UNIT 4 DISASTER PREPAREDNESS: INDIAN CONTEXT

Structure

4.0 LEARNING OUTCOME

After studying this Unit, you should be able to:

- Understand the approach of the United Nations towards preparedness and the response of the government at all levels in India;
- Analyse the culture of preparedness and quick response as well as organisational issues involved in preparedness in India; and
- Examine requirements in earthquake risk mitigation

4.1 INTRODUCTION

There has been a marked shift in the global approach to disasters in recent years, particularly since 1990, which marked the beginning of the International Decade for Natural Disaster Reduction. Preparedness is not a project driven agenda, and needs very deep, attitudinal changes in governance, as well as the institutional modalities of participation/ involvement of the civil society.

Hitherto, the approach towards coping with the effects of natural disasters has been post-disaster management, limited to problems such as law and order, evacuation and warnings, communications, search and rescue, fire-fighting, medical and psychiatric assistance, provision of relief and sheltering, etc. After the initial trauma of the natural disaster, which

lasts the first few days or weeks, the phase of recovery begins, involving the activities of reconstruction and economic, social and psychological rehabilitation. This engages local people initially, but is eventually taken up by the government authorities. Soon thereafter, the occurrence of the disaster is generally relegated to historic memory till the next one occurs, either in the same area or in some other part of the country.

It is not possible to do away with the devastation of natural hazards completely. However, experience has shown that destruction from natural hazards can be minimised by a well-functioning warning system, combined with preparedness on the part of the vulnerable community. Warning systems and preparedness measures reduce/ modify the scale of disasters. A community that is prepared to face disasters and has received, and understands the warnings of impending hazards, and has taken precautionary and mitigation measures, will be able to cope better and resume normal life sooner.

It is becoming increasingly evident now that a relatively smaller investment in disaster preparedness can save thousands of lives and vital economic assets, as well as reduce the cost of overall relief assistance.

4.2 INTERNATIONAL APPROACH TO DISASTER MANAGEMENT

International Decade for Natural Disaster Reduction (IDNDR)

Recognising the rapidly rising world-wide toll of human and economic losses due to natural disasters, the UN General Assembly in 1989 took a decision to launch a far reaching global undertaking during the nineties to save human lives and reduce the impacts of natural disasters. With this aim in mind, the decade 1990-2000 was declared as the International Decade for Natural Disaster Reduction (IDNDR).

The objective of the IDNDR was to reduce, through concerted international action, with focus on developing countries, the loss of life, property damage and social and economic disruption caused by natural disasters such as earthquakes, floods, cyclones, landslides, locust infestations, drought and desertification and other calamities of natural origin.

The aim of IDNDR was that all countries should have:

a) Comprehensive national assessments of risks from natural hazards, with these assessments taking into account their impact on developmental plans,

b) Mitigation plans at national and/or local levels, involving long term prevention and preparedness and community awareness, and

c) Ready access to global, regional, national and local warning systems and widespread dissemination of such warnings.

A major conference of the IDNDR programme was held in Yokohama (Japan) in May 1994, where a plan of action for disaster reduction called the Yokohama Strategy was evolved. The Yokohama Strategy gave guidelines for Natural Disaster Prevention, Preparedness and Mitigation, shifting the focus and emphasis from disaster management to disaster prevention and preparedness.

The Yokohama Conference, based on the assessment of the progress accomplished during the first half of the decade, formulated a strategy for disaster reduction centred on the

objective of saving human lives and protecting property. The strategy called for an accelerated implementation of a Plan of Action to be based on certain variables such as development of a global culture of prevention as an essential component of an integrated approach to disaster reduction, policy of self-reliance in each vulnerable country and community comprising capacity building as well as allocation and efficient use of resources, community participation in the disaster reduction process, improved risk assessment, broader monitoring and communication of forecasts and early warnings.

During the remaining part of the decade, it called upon all countries to unequivocally give political commitment to reduce their vulnerability through appropriate means. Disaster prevention, mitigation and preparedness were given emphasis. At the end of IDNDR (1990-2000), the programme continues in the form of International Strategy for Disaster Reduction (ISDR).

The Hyogo Framework for Action for a Safer World

The World Conference on Disaster Reduction, held in the city of Kobe in the Hyogo region of Japan in 2005, brought the global disaster management community together once again to review the progress on the Yokohama strategy, and to plan a framework of action for the subsequent ten years. The result of the conference, the Hyogo Framework for Action, highlighted the following action agenda for the decade 2005-15:

1) Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation

2) Identify, assess and monitor disaster risks and enhance early warning systems

3) Use knowledge, innovation and education to build a culture of safety and resilience at all levels

4) Reduce the underlying risk factors

5) Strengthen disaster preparedness for effective response at all levels

The process started by the Yokohama Strategy and the Hyogo Framework for Action is the basis for a global shift in disaster management approach from response towards preparedness.

4.3 PARADIGM SHIFT

In line with the Yokohama message (1994), there is a distinct policy shift in India towards mitigation and preparedness from limited response and post- disaster relief. The Tenth Plan (2002-07) includes a full chapter on Disaster Management. Traditionally, disaster management had been treated as "calamity relief" expenditure, classified under non-plan expenditure head. Henceforth, there would be greater commitment of plan funds for disaster mitigation, even in existing schemes dealing with related subjects. There are various plan schemes in operation, such as, drinking water supply, sanitation, drought proofing, afforestation *et al* which are indirectly related to disaster management. External assistance for post- disaster reconstruction and streamlining of management structures assistance is also provided under plan head. There is currently, articulation for more commitment of Plan funds. Accordingly, the 11th Finance Commission and the High Powered Committee (2001) have advocated a proactive stance on the part of the Planning Commission for disaster mitigation and preparedness in sector plan heads. The

High Powered Committee has called for earmarking 10 per cent of plan funds at all levels for disaster mitigation, prevention and preparedness activities.

This follows successive high impact disasters such as the Gujarat earthquake (2001) and the Orissa Cyclone (1999), which adversely affected the economy, setting back development several years. Disasters affect businesses in that the investment climate in disaster-hit areas gets disturbed for long time owing to loss of infrastructure and apprehensions on the part of the business community regarding similar future losses. As articulated in the Tenth Plan, in 2001 alone, 12,000 crore worth of property was destroyed. Hence, plan schemes have to proceed, dovetailing disaster management with development objectives for abiding gains.

Recommendations of the 11th Finance Commission, were that, henceforth, works of a capital nature, which can prevent recurrence of calamities, should be met out of plan funds, besides expenditure on restoration of infrastructure and other capital assets, except those intrinsically connected with relief operations and connectivity with affected area and population should be met out of plan funds. The Tenth Plan will commit funds to disaster management R&D, besides undertaking initiatives towards community mobilisation, human resource development, establishment of control rooms, and forging international cooperation in the area of disaster management. Disaster Mitigation attempts would be taken through mandatory disaster mitigation analysis of project schemes in vulnerable areas. Environmental protection, afforestation programmes, pollution control, construction of earthquake resistant structures etc. would be given high priority in plans.

In exigent circumstances, funds need to be diverted from other schemes to disaster management. The Planning Commission is working out a methodology to make such decisions expeditious. Besides, state governments are advised to implement existing plan schemes related to disaster management with greater urgency. The watchword in the Tenth Plan is planning for "safe development".

The Twelfth Finance Commission's terms of reference specifically mentioned *mitigation* and *preparedness* apart from *relief* and *rehabilitation as part of its mandate* (The Tenth Plan, 2002-07). The 12th Finance Commission has categorically stated that provision for disaster prevention and mitigation would be part of the state plan and not calamity relief. Definition of 'calamity' would include landslides, avalanches, cloudbursts and pest attacks. It had hitherto been limited to cyclone, drought, earthquake, fire, flood and hailstorm. There are two windows for meeting relief expenditures following natural disasters: the Calamity Relief Fund (CRF) and the National Calamity Contingency Fund (NCCF) following recommendations of the 11th Finance Commission. The latter supplements the former and caters only to immediate relief requirements. Long-term restorative works involving capital assets are to be made through diversions from plan funds. As per the Tenth Plan, there is need to specify arrangements in this regard.

4.4 DISASTER PREPAREDNESS IN INDIA

Significance of preparedness was realised during the Bhuj (Gujarat) Earthquake (2001), when logistics were found grossly inadequate to deal with the impact of the disaster. Professionally trained rescue teams were not available, other facilities were also lacking, like professionally trained dog squads and mobile hospitals. Though teams from foreign countries reached affected areas, there was precious time lost in saving lives. To make up for these inadequacies, the following steps are being taken by the Government of

India, as per the *Status Report of the Ministry of Home Affairs, Government of India, 2004:*

- Eight battalions of central paramilitary forces would be developed as specialist response teams, equipped with modern hardware and trained in the use of the same. They would have the capability to handle any kind of emergency in any situation. It is also proposed to group them together as National Emergency Response Force.
- All personnel of Central Paramilitary Forces would also be trained in search and rescue so that nearby battalions can be deployed before the army takes over. To that end, their training curriculum would be updated/modified.
- States have been asked to set up their own specialist teams.10 per cent of the allocation from the CRF shall be committed to logistics for these search and rescue teams (SAR). Training would be provided in search and rescue to state armed police. Maharashtra, Orissa, Gujarat and Delhi had made the arrangements in this regard, till August 2004.
- Regional Response centres would be set up across the country. Relief supplies and other needed equipment would be kept in these centres. Specialist response teams would be stationed during crises.
- Mobile hospitals would be provided, attached to different hospitals in the country. These will reach the site of the disaster during crises.
- Hospital preparedness to deal with disasters would be improved. Medicos would be given training and the subject would be included in the undergraduate curriculum for medics.
- Incident Command System would be developed. The Lal Bahadur Shastri National Academy of Administration, Mussoorie, has the onus to develop capacity in this regard.
- To minimise response time, concerned departments would be asked to prepare preparedness plans, by way of emergency support plans in advance. They have been asked to constitute response teams and allocate resources in advance for disaster response. States have been asked to arrange for pre-contracts of relief items to avoid delays in procuring relief.
- India Disaster Response Network would be set up which would be a web database of inventory and controlling officers in charge of items. The database will be available at State District and National Level.
- States are being assisted with emergency operations centres schemes at state and district centers. Financial assistance would be provided under GoI-UNDP scheme and Modernisation of Police Force scheme. These would be composite control rooms to look after law and order and disaster management issues.

Disaster preparedness planning is a *sequential* and *continuous* process. Good planning requires correct diagnosis, resource evaluation and feedback of policy implementation. Because of the wide scope of disaster preparedness and the numerous actors involved, it is essential that a framework for coordination is accepted and provided for. Following awareness of the same, the government of India proposes to affect the shift from short-term relief to long- term mitigation, preparedness and prevention through:

a) Institutional changes

b) Policy

c) Enunciation of legal and techno-legal framework

d) Mainstreaming mitigation into development process

e) Funding mechanism

f) Specific schemes addressing mitigation

g) Preparedness measures

h) Capacity building

i) Human resource development(HRD), and

j) Above all, community participation.

Institutional and Policy Changes

The Government decided to enact a central legislation on disaster management in the aftermath of the tsunami disaster on 26th December 2004. *(The Bill has been passed by both the houses and received Presidential assent in February 2006*). Keeping in view the federal polity, the Act has been enacted under the Entry *'Social Security and Social Insurance*' in the Concurrent List of the Constitution of India, since it will have the advantage to allow the State Governments also to have their own legislation.

The salient features of the Act include, setting up of a National Disaster Management Authority under the Chairmanship of the Prime Minister; State Disaster Management Authorities in the States/Union Territories under the chairmanship of the Chief Minister or Lieutenant Governor or the Administrator, as the case may be; and the District Disaster Management Authority under the District Magistrate in each district. The National and State Authorities shall be responsible for laying down the policies, plans and guidelines for disaster management. The District Authority shall act as the district planning, coordination and implementing body for all disaster management related functions. These functions will include mitigation and preparedness measures, besides response, relief and rehabilitation.

These authorities have been constituted to address the multi-disciplinary character/requirement of/in disaster management. Hence, members from various ministries, *viz.* water resources, drinking water supply, environment and forests, urban development and rural development etc. would be on these bodies. Many States and Union Territories (10 till August, 2004 Tamil Nadu, Arunachal Pradesh, Uttaranchal, Orissa, Gujarat, Kerela, Nagaland, Delhi, Andaman and Nicobar administration and Chandigarh administration) had notified such authorities. Others were in the process of setting them up. The National Disaster Management Authority has also started functioning at the Centre with the Prime Minister as Chairman, a vice chairman of Cabinet Minister Rank and other members with the rank of Minister of State.

A key role has been assigned to the local authority for ensuring training of its officers and employees, maintenance of resources so that these are readily available for use in the event of a disaster and ensuring that all construction projects in their area of jurisdiction conform to the prescribed standards and specifications. The local authority shall also carry out relief, rehabilitation and re-construction activities in the affected areas.

The Act also seeks to constitute a National Institute of Disaster Management, which shall plan and promote training and research, documentation and development of national level information base relating to disaster management policies, prevention mechanism and mitigation measures. A National Disaster Response Force shall also be constituted for specialist response. The erstwhile National Centre for Disaster Mnagement (NCDM) has been reconstituted as the National Institute of Disaster Management (NIDM) and is located in New Delhi.

The Act seeks to constitute Disaster Response Fund and Disaster Mitigation Fund at the National, State and District level. It mandates that there shall be no discrimination on the ground of sex, caste, community, descent or religion, while providing compensation and relief to the victims. The powers to issue directions to the government authorities, organisations and statutory bodies to facilitate and assist in disaster management have been vested in the Central government.

The Act seeks to make provision for punishment for obstructing response, making false claims, misappropriation of money or materials and issue of false warning. However, it provides immunity to government organisations and officers for action taken in good faith.

Besides, a National Emergency Management Authority is proposed, which would be designed as per the Secretariat -Directorate structure to make it an integral part of administration, at the same time, retaining the flexibility of a field organisation. It will have multi-disciplinary membership with representatives from the Ministries/Departments of Health, Water Resources, Environment and Forests, Agriculture, Railways, Atomic energy, Defence, Chemicals, Science and Technology, Telecommunication, Urban Employment & Poverty Alleviation, Rural Development and India Meteorological Department, under an officer of the rank of Secretary /Special Secretary, to the Government in the Ministry of Home Affairs. This authority would meet as often as required to review the status of mitigation and preparedness measures and warning systems in the country. When a disaster strikes, this authority would assist the states with macro management aspects, such as financial, technical and inventory support, coordination of resources and activities of all agencies involved in relief and rehabilitation, besides taking up any other work entrusted to it by the government.

State Relief Departments and District Coordination and Relief Committee would now be restructured to incorporate mitigation, preparedness and prevention aspects to their limited role of relief and rehabilitation. They would be re-designated, State Departments of Disaster Management, and District Disaster Management Committees respectively, which suggests their enhanced area of functioning.

There would be four functional groupings within the state disaster management department:

- Hazard Mitigation
- Preparedness and Capacity Building
- Relief and Response
- Administration and Finance

The changeover has already been reported in 11 states and UTs (reported till August 2004), in Andhra Pradesh, Arunachal Pradesh, Bihar, Himachal Pradesh, Rajasthan, Tamil Nadu, Uttaranchal, Nagaland, Andaman & Nicobar administration, Sikkim and Lakshadweep. It is underway in other states.

District Disaster Management Committees would invite membership from relevant departments and would prepare a long-term mitigation plan apart from continuing with the preparedness and response plans. Since, district heads of departments involved in mainstream development would be involved in it, there would a natural dovetailing of district plan with disaster mitigation and preparedness plan. District Disaster Management Committee is already functional in 256 districts. Other districts in different states are in the process of following up.

(Note: With regard to administrative preparedness, students are advised to follow up latest developments through Government Notifications, newspaper records and periodicals).

State Disaster Management Authorities in Gujarat and Orissa

The existing administrative structure to deal with the ravages of the earthquake was not found satisfactory and hence the Gujarat Government constituted The Gujarat State Disaster Management Authority on 8th February 2001 with the Chief Minister as Chairperson and ten other members. The Resolution spoke of the need for a permanent arrangement to handle a calamity. It is therefore evident that the existing disaster management system at the State level is being improved.

The objectives of the Gujarat State Disaster Management Authority (GDMA) are the following: -

1) To undertake rehabilitation and reconstruction as also social and economic activities for restoration of the situation.

2) To make efforts to minimise the impact of natural disasters.

3) To make the best use of funds, grants, donations, assistance etc received from the government of India and other foreign countries or any other institution/persons for prevention of such natural calamities or handling the after-effects.

The jurisdiction of this authority will be the entire State and it will work as an autonomous body. It has been registered as a society under the Societies Registration Act, 1860. The Government of Gujarat has also created a separate Rehabilitation and Reconstruction Division under the General Administration Department of the State government and the work of the Gujarat State Disaster Management Authority has been transferred to the General Administration Department.

Further, the State Government constituted a taskforce to suggest effective measures for preparation of a long-term Disaster Management Plan, headed by the Chief Executive Officer (C.E.O.) of the Gujarat State Disaster Management Authority.

The Gujarat State Disaster Management Authority, constituted on the pattern of a similar authority formed in Orissa earlier, has a C.E.O and two Additional C.E.Os. It has six Directors and a Chief Engineer who look after different aspects of work relating to disaster management. The Chief Minister is the chairperson of GSMDA and it meets at least once a month. It has the powers of the State Cabinet.

Besides this, two committees have been constituted for redress of grievances; one at the district level, which is headed by the Minister in charge of the concerned district and the other at the village level headed by an officer not below the rank of the Deputy Collector or Mamlatdar.

District Collector with the help of Deputy Collector looks after the requirements of the urban areas and the District Development Officer looks after the rural areas. Reconstruction cell has been created in each affected district and in every line department chief coordinators have been designated to smoothen over the problems. It is also proposed to establish regional centres of and work on:

1) Search and rescue teams to be attached to the regional centres of GSDMA

2) Making inventory of resources.

3) Risk transfer through insurance cover.

4) To shift the focus from relief to reconstruction and disaster mitigation.

5) Disaster planning through creation of task force at the state level.

The setting up of the GSDMA followed the setting up of a similar authority, the OSDMA in Orissa following the 1999 super cyclone. Thus we see that with the establishment of the Gujarat and Orissa State Disaster Management Authorities, a nodal authority has been created at the State level that will take up social and economic activities for rehabilitation and resettlement of the affected people in the shortest possible time.

The most recent example is of the DMMC (Disaster Mitigation and Management Centre) established by the Government of Uttaranchal. This is a path breaking initiative as in contrast to the authorities set up in Orissa and Gujarat, this is an intervention made before a disaster strikes in a known vulnerable area. Uttaranchal is also the first State in the country to have a Ministry of Disaster Management.

Following situations such as the Orissa Super cyclone (October, 1999), the Gujarat Earthquake (January, 2001) and the South Asian Tsunami (December, 2004), the need for systems to respond at the earliest and in the most appropriate manner has been clearly highlighted.

Example of SUMA

At the level of the Central Government, the Ministries of Defence, Health, Agriculture, Railways, Surface Transport, Power and others have a critical role to play. All Armed Forces should also have a dedicated component of personnel and equipment at the Command level for disaster management. An appropriate organisational set up at the state level for expeditious response is also necessary. Such a set up could be formulated on the lines of the one presented by the SUMA (Supplies Management) model launched as the collective efforts of the Latin American Countries in order to improve the administration of supplies in the aftermath of a disaster situation. It provides a solution to the problems with the arrival of unsolicited supplies thus enabling speedier distribution of relief material and assistance as the situation warrants in reference to the SUMA Model. This too would be worked out and incorporated in the Disaster Management Plan in due course.

4.5 ISSUES INVOLVED IN DISASTER PREPAREDNESS

Disaster preparedness works on the assumption that disasters will happen, and that, given that, measures can be implemented to reduce the effect of the disaster. Community preparedness, which means actions taken by the community to mitigate the effects of potential disasters, is one of the most important aspects of Preparedness as the local community is the first responder to a disaster. Preparedness measures may include:

- Risk assessment (to point out which measures to implement)
- Early warning systems
- Life safeguarding equipment, for example, cyclone shelters
- Resources and emergency kits in anticipation of need
- Maintaining emergency rosters and evacuation plans
- Emergency information and communication systems
- Training to ensure adequate emergency response capacity (particularly amongst the local populace), maintenance of preparedness levels
- Public education and preparedness campaigns

Disaster Preparedness is given the following framework (Sharma, 1998).

Disaster Preparedness Framework		
Vulnerability Assessment	Planning	Institutional Framework
Information Systems	Resource Base	Warning Systems
Response Mechanisms	Public Education and Training	Rehearsals

Explanations regarding each variable, (ibid), are as follows:

Vulnerability assessment is the starting point of disaster preparedness efforts. Assessments give the vulnerability profile of the area in terms of possible loss of life and property in an area in the event of a disaster. Data collected gives information on two counts: physical vulnerability of structures and scale of damage likely from disasters of differing magnitudes regarding differential vulnerability of segments of population to different disasters residing in hazard prone areas of differing degrees of susceptibility and type of hazard. Other related data should also be incorporated. As explained by Sharma (1998), it will not suffice to declare an area hazard prone; migration patterns, activities pursued by inhabitants, grading of houses on the basis of vulnerability would be essential related information.

Planning is the central aspect of a disaster preparedness plan. According to Vinod K. Sharma (1998), the objective is to have agreed upon, implementable plans in place, for which commitment and resources are relatively assured. Planning for readiness includes working out agreements between people or agencies as to who will provide services in an emergency to ensure an effective, coordinated response. There are the following essential requirements of a workable disaster plan:

- Clearly stated objective or set of objectives
- Systematic sequence of activities in a logical and clear manner
- Specific tasks and responsibilities for involved agencies
- Integration of activities, tasks and responsibilities
- Integrate its activities, tasks and responsibilities to enable the overall objective or set of objectives to be achieved.

Disaster Contingency Plans do not address the entire disaster management continuum, comprising recovery, rehabilitation, preparedness, *et al* (explained as disaster management cycle in Unit 2), but explore the wherewithal to tackle specific hazards, such as a flood within a definite time period. Hence, there would be many contingency plans to tackle hazards, which would comprise the National Strategy to combat disasters. There are policy dilemmas involved in preparing disaster preparedness plans. For instance, should the plan be short-term or long-term? Long-term preparedness would demand consistent resource commitment, which could be difficult for hazard prone, but poor countries like Bangladesh. However, the extent of damage wrought each year due to floods would demand a long-term commitment. Besides the nature of hazards, a particular country/ region is prone to, would also determine the character of the preparedness plan. For example, the hazard could be slow-onset, like drought or sudden/sporadic, like floods, which would demand different preparedness/mitigation, as considered apt strategies. In the final analysis, the choice of each country would depend on numerous factors, such as the nature of hazard, political priorities, risk perception, interest articulation/ lobby pressure in this regard, etc. The other dilemma is regarding participation in the planning process, regarding who all should be involved? Though much has been said in advocacy of local planning, it is fact that it is hard to implement. How should the local people be involved, how would logistics in this regard be engaged, to what extent would officials be receptive/ tolerant to/of it?, remain some of the persistent questions; then, also whether centralised or decentralised mode of operation should be opted. The issue chiefly relates to decisions, and what level of autonomy should be afforded/allowed at the local or regional levels.

Regarding *institutional framework*, rationalisation of the administrative apparatus and coordination are essential requirements. Unnecessary proliferation of agencies should be avoided. As far as coordination is concerned, there is no 'one way' of instituting it. Each State has to work it out as per the facilities at hand, implying scope and the requirements regarding the same to produce the best possible state. A central coordinating agency providing for inter-ministerial coordination is a preferred provision in this regard.

Specific definition of roles and responsibilities should not be lost sight of in institutional delineation. They should be specific and adequate in that specialist competence should have been duly respected. Assigning functions to an agency lacking in technical know-how in that respect would be a self-defeating exercise. Similarly, it would be better to leave interest/need articulation to local leaders instead of assigning the task to a central government official.

Regarding *information systems*, information collation is the requirement since information comes from many sources such as, in the case of India, from the ministries of health and agriculture, regarding nutritional status and crop production and the meteorological offices regarding forecasts. There is need for a central coordinating agency in this respect for speedy response or/and timely mitigation action. Considering the source of such information and the requirement of constant updating of such information through periodic vulnerability and risk assessments, to noting changes if any, in vulnerable segments/area *et al* are other pertinent requirements. Usually early warning signs from local communities are ignored, which is perilous. Assessments should include information on available logistics and inventory such as transport facilities et al to know where additional capacity is required as per the plan, which is renewed from time to time to incorporate newer/added threats as anticipated/encountered so that when the disaster strikes, preparedness matches up to the requirements.

Regarding *resources*, written agreements should be solicited for surety. Critical issues involved in this regard, in the words of Sharma (1998), are "special arrangements for the acquisition and disbursements for funds; policies and arrangements for the acquisition and disbursements; policies and agreements for the use of other's equipment and services; and emergency funding strategies." A special emergency contingency fund would help, since all supplies cannot be stockpiled, or there could be unforeseen requirements, which had not been budgeted; insurance should be a necessary requirement/condition in loans for farmers for agricultural extension and developments, for example, to shield losses during disasters. There are administrative issues involved, in that aid from international and internal sources needs to be coordinated to ensure its timely and proper use and avoid wastage and lessen scope for irregularities.

Regarding *warning systems*, governments should look at alternate communication requirements such as police wireless, amateur radio, as normal communication is disrupted due to damage to poles, underground cables, etc. Indigenous knowledge regarding impending disasters, based on factors such as animal behavior, etc., should not be underestimated. Such knowledge should be built into disaster plans. Also, translation of warnings in user-friendly terms, preferably in local language is another requirement. Technical jargon is usually not comprehensible to the locals, who choose to ignore it. Public education and training in this regard in the sense of awareness of seriousness of official warnings issued with a view to compliant behavior is necessary. Forewarning is a crucial component in preparedness. The same should be ensured.

Regarding *response,* specific activities involved are:

- Evacuation Procedures
- Search and Rescue
- Security Affected Areas
- Assessment Teams
- Activating Special Installations, such as emergency hospital facilities.
- Preparing Emergency Reception Shelters
- Activating Emergency Programmes for Airports, Harbors and Land Transport.

A range of services is required, ranging from basic services like food and shelter, medical supplies, sanitation to special requirements of vulnerable segments like children to logistics such as tents, storage facilities, transport etc.

Activation of local governments is deemed an essential requirement for the purpose.

Public education has to cover schools, extension workers in villages and experts such as engineers and architects, etc. The role of the media is especially emphasised in generating awareness of disasters and how to deal with them among common people.

Rehearsals are absolutely necessary for effective preparedness. For example, as per news reports, in Japan, they are rehearsing catching wild animals and serpents that get out of zoos during earthquakes there. Such kinds of exercises are vital for dealing effectively with real life situations.

Some Problems

The problem areas in preparedness can be organisational and planning related issues, like inadequate policy direction, outdated plans and over concentration on recovery and response activities, which leads to low preparedness. Lack of resources or resource organisations and unclear allocation of these resources is also likely to create gaps or overlaps in the preparedness arrangements. Other problems like inadequate coordination and lack of cooperation at the policy making and implementation level, public awareness and suitable training for the disaster managers usually contribute significantly to poor disaster preparedness activities.

Towards Preparedness

Effective disaster preparedness is a dynamic commitment/requirement. It is very difficult to maintain adequate preparedness levels under circumstances where the disaster threat is low and/or very infrequent. Some aspects of preparedness are:

- *National Disaster Policy*: There is a need for a clear and comprehensive national disaster policy which covers all aspects of disaster management spectrum and which ensures that preparedness is given proper consideration and priority.
- *National Legislation*: Special disaster legislation may be necessary to ensure that preparedness aspects of national policy are adequately covered and implemented. Disaster legislation also helps to formalise a clear and workable organisational structure, so that levels of disaster preparedness are identified.
- *National Disaster Management Centre/Section*: As disaster preparedness is a dynamic requirement, therefore, there is a constant need of monitoring the preparedness activities. This can be done through a specialised agency and officers.The Disaster Managment Act covers all aforesaid requirements.
- *Assessment of Preparedness Action*: Adequate arrangements for identifying, assessing and monitoring the disaster threat are also necessary. In turn, this enables a reasonable forecast to be made of the likely effects arising from the disaster. The effects may be like casualties, damage and destruction of property, disruption of services, damage to crops in case of a rural area, damage to national infrastructure, economic and livelihood loss etc.
- *Planning Framework*: Fully effective preparedness plans need to be applied at national, provincial/regional and local government levels. Planning needs to be systematic and stage wise. This also helps to ensure that the measure can be systematically monitored and kept up-to-date.
- *Utilisation of Resources*: If available resources have to be utilised to the optimum effect, there must be an accurate and up-to-date inventory of all resource organisations, clear allocation of the roles and responsibilities which resource organisations are required to do during an emergency; there should be suitable preparedness arrangements within the resource organisations so that they are able to fulfill their roles desirably and capacity of the resource organisations should be monitored time to time to ensure no problems during the emergency.
- *Operational Facilities and Systems*: Adequate preparedness of the various facilities and systems, which are required for response operation, is also very important. Such facilities and systems usually include emergency or stand-by communications, a warning system, a system to activate and initiate immediate action at the organisational level and at its resource organisations, emergency operation centres, system for damage and need assessment and emergency relief arrangements, etc.

- *Equipment and Supplies*: If stockpiles of emergency equipment and supplies are held, these need appropriate surveillance to ensure their serviceability and ready availability during a disaster situation. The equipment should be kept at the level where it is going to be used first. At the same time, a vendor list should be maintained in order to quickly procure material at the time of emergency. Also, if there are some resources within the community, which can be used, such resources should be identified well before.
- *Training*: Training is obviously the most important component of preparedness. If possible, a permanent training programme or system is desirable. This should cover the needs of both the government and non- governmental organisations. Also, training is required for persons who are a part of the Disaster Management Programme; they may be volunteers from within the community.
- *Public Awareness and Education*: An aware, alert and informed public is a most valuable asset for preparedness. Public awareness programmes can be presented in a variety of forms, to suit particular circumstances. Events such as National Disaster Preparedness Day are helpful in promoting and sustaining public awareness. Inclusion of Disaster awareness in school programmes usually has a long-term impact.

Resources likely to be involved for disaster prevention and preparedness at various levels of activities can be:

Activity	**Resources**
Identification and analysis of disaster threats	• Academic and Research Institutions • Technical Authorities • Government and private agencies having public responsibility (dealing with land, sea and transport systems) • Private sector authorities dealing with projects or production which may generate potential threat (chemical factories etc) • International Agencies
Need and possibilities for implementation	• Government Organisations • National Planning Authorities • Disaster Management Authorities • Specialised Agencies
Implementation	• Government Organisations • Non-Government Organisations • Military Forces • International Disaster Assisting Agencies • Disaster Management Authorities
Sustainability of the programme	• Non-Government Organisations • Public • Educational Authorities

4.6 CAPACITY BUILDING FOR EARTHQUAKE VULNERABILITY REDUCTION

A) NATIONAL PROGRAMME FOR CAPACITY BUILDING OF *ENGINEERS* IN EARTHQUAKE RISK MITIGATION, (NPCBEERM).

In view of the vulnerability of almost 55 per cent of the Indian landmass to earthquakes, the National Institute of Disaster Management, Ministry of Home Affairs with a view to instituting structural earthquake risk mitigation measures, has prepared a National Roadmap, which charts activities to be undertaken now. The Ministry of Home Affairs is the nodal ministry for disaster management in the country (except droughts). The transfer of the subject/responsibility from the Ministry of Agriculture to the Ministry of Home Affairs marks a shift of emphasis from a hitherto "reactive" relief to "proactive" mitigation and preparedness. In the last 15 years, India has suffered 6 earthquakes of moderate intensity, which have caused extensive damage to life and property in the affected regions. The devastation from the Latur Earthquake of 1993 and the Bhuj Earthquake of 2001 have once again driven home the point for mitigation policy planning with a view to controlling the impacts of disasters, particularly for disaster risk mitigation from earthquakes to prevent/minimise further extensive damages, which would otherwise be wrought, considering the frequency of tremors in seismic zones IV and V.

With a view to the objective, the following action areas have been identified:

- Institutional Structures
- Disaster Mitigation and Preparedness Projects
- Early Warning Systems
- Preparedness
- Quick Response and
- Human Resource Development

The chief problem/action area is Human Resource Development for earthquake engineering. Though the Bureau of Indian Standards (BIS) has laid down building standards for earthquake prone areas, implementation has suffered due to lack of manpower and technical competence with the State Public Works Departments (PWD) and municipal bodies.

***Specific guidelines/instructions/ attempts with a view to reducing earthquake vulnerability include*:**

Setting up a National Resource Centre (engineering institute), to develop training modules and impart training to select faculty members from 2 or 3 engineering institutes at State/ UT level. Training would be imparted by the National Resource Institutes: The Indian Institutes of Technology, Mumbai, Kharagpur, Kanpur, Chennai, Roorkee and the Indian Institute of Science, Bangalore and a few other leading institutes for technical updating and developing expertise in earthquake engineering. The National Core Group on Earthquake Mitigation constituted under the Ministry of Home Affairs will designate the IITs and IIS Bangalore and few other leading institutes and colleges (total 10) as National Resource Institutes to provide training to the faculty of engineering colleges. The Centre shall advise

each State/UT to nominate (2-3) engineering colleges as State Resource Institutes. Manpower prepared would be used to train municipal and public works department (PWD) engineers and the private sector engineers in a phased manner and advise State governments and municipal urban local bodies on required amendments in state bye- laws for better compliance with BIS standards.

A Hazard Safety Cell will be constituted in each state to ensure compliance with building byelaws and safe construction practices and creation of a framework to conduct certification courses for engineers and architects, review building bye-laws, suggest necessary changes to incorporate in BIS codes in building bye laws and other related activities. Membership shall be drawn from members selected from state resource institutes/ retired senior engineers across the state and specialists in the subject matter under the chairmanship of the State Relief Commissioner. The Central government shall provide financial support for one non-official member in each state for two years.

State governments have been instructed to review, and if necessary, amend existing byelaws to incorporate BIS seismic codes and ensure that plans/designs of construction of government facilities incorporate the standards.

In municipal areas, State governments are required to make it mandatory for builders/ buyers to submit building plans prepared by the structural engineers to get building construction permission and make structural engineers who have prepared the plan, responsible for adherence to BIS codes and building bye laws.

States have been advised to enact Disaster Management Acts to provide for adequate powers for authorities coordinating mitigation, preparedness and response as well as for mitigation and prevention measures required to be taken. State governments have also been advised to convert their relief codes into disaster management codes by building into it the process necessary for disaster management and mitigation plans as well as elements of preparedness apart from response and relief.

They have been asked to retrofit critical facilities on a priority basis; lay down mandates for private builders/developers to retrofit multiplexes, cinema halls etc.

There is proposed to be a gradual shift to a certification regime for civil engineers in the private sector for which advice from the trained personnel of State Resource Institutes would be sought.

Implementation of the Project

Implementation of the project will be under the aegis of the Ministry of Home Affairs, which shall be the nodal ministry for the implementation of the project. A Project Management Board will be constituted under the chairmanship of Secretary, Border Management to provide overall guidance to the programme. The project implementation will be overseen by a Steering Committee (SC) consisting of members of a core group on earthquake mitigation and representatives of various resource institutes across the country, under the Chairmanship of the joint secretary, NDM. The SC will meet quarterly to review the progress of the programme.

In each State/UT, a Steering Committee will be constituted out of selected members of resource institutes across the states and specialists in the subject matter under the chairmanship of the State Relief Commissioner to review the progress of the programme at the state level. The SC will meet quarterly to review the progress of the programme.

B) NATIONAL PROGRAMME FOR CAPACITY BUILDING OF ARCHITECTS IN EARTHQUAKE RISK MITIGATION- (NPCBAERM)

The architect prepares the design of the building. It is only thereafter, that the engineer supervises its implementation on the ground. Therefore, the role of the architect is crucial in securing a safe structure. Present constraint is that seismic design is not taught in architecture institutes at the undergraduate level. Though requisite modification in the syllabus is now being considered, practicing architects need to be trained in seismic safety. Hence, there is need to impart training to architects and gradually move towards a certification regime where, properly trained and educated architects are issued certificates to carry on their practice. Present regulatory infrastructure of architects in the country is the IIA or the Indian Institute of Architects, which is a voluntary organisation registered under the Societies Registration Act, and the Council of Architecture or CoA, which performs the statutory duty of registration. The IIA studies and promotes the best practices in architecture from aesthetic and scientific perspectives. It does not register architects though it is a primary organisation, represented in all major national and international committees. The CoA oversees the profession from the efficiency and the ethics perspectives. Anyone desirous of practicing the profession has to register with the CoA. Hence, in consultation with the CoA, it would be made mandatory for practicing architects to undergo a one-week training module and submit the certificate with the CoA.

The Project Framework is as follows:

The 110 institutes offering architecture will be networked and developed as training institutes for the proposed/mandated one-week course.

Faculty from these institutes will be trained at the National Resource Institutes, which would be about 10 in number, selected in consultation with IIA and the CoA and the Core Group on Earthquake Risk Mitigation.

Support will be provided to the National Resource Centres for library and laboratory facilities.

The Ministry of Home Affairs will be the nodal agency for the formulation and implementation of the project. Programme Management would be under the aegis of a Steering Committee (SC) consisting of the members of the core group on earthquake risk mitigation, IIA and the CoA, and various resource institutes across the country, under the chairmanship of the joint secretary, NDM. SC will meet quarterly to review the progress of the project.

At the State level, a steering committee will be formed out of the nominees of the Council of Architecture, selected members of the resource institutes in the states and specialists in the subject matter under the chairmanship of the State Relief Commissioner/Secretary Disaster Management to review the progress of the plan at the state level. It will meet quarterly to review the performance. Financial assistance shall be given to National Resource Institutes as grants under non-plan head since it is expenditure incurred on capacity building and not creation of assets.

4.7 EXTERNAL LINKAGES

Though the Government of India makes no formal requests, international organisations offer *suo moto* assistance, which is accepted. Linkages exist with the UN Office for Coordination of Humanitarian Affairs (UN OCHA), which has been made responsible for

all international disaster response; the UNDP, which is in charge of prevention and mitigation aspects; and, the UN Disaster Assistance and Coordination System (UNDAC), (Tenth Plan Document, GoI).

GoI-UNDP INITIATIVE

The following activities are underway as combined GoI- UNDP initiative to build resilience to earthquake disasters at the State, District and Local levels:

Construction and strengthening of existing Emergency Operations Centres (EOCs) with a view to providing multi-hazard resistant structures, equipped with latest communication equipments (provided by the UNDP).

Training of elected representatives of the people at local level, with a view to capacity enhancement, since they are the first responders to crisis events and also members of Disaster Management Committees.

Introduction of "Disaster Management" in school syllabi to establish base for development of subsequent education and training in the subject. CBSE has taken the lead in this regard by introducing the subject in standard VIII and IX. (it is proposed for standard X). Delhi, Gujarat, Tamil Nadu, Sikkim, Mizoram and Orissa have already complied with the requirement. National Council for Educational Research and Training (NCERT) is working on a teachers' training programme to ensure safety, health and welfare (SHW) of school children.

Formulation of Village Disaster Management Plans and formation of Village Disaster Management Volunteer Teams as a priority measure would be undertaken. Volunteers will be imparted training by various line departments like fire brigade, police, civil defence, etc. States are being requested to dovetail disaster management plans with development plans. Many States have initiated the process of converting state relief codes into state disaster management codes.

Urban Earthquake Vulnerability Reduction Project

Under combined GoI-UNDP initiative, specifically for 38 cities in seismic zones 3,4, and 5, there is underway, a GoI-UNDP vulnerability reduction demonstration project (2002-07), which aims to develop capacities of communities, government functionaries, and all involved stakeholders in responding better to disasters.

Specific Objectives of the Programme are as follows:

- Development of State and District Disaster Management Plans
- Development of Disaster Risk Management and Response Plans at Village/Ward, Gram Panchayat, Block/Urban local body level.
- Constitution and training of Disaster Management Teams (DMTs), and Disaster Management Committees at all levels with adequate representation of women in all committees and teams at Village/Ward, Gram Panchayat, Block/Urban Local body, District and State. At the village level, the DMT is a number of village task forces on various aspects of disaster management.
- Capacity building of DMTs at all levels
- Special training for women in shelter management, rescue and evacuation, first aid, water and sanitation, etc.

- Capacity building in cyclone and earthquake resistant features for houses in disaster prone districts, training in retrofitting, and construction of technology demonstration units.
- Integration of disaster management plans with development plans of local self-governments.
- Mainstreaming of disaster management in training, capacity building and education curricula at all levels across the country.
- Thrust would be on involving specialist urban planning institutions in preparing plans and women.

Broadly, the objectives of the Programme are:

1) **Awareness Generation**

Create awareness among government functionaries, technical institutions, NGOs, CBOs, and communities about earthquake vulnerability and possible preventive actions. Information dissemination would be attempted through available media like the newspapers, television radio, and interactive sessions with stakeholders and civil society actors, engineers and architects, dissemination of print material among students, community members, advertisement campaigns etc., about earthquake resistant housing techniques, critical response activities such as shelter management, rescue and evacuation, etc., preferably/also in vernaculars.

2) **Earthquake Preparedness Plan**

Development and institutionalising of earthquake preparedness and response plans and practice these through mock drills; civil society institutions from the ward to the city level such as the Lions Club the Rotary Club, disaster management teams, involving state agencies, NCC and the NSS, etc., will be involved in such drills.

3) **Developing a Techno-Legal framework**

Development of regulatory framework (techno-legal regime) to promote safe construction and systems to ensure compliance with safe building norms. Emphasis would be on developing orientation of safe development practices among policy-makers. Provision of institutional mechanisms like city specific audit agencies for overseeing safe development practices, creating empowered community watchdog bodies to review zoning regulations in old and new city areas, revise building codes, oversee certification system for engineers and architects, consultation and partnerships with financial institutions and insurance agencies for disaster resistant features in new buildings and retrofitting in old ones. Providing for an institutional framework for National/ State level Ombudsman is essential to ensure compliance with safe building practices, and undertaking academic exercises like building databases regarding vulnerabilities and risks in specific areas as decision support and preparing training modules for architects and engineers in 'earthquake engineering'.

4) **Capacity Building**

Capacity building for certification by government functionaries and professionals (engineers and architects) is necessary. It would involve developing expertise in local academic institutions, training and orientation programmes for state level functionaries, NGOs, local government, private sector stakeholders, etc. (real estate firms, builders, contractors, etc.) in preparing vulnerability reduction plans, training of selected government engineers from

prominent engineering departments such as PWD, MES, Urban Development authorities on seismic resistant construction, code provisions, safety and evaluation techniques, retrofitting etc. in collaboration with the National Programme on Earthquake Engineering Education (NPEEE) a programme of the Ministry of Human Resource Development, sensitising and training community organisations like the Resident Welfare Associations (RWA) in earthquake preparedness and response plans, assisting with R&D in disaster resistant technology and vulnerability analysis at the National level, providing support for setting up resource centres in major cites for technology transfer.

5) **Networking**

Networking knowledge on best practices and tools for earthquake risk management, including creation of information systems containing inventory of resources for emergency operations.

The Government of India and the UNDP are engaged in an information technology (IT) based project for knowledge-networking across institutions involved in disaster management. A web based portal has been created for inter-city cooperation on earthquake vulnerability reduction initiatives to provide a forum for city representatives, project coordinators and National Advisers to share experiences and learning on urban earthquake risk and risk management for linking the practitioners involved in the programme. The web portal would also link various institutions engaged in different aspects of disaster management viz. prevention, preparedness, mitigation, social and scientific research, academic inquiry etc., for comprehensive and concerted effort towards disaster management. Presently, the effort is piecemeal and dispersed across institutions. Consequently, it becomes difficult to:

- Apply technology where needed because know- how is missing.
- Know about best practices in the subject area.
- Ensure comprehensive not piecemeal effort at disaster management.
- Retrieve knowledge where it is immediately needed since most knowledge is tacit or implicit, confined to the bearer, and needs to be codified as explicit knowledge. The catchword is Knowledge Management, explained as *all about getting the right knowledge, in the right place, at the right time.*

The intent is to network knowledge across institutions so that organisations collaborate for information sharing and collation of information hitherto unavailable and enhance their knowledge base. In the absence of such an approach/effort, institutions operate in their isolated modes/worlds and administration develops a self-defeating 'disjointed' character. Disaster management is a fast developing field. To keep abreast of latest developments and access the latest information on issues like, climate change, web connectivity is absolutely imperative.

The programme also intends to replicate successful experiments elsewhere without loss of reaction time. Otherwise information lies in a corner, when it is immediately required somewhere. Hence, reaction time should be minimum in the sense of accessibility of information. Accordingly, the intent is to keep a record of *best practices* in disaster management for quick replication, wherever needed. This would develop the coping capacity in regions where know-how is lacking.

Develop a data bank for ready access wherever required, regarding facts for decision making or access to best practices.

Hence, the portal provides information on Knowledge Collaboration Tools and incentive based tools such as:

- Moderated access and facilitation
- Programme monitoring and methodology sharing tools
- Members workspace for decentralised content management
- Powerful search engines
- Moderated discussion forum for problem solving
- Document management system
- Moderated intra-network e-mail

The portal links departments, statutory agencies, research organisations *et al* cross-country at National and State levels to provide comprehensive input for disaster risk reduction policy and best practices. In this programme, the UNDP would play a supportive role in that it would provide knowledge of best practices, orient administration at the National State and Local Levels towards disaster mitigation, specifically with regard to earthquake risk mitigation, empower communities to enable them to help themselves in times of crisis, before effective intervention.

Earthquake Vulnerability Reduction in Rural Areas

Seismically safe construction would be ensured under Indira Awas Yojana (IAY) and Sampooran Grameen Rojgar Yojana (SGRY). This would contribute to popularising hazard safe construction practices in rural areas. A programme to assist the States and Union Territories in training and certification of 5000 rural masons has been formulated in consultation with the Housing and Urban Development Corporation (HUDCO) and the Ministry of Rural Development. A Committee of Experts has prepared the Training Module, which would form part of vocational training programme in the Ministry of Human Resource Development.

4.8 CYCLONES AND FLOOD HAZARD MITIGATION

In order to respond effectively to floods, the Ministry of Home Affairs has initiated the National Disaster Risk Management Programme in all the flood hazard prone states. Assistance is being provided to the states in preparation of disaster management plans at the State, District, Block / Taluka and Village levels. Elected representatives are being trained in flood hazard mitigation programmes; besides, awareness campaigns targeted at all the stakeholders involved besides, community members. Bihar, Orissa, West Bengal, Assam and Uttar Pradesh are among the 17 states, where this programme is being implemented with assistance from the UNDP, USAID, and the European Commission. A National Core Group on Cyclone Monitoring and Mitigation has been constituted with experts from the India Meteorological Department, National Centre for Medium Range Weather Forecasting, Central Water Commission, National Remote Sensing Agency and Indian Space Research Organisation as members, besides administrators from the relevant ministries and departments and state governments vulnerable to cyclones. The Core Group would look after cyclone warning with a view to making it user friendly, and meet the requirements of technology up-gradation, coordination between involved agencies, official and non- official. Besides, Rs.1050 crore project has been sanctioned by the Planning

Commission, which would be implemented with the help of the World Bank. This would emphasise cyclone shelters, coastal green belts, strengthening warning system, training and education, etc., that help curb the cyclone hazard.

Likewise, National Core Group has been constituted for Landslide Hazard Mitigation. Secretary, Border Management will be the Chairman. It would comprise secretaries of departments of science and technology, road transport and highways, heads of Geological Survey of India (GSI) and National Remote Sensing Agency. The GSI is the nodal agency. Through remote sensing, mapping of landslide prone areas would be carried out. Information from various sources would be collated at the GSI and a landslide mitigation plan drawn up, accordingly.

4.9 CONCLUSION

It is not possible to do away with the devastation of natural hazards completely. However, experience has shown that destruction from natural hazards can be minimised by a well functioning warning system, combined with preparedness on the part of the vulnerable community. Warning systems and preparedness measures reduce and modify the scale of disasters. A community that is prepared to face disasters receives and understands warnings of impending hazards, and has taken precautionary and mitigation measures, will be able to cope better and resume their normal life sooner. This requires deep rooted and long-term changes in the approach of the government at all levels, of the civil society organisations and the community. The traditional view is that the more severe the force of the phenomena, the greater the losses. There is hence a need for concentration on disaster response, rather than prevention or preparedness. However, this position is only partially accurate as the scale of damage and destruction always depends on what might be affected. The size of the disaster therefore varies depending on the vulnerability, that is, the number of elements that can be damaged and their ability to withstand the forces of the phenomena.

It, therefore, becomes important for the global community to lay greater emphasis on ways and means of preventing and preparing for disasters. This proactive approach is far better than seeking to restore the community to its pre-disaster status and then waiting for history to repeat itself. There is a need to examine the relation between environmental degradation and vulnerability to disasters and their combined effects on both natural and man-made habitats. There is also a need to co-ordinate efforts to reduce vulnerability to disasters. While preventive measures will not halt earthquakes or cyclones, they will minimise the impact of such disasters on the environment. Accordingly, there is increasing mobilisation of efforts at the international level towards imparting a disaster management perspective to development. The emphasis has to be on preventing and mitigating disasters in order to minimise loss of development gains when they strike.

4.10 KEY CONCEPTS

Incident Command System : It is a system of organisational flexibility, which allows for expansion of an organisation as per need to handle the contingent situation best. Personnel on the ground are allowed flexibility to take quick on the spot decisions as per the demand of the situation. Another significant requirement is collation of all effort

under an umbrella organisation to attain desired coherence in functioning. This concept was developed in the US following inability of traditional organisational forms to handle frequent wild fires in California.

Plan and Non-Plan Expenditure : Expenditure that leads to *creation of assets* is classified plan expenditure; that pertaining to *capacity building* and other general maintenance is classified, non- plan expenditure.

Preparedness : The United Nations Disaster Relief Office (UNDRO) uses the following definition for Disaster Preparedness: "Disaster Preparedness may be described as (a series of) measures designed to organise and facilitate timely and effective rescue, relief and rehabilitation operations in cases of disaster…. Measures of preparedness include among others, setting up disaster relief machinery, formulation of emergency relief plans, training of specific groups (and vulnerable communities) to undertake rescue and relief, stockpiling supplies and earmarking funds for relief operations".

Retrofitting : Retrofitting is the process of making existing buildings disaster resistant by incorporation of disaster resistant features in their structural and non-structural systems. Many people fear for existing buildings in the belief that disaster resistant features can only be incorporated in new buildings, but this is not so. These can be effectively and economically introduced in new buildings, depending on the construction material, technology and condition of the building. Retrofitting is most effective in earthquake and cyclone prone areas. The cost aspects of retrofitting and the long-range benefits that will be available by adopting retrofitting of existing unsafe buildings have been researched and documented the world over. It has been estimated that the cost of retrofitting would be around 5-10 per cent of the cost of new construction. Of course, the cost of retrofitting will vary according to the condition of the existing structure. In view of the huge losses suffered by the country in the earthquakes in the last fifteen (15) years, it has been strongly recommended that retrofitting of buildings and structures as a component of disaster management should be adopted as a point of policy of the Government of India as well as the State Governments and funding be earmarked for the purpose urgently.

4.11 REFERENCES AND FURTHER READING

"Hyogo Framework for Action", available at United Nations International Strategy for Disaster Reduction, at http:// www.unisdr.org

GoI- UNDP, Dec. 2004, Disaster Risk Management Programme, Project Management Board, (PMBNDM), Ministry of Home Affairs.

GoI, Tenth Plan, "Disaster Management", 2002-07.

GoI-UNDP, Disaster Risk Management Programme, 2002-07, Ministry of Home Affairs,

Government of India and the United Nations Development Programme (UNDP).

GoI-UNDP, "Knowledge Management in Disaster Risk Reduction: The Indian Approach", Government of India, Ministry of Home Affairs, National Disaster Management Division, Official Documents, World Conference on Disaster Reduction 18-22 Jan.2005, Kobe, Hyogo, Japan, at http://www.ndmindia.nic.in/WCDRDOCS/knowledge-manageme.pdf.

Government of India, Ministry of Home Affairs, August 2004, "Disaster Management in India: A Status Report", National Disaster Management Division, Ministry of Home Affairs.

National Programme For Capacity Building of Architects in Earthquake Risk Mitigation-(NPCBAERM), Government of India, Ministry of Home Affairs, Disaster Management Division.

National Programme for Capacity Building of Engineers in Earthquake Risk Mitigation, National Disaster Management Division, Government of India (NPCBEERM), Government of India, Ministry of Home Affairs, Disaster Management Division.

Report of the High Powered Committee on Disaster Management, 2001, Government of India, New Delhi.

Sharma Vinod S., 1998, Training Workshop on Vulnerability and Preparedness, National Centre for Disaster Management, Indian Institute of Public Administration, New Delhi.

"The Twelfth Finance Commission Report", *Economic Survey*, 2004-05.

4.12 ACTIVITIES

1) Inquire from the local authorities in your area if there is any disaster preparedness plan for your district. If yes, study it and list things you should be doing in times of such crises. If no, make a table of key role-players and their responsibilities, as you understand them.

2) Make a disaster preparedness plan for your family. Identify the hazards within your house and its surroundings that can lead to injury or damage in the event of an earthquake, prepare a list of do's and don'ts for people living in your neighbourhood.