At the same time there are large numbers of disaster which were not able to generate the desired level of enthusiasm among the stakeholder to initiate the recovery programmes.

Disasters of varying magnitude and intensities keep on occurring in India on a regular basis. A few of these have been highly devastating. There were several disasters that have impacted the country during the last 10 years, causing significant and widespread damage to life and property. These disasters had disrupted the normal pattern of life in the affected regions due to severe impact on socio-economic and physical infrastructure, including public and private properties.

The damage pattern of few select disasters events have been described in table 1. The major disaster, which are of unprecedented nature require rehabilitations and reconstruction of affected areas. Among the various disasters listed in Table 2 Gujarat earthquake had a formal reconstruction programme. Details of the efforts made by the Government of Gujarat have been discussed in the last section of the chapter.

Table 3.2: Damage due to Recent Disasters in India

Year and Place of occurrence		Impact
2001	Bhuj Earthquake	Huge devastation, 13805 people killed. Large-scale damage to urban built environment. This ranks among the most severe earthquakes in independent India in terms of loss of life and property.
2004	Asian Tsunami	Earthquake of Magnitude 9.3 off north Sumatra coast generated devastating Tsunami waves affecting several countries in South East Asia. In India Andaman & Nicobar Islands, Tamil Nadu, Pondicherry, Andhra Pradesh and Kerala were affected and about 12400 people lost their lives
2005	Kashmir Earthquake	Earthquake occurred in POK causing huge devastation. In India, the State of Jammu and Kashmir suffered heavy damage to property. About 1300 people killed
2008	Bihar Floods	Floods in 2008 were of unprecedented nature; their effect had been catastrophic which inundated more than 2500 villages in 18 districts of North Bihar. The flood caused colossal loss of life and property affecting about 5 million people. The death toll rose to around 1000 and rendered some 3 million people homeless.

Source: Analysis of various documents

3.2 CONCEPT OF DISASTER MANAGEMENT CYCLE

Disaster management is a discipline, which deals with avoiding risks as well as aims to minimize the probable losses from hazards. It also provides prompt and appropriate emergency management as well as effective early recovery. The concept of Disaster Management Cycle (DMC) illustrates the process of achieving the effective disaster management in a systematic manner (Figure 2.1). If applied in right earnest the cycle lead to well prepared, effective early warning systems with programmes to reduce vulnerabilities. At the same time, the cycle also results in effective recovery comprising of rehabilitation and reconstruction of affected society. The DMC may be divided broadly into two parts as:

- Pre-disaster management - comprised of those activities which are generally initiated before a disaster strike like prevention, mitigation and preparedness. These terms can be defined as following:
 - a) Prevention - generally means those activities which help in avoiding the occurrence of a disaster situation
 - b) Mitigation - generally refers to those activities which help in minimizing the impact of a disaster through a series of structural and non-structural measures.
 - c) Preparedness - refers to those activities and measures which are taken in advance to ensure effective response in case of an emergency. Development of preparedness plans, organizing drills, issuance of early warning and evacuation of people from threatened locations are some of the activities under preparedness.
- Post-disaster management - comprised of those activities which are generally initiated after a disaster has already struck like response and recovery. These terms can be defined as following:
 - a) Response - refers to those actions and activities which are taken to provide immediate assistance to maintain life, improve health and support the morale of the affected community after a disaster has struck. Generally, response is comprised of search, rescue and provision of relief efforts.
 - b) Recovery - basic aim of recovery programmes is to bring affected region and community to normalcy. It is a very important aspect of disaster management which is further classified into rehabilitation and reconstruction phases. The recovery phase provides a development opportunity to incorporate necessary measures to curtail future disasters. Under this stage the provisions from temporary housing to well laid out socio-economic infrastructure facilities do take place. Further details about the recovery programmes have been discussed in following sections.

Figure 3.4: Disaster Management Cycle



3.3 COMPONENTS OF RECOVERY

As discussed earlier the actions taken during the period following the emergency phase is often defined as the recovery phase. It is very difficult to draw a line between the different stages of response and recovery. However, the two stages have very distinctive characteristics. The recovery is comprised of rehabilitation and reconstruction of disaster affected community and area. The precise time when response ends and recovery starts, depends on various factors like disaster type, the extent of damage, level of preparedness, coping capacity of the affected community, the legislative and administrative powers to recover from such situations and political stability and resolve to recover from such situations etc.

The recovery process starts immediately after the disaster. The affected community starts recovering from the damage and losses incurred due to the impact of disaster. However, the entire process of post-disaster recovery process can broadly be divided into three major parts as described in the following Table 3.

Table 3.3: Components of the Recovery Process

Components	Time Line	Activities to be taken care
Short term recovery (Response)	Up to one month	<ul style="list-style-type: none"> ● Damages, loss and need assessment ● Support for food, cloths and emergency health ● Temporary shelters ● Restoration of infrastructure
Medium term recovery (Rehabilitation)	Up to one year	<ul style="list-style-type: none"> ● Intermediate shelters ● Continued support for food, cloths and health ● Establishment of institutional mechanism ● Mobilization of resources ● Socio-psycho care ● Opening of schools etc.
Long term recovery (Reconstruction)	Several years	<ul style="list-style-type: none"> ● Restoration of permanent housing ● Restoration of physical and social infrastructure ● Documentation of lessons learnt

The short term recovery is the response phase and not much emphasis is given to the physical recovery process. The medium term and long term recovery basically constitute the physical recovery process. The medium-term recovery process refers to key activities which facilitates transition from response to recovery. The long-term recovery activities include socio-economic rehabilitation, reconstruction of housing, infrastructure and business etc. Another way of classifying the recovery process is as discussed in the following paragraphs:

Recovery and Reconstruction

- Rehabilitation or medium term recovery refers to the actions taken in the aftermath of a disaster to restore basic services and life supporting activities to bring pattern of life to that level as it was existed before the disaster. Based on the activities rehabilitation or short term recovery process can be further classified as following:
 - a) Physical Rehabilitation - the restoration of all physical assets and infrastructure like housing, electricity supply, water supply, sewerage, roads and bridges, irrigation networks, communication networks etc.
 - b) Social Rehabilitation - the restoration of medical, health and education activities in the affected areas as well as the psycho-social care, trauma counseling do take place under this category. Various social welfare schemes for women and children of the affected areas are also taken care under this category.
 - c) Economic Rehabilitation - aims to bring the affected community into the mainstream again. Various programmes and activities taken up at this stage are focused towards development of livelihood activities of agricultural farmers, labourers, artisans etc. At this stage special programme to provide immediate employment to the affected community are generally started; if the situation warrants specialized training programmes for generating livelihood options may be started. Few activities like social forestry and food for work programme etc. are usually taken up at this stage.
 - d) Other Related Programmes and Activities - programmes and activities under this category include remaining welfare schemes. Few important activities like rehabilitation of environment, debris recycling and management, repair and restoration of monuments are few of the prominent activities taken up here.
- Reconstruction is the stage where all programmes and activities taken up at rehabilitation stage are provided with the permanency. Thus, the reconstruction is the stage where long-term development plans are taken up which takes care for future disaster risks and possibilities to reduce such risks by incorporating appropriate measures. The main motive here is to build back better. The focus here is not only to provide facilities but in a better manner to counter the possibilities of future disasters.

The experience gained from the post-disaster management programmes at national level indicate that number of efforts had been taken to bring back life to normalcy, under response and recovery programmes after all disaster events. However, most of the disasters end up with response and relief distribution without systematic formal recovery or reconstruction programmes. Analysis of such programmes reveals that there have hardly been any concerted efforts to undertake formal reconstruction programmes and linking such programmes with the preventive measures to reduce risk due to future disasters.

Unfortunately, there are limited numbers of formal post-disaster recovery and reconstruction programmes taken up, which are limited to select mega disasters only. Thus, there appears to be a missing link between post-disaster reconstruction and rehabilitation programmes and disaster prevention (structural and non structural), mitigation and preparedness activities after most of the disasters. There are number of examples where repeat or successive disasters have caused considerable damage in the same areas as can be seen from the following two events:

- 13,000 were killed in 1934 M8.3, Bihar- Nepal earthquake. In August 1988, 900 people were killed in the M 6.6, Darbhanga earthquake. Both events caused huge devastation.

- Anjar town in Kutch District was destroyed due to 1956 M7.0, Anjar earthquake. In January 2001, the town was again destroyed by the M 6.9, Bhuj

As such there is no clear recovery and reconstruction policy at national level. These two examples also highlight the need for well-designed and implemented post-disaster reconstruction programmes at the national level, with very well established risk mitigation measures to counter future risks. In absence of such programme and policy guidelines, same places and communities face same disasters in successive events.

3.4 TRANSITION OF HOUSING RECOVERY AFTER A MAJOR DISASTER

It takes a lot of time (in cases up to several years) to shift the affected population into a permanent housing from the damaged or destroyed house. To reach the permanent house, the households have to pass through various stages of transitional housing, which are not necessarily at the same place. All these stages have their own considerations and implications. Various stages of transitional housing may be classified as:

Table 3.4: Stages of Transitional Housing

Housing stage	Time line	Description
Emergency shelters	First few days to weeks	Immediate shelters are the places where an affected community find place to live immediately after a disaster like school, tents etc. Generally limited amenities are provided in such shelters. However, limited provisions for food, water and sanitation are made. Here, people live together with no privacy. Cooked food is supplied to all the residents. Generally, there is no provision for independent spaces and entire community stays together. Depending on local conditions and type of disaster, people may be required to stay in such shelters from few days to few weeks before either they return to their homes or shift to temporary shelters. The emergency shelters have environmental considerations similar to crowded places. Such situations require adequate provision for hygienic conditions by providing safe food and drinking water, adequate sanitation, ventilation within the camps and appropriate lighting arrangement etc.; in such conditions one of the major

Recovery and Reconstruction

		concerns is to control of epidemic outbreak. Such facilities must provide sufficient protection against natural elements like rain, wind, heat and cold etc.
Temporary Shelters and/or Temporary Housing	First few weeks to years	Temporary or intermediate shelters are those places where people have to stay after emergency period is over and till the time they are provided with adequate permanent houses under reconstruction phase. It is an improved version of the earlier stage. Every family gets an independent space for living with proper demarcation of spaces for cooking, bathroom, and sleeping. Here, disaster affected people may be staying in such shelters for longer durations (may be in years). At this stage efforts are made to provide an independent space to every family or to a group of families. These shelters are semi-permanent in nature with a provision of bare minimum facilities required for living. Structure should be erected in such a fashion that they can withstand the vagaries of nature in the immediate future. Like in case of earthquake disaster affected areas, there are always chances of aftershocks, so such houses should be able to withstand these shocks. Similarly, the houses should have appropriate provisions to take care of security against natural effects like rain, extreme heat and cold conditions. Adequate light and ventilation arrangements for all houses must be ensured. The semi-permanent/permanent provisions for safe drinking water and adequate sanitation etc. are a must. Under this stage people have to be provided with semi permanent type of bathroom/toilets, kitchen with adequate arrangements for sewerage discharge.
Permanent Housing	Several years	Permanent houses are provided to the affected community after completion of reconstruction phase. These houses have necessary facilities and appropriate environment for a decent

		<p>comfortable living. Planning the village/site layouts and individual dwelling units require a lot of consideration to accommodate traditional living styles and local cultural values. Use of building material and construction practices also required to be carefully selected, because traditional building material and techniques have been evolved based on the local climatic conditions and availability of good building materials. New building material and construction technology may not be fully accepted by the locals. Site selection for new location of the affected village requires not only appropriate soil investigation but also other socio-economic-environmental considerations, based on the local hazard profile. If the reconstruction has to be made on new site, the land acquisition from agriculture and forest land is required, which have its own implications. A careful process and consultations have to be followed with the affected/beneficiaries. Similarly, distance from newly established village/site/location from the exiting site/village require careful examination, which may develop further complications. Proper debris disposal/management, if the construction has to be made on the same site. A proper strategy need to be evolved about the reuse of the debris so generated (especially in case of an earthquake).</p>
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3.5 PRINCIPLES AND APPROACHES FOR POST-DISASTER RECOVERY

There are basic principles which need to be looked into before implementing the recovery programmes. Few of such principles to be followed are:

- Empowerment of local community to take care of recovery process. It is always desirable to have local community involved in the recovery process as it requires local resources.
- Involvement of local community and give them the ownership of the recovery programme
- Give due considerations to the local traditional values, customs with preference to the local material. Priority of the local community shall form the basis for development
- Incorporate disaster risk mitigation components into the recovery process. As discussed in the earlier section, without disaster mitigation efforts, the recovery process may fail in next disasters. Similarly, adopt a holistic and comprehensive multi-hazard approach taking into consideration all possible hazards, which

are prevailing at local level as well take care of linkages with the pre-disaster management.

- To achieve these planning principles, one has to have a strong dedicated leadership at all levels including grass root leaderships.

Disaster events especially big earthquakes have potential of converting a bustling habitat/city/town into ruins. There are several big earthquakes in the recent past at international level, which had caused huge devastations. Majority of such earthquakes disasters had resulted in massive to big recovery programmes. In recovering the earthquake affected areas from disaster situations various models and approaches had been used for effective post-disaster recovery process. Some of the models prevalent at international level include the owner-driven approach, the subsidiary housing approach, the participatory housing approach, the contractor-driven approach in-situ, and the contractor-driven approach ex nihilo. Table 5 indicates the damages caused and recovery strategy adopted for recovering the earthquake affected areas from few of these earthquakes.

It has been observed that two major approaches had been used for recovery of disaster affected areas in India. The approaches can be summarized as following:

- Redevelopment approach is where state governments had played a very effective role in physical recovery and economic rehabilitation of affected areas. In such cases the government procures funding from agencies like World Bank, Asian Development Bank or similar national or international agency for recovery of the disaster affected areas. Such approaches are very effective in case of large scale disasters. Similar approach had been very effectively utilized in case of Latur earthquake (Maharashtra, 1993) and Bhuj earthquake (Gujarat, 2001) as well as several cyclone reconstruction programmes in Andhra Pradesh during the decade of 90's. One of the major highlight of this approach is that a major portion of resources is generally spent on housing and physical infrastructure. As the external agencies are involved with clear guidelines to incorporate mitigation efforts, such recovery programmes result in disaster safe infrastructure and housing.

Table 3.5: Reconstruction Strategy in case of recent earthquakes at International Level

Earthquake and Country (Year)	Death Toll	Economic Loss US\$ (billion)	Damaged housing units and need of repair, reconstruction	No. of years to complete the project	Implementing Organization	Approach adopted
Bhuj, India (2001)	13805	6	1143624	2	GSDMA	Owner driven and in-situ, minimum relocation
Chi-Chi, Taiwan (1999)	2455	12	74255	4	Earthquake post disaster recovery commission	Temporary houses and for some special categories permanent houses
Marmara, Turkey (1999)	17000	6	43850	4	PMU (PMO)	in-situ and relocation

El quindo, (1999) Columbia	1185	1.6	80000	3	Kobe city and Local govt.	relocation and in-situ
Kobe, Japan (1995)	6401	84.4	448929	6	Fondo Redesl Eje Cafetero	Large scale temporary housing
Latur, India (1993)	7601	300 million	220000	6	PMU	relocation and in-situ repair
Mexico City, Mexico (1985)	4000	4-5 (housing)	72000	5	Low Income housing reconstruction programme	in-situ reconstruction

Source: The Kutch Earthquake 2001- recollection, lessons and insights

- Limited intervention approach is where assistance given to affected households with limited or no controls over its use. Here affected families are provided limited assistance and supervision to recover from the disaster. In certain cases the assistance given to affected households with checks and counter-checks for utilization of funds as per programme guidelines has also been observed. NGO driven community participation with checks and counter-checks for utilization of funds as per programme guidelines. Community participation to be facilitated in the design of dwellings/settlements, monitoring of quality of construction and procuring of various documents required for establishing entitlements of land.

The approaches adopted so far for post-disaster reconstruction programmes have resulted in mixed outputs. A number of massive reconstruction programmes had been initiated to rebuild the earthquake and cyclone affected areas of the country with financial assistance from internal and external agencies, including the World Bank. The state governments implemented the World Bank assisted reconstruction programmes. These programmes were trendsetters in terms of empowering communities and emphasizing much on structural and non-structural mitigation efforts at the respective state level. Similarly, there are number of instances where the respective state governments had initiated reconstruction programmes, which could not generate much enthusiasm either on public participation or mitigation efforts. For example, the reconstruction programme after number of big disasters could not create much needed impetus for effective earthquake risk mitigation programme through community participation. The experiences gained from such post disaster reconstruction programmes may be termed as a missed opportunity to improve upon and streamline the existing system.

3.6 LINKAGES BETWEEN PHYSICAL RECOVERY AND DEVELOPMENT

The major emphasis during the post-disaster management programmes is to bring back life to normalcy. It has been observed disaster after disaster that such efforts are limited to merely relief distribution with limited efforts to recover the affected society. There are numerous examples at national level where disaster management initiatives have neither been initiated nor integrated into a well thought out disaster recovery programme. The physical recovery process after a big disaster generally starts at the end of the response phase and it may continue for several years. The

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aim of such programmes is to bring life back to normal, with an emphasis on creating better and safer living conditions in the affected areas than what existed before the disaster, through construction of safe housing, lifelines and infrastructures facilities. Such programmes must be designed in a manner that would certainly have the long term sustainable approach beyond survival and relief.

Post disaster recovery programmes provide opportunity to work with communities and serve local needs. For a successful recovery programme there are certain prerequisite like empowerment of affected community, decentralization, concentration on mitigation efforts and minimum relocation, which needs to be taken care of. Post disaster recovery is a complex issue with several dimensions. Government, non-governmental and international organizations have their own stakes in such programmes, and links must be established among them, as well as with the community. While developing the community resilience for disaster risk mitigation, it may be kept in mind that the area may face other type of disasters as well in future. Therefore, the opportunity under post disaster recovery programme must be availed to build multi-hazard safe built environment, including infrastructure facilities in the area.

It had been observed that the performance of the reconstruction programmes depend upon the implementation mechanism established by the local government for this purpose. Thus, there is a need for establishing an effective institutional mechanism at local level for making post disaster recovery programme a success. Unless such mechanism is in place, it will be difficult to implement multi-hazard comprehensive and holistic approach, which also emphasize upon establishing linkages between disaster risk mitigation and regular development programmes at local level. To make a successful recovery programme, initial analysis must be based on detailed damage and needs assessment of the affected regions with appropriate allocation of funds for carrying out the required recovery of the affected areas. Here, it may be kept in mind that in case of Gujarat earthquake, government of Gujarat established the Gujarat State Disaster Management Authority (GSDMA) immediately after the earthquake. The GSDMA took care of entire post earthquake recovery phase. The GSDMA not only implemented the recovery programme very effective, it is able to establish the linkages between development and disaster risk mitigation and management at all level and in all sectors.

There are few leading lights at national levels for highly effective post disaster recovery programmes. The post earthquake reconstruction programmes taken up in the state of Maharashtra after the Latur, 1993 earthquake and in Gujarat after the Bhuj, 2001 earthquake are still considered one of the best practices at national and international level for their achievements, these programmes were able to establish with effective risk mitigation in respective states. Besides these two programmes, reconstruction programmes in the state of Andhra Pradesh after the cyclones of 1990 and 1996 were also taken up. All such programmes had resulted in very well laid out activities for physical and socio-economic recovery as well as linking reconstruction with the preventive methods for taking care of future disasters. All these programmes have very strong inbuilt components on capacity building of the affected communities to counter physical as well as socio-economic vulnerabilities at local levels. There is a need for a long term post disaster recovery strategy to solve the recurring disasters at national level. The proposed strategy must appreciate linkages between prevention, mitigation and preparedness for effective control of disasters, as well as the post disaster response and recovery operations.

The recovery programmes emphasize upon creating better living standards in the affected areas than what existed before the disaster through construction of disaster safe lifelines and infrastructures facilities. Disasters, whether caused by earthquake, flood, fire or high winds, can disrupt even basic amenities like sanitation, safe

drinking water, housing, schools and healthcare. In such a scenario, it becomes utmost necessary to utilize the post flood reconstruction programme to build all such facilities in an appropriate manner, which will definitely help in reducing the vulnerability of the state for future disasters.

The recovery after a disaster provides an opportunity to improve the existing system and to make it disaster resilient. Thus it becomes important to stress upon adaptation of proper building standards, materials, technologies and land use planning. The broad learning from the recovery programmes taken up at national level in India may be summarized as:

- It is possible to reduce loss of life and property through preventive measures, if it is included in the recovery process.
- Preparedness at every level and all concerned sectors/agencies is necessary to have effective response.
- Pre-Disaster Recovery Planning is a must to ensure better coordination among various sectors at different levels. Such planning needs to be formalized in the shape of manuals and Standard Operating Procedures so that there is no confusion during and after disasters.
- There is a big need to document the lessons learnt from recovery programme after every disaster event.

To develop a link between post-disaster recovery programmes and effective development to take care of future risk mitigation activities, few of the steps may be taken are as following:

- **Developing a risk sensitive land use** - Land-use changes and zoning regulations are important tools to mitigate the impact of impending disasters. Physical recovery proved that opportunity to incorporate this aspect. In case relocation or even redevelopment of an affected area is considered, it becomes much easier to introduce the land use planning and zoning regulations. By adopting these guidelines the population density can be managed within prescribed limits as well as change in the existing land use in high risk areas can result in mitigation for future disasters.

Under the post Bhuj earthquake reconstruction programme, four severely affected towns of Bhuj, Bhachao, Anjar and Gandhidham were redeveloped. One of the very effective methods used there was change in existing land use planning. In these town the densely populated urban areas were cleared of damaged building for well spread out road network and more open areas and parks. This approach not only reduce future risks but also provide spaces for carrying out emergency operations during response phase as well as provide sufficient space for evacuation and erection of emergency shelters in case of a future disaster.

- **Disaster safe housing and infrastructure development** – The recovery process highlights the importance on rebuilding the affected community by reconstruction of housing and infrastructure. At this stage not only the housing and infrastructure is built again, it is built with high standards to resist the future disasters. To take care of improved standards specialized building codes and planning guidelines need to be prepared. Since most of the damaged houses are located in remote rural areas in smaller villages and hamlets comprising of economically poor inhabitants; such houses are generally built with traditional locally available building material comprised to bamboo, thatch, wood/timber etc. In such a scenario, it is appropriate to develop a strategy to maintain continuity with the existing system through development of appropriate technology, imparting education and training, creating awareness for inducting improved technologies and upgrading the skills of local artisans

and building infrastructure. The indigenous technologies of house construction have very important inbuilt disaster resistant feature which needs to be retained and additional features for safety of the houses needs to be added in the new houses. The mitigation strategies adopted must recognize and integrate the positive elements of traditional construction practices, locally available building materials and the cost-effective traditional coping mechanisms of the people residing in risk prone areas. It is important to emphasize during this phase upon the building standards, materials, technologies and planning apart from architectural guidelines that permit local artisans and households to build functionally efficient housing in response to their own needs, affordability and creativity combined with adequate resistance to withstand destabilizing forces during disasters.

- **Retrofitting of housing and lifelines** – it is a very common observation that original structural inadequacies like inappropriate design and execution, degradation in the strength of material over a period of time and inadequate upkeep of the structure or even due to unsafe alterations carried out over a period of time, buildings/houses become deficient in strength. During the recovery phase many existing buildings, specially the lifelines, are found deficient against future disasters; such buildings require retrofitting. The retrofitting provides that required additional strength to structures and enable them to resist future disasters. There are various means and methods adopted for retrofitting, which are further classified into structural and non-structural retrofitting techniques. It is again a very common observation that pilot retrofitting programmes are taken up on pilot basis after a big disaster caused by an earthquake or a cyclone. After a big disaster considerable damage is usually observed to heritage structures, which require repair and retrofitting. These structures are normally old structures, and therefore weak against the devastating forces of hazards. To reduce the vulnerability of such structures it is always advisable to retrofit such structures.

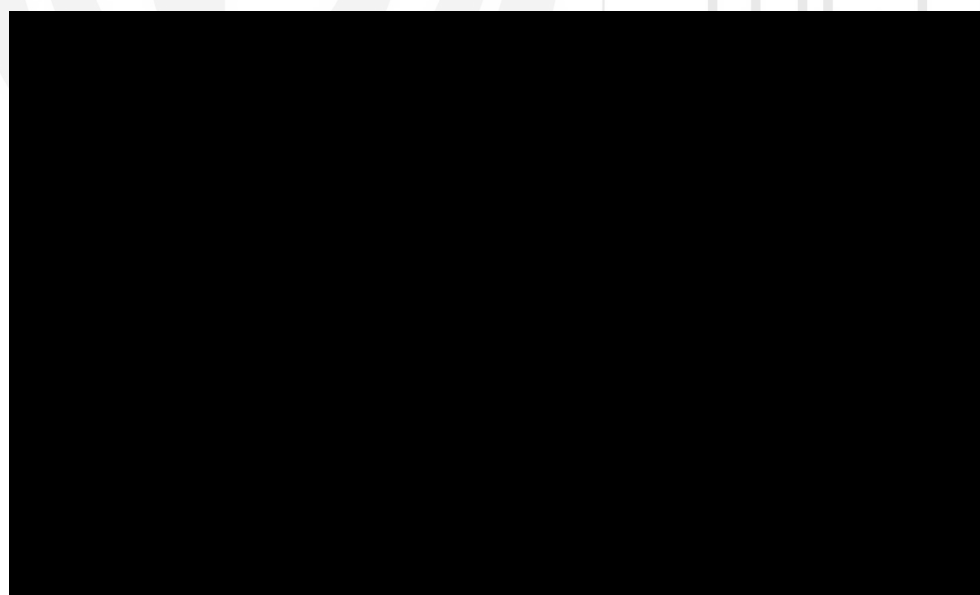
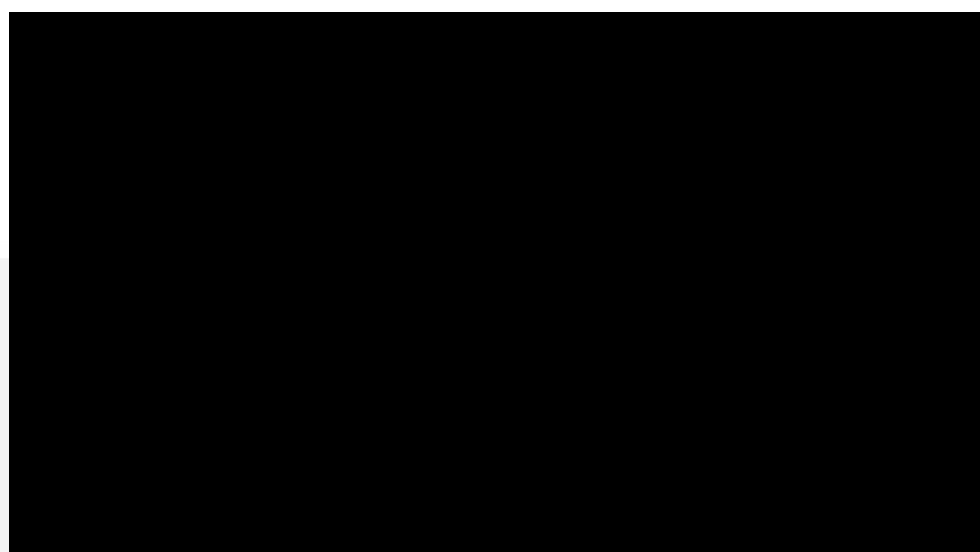
3.7 GUJARAT EARTHQUAKE RECONSTRUCTION PROGRAMME - A CASE STUDY

The state of Gujarat was struck by an earthquake of magnitude 6.9 on Richter scale on 26 January 2001. The earthquake caused widespread damages to the built environment of the affected areas. The earthquake resulted in huge devastation to life and property. More than 7500 villages in 21 districts of the state were affected. Four towns of Kutch district were devastated as well as the capital city of Ahmadabad was affected badly. About 13805 people lost their lives and another 1,67,000 people faced injuries of varying degrees due to this earthquake. The earthquake caused wide spread devastation in all sectors including industries, education, health, telecommunication, water supply, roads and highways etc. Thousands of people including artisans lost their means of livelihood in the wake of the disaster. The earthquake disaster was termed as a calamity of rare severity. Figure 3.5 indicates the damage to housing sector due to the earthquake. Figure 3.6 shows the estimated reconstruction cost after the Bhuj earthquake.

Table 3.6: Important information related to the Earthquake

Date and time	26 January 2001 at 8:46 am
Magnitude	6.9 on the Richter scale
Epicenter	20 km Northeast of Bhuj Town
No of districts affected	21 out of 25 districts

Most affected areas	Kutch, Ahmadabad, Jamnagar, Rajkot and Surendranagar
Death toll	13805
Affected villages	7904 villages affected in 182 Talukas in 21 districts
Affected population	15.9 million (42.06%) affected out of total population of 37.8 million
Total estimated loss of damage	Rs. 21262 crore



Post-earthquake Management

The Government of Gujarat (GoG) had set up the Gujarat State Disaster Management Authority (GSDMA) for the reconstruction and rehabilitation of the earthquake affected area immediately after the earthquake. A loan was taken from the World Bank and the Asian Development Bank for the rehabilitation and reconstruction of affected areas besides various other bilateral agencies had also provided financial assistance for this purpose. Number of international NGOs also came forward to assist the state government in the time of crisis and to help in recovery process of the affected areas of the state. Several National level

Recovery and Reconstruction

organizations like the Housing and Urban Development Corporation (HUDCO) and the National Housing Bank (NHB) etc. had provided financial assistance for the recovery process to the state government.

A large number of NGOs, national and international, participated in the relief operations. Many of these NGOs gradually withdrew after the completion of relief phase, as they did not have sufficient resources to participate in the reconstruction program. However, a number of NGOs continued and contributed to the rehabilitation and reconstruction programme as well. The government actively sought support from NGOs in the recovery process on partnership basis. To fulfill the huge requirement of finances, the cost of reconstruction was funded through the various sources. Besides the loan and grants from international agencies, other prominent contributors to this aspects was the government of India and the state government of Gujarat, Relief Funds of the Prime Minister and Chief Minister and assistance from the corporate sector and NGOs. Physical achievements under Gujarat Emergency Earthquake Reconstruction Project (GEERP), initiated by the Government of Gujarat are as following:

- 1,143,367 houses restored by repair and reconstruction
- 929,682 houses repaired
- Reconstruction
 - i) 213,685 houses reconstructed
 - ii) 1,082 material banks established to supply subsidized building material including cement
- Public Private Partnership Programme (50% cost by NGOs & 50% by government)
 - i) 289 number of villages adopted by NGOs
 - ii) 37,673 number of houses to be constructed:
 - iii) 24 villages adopted for infrastructure creation by Confederation of Indian Industries
- Relocation of villages
 - i) Full Relocation
 - 2) 24 number of villages
 - 3) 5,225 houses relocated
- Partial Relocation
 - 37 number of villages
 - 10,299 houses relocated

Salient Feature of the Recovery programme

- The recovery programme was the biggest ever such programme undertaken at that time.
- Multi-hazard resistant reconstruction made mandatory to resist cyclones, earthquake and other natural hazards.
- Guidelines were prepared to direct people for disaster safe construction and repair of houses. Masons training manual was also prepared and over 27000 masons and 6000 engineers were trained for multi-hazard resistant housing

reconstruction. Engineers were appointed in villages to supervise housing construction and provide technical guidance.

- Owner driven housing construction facilitated by financial, material and technical assistance by government. Payments were made in three installments for new construction to ensure multi-hazard resistant construction. The second and third installments were given only after verification and certification by engineers.
- Massive information, education and communication activities undertaken to educate people on multi-hazard resistant construction. Over one million pamphlets on safe housing repair and reconstruction distributed in earthquake-affected areas.
- Awareness programme about the safe construction practices and retrofitting of houses were shown in 2500 villages. Shake table demonstrations were done for creating awareness among the masses.
- All reconstructed houses are insured against fourteen types of natural and man-made disasters.
- This recovery programme is one of international best practices. For its highly successful implementation of the programme, the GSDMA was awarded the UN SASAKAWA Award, besides several other national and international recognitions.

3.8 LET US SUM UP

This Unit highlights the concept of disaster management cycle and specifies the components of disaster recovery. The principles and approaches for post-disaster recovery have been explained. Finally the linkages between physical recovery and development have been established.

3.9 FURTHER READINGS AND REFERENCES

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UNIT 4 DISASTER PSYCHO-SOCIAL CARE AND SOCIO-ECONOMIC REHABILITATION

Structure

- 4.0 Objectives
- 4.1 Introduction
- 4.2 Significance of Disaster Psycho-Social Care
- 4.3 Common Psychological Reactions Following a Disaster
- 4.4 Common Reactions among the Disaster Affected Children
- 4.5 Community Based Disaster Psycho-Social Care
- 4.6 Do's and Don'ts in Disaster Psycho-Social Care
- 4.7 Let Us Sum Up
- 4.8 Further Readings and References

4.0 OBJECTIVES

An overview of disaster psycho-social care in India is the focus of this unit. The thrust is on making the learner understand specific psycho-social effects of various disasters, common psycho-social reactions, age specific reactions, Indian models of extending psycho-social services to the survivors. At the end of this unit you should be able to:

- define both the concept of psycho-social support and mental health services;
- explain the importance of disaster psycho-social and mental health care for the health service professionals;
- mention the common psycho-social reactions found among the disaster survivors;
- distinguish between age specific psycho-social effects on adults and children;
- describe the concept of community based disaster psycho-social care model followed in India;
- give an overview of psycho-social care disaster provisions in India;
- identify the roles of different stakeholders in extending psycho-social care provisions; and
- differentiate between dos and don'ts in extending psycho-social care to the survivors.

4.1 INTRODUCTION

The word disaster either natural or man-made reminds us the most horrific images of human sufferings in multifarious ways. However, until recently there has been a general tendency to consider the basic needs of the affected people and therefore, the emphasis was on providing curative care, food, shelter, relief, immunization,

income generating activities, and others. Addressing mental health and psycho-social needs has often been considered as secondary and accessory to the basic needs. Nevertheless, a global realization has evolved and emerged that the loss experience and emotions attached to it are complex and is much more than just the superficial aspect reported by media as witnessing disasters through the eyes of television camera hardly gives true insight into the psychological suffering (Boer and Dubouloz, 2000). As the deep hurt and anguish caused by the loss of human life, as well as the disruption of daily life are far more difficult to overcome, more so in man-made disasters, like riots. Therefore, emotional needs have to be given priority along with relief, rehabilitation and care of physical health.

Thus, mental health management as an essential component in all disaster management plans either for man-made or for natural has recently received top attention from the Department of Mental Health of the World Health Organization (WHO), which defines “health” as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. Mental health is an important component of the well being of people exposed to disasters and critical to successful rehabilitation and development of the societies in the aftermath. Many immediate reactions largely depend upon the physical explicitness of a disaster, such as, *exposure to extreme danger, witnessing near one’s deaths, helplessness, hopelessness, and trauma of having to choose between one’s own survival and that of others* (Murthy, 2000). Therefore, mental health at individual and community level becomes necessity to be maintained to prevent possible psychiatric disorders after any disaster and to maximize the progress of successful rehabilitation and development of communities in post disaster scenario.

4.2 SIGNIFICANCE OF DISASTER PSYCHO-SOCIAL CARE

The terms psycho-social support/care and mental health services are commonly used interchangeably. However, one needs to understand the difference between psycho-social support and mental health services very clearly. Nevertheless, both the services are two sides of the same coin, hence interwoven with one another as parts of a comprehensive and continuum care services.

Psycho-social support in the context of disasters refers to comprehensive interventions aimed to address a wide range of psycho-social problems arising in the aftermath of a disaster. For example, listening actively to the survivors, helping them to restart their daily routine works, helping them to get connected with their near and dear ones, providing legal and paralegal help, may also be considered as parts of this intervention package. Any intervention that helps in reducing the level of actual and perceived stress stemming out of the disastrous situation, and in preventing adverse psychological and social consequences among disaster affected people can be defined as disaster psycho-social support/care services. These services can be provided by imparting basic skills training on the subject to the community level people/workers (CLWs). s/he can be a teacher, anganwadi worker, panchayat member, social workers, local NGO people, local youths, members of mahila mandals, etc.

Whereas, **disaster mental health** services refer to the medical interventions for identification and management of manifest stress related clinical psychological signs/symptoms or of the mental disorders among disaster affected persons. In addition, interventions aimed at mental health and psychological well-being promotion, and prevention of psychological/psychiatric symptoms among disaster affected population are also included under disaster mental health services. These services need expertise services of psychiatrist, psychologists, mental health professionals, psychotherapist, etc.

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The experience of trauma after any disaster is multidimensional and complex, therefore everyone who is trained in this can make a significant difference in the lives of the affected population. The key goals of adopting a community model of disaster mental health and psycho-social care are:

- Preventing long-term psychiatric disorders in the disaster affected society;
- Providing relief from mental suffering and psychological distress;
- Maintaining mental well-being and equilibrium;
- Promoting positive mental health;
- All the above four become more important for the optimal utilization of resources and economic opportunities offered through the community rehabilitation and development programmes (WHO, Division of Mental Health, 1991);
- Strengthening the social support networks in the affected area;
- Facilitating the community participation in all activities taken place in mitigation and relief and rehabilitation phase.

Often it is observed that the affected adults as well as the disaster workers overlook the need to respond and explain things to affected population in any disaster and need extra care and comfort. If the management fails to address their fears and insecurities the internal turmoil and pain can leave them sad, confused and frightened and this will remain with them for a long time to come and affect the social and economic fabrics of the society.

Check Your Progress I

Note: Use the space provided for your answer

- 1) Distinguish between psychosocial and mental health interventions after a disaster.

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- 2) What are advantages of extending psychosocial and mental health services to the disaster affected community?

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4.3 COMMON PSYCHOLOGICAL REACTIONS FOLLOWING A DISASTER

First of all one should understand that any psychological and emotional reaction is not itself all negative, for it can increase the chances of the survival of the victim. Stress becomes a threat to mental health when it overwhelms the capacity of the victims to cope with the new situations by mastering their own reactions. A cauldron of emotional reactions can come to boil after a disaster. Although people react differently to traumatic events on the basis of their experiences and personality, there are number of common responses that are experienced by the majority of those involved. These common post-disaster reactions include

- **emotional** (panic attacks, shock, fear, anger, sadness and guilt feeling),
- **psychosomatic** (sleep disturbances, physical problems like muscle tension, palpitation, headaches, nausea, diarrhea or constipation, and breathing difficulties),
- **cognitive** (repeated thoughts and involuntarily triggering the memories, nightmares, confusion, flashbacks, difficulty in concentrating and making decisions, memory problems, shortened attention span, etc), and
- **behavioural and attitudinal** (disruptions in social relationship, poor motivation and concentration, lethargy, hopelessness, etc) difficulties. Normally, these reactions ‘settle’ over the first week. If, however, they remain protracted and intense and moreover, If symptoms persist for a period of three months or after that the person is very likely to suffer from various psychological disorders.

When one talks of common reactions among the disaster affected population, one should also differentiate between the psycho-social reactions exhibited/expressed by adults and children. Children are affected by any disaster just the way adult are, although their reactions might differ from those of the adults. Disasters disrupt the sense of well-being by destroying normal predictable and consistent life routines of children thus, deeply hamper the process of healthy psychological and personality development. Since children have limited capacities to process information their sense of what happened is often not realistic and they are not able to comprehend the totality of the situation. Therefore, before planning for any type of psycho-social interventions, one needs to understand the common psycho-social reactions shown by children in various age groups.

Check Your Progress II

Note: Use the space provided for your answer

- 1) What are different types of post-disaster psychosocial reactions commonly found among the survivors?

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2) Give some examples of psychosomatic and cognitive reactions. What are the key differences between these two groups of reactions?

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4.4 COMMON REACTIONS AMONG THE DISASTERS AFFECTED CHILDREN

Factors which increase their vulnerability

Children in disasters are often dislocated from their homes, subject to situations which may be difficult and different from their **familiar, comfortable and accustomed lives**. This along with the **death of family members** can be considered as the primary source of stress and insecurity in children. However, **witnessing hundreds of deaths and injured** can result in unhappiness, sadness, fear and worried. Again their and their family members **struggle for food, shelter, and other amenities** can add to their fear and insecurity and continue to threaten their sense of well-being. **Witnessing different forms of violence, social unrest and child abuse** can also raise their level of vulnerability to the maximum and can have lifetime irreversible impact on their personality. While these factors definitely increase the vulnerability of all children coming in the age range of 1-18 years, we must look at the special vulnerability of some children within this bigger group in a disaster scenario. Their needs get compounded by the pre-disaster living conditions of some children and the new demands of post-disaster living conditions. These unexpected living conditions many a times go beyond their normal coping strategies and their ability to adjust with the new situation. The next section will be devoted to the specific situations of these special groups of affected children in a disaster scenario.

Factors responsible for their reactions

The mental health and psycho-social impact of any disaster on children depends largely on the following factors:

- their developmental age,
- type of disasters (disasters caused by manmade hazards affect children's psyche in a much deeper way, e.g. communal riots and terrorism)
- the nature of loss they experienced,
- the amount of exposure to trauma,
- sufferings/devastation they witnessed,
- social support dynamics prevail during that phase of disaster, and
- the nature of post-disaster care specially designed to meet their multifarious needs. Let us look at specific effects of disasters on children in terms of psychological, social and educational repercussions.

Psychological and Social effects include

- Fear, insecurity and anxiety;
- Loss of protected and familiar environment, where children were staying before the disaster. Generally after a disaster there is a drastic change of place of living. It could be in terms of living in a relief camp or temporary shelter or shifting to some other relative's place. This displacement creates tremendous stress in the children;
- Sadness and depression (often difficult to recognize);
- Anger and irritability;
- Behavioural problems like disobeying, argumentative, and aggression, lying, stealing (in later phase if the psycho-social needs are not addressed);
- Performance deterioration (immediate and long-term) in academics and other co-curricular activities;
- Difficulty in relationship/friendship, therefore might suffer from loneliness;
- Increased risk of substance abuse like, consuming alcohol, drugs, narcotics etc., and involvement in delinquent activities (for preadolescent and adolescent groups);
- Subsequent personality disorders.

Although the following problems are social and/or educational in nature but certainly have far reaching psychological impact at the individual and community level:

- Family disorganization, such as death of one parent or both parents or father/mother marries somebody else after the death of the spouse or children were adopted by somebody else;
- Change of life style and Change in social roles. For example, in case of death of earning members and parents, the child has to take the role of the family head, take care of the younger siblings, go to the market, manage the household chores, etc;
- Unaccompanied children: starvation, child trafficking, sexual abuse/witnessing rape and other forms of violence, child labour/exploitation;
- School dropout rate increases tremendously especially for girls.

Apart from the above mentioned psycho-social effects of disasters, disasters do have adverse physical and educational effects, which compound the reactions of psycho-social effects followed by disasters. However, irrespective of the type and severity of any natural and manmade disaster, it is more important to understand how children who have experienced disaster would be processing the information and what sort of reactions they show as a result of such experiences of disasters. Therefore, it is imperative to understand how children at various ages would be viewing their losses and trauma.

REACTIONS IN DIFFERENT AGE GROUPS OF CHILDREN

Early Childhood (1-5 years)

- Temper tantrums & Crying
- Clinging and demanding
- Scary nightmares
- Helplessness

Recovery and Reconstruction

- Regressive behaviour (thumb sucking, wanting to be carried, bed-wetting)
- Moodiness, irritation
- Fear of darkness or sleeping alone
- Easily frightened and then anger
- Increased aggression specially in boys

The age-specific reactions in children are common and normal responses to an event that is beyond their coping abilities. Teachers are advised to observe these reactions over a period of two weeks and in case the reactions persist, s/he can consult a school psychologist or a counsellor or a clinical psychologist or a trained disaster psycho-social worker. A teacher/school counselor should be oriented on this aspect of psycho-social care.

Middle Childhood (5-11years)

- Physical complaints – headache, stomach aches
- Aggression
- Fear of darkness/sleeping alone/separation from parents
- Lack of self competency
- Understand loss and become very anxious
- Regression to behaviours like thumb sucking etc
- Nightmares and inability to sleep
- Fear of recurrence
- Difficulty in following routines
- Does not mingle with friends
- Behavioural problems
- Emotional problems like apathy, anxious, withdrawn, depressed
- Disinterest or difficulties in school work– disturbs others, worrying, being tense, undisciplined, refusal to go to school, poor concentration
- Feel guilty and responsible for the loss

Adolescents (13-18 years)

- Seeks isolation, becomes less communicative
- Sleeplessness or increased sleep
- Feel different or alienated because of their experiences
- Irritability
- Increased risk taking behaviours
- Increase substance abuse
- Avoidance of trauma related thoughts, feelings and activities
- Aggression - fights, destructive, arguments
- Feelings of hopelessness, feeling of neglect and isolation
- Disobedience, specially towards authority and parents
- Tries to get involved in activities to get a sense of control like rescuing and organising at the camps

- Angry, frustrated and may feel very helpless
- Depression due to loss
- Guilt for not being able to do enough or for having survived
- Inability to concentrate
- Behavioural problems like - aggression, lying, stealing
- Dropping out of school or work
- Aches and pains due to stress

Source: National Institute of Mental Health & Neuro Sciences (NIMHANS) Training of trainers Module on disaster psycho-social care -2004

The following groups of children are considered to have special vulnerability in a disaster scenario: Each of these groups of children have different vulnerabilities, therefore altogether have different types of needs and require special attention and support.

- Children who lost one or both the parents
- Children who were differently able in the pre-disaster period and those who became disabled after the disaster
- Children whose parents have remarried
- Unaccompanied minors
- Girls
- Children who need critical medical care facilities

Check Your Progress III

Note: Use the space provided for your answer

1) Why do you think children are more vulnerable in a post-disaster situation?

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2) The reaction of a child to a particular disaster depends on some factors. What are they?

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3) What are common psychosocial reactions found among the pre-school children?

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4) Which types of disasters (caused by natural or manmade) leave deeper and more serious impacts on children? Give examples.

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4.5 COMMUNITY BASED DISASTER PSYCHO-SOCIAL CARE

The psycho-social aspects of disasters on human beings have been acknowledged as an international agenda (WHO, 1992). However, in India, the psycho-social aspects have never been emphasized until very recently after tsunami, 2004. The Bhopal gas tragedy (1984) was the most important disaster to draw the national attention due to its severe impact and the sensitivity of the politico-economic issues involved. The psycho-social impact was studied systematically although intervention programmes were more of psychiatric in nature. Latur earthquake (1993), and Andhra Pradesh Super Cyclone (1996) were disasters in which mental health professionals took an active part in terms of providing mental health services and undertaking research to study the psycho-social impact of these disasters.

The ICMR studies over last twenty years have provided strong base for integration of mental health services with general health care services and sensitization of the community members and rescue workers. However, it has been difficult to integrate the mental health services at micro and macro level. Recently, National Disaster Management Agency and National Institute of Disaster Management has mixed experiences in providing health care services in disaster situations. However, the finer details of the mechanisms and strategies for integration of mental health services with general health care services still need to be worked out.

In the post Tsunami phase in India, the WHO along with the Department of Social Welfare, United Nations Team for (UNTRS), and partners have developed a model for providing sustained, low cost community-based volunteer provided support systems. Community level workers who are the anchor for this programme are selected from various categories of people, including teachers, health workers, and members of self help groups etc, who have volunteered for this purpose. A cascading system of training was developed and in Tamil Nadu, 2813 Community Level Workers (CLWs) were trained in the 11 affected Districts. They were able to support more than 30,000 families and 150,000 individuals.

Case Study

The Indian Council of Medical Research (ICMR) carried out various studies after large scale earthquakes in India and highlighted the need to focus on the emotional and psychological needs of the population in disaster affected areas. The study projected the proportion of population falling under three levels of psychological disturbances i.e. mild to moderate, moderate to severe and diagnosable psychiatric disorders. The large part of the population (70-90%) faces mild to moderate transient psycho-social disturbances, which are observed over 4-6 weeks after disaster. Moderate to severe psychological disturbances, sub-syndromal psychiatric problems and acute stress related disorders are observed in 30-50% of people between 3-6 months. Very small proportion of population (5-15%) manifest diagnosable psychiatric disorders related to stress after 6 months. The specialized mental health services are required any time after 2-3 months for a very small population. The study pointed that the communities are able to take care of mental health problems within their own resources. The services for mental health problems can be provided with general health care services by the health professionals and counselors, under the disaster situations.

The work of the Community Level Workers (CLWs) was coordinated under the Department of Social Welfare and the District Social Welfare Officers provided coordination, supervision and linkage with health systems. An exclusive cell was created in the Directorate of Social Welfare for management of the entire activity in Tamil Nadu. Similar programmes were taken up in Kerala, Andhra Pradesh and Pondicherry and have proved to be of immense value in providing psycho-social support. Special attention needs to be paid to children and schools are a good opportunity to reach them.

There has to be community-based support for those who are out of school. The needs and expectations of the community changes over the period of recovery and rehabilitation and the programme needs to be aligned to this scenario. Alcohol abuse and related problems also seem to be prevalent in such settings and the Community Level Workers (CLWs) were provided additional capacity for addressing this important issue. A resource kit has been developed compiling all the materials and manuals and will serve as a guide for disaster preparedness and mitigation programmes.

ROLE OF SCHOOLS IN COMMUNITY (SCHOOL) BASED DISASTER PSYCHO-SOCIAL CARE

Impact of major natural and man-made disasters on school children and school buildings have been enormous in last few decades in India. A few incidents, such as, Gujarat earthquake on 26 January 2001 claimed lives of 971 school children and 31 teachers and destroyed/damaged 1884 school buildings and 5950 classrooms; a devastating school fire in Kumbakonam (Tamil Nadu) claimed 94 lives of young children on 16 July 2004, 17,000 children died and 2,448 schools collapsed in the 2005 Kashmir earthquake; 441 school children died in a stampede at a school function in Dabwali (Haryana) in December 1995. All these incidents invoke tremendous stress and other psychological reactions amongst the children, teachers and others in the schools.

After Gujarat earthquake, riots, Tsunami in South India, earthquake in J & K, training of teachers in basic disaster psycho-social care skills have been done successfully and a large number of teachers are now trained in this aspect. It was found that training of teachers in basic psycho-social care skills was helpful to the teachers to help themselves, their family members, colleagues, staff, children and the community at large. They considered it as a part of the basic survivor's skills or life competency skills that every teacher must learn.

Try and Understand the children	Reduce the impact of the disaster on them	Give them care and support
Serve their behaviour and listen to what they say	Listen to what they say	Use play to offer support and help
Accept their behaviour and what they say completely	Give them love and assurance and meet their basic needs	Talk with the children and find out what they need
Continuously monitor what they say to you and how they behave	Model positive living and good coping skills	Try to help them to return to their normal life routines

SCHOOL TEACHERS

Training and retraining teachers on these life competency skills would not only help them to identify children with stress symptoms, behavioural and emotional problems but also to understand the performance deterioration of disaster affected children in better way. However, they are trained; they should try to follow the dos and don'ts mentioned below.

Do's & Don'ts

- Help the child talk about the issue and note behaviours/reactions.
- Give extra attention to new children in your class make them comfortable.
- Reassure the child.
- Monitor the academic progress.
- Provide extra academic support to cope with the academic loss.
- Listen to these children with patience.
- Enhance the self-esteem of children.
- Keep interacting with the family.
- Maintaining the contact and discussion with the community level psychosocial workers.
- Keeping a record of abnormal reactions and behavioural problems found among the target group i.e. the disaster victims.
- Observe disaster affected children and their behaviour pattern to notice any change in their behaviour and habit.
- Do not ridicule the child for regressive behaviours.
- Do not say that everybody faced same difficulties/losses, so try to be normal.
- Do not scold child in front of other children in classroom in case the child is not able to perform (as compared to his pre-disaster performance), do class works.

- Don't say that you have become careless and do not want to study in the pretext/excuse of disaster.
- Don't say that you try to forget the incident, everything will be normal as before.
- Do not give false promise.

Thus, the role of schools/teachers in providing psycho-social support to the disaster affected people inside and outside the school community has been significant in India. Therefore, the forthcoming National Guidelines on Psycho-social Care and Mental Health Services in Disasters in India has included capacity building of teachers in these skills as a crucial step, which would be institutionalized shortly. Teachers are also considered as an important group of Community Level Workers (CLWs) to provide psycho-social care services to the disaster affected population.

As teachers in a caregiver's role they must understand the process and procedures of facilitating children's fast recovery from the trauma. This will enable the children to withstand the negative effects of the catastrophic event in a more appropriate way. Here the adult caregivers can be divided into 4 prime categories viz. parents/relatives, school teachers, and caregivers from outside, especially pediatricians. These caregivers must understand the emotional/behavioural reactions the child is exhibiting and then offer support and security to the child. They also are responsible to develop healthy coping mechanisms in the child.

PEER AS COUNSELLORS

Since, school based disaster management is now being made a compulsory safety practice in all schools and this involves various groups of children from the planning to the implementation stage, little orientation on the psychological impact of disasters to these groups would work wonder. Peer counseling formally or informally takes place amongst/between children in every school. Traumatized children often feel comfortable and convenient to share their feelings, thoughts, emotions and behaviours with their friends, seniors, or even with juniors. After any disaster if teachers orient the children in classrooms to follow certain dos and don'ts mentioned below, then teachers can monitor the child's all round progress very easily. This would help them to know about these traumatized children easily.

Do's and Don'ts

- Try to listen carefully to any child victim who you think is behaving differently from his normal behaviour (try to collect as many information about him/her as you can and keep touch with the teachers)
- Don't make gossip about the children who show behaviour problems and get scolding in the class or show performance deficiency or deterioration
- Inform the school counselor (if any) or the teachers regarding the change in behaviour or habit e.g. smoking/taking alcohol/stealing/ violent acts etc.
- You can also be a mediator between the family members of the victims and teachers
- Try talking to these children and encourage them to share his/her feelings with you.
- Keep all these information specified to you, teachers and significant others.
- Try to involve these children in different extra-curricular activities in and out side school (if you belong to the same place).
- If possible, help them in studies and other areas of needs

Check Your Progress IV

Note: Use the space provided for your answer

- 1) Define community based disaster psycho-social and mental health care services.

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- 2) Who are the community level workers? Give examples.

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- 3) What role does a school play in the community-based disaster psycho-social care model?

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- 4) What can you do if you were a peer counsellor?

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4.6 DO’S & DON’TS IN DISASTER PSYCHO-SOCIAL CARE

While interacting/providing psycho-social counseling to the disaster affected population, the following tips would provide some guidance:

Do say

- These are normal reactions to abnormal situations.
- I can understand that you feel this way.

- It was not your fault.
- You are not mad.
- Things may never be same as it before the incident.

Do not say

- It could have been worse.
- You can always have another house and car.
- It is best if you stay busy.
- Leave everything to God.
- You try to control your emotions.
- This has happened to others also, so you need not behave in this way.
- Try to forget about the disaster.
- As a counselor in a community one can:
 - Encourage the clients to resume his daily chores and occupational activities at the earliest,
 - Encourage them to express and ventilate,
 - Allow and encourage them to perform the rites and rituals,
 - Guide them to avoid indiscriminate use of tranquilizers,
 - Be careful of any addiction that may clients may opt,
 - Provide empathetic assurance,
 - Encourage them to attend religious discourse, spirituality camps, meditation camps, etc,
 - Request them to ask for help when they feel bad continuously and assure them that asking help is not a sign of weakness or of madness,
 - Encourage them to speak to others, share their feelings even if they are strange, absurd and silly,
- Take one task at a time,
- Delegate responsibility,
- Consult a psychologist or psychiatrist before taking any medication to get relief from the symptoms.

4.7 LET US SUM UP

Disasters disrupt the sense of well-being by destroying normal predictable and consistent life routines of adults and children thus, deeply hamper the process of healthy psychological and personality development. Children are affected by any disaster just the way adult are, although their age-specific reactions to a particular disaster might differ from those of the adults. Post-disaster psycho-social care is specially designed to meet survivors' multifarious needs. These services also cater to the needs of the more vulnerable groups, such as children, people with disabilities, people dependent with critical health care facilities, elderly and women. School is also a vital link between the community and the care givers. As a community level of workers, you need to know the essential do's and don'ts and principles of psycho-social care giving.

4.8 FURTHER READINGS AND REFERENCES

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