

**Government of India
Ministry of Home Affairs**

DISASTER MANAGEMENT IN INDIA

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SECTION -I

Introduction

1.1 India has been traditionally vulnerable to natural disasters on account of its unique geo-climatic conditions. Floods, droughts, cyclones, earthquakes and landslides have been a recurrent phenomena. About 60% of the landmass is prone to earthquakes of various intensities; over 40 million hectares is prone to floods; about 8% of the total area is prone to cyclones and 68% of the area is susceptible to drought. In the decade 1990-2000, an average of about 4344 people lost their lives and about 30 million people were affected by disasters every year. The loss in terms of private, community and public assets has been astronomical.

1.2 At the global level, there has been considerable concern over natural disasters. Even as substantial scientific and material progress is made, the loss of lives and property due to disasters has not decreased. In fact, the human toll and economic losses have mounted. It was in this background that the United Nations General Assembly, in 1989, declared the decade 1990-2000 as the International Decade for Natural Disaster Reduction with the objective to reduce loss of lives and property and restrict socio-economic damage through concerted international action, specially in developing countries.

1.3 The super cyclone in Orissa in October, 1999 and the Bhuj earthquake in Gujarat in January, 2001 underscored the need to adopt a multi dimensional endeavour involving diverse scientific, engineering, financial and social processes; the need to adopt multi disciplinary and multi sectoral approach and incorporation of risk reduction in the developmental plans and strategies.

1.4. Over the past couple of years, the Government of India have brought about a paradigm shift in the approach to disaster management. The new approach proceeds from the conviction that development cannot be sustainable unless disaster mitigation is built into the development process. Another corner stone of the approach is that mitigation has to be multi-disciplinary spanning across all sectors of development. The new policy also emanates from the belief that investments in mitigation are much more cost effective than expenditure on relief and rehabilitation.

1.5 Disaster management occupies an important place in this country's policy framework as it is the poor and the under-privileged who are worst affected on account of calamities/disasters.

1.6 The steps being taken by the Government emanate from the approach outlined above. The approach has been translated into a National Disaster Framework [a roadmap] covering institutional mechanisms, disaster prevention strategy, early warning system, disaster mitigation, preparedness and response and human resource development. The expected inputs, areas of intervention and agencies to be involved at the National, State and district levels have been identified and listed in the roadmap. This roadmap has been shared with all the State Governments and Union Territory Administrations. Ministries and Departments of Government of India, and the State Governments/UT Administrations have been advised to develop their respective roadmaps taking the national roadmap as a broad guideline. There is, therefore, now a common strategy underpinning the action being taken by all the participating organisations/stakeholders. A copy of the roadmap is at **Annexure – I**.

SECTION-II

Institutional and Policy Framework

2.1 The institutional and policy mechanisms for carrying out response, relief and rehabilitation have been well-established since Independence. These mechanisms have proved to be robust and effective insofar as response, relief and rehabilitation are concerned.

2.2 At the national level, the Ministry of Home Affairs is the nodal Ministry for all matters concerning disaster management. The Central Relief Commissioner (CRC) in the Ministry of Home Affairs is the nodal officer to coordinate relief operations for natural disasters. The CRC receives information relating to forecasting/warning of a natural calamity from India Meteorological Department (IMD) or from Central Water Commission of Ministry of Water Resources on a continuing basis. The Ministries/Departments/Organizations concerned with the primary and secondary functions relating to the management of disasters include: India Meteorological Department, Central Water Commission, Ministry of Home Affairs, Ministry of Defence, Ministry of Finance, Ministry of Rural Development, Ministry of Urban Development, Department of Communications, Ministry of Health, Ministry of Water Resources, Ministry of Petroleum, Department of Agriculture & Cooperation, Ministry of Power, Department of Civil Supplies, Ministry of Railways, Ministry of Information and Broadcasting, Planning Commission, Cabinet Secretariat, Department of Surface Transport, Ministry of Social Justice, Department of Women and Child Development, Ministry of Environment and Forest, Department of Food. Each Ministry/Department/Organization nominate their nodal officer to the Crisis Management Group chaired by Central Relief Commissioner. The nodal officer is

responsible for preparing sectoral Action Plan/Emergency Support Function Plan for managing disasters.

2.3 National Crisis Management Committee (NCMC): Cabinet Secretary, who is the highest executive officer, heads the NCMC. Secretaries of all the concerned Ministries /Departments as well as organizations are the members of the Committee. The NCMC gives direction to the Crisis Management Group as deemed necessary. The Secretary, Ministry of Home Affairs is responsible for ensuring that all developments are brought to the notice of the NCMC promptly. The NCMC can give directions to any Ministry/Department/Organization for specific action needed for meeting the crisis situation.

2.4 Crisis Management Group: The Central Relief Commissioner in the Ministry of Home Affairs is the Chairman of the CMG, consisting of senior officers (called nodal officers) from various concerned Ministries. The CMG's functions are to review every year contingency plans formulated by various Ministries/Departments/Organizations in their respective sectors, measures required for dealing with a natural disasters, coordinate the activities of the Central Ministries and the State Governments in relation to disaster preparedness and relief and to obtain information from the nodal officers on measures relating to above. The CMG, in the event of a natural disaster, meets frequently to review the relief operations and extend all possible assistance required by the affected States to overcome the situation effectively. The Resident Commissioner of the affected State is also associated with such meetings.

2.5 Control Room (Emergency Operation Room): An Emergency Operations Center (Control Room) exists in the nodal Ministry of Home Affairs, which functions round the clock, to assist the Central Relief Commissioner in the discharge of his duties. The activities of the Control Room include collection and

transmission of information concerning natural calamity and relief, keeping close contact with governments of the affected States, interaction with other Central Ministries/Departments/Organizations in connection with relief, maintaining records containing all relevant information relating to action points and contact points in Central Ministries etc., keeping up-to-date details of all concerned officers at the Central and State levels.

2.6 Contingency Action Plan: A National Contingency Action Plan (CAP) for dealing with contingencies arising in the wake of natural disasters has been formulated by the Government of India and it had been periodically updated. It facilitates the launching of relief operations without delay. The CAP identifies the initiatives required to be taken by various Central Ministries/Departments in the wake of natural calamities, sets down the procedure and determines the focal points in the administrative machinery.

2.7 State Relief Manuals: Each State Government has relief manuals/codes which identify that role of each officer in the State for managing the natural disasters. These are reviewed and updated periodically based on the experience of managing the disasters and the need of the State.

2.8 Funding mechanisms: The policy and the funding mechanism for provision of relief assistance to those affected by natural calamities is clearly laid down. These are reviewed by the Finance Commission appointed by the Government of India every five years. The Finance Commission makes recommendation regarding the division of tax and non-tax revenues between the Central and the State Governments and also regarding policy for provision of relief assistance and their share of expenditure thereon. A **Calamity Relief Fund (CRF)** has been set up in each State as per the recommendations of the Eleventh Finance Commission. The size of the Calamity Relief Fund has been fixed by the

Finance Commission after taking into account the expenditure on relief and rehabilitation over the past 10 years. The Government of India contributes 75% of the corpus of the Calamity Relief Fund in each State. 25% is contributed to by the State. Relief assistance to those affected by natural calamities is granted from the CRF. Overall norms for relief assistance are laid down by a national committee with representatives of States as members. Different States can have State-specific norms to be recommended by State level committee under the Chief Secretary. Where the calamity is of such proportion that the funds available in the CRF will not be sufficient for provision of relief, the State seeks assistance from the **National Calamity Contingency Fund (NCCF)** - a fund created at the Central Government level. When such requests are received, the requirements are assessed by a team from the Central Government and thereafter the assessed requirements are cleared by a High Level Committee chaired by the Deputy Prime Minister. In brief, the institutional arrangements for response and relief are well-established and have proved to be robust and effective.

2.9 In the federal set up of India, the basic responsibility for undertaking rescue, relief and rehabilitation measures in the event of a disaster is that of the State Government concerned. At the State level, response, relief and rehabilitation are handled by Departments of Relief & Rehabilitation. The State Crisis Management Committee set up under the Chairmanship of Chief Secretary who is the highest executive functionary in the State. All the concerned Departments and organisations of the State and Central Government Departments located in the State are represented in this Committee. This Committee reviews the action taken for response and relief and gives guidelines/directions as necessary. A control room is established under the Relief Commissioner. The control room is in constant touch with the climate monitoring/forecasting agencies and monitors the action being taken by various agencies in performing their responsibilities. The district level is the key level for disaster management and relief activities. The

Collector/Dy. Commissioner is the chief administrator in the district. He is the focal point in the preparation of district plans and in directing, supervising and monitoring calamities for relief. A District Level Coordination and Relief Committee is constituted and is headed by the Collector as Chairman with participation of all other related government and non governmental agencies and departments in addition to the elected representatives. The Collector is required to maintain close liaison with the district and the State Governments as well as the nearest units of Armed Forces/Central police organisations and other relevant Central Government organisations like Ministries of Communications, Water Resources, Drinking Water, Surface Transport, who could supplement the efforts of the district administration in the rescue and relief operations. The efforts of the Government and non-governmental organisations for response and relief and coordinated by the Collector/Dy. Commissioner. The District Magistrate/Collector and Coordination Committee under him reviews preparedness measures prior to a impending hazard and coordinate response when the hazard strikes. As all the Departments of the State Government and district level report to the Collector, there is an effective coordination mechanism ensuring holistic response.

2.10 New institutional mechanisms: As has been made clear above, the existing mechanisms had based on post-disaster relief and rehabilitation and they have proved to be robust and effective mechanisms in addressing these requirements. The changed policy/approach, however, mandates a priority to full disaster aspects of mitigation, prevention and preparedness and new institutional and policy mechanisms are being put in place to address the policy change.

2.11 It is proposed to constitute a National Emergency Management Authority at the National level. The High Powered Committee on Disaster Management which was set up in August, 1999 and submitted its Report in October, 2001, had inter

alia recommended that a separate Department of Disaster Management be set up in the Government of India. It was, however, felt that conventional Ministries/Departments have the drawback of not being flexible enough specially in terms of the sanction procedures. The organisation at the Apex level will have to be multi-disciplinary with experts covering a large number of branches. The National Emergency Management Authority has, therefore, been proposed as a combined Secretariat/Directorate structure – a structure which will be an integral part of the Government and, therefore, will work with the full authority of the Government while, at the same time, retaining the flexibility of a field organisation. The National Emergency Management Authority will be headed by an officer of the rank of Secretary/Special Secretary to the Government in the Ministry of Home Affairs with Special Secretaries/Additional Secretaries from the Ministries/Departments of Health, Water Resources, Environment & Forests, Agriculture, Railways, Atomic Energy, Defence, Chemicals, Science & Technology, Telecommunications, Urban Employment and Poverty Alleviation, Rural Development and India Meteorological Department as Members of the Authority. The Authority would meet as often as required and review the status of warning systems, mitigation measures and disaster preparedness. When a disaster strikes, the Authority will coordinate disaster management activities. The Authority will be responsible for:-

- i) Coordinating/mandating Government's policies for disaster reduction/mitigation.
- ii) Ensuring adequate preparedness at all levels in order to meet disasters.
- iii) Coordinating response to a disaster when it strikes.
- iv) Coordination of post disaster relief and rehabilitation.

The National Emergency Management Authority will have a core permanent secretariat with three divisions – one for Disaster Prevention, Mitigation &

Rehabilitation, the other for Preparedness and the third for Human Resource Development.

2.12 At the State level, as indicated in para disaster management was being handled by the Departments of Relief & Rehabilitation. As the name suggests, the focus was almost entirely on post-calamity relief. The Government of India is working with the State Governments to convert the Departments of Relief & Rehabilitation into Departments of Disaster Management with an enhanced area of responsibility to include mitigation and preparedness apart from their present responsibilities of relief and rehabilitation. The changeover has already happened in eight State Governments/Union Territory Administrations. The change is under process in other States.

2.13 The States have also been asked to set up Disaster Management Authorities under the Chief Minister with Ministers of relevant Departments [Water Resources, Agriculture, Drinking Water Supply, Environment & Forests, Urban Development, Home, Rural Development etc.] as members. The objective of setting up an Authority is to ensure that mitigation and preparedness is seen as the joint responsibility of all the Departments concerned and disaster management concerns are mainstreamed into their programmes. This holistic and multi-disciplinary approach is the key to effective mitigation.

2.14. At the district level, the District Magistrate who is the chief coordinator will be the focal point for coordinating all activities relating to prevention, mitigation and preparedness apart from his existing responsibilities pertaining to response and relief. The District Coordination and Relief Committee is being re-constituted/re-designated into Disaster Management Committees with officers from relevant departments being added as members. Because of its enhanced mandate of mitigation and prevention, the district heads and departments engaged

in development will now be added to the Committee so that mitigation and prevention is mainstreamed into the district plan. The existing system of drawing up preparedness and response plans will continue. There will, however, also be a long term mitigation plan. District Disaster Management Committees have already been constituted in several districts and are in the process of being constituted in the remaining multi-hazard prone districts.

2.15 Similarly, we are in the process of creating Block/Taluq Disaster Management Committees in these 169 multi-hazard prone districts in 17 States. At the village level, in 169 multi-hazard prone districts, we are constituting Disaster Management Committees and Disaster Management Teams. Each village will have a Disaster Management Plan. The process of drafting the plan has already begun. The Disaster Management Committee which draws up the plans consists of elected representatives at the village level, local authorities, Government functionaries including doctors/paramedics of primary health centres located in the village, primary school teachers etc. The plan encompasses prevention, mitigation and preparedness measures. The Disaster Management Teams at the village level will consist of members of voluntary organisations like Nehru Yuvak Kendra and other non-governmental organisations as well as able bodied volunteers from the village. The teams are provided basic training in evacuation, search and rescue etc. The Disaster Management Committee will review the disaster management plan at least once in a year. It would also generate awareness among the people in the village about dos' and don'ts for specific hazards depending on the vulnerability of the village. A large number of village level Disaster Management Committees and Disaster Management Teams have already been constituted.

2.16 The States have been advised to enact Disaster Management Acts. These Acts provide for adequate powers for authorities coordinating mitigation,

preparedness and response as well as for mitigation/prevention measures required to be undertaken. Two States [Gujarat & Madhya Pradesh] have already enacted such a law. Other States are in the process. The State Governments have also been advised to convert their Relief Codes into Disaster Management Codes by including aspects of prevention, mitigation and preparedness.

2.17 In order to further institutionalize the new approach, the Government of India have decided to enunciate a National Policy on Disaster Management. A draft policy has accordingly been formulated and is expected to be put in place shortly. The policy shall inform all spheres of Central Government activity and shall take precedence over all existing sectoral policies. The broad objectives of the policy are to minimize the loss of lives and social, private and community assets because of natural or manmade disasters and contribute to sustainable development and better standards of living for all, more specifically for the poor and vulnerable sections by ensuring that the development gains are not lost through natural calamities/disasters.

2.18 The policy notes that State Governments are primarily responsible for disaster management including prevention and mitigation, while the Government of India provides assistance where necessary as per the norms laid down from time to time and proposes that this overall framework may continue. However, since response to a disaster requires coordination of resources available across all the Departments of the Government, the policy mandates that the Central Government will, in conjunction with the State Governments, seek to ensure that such a coordination mechanism is laid down through an appropriate chain of command so that mobilization of resources is facilitated.

2.19 The broad features of the draft national policy on disaster management are enunciated below:-

- i) A holistic and pro-active approach for prevention, mitigation and preparedness will be adopted for disaster management.
- ii) Each Ministry/Department of the Central/State Government will set apart an appropriate quantum of funds under the Plan for specific schemes/projects addressing vulnerability reduction and preparedness.
- iii) Where there is a shelf of projects, projects addressing mitigation will be given priority. Mitigation measures shall be built into the on-going schemes/programmes
- iv) Each project in a hazard prone area will have mitigation as an essential term of reference. The project report will include a statement as to how the project addresses vulnerability reduction.
- v) Community involvement and awareness generation, particularly that of the vulnerable segments of population and women has been emphasized as necessary for sustainable disaster risk reduction. This is a critical component of the policy since communities are the first responders to disasters and, therefore, unless they are empowered and made capable of managing disasters, any amount of external support cannot lead to optimal results.
- vi) There will be close interaction with the corporate sector, non-governmental organisations and the media in the national efforts for disaster prevention/vulnerability reduction.
- vii) Institutional structures/appropriate chain of command will be built up and appropriate training imparted to disaster managers at various levels to ensure coordinated and quick response at all levels; and development of inter-State arrangements for sharing of resources during emergencies.
- viii) A culture of planning and preparedness is to be inculcated at all levels for capacity building measures.

- ix) Standard operating procedures and disaster management plans at state and district levels as well as by relevant central government departments for handling specific disasters will be laid down.
- x) Construction designs must correspond to the requirements as laid down in relevant Indian Standards.
- xi) All lifeline buildings in seismic zones III, IV & V – hospitals, railway stations, airports/airport control towers, fire station buildings, bus stands major administrative centres will need to be evaluated and, if necessary, retro-fitted.
- xii) The existing relief codes in the States will be revised to develop them into disaster management codes/manuals for institutionalizing the planning process with particular attention to mitigation and preparedness.

2.19 With the above mentioned institutional mechanism and policy framework in position and the actions taken to implement the policy guidelines, it is expected that the task of moving towards vulnerability reduction will be greatly facilitated.

SECTION III

Early Warning System

Cyclone Forecasting

3.1 Tropical Cyclones are intense low pressure systems which develop over warm sea. They are capable of causing immense damage due to strong winds, heavy rains and storm surges. The frequency of the TC in the Bay of Bengal is 4 to 5 times more than in the Arabian Sea. About 35% of initial disturbances in the north Indian ocean reach TC stage of which 45% become severe.

3.2 Indian Meteorological Department (IMD) is mandated to monitor and give warnings regarding Tropical Cyclone (TC). Monitoring process has been revolutionized by the advent of remote sensing techniques. A TC intensity analysis and forecast scheme has been worked out using satellite image interpretation techniques which facilitate forecasting of storm surges.

3.3 Data resources are crucial to early forecasting of cyclones. Satellite based observations are being extensively utilized. Satellite integrated automated weather stations have been installed on islands, oilrigs and exposed coastal sites. Buoys for supplementing the surface data network in the tropical ocean have been deployed. The Government have also started a National Data Buoy Programme. A set of 12 moored buoys have been deployed in the northern Indian Ocean to provide meteorological and oceanographic data.

3.4 Dynamic forecasting of TCs requires knowledge of the vertical structure of both the Cyclone and the surrounding environment. The rawin sonde remains the principal equipment for sounding. The Doppler Radar wind profiler provides hourly soundings. A mesosphere, stratosphere, troposphere (MST) radar has also been installed at Thirupatti. Another profiler is being developed and will be

deployed at IMD Pune. Another important source of upper level data is the aircraft reports. Increasing number of commercial jet aircraft are equipped with the Aircraft Meteorological Data Relay system. This data is being made available is also being used by the IMD for analysis and predictions.

3.5 Radars have been used to observe TCs since long. Surveillance of the spiral rain bands and the eye of the TC is an important function of the coastal radars. 10 Cyclones Detection Radars have already been installed. These radars are providing useful estimates of storm centres upto a range 300-400 Km. Doppler radars provide direct measurements of wind fields in TCs. Due to range limitation, Doppler wind estimates are usually within a range of about 100 Km. IMD has deployed Doppler radars at 3 sites on the east coast. Another set of 3 Doppler radars are being deployed in Andhra Pradesh in near future.

3.6 The meteorological satellite has made a tremendous impact on the analysis of cyclones. All developing cloud clusters are routinely observed through satellite cloud imagery & those showing signs of organisation are closely monitored for signs of intensification. TC forecasters everywhere use the Dvorak technique to estimate storm location and intensity. It has been found to provide realistic estimates for TCs in the Bay of Bengal as well as Arabian Sea. INSAT data has also been used to study the structures of different TCs in the Bay of Bengal. IMD is also producing Cloud Motion Vectors (CMVs). Very High Resolution Radiometer (VHRR) payload onboard INSAT –2E which have been improved upon to provide water vapor channel data in addition to VIS & IR onboard INSAT – 2E. A separate payload known as Charged Couple Device (CCD) has also been deployed onboard this satellite.

3.7 The goal of any warning system is to maximize the number of people who take appropriate and timely action for the safety of life and property. All warning systems start with detection of the event and with people getting out of harm's way. Such warning systems encompass three equally important elements namely; Detection and Warning; Communication; and Response.

3.8 The two stage warning system has been in existence since long in IMD. Recently it has been improved upon by introducing two more stages - the 'Pre-Cyclone watch' and the 'post-landfall Scenario'. This four stage warning system meets the requirements of Public Administrators and Crisis Managers. The 'Pre-Cyclone Watch' stage, contains early warning about the development of a cyclonic disturbance in the form of monsoon depression which has a potential to threaten the coast with cyclone force winds. The coastal stretch likely to be affected is identified. This early warning bulletin is issued by the IMD before the Cyclone-Alert Stage. This provides enough lead time for the crisis managers to undertake preparedness actions.

3.9 After the early warning on the 'Pre-Cyclone Watch' the Collectors of coastal and few immediate interior districts and the Chief Secretary of the concerned maritime State are warned in two stages, whenever any coastal belt is expected to experience adverse weather (heavy rain/gales/tidal wave) in association with a cyclonic storm or a depression likely to intensify into a cyclonic storm.

3.10 The second stage of "Cyclone Alert" is sounded 48 hours in advance of the expected commencement of adverse weather over the coastal areas. Forecasts of commencement of strong winds, heavy precipitation along the coast in association with arrival of cyclone are issued at the alert stage. Landfall point is usually not identified at this stage. The third stage warning known as

“Cyclone Warning” is issued 24 hours in advance. Landfall point is forecast in this stage of cyclone warning. In addition to the forecasts for heavy rains and strong winds, the storm surge forecast is also issued. Since the storm surge is the biggest killer so far as the devastating attributes of a storm are concerned, information in this regard is most critical for taking follow up action for evacuation from the low lying areas likely to be affected by the storm.

3.11 After the landfall of the cyclone the strong winds with gale force speeds continue over certain interior districts of the maritime States hit by the cyclone. To take cognizance of that, a fourth stage known as ‘Post-landfall Scenario Stage’ is now identified usually as a part of the ‘Cyclone Warning Stage’ either at the time of landfall of the disturbance or about twelve hour in advance of it. It includes warnings of strong winds and heavy rains likely to be encountered in the interior districts.

3.12 For communications, the IMD makes use of 97 point-to-point teleprinter links connecting different field offices. Switching computers have been provided at 5 Regional Centres. These computers are linked to the central Regional Telecom Hub Computer at New Delhi. In addition, 69 centres have been provided with 85 telex connections. Besides, 27 field offices have been provided with Radio Teletype facility. IMD also utilizes VSAT technology which has been installed at field offices. In addition, there are a number of HF/RT and VHF links.

3.13 Cyclone warnings are communicated to Crisis Managers and other concerned organizations by high priority telegrams, telex, telephones and Police wireless. Cyclone warning are provided by the IMD from the Area Cyclone Warning Centres (ACWCs) at Calcutta, Chennai and Mumbai and Cyclone Warning Centers (CWCs) at Vishakhapatnam, Bhubaneswar and Ahmedabad.

There is also a Satellite based communication system called the Cyclone Warning Dissemination Systems (CWDS) for transmission of warnings. There are 250 such cyclone-warning sets installed in the cyclone prone areas of east and west coast. The general public, the coastal residents and fishermen, are also warned through the Government machinery and broadcast of warnings through AIR and Television.

Flood Forecasting

3.17 Flooding is caused by the inadequate capacity within the banks of the rivers to contain the high flow brought down from the upper catchments due to heavy rainfall. It is also caused by accumulation of water resulting from heavy spells of rainfall over areas, which have got poor drainage characteristics.

3.18 Flooding is accentuated by erosion and silting leading to meandering of the rivers in plains and reduction in carrying capacity of the river channel. It is also aggravated by earthquakes and land slides, leading to changes in river course and obstructions to flow. Synchronization of floods in the main rivers and tributaries and retardation of flow due to tidal effects lead to major floods. Cyclones bring in their wake considerable loss of life and property.

3.19 The flood forecasting and warning system is used for alerting the likely damage centers well in advance of the actual arrival of floods, to enable the people to move and also to remove the moveable property to safer places or to raised platforms specially constructed for the purpose.

3.20 A beginning in scientific flood forecasting was made in November, 1958 by Central Water Commission (then known as Central Water & Power Commission) when a Flood Forecasting Centre was set up at its Headquarters, at Delhi, for

giving timely Forecasts and Warnings of the incoming floods to the villages located in the river areas around the National Capital, Delhi. The network has been expanding and by now the Flood Forecasting Network of the Central Water Commission(CWC) covers all the major flood prone inter-State river basins in the country.

3.21 At present there are 166 flood forecasting stations on various rivers in the country which includes 134 level forecasting and 32 inflow forecasting stations, river-wise break up of which is as under :

Sl.No.	Name of River Systems	No. of Flood Forecasting Stations		
		Level	Inflow	Total
1.	Ganga & Tributaries	71	14	85
2.	Brahmaputra & Tributaries	27	-	27
3.	Barak-System	2	-	2
4.	Eastern-Rivers	8	1	9
5.	Mahanadi	2	1	3
6.	Godavari	13	4	17
7.	Krishna	2	6	8
8.	West Flow Rivers	9	6	15
	TOTAL	134	32	166

3.22 The Flood Forecasting Network covers the 14 States and one Union Territory in addition to NCT of Delhi. State-wise number of flood forecasting centres are as under :

Sl. No.	State / Union territory	No. of Flood Forecasting Stations		
		Level	Inflow	Total
1.	Andhra Pradesh	8	7	15
2.	Assam	23	-	23
3.	Bihar	32	-	32
4.	Chhattishgarh	01	-	01
5.	Gujarat	6	4	10
6.	Haryana	-	01	01
7.	Jharkhand	-	04	04

8.	Karnataka	01	03	04
9.	Madhya Pradesh	2	-	02
10.	Maharashtra	5	02	07
11.	Orissa	10	01	11
12.	Uttaranchal	01	02	03
13.	Uttar Pradesh	31	04	35
14.	West Bengal	11	03	14
15.	Dadra & Nagar Haveli	01	01	02
16.	N.C.T. of Delhi	02	-	02
All India total		134	32	166

3.23 The Flood Forecasting involves the following four main activities :-

- (i) Observation and collection of hydrological and hydro-meteorological data;
- (ii) Transmission of Data to Forecasting Centres;
- (iii) Analysis of data and formulation of forecast; and
- (iv) Dissemination of forecast.

3.24 On an average, 6000 forecasts at various places in the country are issued during the monsoon season every year. The analysis of the forecasts issued during the last 25 years (1978 to 2002) indicates that accuracy of forecasts has consistently increased from around 81% to 98%. Forecast is considered accurate if forecast water level is within ± 15 cm. of actual water level of the inflow forecast (i.e. discharge) is within $\pm 20\%$ of actual discharge.

3.25 In monitoring the floods, severity of floods are placed in the following four categories by the central Water Commissions.

(i) **Low flood stage:**

It is that flood situation when the water level of the river is flowing between warning level and danger level of the forecasting stations.

(ii) **Medium flood stage:**

The river is called in medium floods when its water level is at or above the danger level of the forecasting station but below 0.50 of its highest flood level (HFL).

(iii) **High flood stage:**

When the water level of the river is below the HFL but within 0.50 m. of the HFL of the forecasting stations.

(iv) **Unprecedented flood stage :**

The river is called in unprecedented floods when it attains water level equal to or above its previous HFL at any forecasting station.

3.26 A computerized monitoring system has been developed under which daily water levels as observed at 0800 hrs. and forecasts issued by field units are transmitted to CWC headquarters in New Delhi. Based on the compilation of all such data received from field divisions, daily water level and flood forecast bulletins in two parts for stage and for inflow forecasting stations respectively.

3.27 Special Yellow Bulletins are issued whenever the river stage at the forecasting site attains a level within 0.50 m of its previous HFL. Red Bulletins highlighting security of the problem are also issued whenever the water level at the forecasting stations equals or exceeds previous HFL.

3.28 Bulletins are also updated on CWC Web site: www.cwc.nic.in for wider publicity among user agencies during flood season.

SECTION IV

Disaster Prevention and Mitigation

4.1 The Yokohama message emanating from the international decade for natural disaster reduction in May, 1994 underlined the need for an emphatic shift in the strategy for disaster mitigation. It was inter alia stressed that disaster prevention, mitigation, preparedness and relief are four elements which contribute to and gain, from the implementation of the sustainable development policies. These elements alongwith environmental protection and sustainable development, are closely inter related. Therefore, nations should incorporate them in their development plans and ensure efficient follow up measures at the community, sub-regional, regional, national and international levels. The Yokohama Strategy also emphasized that disaster prevention, mitigation and preparedness are better than disaster response in achieving the goals and objectives of vulnerability reduction. Disaster response alone is not sufficient as it yields only temporary results at a very high cost. Prevention and mitigation contribute to lasting improvement in safety and are essential to integrated disaster management.

4.2 The Government of India have adopted mitigation and prevention as essential components of their development strategy. The Tenth Five Year Plan document has a detailed chapter on Disaster Management. A copy of the said chapter is enclosed at Annexure – II. The plan emphasizes the fact that development cannot be sustainable without mitigation being built into developmental process. Each State is supposed to prepare a plan scheme for disaster mitigation in accordance with the approach outlined in the plan. In brief, mitigation is being institutionalized into developmental planning.

4.3 As indicated in the earlier chapter, the Finance Commission makes recommendations with regard to devolution of funds between the Central

Government and State Governments as also outlays for relief and rehabilitation. The earlier Finance Commissions were mandated to look at relief and rehabilitation. The Terms of Reference of the Twelfth Finance Commission have been changed and the Finance Commission has been mandated to look at the requirements for mitigation and prevention apart from its existing mandate of looking at relief and rehabilitation. A Memorandum has been submitted to the Twelfth Finance Commission after consultation with States. The Memorandum proposes a Mitigation Fund.

4.4 The Government of India have issued guidelines that where there is a shelf of projects, projects addressing mitigation will be given a priority. It has also been mandated that each project in a hazard prone area will have disaster prevention/mitigation as a term of reference and the project document has to reflect as to how the project addresses that term of reference. A copy of the guidelines is at **Annexure – III**.

4.5 Measures for flood mitigation were taken from 1950 onwards. As against the total of 40 million hectares prone to floods, area of about 15 million hectares have been protected by construction of embankments. A number of dams and barrages have been constructed. The State Governments have been assisted to take up mitigation programmes like construction of raised platforms etc. Floods continue to be a menace however mainly because of the huge quantum of silt being carried by the rivers emanating from the Himalayas. This silt has raised the bed level in many rivers to above the level of the countryside. Embankments have also gives rise to problems of drainage with heavy rainfall leading to water logging in areas outside the embankment.

4.6 Due to erratic behaviour of monsoons, both low and medium rain fall regions, which constitute about 68% of the total area, are vulnerable to periodical

droughts. Our experience has been that almost every third year is a drought year. However, in some of the States, there may be successive drought years enhancing the vulnerability of the population in these areas. Local communities have devised indigenous safety mechanisms and drought oriented farming methods in many parts of the country. From the experience of managing the past droughts particularly the severe drought of 1987, a number of programmes have been launched by the Government to mitigate the impact of drought in the long run. These programmes include Drought Prone Area Programme (DPAP), Desert Development Programme (DDP), National Watershed Development Project for Rainfed Areas (NWDPR), Watershed Development Programme for Shifting Cultivation (WDPS), Integrated Water Development Project (IWDP), Integrated Afforestation and Eco-development Project Scheme (IAEPS).

4.7 A comprehensive programme has been taken up for earthquake mitigation. Although, the BIS has laid down the standards for construction in the seismic zones, these were not being followed. The building construction in urban and suburban areas is regulated by the Town and Country Planning Acts and Building Regulations. In many cases, the Building regulations do not incorporate the BIS codes. Even where they do, the lack of knowledge regarding seismically safe construction among the architects and engineers as well as lack of awareness regarding their vulnerability among the population led to most of the construction in the urban/sub-urban areas being without reference to BIS standards. In the rural areas, the bulk of the housing is non-engineered construction. The mode of construction in the rural areas has also changed from mud and thatch to brick and concrete construction thereby increasing the vulnerability. The increasing population has led to settlements in vulnerable areas close to the river bed areas which are prone to liquefaction. The Government have moved to address these issues.

4.8 A National Core Group for Earthquake Mitigation has been constituted consisting of experts in earthquake engineering and administrators. The Core Group has been assigned with the responsibility of drawing up a strategy and plan of action for mitigating the impact of earthquakes; providing advice and guidance to the States on various aspects of earthquake mitigation; developing/organizing the preparation of handbooks/pamphlets/type designs for earthquake resistant construction; working out systems for assisting the States in the seismically vulnerable zones to adopt/integrate appropriate Bureau of Indian Standards codes in their building byelaws; evolving systems for training of municipal engineers as also practicing architects and engineers in the private sector in the salient features of Bureau of Indian Standards codes and the amended byelaws; evolving a system of certification of architects/engineers for testing their knowledge of earthquake resistant construction; evolving systems for training of masons and carry out intensive awareness generation campaigns.

4.9 A Committee of experts has been constituted to review the building byelaws. The State Governments have been advised to ensure rigorous enforcement of existing bye laws. A national programme for capacity building for earthquake mitigation has been finalized for imparting training to 10000 engineers in public and private sectors. Since earthquake engineering is not a part of course curriculum in engineering colleges at undergraduate level at present, it is proposed to select 3 to 4 leading engineering colleges in each State and train the faculty members of the civil engineering departments in earthquake engineering at the Indian Institutes of Technology and few other apex level institutes which have the requisite capabilities. These faculty members will take up training of municipal engineers as well as the training of engineers/architects in the private sector in RCC and masonry construction. The first phase of this programme for imparting training to 10000 engineers will be

completed within a period of three years. The trained faculty members of the leading engineering colleges will also assist the State Governments in the detailed evaluation of lifeline buildings and their retrofiting, wherever necessary.

4.10 It has been decided to include earthquake engineering education in the engineering colleges at undergraduate level. The course curriculum for this purpose has already been finalized by a group of experts taken from IITs and will be introduced in the engineering colleges within an year. A system of special audit of buildings is being put in place with a view to ensuring that the new constructions conform to the latest building byelaws, which have been reviewed and revised recently by Bureau of Indian Standards.

4.11 While these mitigation measures will take care of the new constructions, the problem of unsafe existing buildings stock would still remain. It will not be possible to address the entire existing building stock, therefore the life line buildings like hospitals, schools or buildings where people congregate like cinema halls, multi-storied apartments are being focussed on. The States have been advised to have these buildings assessed and where necessary retrofited. The Ministry of Finance have been requested to advise the financial institutions to give loans for retrofiting on easy terms. Insofar as the private housing stock is concerned emphasis is placed on awareness generation.

4.12 An earthquake mitigation project has been finalized for reducing the vulnerability to earthquakes. The programme includes detailed evaluation and retrofiting of lifeline buildings such as hospitals, schools, water and power supply units, telecommunication buildings, airports/airport control towers, railway stations, bus stands and important administrative buildings. The programme also includes training of more than one hundred thousand masons for earthquake resistant constructions. Besides, assistance will be provided

under this project to the State Governments to put in place appropriate techno legal regime.

4.13 An accelerated urban earthquake vulnerability reduction programme has been taken up in 38 cities in seismic zones III, IV & V with population of half a million and above. Sensitization workshop for engineers/architects, government functionaries and voluntary organizations have already been held in 36 of the 38 cities. Disaster mitigation and preparedness plans are under preparation in these cities. Awareness generation campaign has already been undertaken. The orientation courses for engineers and architects have been organized to impart knowledge about seismically safe construction and implementation of BIS norms. This programme will be further extended to 166 earthquake prone districts in seismic zones IV & V.

4.14 Rural housing and community assets for vulnerable sections of the population are created at a fairly large scale by the Ministry of Rural Development under the Indira Awas Yojna(IAY) and Sampooran Grameen Rojgar Yojna(SGRY). About 250 thousand small but compact units are constructed every year, besides community assets such as community centres, recreation centres, anganwadi centres etc. Technology support is provided by about two hundred rural housing centres spread over the entire country. The Ministry of Rural Development are now under the process of revising their guidelines for construction of such dwelling units by incorporating appropriate earthquake/cyclone resistant features. Training to the functionaries in the rural housing centres will be organized through the Ministry of Home Affairs. This initiative is expected to go a long way for the construction and popularisation of seismically safe construction at village/block level.

4.15 A National Core Group on Cyclone Monitoring & Mitigation has been constituted. Experts from Indian Meteorological Department, National Centre for Medium Range Weather Forecasting, Central Water Commission, National Remote Sensing Agency and Indian Space Research Organisation have been made the Members of the Core Group, besides administrators from the relevant Ministries/Departments and State Governments vulnerable to cyclones. The Group has been assigned with the responsibility of looking warning protocols for cyclones; coordination mechanism between different Central and State Ministries/Departments/Organisations; mechanism for dissemination of warning to the local people and; cyclone mitigation measures required to be taken for the coastal States. The Group will also suggest short-term and long-term measures on technology upgradation.

4.16 A cyclone mitigation project has been formulated. The project inter alia includes components on strengthening of monitoring/warning systems, coastal shelter belt plantation, mangrove plantation, construction of cyclone shelters, storm surge modeling and water envelope studies. The focus will be on re-generation of coastal shelter belt plantation and mangrove plantation where these have degenerated. The location of the cyclone shelters will be decided in such a manner that no person in the vulnerable zone is required to walk more than two kilometers to reach a cyclone shelter. The cyclone shelters will be multi purpose units to be run as schools or community centres in normal times and will have capacity to house 3000 to 5000 persons with adequate number of toilets, community kitchen and other facilities. Areas will be identified for providing shelter to livestock.

4.17 In the engineering designs for construction, special attention will be paid to the attachment of roof to the dwelling units so as to make such units cyclone

proof, besides incorporating earthquake resistant features. The project will be taken up shortly and is expected to be completed over a period of five years.

4.18 A Disaster Risk Management Programme has been taken up with the assistance from UNDP, USAID and European Union in 169 most hazard prone districts in 17 States including all the 8 North Eastern State. The implementation of the project commenced from October, 2002 and is expected to be concluded by December, 2007. The programme components include awareness generation and public education, preparedness, planning and capacity building, developing appropriate policies, institutional, administrative, legal and techno-legal regime at State, District, Block, village, urban local body and ward levels for vulnerability reduction.

4.19 Under this programme Disaster Management Plans have been prepared for about 3500 villages, 250 Gram Panchayat, 60 blocks and 15 districts. Elected representatives of over 8000 Panchayati Raj Institutions have already been trained, besides imparting training to Members of voluntary organisations. Over 20000 Government functionaries have been trained in disaster mitigation and preparedness at different levels. About 600 engineers and 220 architects have been trained under this programme in vulnerability assessment of lifeline buildings. Training is being imparted to master trainers under the programme. More than 600 master trainers and 1000 teachers have already been trained in different districts in disaster mitigation. Disaster Management Committees consisting of elected representatives, civil society members, Civil Defence volunteers and Government functionaries have been constituted at all levels including village/urban local body/ward levels. Disaster Management Teams have been constituted in villages and are being imparted training in basic functions of first aid, rescue, evacuation and related issues. The thrust of the programme is to build up capabilities of the community since the community is invariably the first responder. During the last

15 months, it has been experienced that the capacity building of the community has been very helpful even in normal situations when isolated instances of drowning, burns etc. take place. With the creation of awareness generation on disaster mitigation, the community will be able to function as a well-knit unit in case of any emergency. Mock drills are carried out from time to time under the close supervision of Disaster Management Committees. The Disaster Management Committees and Disaster Management Teams have been established by notifications issued by the State Governments which will ensure that the entire system is institutionalized and does not disintegrate after the conclusion of the programme. The key points being stressed under this programme are the need to ensure sustainability of the programme, development of training modules; manuals and codes, up-scaling partnerships in excellence, focused attention to awareness generation campaigns; institutionalization of disaster management committees and disaster management teams, disaster management plans and mock-drills and establishment of techno-legal regimes.

4.20 Human Resource Development at all levels is critical to institutionalization of disaster mitigation strategy. The National Centre for Disaster Management at the national level has been upgraded and designated as the National Institute of Disaster Management. It is being developed as a Regional Centre of Excellence in Asia. The National Institute of Disaster Management will develop training modules at different levels, undertake training of trainers and organize training programmes for planners, administrators and command functionaries. Besides, the other functions assigned to the National Institute of Disaster Management include development of exhaustive National level information base on disaster management policies, prevention mechanisms, mitigation measures; formulation of disaster management code and providing consultancy to various States in strengthening their disaster management systems and capacities as well as

preparation of disaster management plans and strategies for hazard mitigation and disaster response.

4.21 Disaster Management faculties have already been created in 29 State level training institutes located in 28 States. These faculties are being directly supported by the Ministry of Home Affairs. The State Training Institutions take up several focused training programmes for different target groups within the State. The Disaster Management faculties in these Institutes are being further strengthened so as to enable them to develop as Institutes of Excellence for a specific disaster. This system has already been institutionalized and is being further strengthened so as to make it a focal point in each State for development of human resources in disaster mitigation and preparedness. Assistance to the State level training institutes will be provided by the National Institute of Disaster Management in the development of training/capsules training modules for different functionaries at different levels.

4.22 Large-scale awareness generation bringing out specific do's and don'ts is crucial to disaster mitigation. A Steering Committee on mass-media campaign has been constituted for this purpose. The Committee is in the process of developing a profile for taking up mass media campaign through audio, video and print media as well as publicity through pamphlets, posters, bus back panels at all levels. The posters would be prominently displayed at buildings like Primary Health Centres, Community Centres, schools and such other places where villagers normally congregate for community activity. The Corporate sector is also being associated with the dissemination of campaign.

4.23 Disaster management as a subject in Social Sciences has been introduced in the school curriculum for Class VIII from the current academic year. The Central Board of Secondary Education which has introduced the curriculum runs a very large number of schools throughout the country and the course curriculum is

invariably followed by the State Boards of Secondary Education. Several State Governments have already introduced the same curriculum in Class VIII from the current academic year. Syllabus for Class IX and X has been finalized and will be introduced in the course curriculum from April, 2004 and April, 2005 respectively.

4.24 In order to assist the State Governments in capacity building and awareness generation activities and to learn from past experiences including sharing of best practices, the Ministry of Home Affairs has compiled/prepared a set of resource materials developed by various organisations/institutions to be replicated and disseminated by State Governments based on their vulnerabilities after translating it into the local languages. The voluminous material which runs in about 10000 pages has been divided into 4 broad sections in 7 volumes. These sections cover planning to cope with disasters; education and training; construction toolkit; and information, education and communication toolkit including multi-media resources on disaster mitigation and preparedness. The Planning section contains material for analyzing a community's risk, development of Preparedness, mitigation and disaster management plans, coordinating available resources and implementing measures for risk reduction. The model bye-laws, DM Policy, Act and model health sector plan have also been included. Education and Training includes material for capacity building and upgradation of skills of policy makers, administrators, trainers, engineers etc. in planning for and mitigating against natural disasters. Basic and detailed training modules in disaster preparedness have been incorporated along with training methodologies for trainers, for community preparedness and manuals for training at district, block, panchayat and village levels. For creating a disaster-resistant building environment, the Construction Toolkit addresses the issue of seismic resistant construction and retrofitting of existing buildings. BIS Codes, manuals and guidelines for RCC, Masonry and other construction methodologies as also for repair and retrofitting of masonry and low-rise buildings have been included.

4.25 IEC material seeks to generate awareness to induce mitigation and preparedness measures for risk reduction. Material and strategies used by various States and international organisations, including tips on different hazards, have been incorporated along with multi-media CDs on disasters. The material has been disseminated to all the State Governments/UT Administrations with the request to have the relevant material, based on the vulnerability of each district, culled out, translated into local languages and disseminate it widely down to the village level.

4.26 The various prevention and mitigation measures outlined above are aimed at building up the capabilities of the communities, voluntary organisations and Government functionaries at all levels. Particular stress is being laid on ensuring that these measures are institutionalized considering the vast population and the geographical area of the country. This is a major task being undertaken by the Government to put in place mitigation measures for vulnerability reduction. This is just a beginning. The ultimate goal is to make prevention and mitigation a part of normal day-to-day life. The above mentioned initiatives will be put in place and information disseminated over a period of five to eight years. We have a firm conviction that with these measures in place, we could say with confidence that disasters like Orissa cyclone and Bhuj earthquake will not be allowed to recur in this country; at least not at the cost, which the country has paid in these two disasters in terms of human lives, livestock, loss of property and means of livelihood.

SECTION V

Preparedness

5.1 Mitigation and preparedness measures go hand in hand for vulnerability reduction and rapid professional response to disasters. The Bhuj earthquake in January, 2001 brought out several inadequacies in the system. The search and rescue teams had not been trained professionally; specialized dog squad to look for live bodies under the debris were not available; and there was no centralized resource inventory for emergency response. Although army played a pivotal role in search and rescue and also set up their hospital after the collapse of Government hospital at Bhuj, the need for fully equipped mobile hospitals with trained personnel was felt acutely. Despite these constraints, the response was fairly well organized. However, had these constraints been taken care of beforehand, the response would have been even more professional and rapid which may have reduced the loss of lives. Specialist search and rescue teams from other countries did reach Bhuj. However, precious time was lost and even with these specialist teams it was not possible to cover all severely affected areas as quickly as the Government would have desired. It was, therefore, decided that we should remove these inadequacies and be in a stage of preparedness at all times.

5.2 The Central Government are now in the process of training and equipping 96 specialist search and rescue teams, with each team consisting of 45 personnel including doctors, paramedics, structural engineers etc. Ten teams have already been trained. These teams will be located at various centres around the country for specialised response. These teams will have the latest equipment as also dog squads for locating survivors in the debris.

5.3 Apart from specialist search & rescue units, it has been decided that personnel of Central Police Organisations should also be imparted training in search and rescue so that they can be requisitioned to the site of incident without loss of time. Pending arrival of the specialist teams, the battalions located near the site of incident would be deployed immediately. For this purpose, a curriculum has been drawn up and integrated into the training curriculum of CPMFs.

5.4 The States have also been advised to set up their own specialist teams for responding to disasters. Assistance will be provided to the State Governments for training their trainers at the national institutes already designated for this purpose. The State Governments' search and rescue teams to be constituted from the State Police will be equipped to meet the requirement. For this purpose, the State Governments have been authorised to utilize 10% of the annual allocation made under the Contingency Relief Fund for purchase of equipments.

5.5 Fourteen Regional Response Centres are being set up in different parts of the country. These centres will have response teams and equipment and resources for being able to respond to any hazard/calamity in the neighbouring States.

5.6 A Steering Committee has been constituted in the Ministry to oversee the creation of capabilities for emergency response.

5.7 A 200 bedded mobile hospital, fully trained and equipped is being set up by the Ministry of Health and attached to a leading Government hospital in Delhi. Three additional mobile hospitals with all medical and emergency equipments are proposed to be located in different parts of the country. These mobile hospitals will also be attached to the leading Government hospitals in the country. This will enable the mobile hospitals to extend assistance to the hospitals with which they are attached in normal time. They will be airlifted

during emergencies with additional doctors/paramedics taken from the hospitals with which the mobile hospitals are attached to the site of disaster.

5.8 It is proposed to purchase dedicated aircraft and helicopters with a view to reducing the response time. The issue is pending for consideration and approval of Empowered Group of Ministers on Disaster Management. Once the airlift facilities are developed for exclusive use for disaster management, it will be possible to provide airlift facilities to specialist search and rescue teams, mobile hospitals and equipments.

5.9 In order to professionalise the response, it is proposed to introduce the Incident Command System in the country. This system provides for specialist incident command teams with an Incident Commander and officers trained in different aspects of incident management – logistics, operations, planning, safety, media management etc. The incident Command System has been finalized keeping in view the systems and procedures prevalent in our country by dovetailing it in the existing governmental machinery already in position. The training of trainers in the Incident Command System has already commenced at Lal Bahadur Shastri National Academy of Administration at Mussoori which has been designated as the nodal training institutes for this purpose.

5.10 A web-enabled centralised data base for the India Disaster Resource Network has been operationalized. The network will ensure quick access to resources to minimise response time in emergencies. The list of resources to be updated in the system has been finalized. It has 226 items. About 60,000 records in 481 districts throughout the country have already been uploaded since Ist September, 2003 when the India Disaster Resource Network was formally inaugurated. The system will give, at the touch of the button, location of specific equipments/specialist resources as well as the Controlling authority for that

resource so that it can be mobilized for response in the shortest possible time. The data base will be available simultaneously at the district, state and national levels.

5.11 The States are being persuaded to set up control rooms/emergency operations centres at the state and district level. Assistance for construction and purchase of equipments for control rooms is being provided. The control rooms, which will function round the clock, will be composite control rooms to look after law and order issues as well as disaster management. Equipments are also being provided for these control rooms under the disaster risk management programme.

5.12 Communication is a major bottleneck in case of any major disaster particularly when the traditional network system already in force brake down. In order to strengthen communications, it has been decided that police network (POLNET) will also be used for disaster management. For this purpose POLNET communication facility will be extended to District Magistrates, Sub Divisional Magistrates as well as the Control Rooms. For emergency communication, mobile satellite based units which can be transported to the site of the disaster are being procured. A group was constituted to draw a comprehensive communication plan for disaster management and the report has since been received. This provides for a dedicated communication system for disaster management with built in redundancies.

5.13 The Geographical Information System (GIS) data base is an effective tool for emergency responders to access information in terms of crucial parameters for the disaster affected areas. The crucial parameters include location of the public facilities, communication links and transportation network at national, state and district levels. The GIS data base already available with different agencies of the Government is being upgraded and the gaps are proposed to be bridged. A

project for this purpose is being drawn up with a view to institutionalising the arrangements. The data base will provide multi layered maps on district wise basis. Three maps taken in conjunction with the satellite images available for a particular area will enable the district administration as well as State Governments to carry out hazard zonation and vulnerability assessment, as well as coordinate response after a disaster.

5.14 In order to further strengthen the capacity for response, the fire services are proposed to be developed into multi hazard response units as is the normal practice in several other countries. It is proposed to provide rescue tenders in addition to fire tenders to each fire unit and fill up all gaps upto sub-divisional level. Hazmat vans will be provided to State capitals and metropolitan cities. This will necessitate recruitment of additional fire men and drivers and intensive training required to be provided to enable them to function as efficient of all purpose response units. A project for development of fire service into all hazard response units has also been finalized and submitted for obtaining necessary financial approval.

5.15 India has a large network of Civil Defence and Home Guards volunteers. The existing strength is about 1.2 million. However, this organization has not so far been associated with disaster mitigation, preparedness and response functions. It is proposed to revamp the Civil Defence organization to enable them to discharge a key responsibility in all the facets of disaster management including preparedness. A proposal in this regard has been finalized and is under consideration of the Government.

5.16 Standard Operating Procedures are being laid down to ensure all the steps required to be taken for disaster management are put in place. The Standard Operating Procedure will also encompass response, besides preparedness.

5.17 With the development of disaster management committees and disaster management teams at all levels including village/urban local body/ward level, the stage will be set for comprehensive preparedness measures to be taken with active participation of the community and non-governmental organizations.

5.18 With the mitigation and preparedness measures outlined in this and earlier section in position, it is expected that natural hazards could be handled more efficiently so as to ensure that these hazards did not get converted into disasters.

SECTION VI

Conclusion

6.1 Disaster Management has to be a multi-disciplinary and pro-active approach. Besides various measures for putting in place institutional and policy framework, disaster prevention, mitigation and preparedness enunciated in this paper and initiatives being taken by the Central and State Governments, the community, civil society organisations and media also have a key role to play in achieving our goal of moving together, towards a safer India. The message being put across is that, in order to move towards safer and sustainable national development, development projects should be sensitive towards disaster mitigation.

6.2 Our mission is vulnerability reduction to all types of hazards, be it natural or manmade. This is not an easy task to achieve, keeping in view the vast population, and the multiple natural hazards to which this country is exposed. However, if we are firm in our conviction and resolve that the Government and the people of this country are not prepared to pay the price in terms of massive casualties and economic losses, the task, though difficult, is achievable and we shall achieve it.

6.3 We have taken the first few but significant steps towards vulnerability reduction, putting in place prevention and mitigation measures and preparedness for a rapid and professional response. With a massive awareness generation campaign and building up of capabilities as well as institutionalization of the entire mechanism through a techno legal and techno financial framework, we are gradually moving in the direction of sustainable development.

6.4 Our vision 2020 is to build a safer and secure India through sustained collective effort, synergy of national capacities and people's participation. What looks a dream today will be transformed into reality in the next two decades. This is our goal and we shall strive to achieve this goal with a missionary zeal. The path ahead, which looks difficult today, will become a lot easier as we move along together.

ANNEXURE-I

MINISTRY OF HOME AFFAIRS [NDM DIVISION]

1. A review of the disaster management mechanism was carried out by the Government of India after the Bhuj earthquake. It was noted that there was need for building up holistic capabilities for disaster management – so as to be able to handle both natural and man-made disasters. It was accordingly decided that the subject of Disaster Management be transferred from the Ministry of Agriculture to the Ministry of Home Affairs (excluding drought and epidemics and those emergencies/disasters which were specifically allotted to other Ministries). The Government (Allocation of Business) Rules, 1961 were accordingly amended in February, 2002. The actual transfer of work took place in June, 2002.

2. India has been very vulnerable to natural hazards and calamities. The Bhuj earthquake accounted for 13805 deaths, the super cyclone in Orissa accounted for 9885 deaths. Government are of the view that if appropriate mitigation measures had been taken these casualties could have been reduced significantly.

3. Each year disasters also account for loss of thousands of crores in terms of social and community assets. It is clear that development cannot be sustainable without building in mitigation into the planning process. Keeping the above factors in view, the Government of India have brought about a change in policy which emphasizes mitigation, prevention and preparedness. With the approval of Dy. Prime Minister, a strategic roadmap as given in the succeeding pages has been drawn up for reducing the country's vulnerability to disasters. Action for reducing our vulnerabilities to disasters shall be taken in accordance with the roadmap. The roadmap will be reviewed every two years to see if any change in direction is necessary.

NATIONAL DISASTER MANAGEMENT FRAMEWORK

I. INSTITUTIONAL MECHANISMS

Expected Outputs	Areas of intervention	Agencies/sectors to be involved and resource linkages.
<p>Nodal agency for disaster management at the national level with appropriate systems</p>	<p>(i)Constitution of National Emergency Management Authority with appropriate legal, financial and administrative powers.</p> <p>(ii)Roles and responsibilities of the NEMA:</p> <ul style="list-style-type: none"> -Coordinating multi-hazard mitigation, prevention, preparedness and response programmes. - Policies for disaster risk reduction and mitigation -Preparedness at all levels. -Coordination of response -Coordination of post disaster relief and rehabilitation. -Amendment of existing laws, procedures, instructions. 	<p>Ministries/ Departments of Health, Water Resources, Environment and Forests, Agriculture, Railways, Atomic Energy, Defence, Chemicals, Science & Technology, Rural Development, Road Transport & Highways etc.</p>

Creation of State Departments of Disaster Management	Departments of Relief & Rehabilitation to be re-designated as Department of Disaster Management with enhanced areas of responsibility to include mitigation, prevention and preparedness	State Governments/ UT Administration.
Setting up State Disaster Management Authorities	<p>(i) State Disaster Management Authority to be headed by the Chief Minister.</p> <p>(ii) The Authority to lay down policies and monitor mitigation, prevention and preparedness as also oversee response.</p>	Ministers for Agriculture, Home, Disaster Management, Water Resources, Health, Road & Transport, Civil Supplies, Environment & Forests, Rural Development, Urban Development and Public Health Engineering Departments as Members.

II. DISASTER MITIGATION/PREVENTION

Disaster mitigation/prevention to be mainstreamed into the development process.	<p>(i) Each Ministry /Department which has a role in mitigation /prevention will make appropriate outlays for schemes addressing mitigation/prevention</p> <p>(ii) Where there is a shelf of projects /schemes, projects / schemes contributing to mitigation to be given a priority.</p> <p>(iii) Wherever possible</p>	Ministries / Department of Govt. of India / State Governments /UT Administration
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	<p>schemes/projects in areas prone to natural hazards to be so designed as to contribute to mitigation, and preparedness.</p> <p>(iv) Projects in vulnerable areas/areas prone to natural hazards to be designed to withstand natural hazards.</p>	
Techno-legal regime	<p>(i) regular review of building codes and its dissemination</p> <p>(ii) construction in seismic zones III, IV and V to be as per BIS codes/National Building Codes.</p> <p>(iii) Construction in areas vulnerable to cyclones to be so designed as to withstand the wind hazard as per BIS codes/National Building Codes.</p> <p>(iv) Comprehensive review and compliance of</p> <ul style="list-style-type: none"> - Town and Country Planning Acts -Development Control Regulations -Planning and Building Standards Regulations 	<p>Bureau of Indian Standards/Ministry of urban Development</p> <p>State Urban Development Department / Urban Local Bodies</p> <p>State Urban Development Department / Urban Local Bodies</p> <p>State Urban Development Department / Urban Local Bodies</p>

	(v) Put in place appropriate techno-financial regime (vi) Capacity enhancement of Urban Local Bodies to enforce compliance of techno-legal regimes	State Urban Development Department / Urban Local Bodies State Governments
Land-use Planning and Zoning regulations	(i) Legal framework for Land-use planning and zoning regulations to be reviewed. (ii) Zoning regulations to be enforced.	Ministry of Urban Development Department of Land Resources[MORD] Ministry of Environment and Forests[GOI] State Governments
Plan schemes for vulnerability reduction and preparedness.	State Governments. to formulate Plan Schemes and submit to Planning Commission	State Governments

III. LEGAL/POLICY FRAMEWORK

Disaster Management to be listed in List – III – [Concurrent List] of Seventh Schedule to the Constitution	(i) Bill to be drafted. (ii) Bill to be brought before Parliament	Ministry of Home Affairs/ Ministry of Law (Legislative Department)
State Disaster Management Acts	Model Act to be circulated to the States.	Ministry of Home Affairs State Governments
National Policy on Disaster Management	(i) Mainstreaming disaster management into planning and development process.	Ministry of Home Affairs, Ministry of Finance, Planning Commission, Ministry of

	<p>(ii) Mandate safe construction.</p> <p>(iii) Coordinated action by all relevant Departments as per policy</p>	Environment & Forests, Rural Development, Urban Development and other relevant Ministries to be consulted.
States to enunciate Policy on Disaster Management .	<p>(i) Mainstreaming disaster management into planning and development process.</p> <p>(ii) Mandate safe construction.</p> <p>(iii) Coordinated action by all relevant Departments as per policy</p> <p style="text-align: center;">-</p>	State Governments
State Disaster Management Codes	Amendment of existing relief codes/scarcity codes/famine codes to incorporate mitigation, preparedness and planning measures at all levels from community to State, constitution of Emergency Support Teams /Disaster Management Teams /Committees /State Disaster Management Authorities, delegation of administrative and financial powers to disaster incident managers etc, protocol to update the inventory of resources and plans,	State Governments

IV. PREPAREDNESS AND RESPONSE

<p>National Response Specialist teams</p> <p>Emergency Force/ Response</p>	<p>(i) Designation of units for conversion into Specialist Response Teams.</p> <p>(ii) Designation of training centres.</p> <p>(iii) Training of trainers.</p> <p>(iv) Procurement of equipment</p> <p>(v) Training of teams.</p>	<p>Ministry of Home Affairs</p> <p>Central Industrial Security Force/ Indo-Tibetan Boarder Police/ Border Security Force/ Central Reserve Police Force</p>
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<p>Specialized Response Teams at State level</p>	<p>(i) Designation of units for conversion into Specialist Response Teams.</p> <p>(ii) Designation of training centres.</p> <p>(iii) Training of trainers.</p> <p>(iv) Procurement of equipment using CRF resources</p> <p>(v) Training of teams.</p>	<p>State Department of Disaster Management/State Home Department</p> <p>State Police</p> <p>Traning College/ State Fire Training Institute</p>
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V. NATIONAL NETWORK OF EMERGENCY OPERATION CENTERS [NNEOCs]

Setting up Emergency Operations Centre[EOC] at National level	(i) Multi- hazard resistant construction. (ii) Communication system linkages. (iii) Mobile EOCs for on-site disaster information management	Central Public Works Department Department for Central Public Works Ministry of Home Affairs
State level EOC	(i) Multi- hazard resistant construction. (ii) Communication system linkages. (iii) Mobile EOC for on-site disaster management information	State Governments
District level EOC	(i) Multi- hazard resistant construction. (ii) Communication system linkages.	State Governments
Putting Incident Command System in Place	(i) Designate nodal training centres. (ii) Putting in place protocols/SOPs for Incident Command System.	Ministry of Home Affairs/ Department of Personal and Training/ Lal Bahadur Shastri National Academy of Administration / State Governments/ Administrative Training Institutes
Emergency Support Function Plan	(i) departments/agencies which perform emergency support functions to draw up ESF plans, constitute teams,	Central Government Ministries/ Departments State Governments

	and set apart resources in advance so that post-disaster response is prompt.	
India Disaster Resource Network	<p>(i) A web enabled GIS-based resource inventory listing out all the necessary resources for emergency response available at the district and State level throughout the country so that resources can be mobilized at short notice.</p> <p>(ii) Set up servers, draw up and install programmes, input data.</p> <p>(iii) Half yearly updating</p>	Ministry of Home Affairs State Governments.
Communication linkages which will be functional even post-disaster.	<p>(i) Draw up communication plan.</p> <p>(ii) Obtain sanctions.</p> <p>(iii) Put communication network in place.</p>	Ministry of Home Affairs Directorate Coordination of Police Wireless State Governments
Regional Response Centres	<p>(i) Identify location of Regional Response Centres.</p> <p>(ii) Identify caches of equipment required.</p> <p>(iii) Obtain sanctions.</p> <p>(iv) Put teams and caches of equipments in place.</p>	Ministry of Home Affairs Border Security Force/ Indo-Tibetan Border Police /Central Reserve Police Force/ Central Industrial Security Force

<p>Training in response to be made a part of training curriculum of CPMFs and State Police Forces.</p>	<p>(i) Draw up capsules. (ii) Train trainers</p>	<p>Ministry of Home Affairs State Governments</p>
<p>State Disaster Management Plans</p>	<p>(i) Plan to be drafted under the supervision of the Chief Secretary. (ii) Plan will include mitigation, preparedness and response elements. (iii) The plan will be multi-disciplinary to be drawn up in conjunction/consultation with all relevant Departments concerned with mitigation, preparedness and response. (iv) Plan to be updated once a year.</p>	<p>State Governments/ State Disaster Management Authorities</p>
<p>District Disaster Management Plans</p>	<p>(i) To be drawn up under the supervision of District Magistrate/Collector and to include mitigation, preparedness and response. (ii) Emergency Support Functions by various Departments to be included. (iii) To be drawn up in consultation with all</p>	<p>State Governments/ State Disaster Management Authorities</p>

	<p>relevant Departments.</p> <p>(iv) District inventory of resources to be maintained.</p>	
Block Disaster Management Plans	<p>(i) To be drawn up under the supervision of District Magistrate/Collector and to include mitigation, preparedness and response.</p> <p>(ii) Emergency Support Functions by various Departments to be included.</p> <p>(iii) To be drawn up in consultation with all relevant Departments.</p> <p>(iv) District inventory of resources to be maintained.</p>	State Governments/ State Disaster Management Authorities / Block Development Administration

<p>Community based mitigation, preparedness and response plans</p>	<p>(i) Enhance community capacity in multi-hazard prone States and districts to respond effectively to disasters-special attention to be given to empowering and capacity building of vulnerable communities and groups including women.</p> <p>(ii) Set up and train village/ Panchayat (for rural areas) and wards/municipal council/corporations (for urban areas) disaster management committees and disaster management teams e.g.</p> <ul style="list-style-type: none"> -Identification of safe shelters and management -Stockpiling of relief materials etc. -early warning dissemination -first-aid and counselling -assist in search and rescue <p>(iii) such plans to be made integral to annual development plan of local bodies</p> <p>(iv) mitigation plans of the community and Panchayats to receive priority under various rural development schemes administered by Panchayats and Urban local bodies</p>	<p>State Governments/ District Administration/ Panchayati Raj Institution /Urban Local Bodies</p>
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VI. EARLY WARNING SYSTEMS

<p>(i) State of the art sensors to be set up.</p> <p>(ii) Hazard monitoring, tracking and modelling.</p>	<p>(i) IMD/CWC to carry out a review of sensors available and draw up plans for strengthening the system.</p> <p>(ii) Models to be updated to improve prediction accuracy.</p>	<p>Indian Meteorological Department/ Central Water Commission/ National Centre for Medium Range Weather Forecasting</p>
<p>Warning Protocols</p>	<p>(i) Warning protocols to be user friendly.</p> <p>(ii) Warning to be communicated as quickly as possible to the States/districts/community.</p> <p>(iii) Protocols should be simple to understand.</p> <p>(iv) Districts to set up protocols for communication of early warning to the community.</p> <p>(v) Panchayats/local bodies to be used for early warning communication.</p> <p>vi) Communication linkages for early warning.</p>	<p>.Ministry of Home Affairs/ State Governments /Indian Meteorological Department/ Central Water Commission/ National Remote Sensing Agency/ Information and Broadcasting/ Doordarshan/ All India Radio</p>

VII. HUMAN RESOURCE DEVELOPMENT & CAPACITY BUILDING

<p>Training for services /cadres/ agencies involved in mitigation, preparedness or response.</p>	<p>(i) Training needs analysis/ Human Resource Development Plan</p> <p>(ii) Drawing up of capsule courses for</p>	<p>Ministry of Home Affairs State Governments</p>
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	<p>training.</p> <p>(iii) Training of trainers.</p> <p>iv) National Institute for Disaster Management to be strengthened.</p> <p>(iv)Setting up /strengthening training institutions in state faculties of Disaster Management in Administrative Training Institutes</p>	
<p>Training of IAS/IPS, State Administrative Service Officers/State Police.</p>	<p>(i) Training curriculum for IAS/IPS and State Administrative Service Officers/State Police Officers to include capsules in disaster management.</p> <p>(ii)Training of Block/Village level staff</p> <p>(iii) Training of PRIs.</p>	<p>Administrative Training Institutes /State Institutes of Rural Development and District Institutes of Education and Training to be used.</p>
<p>Engineers/Architects</p>	<p>Curriculum for undergraduate engineering and B.Arch courses to be amended to include mitigation technologies in general and elements of earthquake engineering in particular</p>	<p>State Governments All India Council for Technical Education Indian Institute of Technologies Professional bodies</p>
<p>Health Professionals</p>	<p>Include crisis prevention, response and recovery and trauma management in the MBBS curriculum.</p>	<p>Ministry of Health and Family Welfare Medical Council of India</p>
<p>Youth organisation</p>	<p>NCC, NSS, Scouts & Guides to include disaster response, search and rescue in their orientation/training programmes.</p>	<p>Ministry of Youth and Sports Ministry of Defence</p>

Masons	Mason training for safe construction	Ministry of Rural Development/ Department of Urban Development/ State Governments
School curriculum	To include disaster awareness.	Central and State Boards of Education

National mass media campaign for awareness generation	Design and develop a communication strategy for awareness campaign	Ministry of Home Affairs /State Governments
	Use audio, visual and print medium to implement awareness campaign	Ministry of Home Affairs /State Governments
	Development of resource materials on mitigation, preparedness and response	Ministry of Home Affairs
Non-government community-based organizations involved in awareness generation and community participation in disaster preparedness and mitigation planning	(i) Facilitate network of non-govt community based organizations at national/State/district levels	Ministry of Home Affairs /National Institute for Disaster Management
	(ii) Co-opted into the planning process and response mechanisms at all levels	Ministry of Home Affairs /National Institute for Disaster Management
Corporate sectors involved in awareness generation and disaster preparedness and mitigation planning	Sensitisation, training and co-opting corporate sector and their nodal bodies in planning process and response mechanisms	Ministry of Home Affairs/ Federation of Indian Industries
Inter-state arrangements for sharing of resources during emergencies and lessons learnt	(i) Arrangements for inter-State sharing of resources to be incorporated in State	Ministry of Home Affairs/ State Governments

	Disaster Management Plans (ii) Inter-state exposure visits to be facilitated for learning from the experiences of other States	Ministry of Home Affairs/ State Governments
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VIII. RESEARCH AND KNOWLEDGE MANAGEMENT

Institutionalise knowledge and lessons learnt in the process of working on the national roadmap	(i) Assessment and evaluation of ongoing programmes and activities regular documentation of key lessons	Ministry of Home Affairs State Governments / National Institute for Disaster Management
	(ii) Establish India Disaster Resource Network as knowledge portal to pool and exchange information and knowledge among all concerned institutions and organization	Ministry of Home Affairs
Develop national disasters database	(i) Systematic inventorization of disasters (ii) Trend analysis and reporting	National Institute for Disaster Management
Promote research in national, state and regional institutions in the areas of disaster risk reduction	(i) mitigation technologies for housing, roads and bridges, water supply and sewerage systems, power utilities, (ii) cost-effective equipments for specialized rapid response and preparedness in --temporary and transition shelter in post-disaster situations	Ministries / Departments of Central Government

	<ul style="list-style-type: none">--search and rescue equipments--provision of drinking water, emergency health and sanitation in post-disaster situations-post-trauma stress management and care(iii) promote participation of corporate sector in finding out technological solutions for disaster risk reduction	
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DISASTER MANAGEMENT
THE DEVELOPMENT PERSPECTIVE

1. Five Year Plan documents have, historically, not included consideration of issues relating to the management and mitigation of natural disasters. The traditional perception has been limited to the idea of “calamity relief”, which is seen essentially as a non-plan item of expenditure. However, the impact of major disasters cannot be mitigated by the provision of immediate relief alone, which is the primary focus of calamity relief efforts. Disasters can have devastating effects on the economy; they cause huge human and economic losses, and can significantly set back development efforts of a region or a State. Two recent disasters, the Orissa Cyclone and the Gujarat Earthquake, are cases in point. With the kind of economic losses and developmental setbacks that the country has been suffering year after year, the development process needs to be sensitive towards disaster prevention and mitigation aspects. There is thus need to look at disasters from a development perspective as well.

2. Further, although disaster management is not generally associated with plan financing, there are in fact a number of plan schemes in operation, such as for drought proofing, afforestation, drinking water, etc., which deal with the prevention and mitigation of the impact of natural disasters. External assistance for post-disaster reconstruction and streamlining of management structures also is a part of the Plan. A specific, centrally sponsored scheme on disaster management also exists. The Plan thus already has a defined role in dealing with the subject.

3. Recently, expert bodies have dwelt on the role of the Planning Commission and the use of plan funds in the context of disaster management. Suggestions have been made in this regard by the Eleventh Finance Commission, and also the High Powered Committee on Disaster Management. An approach on planning for safe development needs to be set out in the light of these suggestions.

4. This chapter reflects the considerations outlined above. It briefly outlines the global context and the Indian experience of disasters, sets out the institutional and financial arrangements for disaster management and the response towards these in the country, looks at directions for improvement, and concludes with a strategy to facilitate planning for safe national development in the Tenth Plan period.

THE GLOBAL CONTEXT

5. There has been an increase in the number of natural disasters over the past years, and with it, increasing losses on account of urbanisation and population growth, as a result of which the impact of natural disasters is now felt to a larger extent. According to the United Nations, in 2001 alone, natural disasters of medium to high range caused at least 25,000 deaths around the world, more than double the previous year, and economic losses of around US \$ 36 billion. These figures would be much higher, if the consequences of the many smaller and unrecorded disasters that cause significant losses at the local community level were to be taken into account. Devastations in the aftermath of powerful earthquakes that struck Gujarat, El Salvador and Peru; floods that ravaged many countries in Africa, Asia and elsewhere; droughts that plagued Central Asia including Afghanistan, Africa and Central America; the cyclone in Madagascar and Orissa; and floods in Bolivia are global events in recent memory. However, what is disturbing is the knowledge that these trends of destruction and devastation are on the rise instead of being kept in check.

6. Natural disasters are not bound by political boundaries and have no social or economic considerations. They are borderless as they affect both developing and developed countries. They are also merciless, and as such the vulnerable tend to suffer more at the impact of natural disasters. For example, the developing countries are much more seriously affected in terms of the loss of lives, hardship borne by population and the percentage of their GNP lost. Since 1991, two-third of the victims of natural disasters were from developing countries, while just 2 per cent were from highly developed nations. Those living in developing countries and especially those with limited resources tend to be more adversely affected. With the alarming rise in the natural disasters and vulnerability per se, the world community is strengthening its efforts to cope with it.

7. As a number of the most vulnerable regions are in India, natural disaster management has emerged as a high priority for the country. Going beyond the historical focus on relief and rehabilitation after the event, we now have to look ahead and plan for disaster preparedness and mitigation, in order that the periodic shocks to our development efforts are minimized.

THE INDIAN EXPERIENCE

Regional Vulnerabilities

8. Physical vulnerability relates to the physical location of people, their proximity to the hazard zone and standards of safety maintained to counter the effects. For instance, some people are vulnerable to flood only because they live in a flood prone area. Physical vulnerability also relates to the technical capacity of buildings and structures to resist the forces acting upon them during a hazard event.

Box 7.1

INDIA'S KEY VULNERABILITIES

Coastal States, particularly in the East Coast and Gujarat are vulnerable to cyclones.

4 crore hectare land mass is vulnerable to floods.

68 per cent of net sown area is vulnerable to drought.

55 per cent of total area is in Seismic Zones III - V, and vulnerable to earthquakes.

Sub-Himalayan/Western Ghat is vulnerable to landslides.

9. The extent to which a population is affected by a calamity does not purely lie in the physical components of vulnerability, but is contextual also to the prevailing social and economic conditions and its consequential effect on human activities within a given society. Research in areas affected by earthquakes indicates that single parent families, women, handicapped people, children and the aged are particularly vulnerable social groups. The geophysical setting with unplanned and inadequate developmental activity is a cause for increased losses during disasters. In the case of India, the contribution of over-population to high population density, which in turn results in escalating losses, deserves to be noted. This factor sometimes tends to be as important as physical vulnerability attributed to geography and infrastructure alone.

10. The continent of Asia is particularly vulnerable to disaster strikes. Between the years 1991 to 2000 Asia has accounted for 83 per cent of the population affected by disasters globally. While the number of people affected in the rest of the world were 1,11,159, in Asia the number was 5,54,439. Within Asia, 24 per cent of deaths due to disasters occur in India, on account of its size, population and vulnerability. Floods and high winds account for 60 per cent of all disasters in India. While substantial progress has been made in other sectors of human development, there is need to do more towards mitigating the effect of disasters.

11. Many parts of the Indian sub-continent are susceptible to different types of disasters owing to the unique topographic and climatic characteristics. About 54 per cent of the sub-continent's landmass is vulnerable to earthquakes while about 4 crore hectares is vulnerable to periodic floods. The decade 1990-2000, has been

one of very high disaster losses within the country, losses in the Orissa Cyclone in 1999, and later, the Gujarat Earthquake in 2001 alone amount to several thousand crore of Rupees, while the total expenditure on relief and reconstruction in Gujarat alone has been to the tune of Rs 11,500 crore.

12. Similarly, the country has suffered four major earthquakes in the span of last fifty years along with a series of moderate intensity earthquakes that have occurred at regular intervals. Since 1988, six earthquakes have struck different parts of the country. These caused considerable human and property losses.

Table 7.1

Major Earthquakes in India, 1988-2001

Date	Location	Magnitude
August 21, 1988	Bihar-Nepal Border	6.4
October 20, 1991	Uttarkashi, Uttar Pradesh	6.6
September 30, 1993	Latur- Osmanabad, Maharashtra	6.3
May 22, 1997	Jabalpur, Madhya Pradesh	6.0
March 29, 1999	Chamoli, Uttar Pradesh	6.9
January 26, 2001	Bhuj, Gujarat	7.7

13. Disasters lead to enormous economic losses that are both immediate as well as long term in nature and demand additional revenues. Also, as an immediate fall-out, disasters reduce revenues from the affected region due to lower levels of

economic activity leading to loss of direct and indirect taxes. In addition, unplanned budgetary allocation to disaster recovery can hamper development interventions and lead to unmet developmental targets.

14. Disasters may also reduce availability of new investment, further constricting the growth of the region. Besides, additional pressures may be imposed on finances of the government through investments in relief and rehabilitation work.

15. In the recent earthquake in Gujarat, more than 14,000 lives were lost, ten lakh houses were damaged and the asset loss has been indicated to be worth 15,000 crore. Tables 7.2 to 7.5 give an indication of the magnitude of the damage and losses incurred by the country in recent natural disasters.

16. The dimensions of the damage, as evident in the tables and the diagram 7.1

Box 7.2

Global Losses Through Natural Disasters

According to Reinsurance Company 'Munich Re' costs associated with natural disasters has gone up 14 fold since the 1950s. Each year from 1991 to 2000, an average of 211 million people were killed or affected by natural disasters - seven times greater than the figure for those killed or affected by conflict. Towards the end of the 1990s, the world counted some 25 million 'environmental refugees'- for the first time more people had fled natural hazards than conflict.

Source: World Disasters Report, 2001

emphasise the point that natural disasters cause major setbacks to development and it is the poorest and the weakest that are the most vulnerable to disasters. Given the high frequency with which one or the other part of the country suffers due to disasters, mitigating the impact of disasters must be an integral component of our development planning and be part of our poverty reduction strategy.

INSTITUTIONAL ARRANGEMENTS

17. The country with its federal system of Government has specific roles for the Central and State Governments. However, the subject of disaster management does not specifically find

Table 7.2

Damage due to Natural Disasters in India

Year	People affected (Lakh)	Houses & buildings, partially or totally, damaged	Amount of property damage/loss (Rs Crore)
1985	595.6	2,449,878	40.06
1986	550.0	2,049,277	30.74
1987	483.4	2,919,380	20.57
1988	101.5	242,533	40.63
1989	30.1	782,340	20.41
1990	31.7	1,019,930	10.71
1991	342.7	1,190,109	10.90
1992	190.9	570,969	20.05
1993	262.4	1,529,916	50.80
1994	235.3	1,051,223	10.83
1995	543.5	2,088,355	40.73
1996	549.9	2,376,693	50.43
1997	443.8	1,103,549	n.a.
1998	521.7	1,563,405	0.72
1999	501.7	3,104,064	1020.97
2000	594.34	2,736,355	800.00
2001	788.19	846,878	12000

Source : Annual Reports, NDM Division, Ministry of Agriculture

Table 7.3
Annual Damage due to Heavy Rains, Landslide and Floods

S. No	Year	Districts affected	Villages affected (No)	Population affected (Lakh)	Crop Area affected (Lakh Ha.)	Houses Damaged (no.)	Human life loss (no.)	Cattle loss (no.)	Estimated value of loss to houses (Rs. in crore)	Estimated value of Public properties (Rs. in crore)
1	1999	202	33,158	328.12	8.45	884,823	1,375	3,861	0.72	-
2	2000	200	29,964	416.24	34.79	2,736,355	3,048	102,121	631.25	389.72
3	2001	122	32,363	210.71	18.72	346,878	834	21,269	195.57	676.05

Source : Annual Reports, Natural Disaster Management Division, Ministry of Agriculture

Table 7.4
Damage due to Cyclone in Orissa in October '2000

Date of occurrence	Total no of districts	Districts affected	Villages affected (No)	Population affected (Lakh)	Crop Area affected (Lakh Ha)	Houses Damaged (no.)	Human life loss (no.)	Cattle loss (no.)
17-18.10.99	30	4	5,181	37.47	1.58	331,580	199	10,578
29-30.10.99	30	12	14,643	129.22	18.43	1,828,532	9,887	444,531

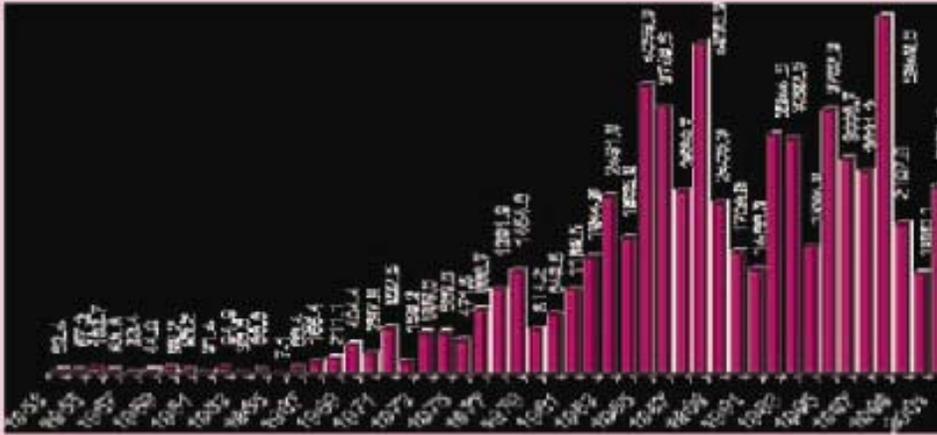
Source : Annual Reports, Natural Disaster Management Division, Ministry of Agriculture

Table 7.5
Losses due to Droughts: 1999-2001

S.No	Year	Districts affected	Villages affected (No)	Population affected (Lakh)	Damage to crops area (Lakh Ha)	Estimated value of damaged crops (Rs crore)	Cattle population affected (in lakh)
1	1999	125	-	369.88	134.22	6.44	345.60
2	2000	110	54,883	378.14	367.00	371.87	541.67
3	2001	103	22,255	88.19	67.44	NA	34.28
TOTAL		338	77,138	836.21	568.66	378.31	921.55

Source: Annual Reports, Natural Disaster Management Division, Ministry of Agriculture

Figure 7.1
Cumulative Annualised
Flood Damage (Rs. in crore)



Source: Central Water Commission.

mention in any of the three lists in the 7th Schedule of the Indian Constitution, where subjects under the Central and State Governments as also subjects that come under both are specified. On the legal front, there is no enactment either of the Central or of any State Government to deal with the management of disasters of various types in a comprehensive manner.

18. The country has an integrated administrative machinery for management of disasters at the National, State, District and Sub-District levels. The basic responsibility of undertaking rescue, relief and rehabilitation measures in the event of natural disasters, as at present, is that of the State Governments concerned. The Central Government supplements the efforts of the States by providing financial and logistic support.

Central Level

19. The dimensions of response at the level of the Central Government are determined in accordance with the existing policy of financing relief expenditure and keeping in view the factors like:

- (i) the gravity of a natural disaster;
- (ii) the scale of the relief operation necessary; and

(iii) the requirements of Central assistance for augmenting financial resources and logistic support at the disposal of the State Government.

20. The Contingency Action Plan (CAP) identifies initiatives required to be taken by various Central Ministries and Public Departments in the wake of natural calamities. It sets down the procedures and determines the focal points in the administrative machinery to facilitate launching of relief and rescue operations without delay.

21. The Ministry of Home Affairs is the nodal Ministry for coordination of relief and response and overall natural disaster management, and the Department of Agriculture & Cooperation is the nodal Ministry for drought management. Other Ministries are assigned the responsibility of providing emergency support in case of disasters that fall in their purview as indicated in Table 7.6.

Table 7.6
Ministries Responsible for Various Categories of Disasters

Disaster	Nodal Ministry
Natural Disasters Management (other than Drought)	Ministry of Home Affairs
Drought Relief	Ministry of Agriculture
Air Accidents	Ministry of Civil Aviation
Railway Accidents	Ministry of Railways
Chemical Disasters	Ministry of Environment & Forests
Biological Disasters	Ministry of Health
Nuclear Disasters	Department of Atomic Energy

The following decision-making and standing bodies are responsible for disaster management at the Central level:

- Union Cabinet, headed by the Prime Minister.
- Empowered Group of Ministers, headed by the Deputy Prime Minister
- National Crisis Management Committee (NCMC), under the chairmanship of the Cabinet Secretary.
- Crisis Management Group (CMG): under the chairmanship of the Central Relief Commissioner comprising senior officers from the various Ministries and other concerned Departments which reviews contingency plans, measures required for dealing with a natural disaster, and co-ordinates the activities of the Central Ministries and the State Governments in relation to disaster preparedness response and relief.
- Technical Organizations, such as the Indian Meteorological Department (cyclone/earthquake), Central Water Commission (floods), Building and Material Promotion Council (construction laws), Bureau of Indian Standards (norms), Defence Research & Development Organization (nuclear/biological), Directorate General Civil Defence provide specific technical support to coordination of disaster response and management functions.

- The setting up of a National Disaster Management Authority (NDMA) is being contemplated by the Ministry of Home Affairs as the proposed apex structure within the government for the purpose. Amongst other major organizational initiatives, it is proposed to:

- (a) establish a specialised and earmarked response team for dealing with nuclear/biological/chemical disasters;

- (b) establish search and rescue teams in each State;

- (c) strengthen communication systems in the North Eastern Region.

State Government

22. The responsibility to cope with natural disasters is essentially that of the State Government. The role of the Central Government is supportive in terms of supplementation of physical and financial resources. The Chief Secretary of the State heads a state level committee which is in overall charge of the relief operations in the State and the Relief Commissioners who are in charge of the relief and rehabilitation measures in the wake of natural disasters in their States function under

the overall direction and control of the state level committee. In many states, Secretary, Department of Revenue, is also in-charge of relief. State Governments usually have relief manuals and the districts have their contingency plan that is updated from time to time.

District and Local Level

23. The district administration is the focal point for implementation of all governmental plans and activities. The actual day-to-day function of administering relief is the responsibility of the Collector/ District Magistrate/Deputy Commissioner who exercises coordinating and supervising powers over all departments at the district level. Though it may not be a common phenomenon, there exists by and large in districts also a district level relief committee consisting of officials and non-officials.

24. The 73rd and 74th constitutional amendments recognise Panchayati Raj Institutions as 'Institutions of self-government'. The amendment has also laid down necessary guidelines for the structure of their composition, powers, functions, devolution of finances, regular holding of elections and reservation of seats for weaker sections including women. These local bodies can be effective instruments in tackling disasters through early warning system, relief distribution, providing shelter to the victims, medical assistance etc.

25. Other than the national, state, district and local levels, there are various institutional stakeholders who are involved in disaster management at various levels in the country. These include the police and para-military forces, civil defence and home-guards, fire services, ex-servicemen, nongovernment organisations (NGOs), public and private sector enterprises, media and HAM operators, all of whom have important roles to play.

Armed Forces

26. The Indian Armed Forces are supposed to be called upon to intervene and take on specific tasks only when the situation is beyond the capability of civil administration. In practice, the Armed Forces are the core of the government's response capacity and tend to be the first responders of the Government of India in a major disaster. Due to their ability to organize action in adverse ground circumstances, speed of operational response and the resources and capabilities at their disposal, the Armed Forces have historically played a major role in emergency support functions such as communications, search and rescue operations, health and medical facilities, transportation, power, food and civil supplies, public works and engineering, especially in the immediate aftermath of disaster. Disaster management plans should incorporate the role expected of them so that the procedure for deploying them is smooth and quick.

External Linkages

27. The Government of India is a member of various international organisations in the field of disaster response and relief. While, as a policy, no requests for assistance or appeals are made to the international community in the event of a disaster, assistance offered suo moto is accepted. Linkages exist with the following organisations:

a) UN Office for Coordination of Humanitarian Affairs (UN OCHA), which has been made responsible by UN General Assembly mandate for all international disaster response.

b) United Nations Development Programme (UNDP), responsible for mitigation and prevention aspects of disaster management.

c) UN Disaster Assessment and Coordination (UNDAC) System.

Streamlining Institutional Arrangements for Disaster Response

28. Institutional arrangements for disaster response are the heart of disaster management systems. There is no dearth of personnel, both civilian and military, experienced in handling situations arising out of natural disasters. However, there certainly is a pressing need for improvement and strengthening of existing institutional arrangements and systems in this regard to make the initial response to a disaster more effective and professional. Most of the resources and expertise needed already exist with the Government. What needs to be streamlined is how they should be integrated, trained and deployed. Some of the areas where improvement is urgently needed are:

a) Integrated planning for disasters, including the integration of relevant Armed Forces formations into disaster management planning at all levels from District to State and Central Government.

b) Setting up of a modern, permanent national command centre or operations room, with redundant communications and data links to all State capitals. The national command centre or operations room needs to be manned on a 24-hour basis by professionals to cater for instant integrated response. There needs to be a properly equipped operations room at the State level as well.

c) Establishment of a national stand by, quick reaction team composed of experienced professionals, both military and civilian, drawn from Central and State Government staff to respond immediately by flying in a matter of hours an experienced response team to the locations when a disaster strikes. This team can be organized and run professionally on the same lines as the United Nations Disaster Assessment and Coordination (UNDAC) teams.

d) Creation of urban search and rescue capacity at all levels, by establishing a fully equipped Search and Rescue unit, as part of the fire service in all State capitals, with trained staff and modern equipment such as thermal imagers, acoustic detection devices etc. This is of immediate relevance since a major weakness exposed in the Gujarat earthquake was a lack of specialised urban search and rescue capability in India.

e) Media policy geared to handling the growing phenomenon of real time television reporting, which generates enormous political pressures on a government to respond rapidly and efficiently. This needs attention since the effect is going to increase, not decrease in future.

f) Closer interface with and better understanding of the international system for disaster response, and putting in place, systems for dealing with international

assistance once it comes in e.g., customs, immigration, foreign policy implications etc. A greater appreciation is needed of the speed and automation of modern international response to a natural disaster. Closer interaction is required between of the Ministry of External Affairs and the relevant inter-national agencies concerned with disaster response.

g) Standard procedures for dealing with domestic humanitarian and relief assistance from non-government sources. Procedures and systems need to be set out to avoid confusion and ensure best utilisation of the assistance being offered, just as in the case of systems for international assistance.

h) Modern unified legislation for disaster management. In view of the current division of responsibilities between the State and Central Government into state, central and concurrent lists, there is a need to create a body of legislation dealing with response to natural disasters and other emergencies, clearly delineating responsibilities and powers of each entity and specifying what powers or actions would need to be triggered on declaration of a disaster by the Government of India or a State Government. This legislation should also incorporate the current legislation dealing with chemical emergencies that has been created by the Ministry of Environment so that all emergencies are dealt with under one law. The legislation should include clear definitions of what constitutes a disaster at a national level.

FINANCIAL ARRANGEMENTS

Financing of Relief Expenditures

29. The policy arrangements for meeting relief expenditure related to natural disasters are, by and large, based on the recommendations of successive finance commissions. The two main windows presently open for meeting such expenditures are the Calamity Relief Fund (CRF) and National Calamity Contingency Fund (NCCF). The Calamity Relief Fund is used for meeting the expenditure for providing immediate relief to the victims of cyclone, drought, earthquake, fire, flood and hailstorm. Expenditure on restoration of damaged capital works should ordinarily be met from the normal budgetary heads, except when it is to be incurred as part of providing immediate relief, such as restoration of drinking water sources or provision of shelters etc., or restoration of communication links for facilitating relief operations. The amount of annual contribution to the CRF of each State for each of the financial years 2000-01 to 2004-05 is as indicated by the Finance Commission. Of the total contribution

indicated, the Government of India contributes 75 per cent of the total yearly allocation in the form of a non-plan grant, and the balance amount is contributed by the State Government concerned. A total of Rs. 11,007.59 crore was provided for the Calamity Relief Fund from 2000-05.

30. Pursuant to the recommendations of the Eleventh Finance Commission, apart from the CRF, a National Calamity Contingency Fund (NCCF) Scheme came into force with effect from the financial year 2000-01 and would be operative till the end of the financial year 2004-05. NCCF is intended to cover natural calamities like cyclone, drought, earthquake, fire, flood and hailstorm, which are considered to be of severe nature requiring expenditure by the State Government in excess of the balances available in its own Calamity Relief Fund. The assistance from NCCF is available only for immediate relief and rehabilitation. Any reconstruction of assets or restoration of damaged capital should be financed through re-allocation of Plan funds. There is need for defining the arrangements in this regard.

31. The initial corpus of the National Fund is Rs.500 crore, provided by the Government of India. This fund is required to be recouped by levy of special surcharge for a limited period on central taxes. An amount of about Rs.2,300 crore has already been released to States from NCCF. A list of items and norms of expenditure for assistance chargeable to CRF/NCCF in the wake of natural calamities is prescribed in detail from time to time.

Financing of Disaster Management Through Five Year Plans

32. Although not specifically addressed in Five Year Plan documents in the past, the Government of India has a long history of using funds from the Plan for mitigating natural disasters. Funds are provided under Plan schemes i.e., various schemes of Government of India, such as for drinking water, employment generation, inputs for agriculture and flood control measures etc. There are also facilities for rescheduling short-term loans taken for agriculture purposes upon certification by the District/State administration. Central Government's assets/infrastructure are to be repaired/rectified by the respective Ministry/Department of Government of India. Besides this, at the occurrence of a calamity of great magnitude, funds flow from donors, both local and international, for relief and rehabilitation, and in few cases for long-term preparedness/ preventive measures. Funds for the latter purposes are also available from multilateral funding agencies such as the World Bank. These form part of the State Plan.

33. There are also a number of important ongoing schemes that specifically help reduce disaster vulnerability. Some of these are: Integrated Wasteland Development Programme (IWDP), Drought Prone Area Programme (DPAP), Desert Development Programme (DDP), Flood Control Programmes, National Afforestation & Ecodevelopment Programme (NA&ED), Accelerated Rural Water Supply Programme (ARWSP), Crop Insurance, Sampurn Grameen Rozgar Yojana (SGRY), Food for Work etc.

Initiatives Proposed by Various Bodies Regarding Financing Under the Plan

34. References have recently been made to the role of the Plan in disaster anagement by the High Power Committee (HPC) on Disaster Management, as well as by the Eleventh Finance Commission. The HPC was constituted in 1999 and submitted its Report in October 2001. The HPC took an overview of all recent disasters (natural as well as manmade) in the country and identified common response and preparedness mechanisms on the basis of a series of consultations with a number of government, non-government, national and international agencies and media organisations. An important recommendation of the Committee was that at least 10 per cent of plan funds at the national, state and district levels be earmarked and apportioned for schemes which specifically address areas such as prevention, reduction, preparedness and mitigation of disasters.

35. The Eleventh Finance Commission too paid detailed attention to the issue of disaster management and, in its chapter on calamity relief, came out with a number of recommendations, of which the following have a direct bearing on the Plan:

(a) Expenditure on restoration of infrastructure and other capital assets, except those

that are intrinsically connected with relief operations and connectivity with the affected area and population, should be met from the plan funds on priority basis.

(b) Medium and long-term measures be devised by the concerned Ministries of the Government of India, the State Governments and the Planning Commission to reduce, and if possible, eliminate, the occurrences of these calamities by undertaking developmental works.

(c) The Planning Commission, in consultation with the State Governments and concerned Ministries, should be able to identify works of a capital nature to

prevent the recurrence of specific calamities. These works may be funded under the Plan.

PLANNING FOR SAFE NATIONAL DEVELOPMENT

36. Development programmes that go into promoting development at the local level have been left to the general exercise of planning. Measures need also to be taken to integrate disaster mitigation efforts at the local level with the general exercise of planning, and a more supportive environment created for initiatives towards managing of disasters at all levels: national, state, district and local. The future blue-print for disaster management in India rests on the premise that in today's society while hazards, both natural or otherwise, are inevitable, the disasters that follow need not be so and the society can be prepared to cope with them effectively whenever they occur. The need of the hour is to chalk out a multi-pronged strategy for total risk management, comprising prevention, preparedness, response and recovery on the one hand, and initiate development efforts aimed towards risk reduction and mitigation, on the other. Only then can we look forward to "sustainable development."

Disaster Prevention And Preparedness Measures Information and Research Network

37. Disaster prevention is intrinsically linked to preventive planning. Some of the important steps in this regard are:

(a) Introduction of a comprehensive process of vulnerability analysis and objective risk assessment.

(b) Building a robust and sound information database: A comprehensive database of the land use, demography, infrastructure developed at the national, state and local levels along with current information on climate, weather and man-made structures is crucial in planning, warning and assessment of disasters. In addition, resource inventories of governmental and non-governmental systems including personnel and equipment help in efficient mobilisation and optimisation of response measures.

(c) Creating state-of-the-art infrastructure: The entire disaster mitigation game plan must necessarily be anchored to frontline research and development in a holistic mode. State-of-the art technologies available worldwide need to be made

available in India for upgradation of the disaster management system; at the same time, dedicated research activities should be encouraged, in all frontier areas related to disasters like biological, space applications, information technology, nuclear radiation etc., for a continuous flow of high quality basic information for sound disaster management planning,

(d) Establishing Linkages between all knowledge- based institutions: A National Disaster Knowledge Network, tuned to the felt needs of a multitude of users like disaster managers, decision makers, community etc., must be developed as the network of networks to cover natural, manmade and biological disasters in all their varied dimensions,

Capacity Building, Training & Education

38. Personnel involved in the exercise have to draw upon knowledge of best practices and resources available to them. Information and training on ways to better respond to and mitigate disasters to the responders go a long way in building the capacity and resilience of the country to reduce and prevent disasters. Training is an integral part of capacity building as trained personnel respond much better to different disasters and appreciate the need for preventive measures. The directions in this regard are:

(a) The multi-sectoral and multi-hazard prevention based approach to disaster management requires specific professional inputs. Professional training in disaster management should be built into the existing pedagogic research and education. Specialised courses for disaster management may be developed by universities and professional teaching institutions, and disaster management should be treated as a distinct academic and professional discipline, something that the American education system has done successfully. In addition to separate diploma/degree courses in disaster management, the subject needs to be discussed and taught as a specific component in professional and specialised courses like medicine, nursing, engineering, environmental sciences, architecture, and town and country planning.

(b) The focus towards preventive disaster management and development of a national ethos of prevention calls for an awareness generation at all levels. An appropriate component of disaster awareness at the school level will help increase awareness among children and, in many cases, parents and other family members through these children. Curriculum development with a focus towards dissemination

of disaster related information on a sustained basis, covering junior, middle and high schools may be worked out by the different school boards in the country.

(c) Training facilities for government personnel involved in disaster management are conducted at the national level by the National Centre for Disaster Management (NCDM) at the Indian Institute of Public Administration, in New Delhi which functions

as the nodal institution in the country for training, research and documentation of disasters. At the State level, disaster management cells operating within the State Administrative Training Institutes (ATIs) provide the necessary training. Presently, 24 ATIs have dedicated faculties. There is a need for strengthening specialised training, including training of personnel in disaster response.

(d) Capacity building should not be limited to professionals and personnel involved in

disaster management but should also focus on building the knowledge, attitude and skills of a community to cope with the effects of disasters. Identification and training of volunteers from the community towards first response measures as well as mitigation measures is an urgent imperative. A programme of periodic drills should be introduced in vulnerable areas to enable prompt and appropriate community response in the event of a disaster, which can help save valuable lives.

39. Capacity building for effective disaster management therefore needs to be grounded and linked to the community and local level responders on the one hand and also to the institutional mechanism of the State and the Nation on the other.

Community Level Initiatives

40. The goal of any disaster management initiative is to build a disaster resistant/resilient community equipped with safer living and sustainable livelihoods to serve its own development purposes. The community is also the first responder in any disaster situation, thereby emphasising the need for community level initiatives in managing disasters. To encourage such initiatives, the following are required:

(a) Creating awareness through disaster education and training and information dissemination are necessary steps for empowering the community to cope with disasters.

(b) Community based approach followed by most NGOs and Community Based Organisations (CBOs) should be incorporated in the disaster management system as an effective vehicle of community participation.

(c) Within a vulnerable community, there exist groups that are more vulnerable like women and children, aged and infirm and physically challenged people who need special care and attention especially during disaster situations. Efforts are required for identifying such vulnerable groups and providing special assistance in terms of evacuation, relief, aid and medical attention to them in disaster situations.

41. Management of disasters should therefore be an interface between a community effort to mitigate and prevent disasters as also an effort from the government machinery to buttress and support popular initiatives.

Strengthening of Plan Activities

42. Given the pervasive nature of disasters and the widespread havoc caused by some of them, planned expenditure on disaster mitigation and prevention measures in addition to the CRF is required. The Central Sector Scheme of Natural Disaster Management Programmes has been implemented since 1993-94 by the Department of Agriculture and Co-operation with the objective to focus on disaster preparedness with emphasis on mitigation and preparedness measures for enhanced capability to reduce the adverse impact of disasters. The major activities undertaken within this scheme include the setting up of the National Centre for Disaster Management (NCDM) at the Indian Institute of Public Administration, creation of 24 disaster management faculties in 23 states, research and consultancy services, documentation of major disaster events and forging regional cooperation. The Eighth Plan allocation of Rs 6.30 crore for this scheme was increased to Rs. 16.32 crore in the Ninth Plan. Within this scheme, NCDM has conducted over 50 training programmes, training more than 1000 people, while 24 disaster management centres with dedicated faculty have been established in the states. Over 4000 people have been trained at the State level. In addition, some important publications and audio-visual training modules have been prepared and documentation of disaster events has been done.

43. Though limited in scope and outlays, the Scheme has made an impact on the training and research activities in the country. Creation of faculties in disaster management in all 28 states is proposed to be taken up in the Tenth Plan in addition to community mobilisation, human resource development, establishment of Control Rooms and forging international cooperation in disaster management.

There is also an urgent need for strengthening the disaster management pedagogy by creating disaster management faculties in universities, rural development institutes and other organisations of premier research.

44. Sustainability is the key word in the development process. Development activities that do not consider the disaster loss perspective fail to be sustainable. The compounded costs of disasters relating to loss of life, loss of assets, economic activities, and cost of reconstruction of not only assets but of lives can scarcely be borne by any community or nation. Therefore, all development schemes in vulnerable areas should include a disaster mitigation analysis, whereby the feasibility of a project is assessed with respect to vulnerability of the area and the mitigation measures required for sustainability. Environmental protection, afforestation programmes, pollution control, construction of earthquake resistant structures etc., should therefore have high priority within the plans.

45. The aim of a mitigation strategy is to reduce losses in the event of a future occurrence of a hazard. Structural mitigation may comprise construction of individual disaster resistant structures like retrofitted or earthquake-resistant buildings or creation of structures whose function is primarily disaster protection like flood control structures, dykes, levees, infiltration dams etc.

46. Mitigation measures on individual structures can be achieved by design standards, building codes and performance specifications. Building codes, critical front-line defence for achieving stronger engineered structures, need to be drawn up in accordance with the vulnerability of the area and implemented through appropriate techno-legal measures.

47. Mitigation measures need to be considered in land use and site planning activities. Constructions in hazardous areas like flood plains or steep soft slopes are more vulnerable to disasters. Necessary mitigation measures need to be built into the design and costing of development projects.

48. Insurance is a potentially important mitigation measure in disaster-prone areas as it brings quality in the infrastructure & consciousness and a culture of safety by its insistence on following building codes, norms, guidelines, quality materials in construction etc. Disaster insurance mostly works under the premise of 'higher the risk higher the premium, lesser the risk lesser the premium', thus creating awareness towards vulnerable areas and motivating people to settle in relatively safer areas.

THE PATH AHEAD

49. For addressing natural calamities such as floods and drought, there already exist a number of plan schemes under which a lot is being done and can be done. State Governments need to make full use of the existing plan schemes and give priority to implementation of such schemes that will help in overcoming the conditions created by the calamity. In some cases this implies possible diversion of the funds from other schemes to those schemes the implementation of which will help meeting the situation. There may also be need in a crisis situation for certain re-appropriations/reallocations among the different departments.

50. The Planning Commission will aim at responding quickly to the needs of the Central Ministries/Departments/States in matters relating to the Plan for meeting situations arising out of natural disasters, by enabling adjustment of schemes to meet the requirements as far as possible. A mechanism will be evolved to take expeditious decisions on proposals which involve transfer of funds from one scheme to another, or any other change which involves departure from the existing schemes/
pattern of assistance, new schemes and relaxation in procedures, etc. in the case of natural disasters.

51. As the first responder in any disaster situation, however, each State needs to build a team , skilled personnel, make provision for specialised equipments, efficient communication network, and relevant, intelligent and easily accessible database. There is also a need to consider creation of a plan scheme in each state basically to meet the minimum requirements for strengthening communications and emergency control rooms, thereby improving coordination and response to disasters. No new institutional structures need be created in such a scheme.

52. In particular, with regard to major disasters, it is also necessary for disaster mitigation components to be built into all development projects. In order to save larger outlays on reconstruction and rehabilitation subsequently, a mechanism would
need to be worked out for allowing components that specifically help projects coming up in highly disaster prone areas withstand the impact of natural disasters as part of approved project cost for projects financed under the Plan.

53. The message for the Tenth Plan is that in order to move towards safer national development, development projects should be sensitive towards disaster mitigation. With the kind of economic losses and developmental setbacks that the country has been suffering year after year, it makes good economic sense to spend a little extra today in a planned way on steps and components that can help in prevention and mitigation of disasters, than be forced to spend many multiples

more later on restoration and rehabilitation. The design of development projects and the process of development should take the aspect of disaster reduction and mitigation within its ambit; otherwise, the development ceases to be sustainable and eventually causes more hardship and loss to the nation.

ANNEXURE-III

GUIDELINES TO STATE GOVERNMENTS

- (i) The State Department of Relief and Rehabilitation may be converted into Department of Disaster Management with the responsibility of looking at the whole cycle of disaster management- prevention, mitigation, preparedness, response, relief and rehabilitation. Steps for prevention/mitigation will need to be taken across a number of Departments. The Department of Disaster Management will coordinate the steps taken by the different Department of the Government in these spheres.
- (ii) Mitigation, preparedness and response are multi-disciplinary activities involving a number of Departments. In order to ensure the fullest involvement of the relevant Departments, the State Government may consider setting up a State Disaster Management Authority under the Chairmanship of the Chief Secretary with the Secretaries of Departments of Water Resources, Health, Agriculture, Animal Husbandry, Roads, Communications, Rural Development, Public Works, Public Health Engineering, Finance and Home as Members. The Secretary of the Department of Disaster Management may be the member-Secretary. This authority will ensure coordinated steps towards mitigation and preparedness as also coordinated response when a disaster strikes.
- (iii) It has been noticed that while the local administration has the requisite skills and capabilities for carrying out search and rescue in recurrent types of disaster like flood, there is lack of capability for specialised search and rescue. Each State may consider setting up specialised search and rescue teams. The teams would need to be composite with one coy of the State Armed Police trained and equipped to carry out

specialised search and rescue; one mobile engineering unit with necessary equipment and one medical assistance team. These teams may be constituted and trained together so as to function as a unit under the overall charge of a designated officer. Guidance/advice required with reference to training and equipment will be provided by the Disaster Management Division of the Ministry of Home Affairs, Government of India.

- (iv) It has been decided that fire services may be trained and equipped to function as all hazard response units as in other countries. This will necessitate some additional equipment and training to the fire units for carrying out search and rescue in all types of disasters. The Government of India will be initiating a separate project for this.
- (v) The Ministry of Home Affairs had advised the State Governments that composite control rooms may be set up at the State level and at the district levels under the District Magistrates for coordinating law and order as well as disaster management and that allocations under the Modernisation of Police Forces Schemes may be used for this purpose. Steps may be taken to put such control room in place quickly with standby communication systems.
- (vi) Disaster mitigation concerns/ aspects may be made an essential term of reference for every plan project/development scheme in the areas vulnerable to disasters. In other words, every plan project will need to state as to how it addresses mitigation concerns. Plans/projects specifically addressing mitigation/ prevention may be given a priority. The Secretary of Department of Disaster Management may be made a member for all bodies/ teams constituted for scrutinizing/approving projects/plans.

- (vii) Funds available under the ongoing schemes may be used for mitigation/preparedness. For example funds under the rural development scheme can be used for construction of cycle shelters in areas prone to cyclones. Similarly, sites and designs of primary school buildings in flood prone areas may be so selected so that they can serve as shelters in times of floods. The design requirements for primary school building and hospitals and other important public buildings in seismic zones V and IV would need to be in accordance with BIS norms for construction in these zones.
- (viii) Every hazard prone district may draw up specific hazard related plans. These plans may be reviewed/updated in the months of April and May each year.
- (ix) Every district located in area prone to hazard will need to maintain an on line inventory of resources available in the Government, public and private sector. This will enable easy and quick mobilization of resources in case of need. A State-wide on line resources inventory would enable the mobilization of resources from neighbouring districts in cases of need.
- (x) State in seismic zone V and IV may ensure that the BIS building codes for these zones have been adopted and are rigorously enforced by the municipal bodies. All construction in the Government sector in these areas must conform to the BIS code.
- (xi) The initial training curriculum of the field staff- VLWs, Karamcharis, Patwaris, Talhatis, Block Agriculture Officers, Block Animal Husbandry Officers other Block Supervisors, State Civil Service Officers, Constables, Sub-inspectors, Dy S.Ps etc. in the States vulnerable to hazards may include capsules on basic dos and don'ts in case of disasters; disaster mitigation and response, search and rescues

techniques etc. In-service training may be organized for staff already in service.

- (xii) Special efforts may be put in for education and awareness. This should include awareness of basic design requirements for constructing private housing in seismic zones IV and V as well as in the belt vulnerable to cyclones.
- (xiii) AICTE have been advised to include engineering aspects of disaster mitigation in the engineering courses at the undergraduate level. State Governments may take similar action with reference to engineering colleges under their universities.
- (xiv) CBSE have been advised to include basic disaster related material in text books for classes 8th, 9th and 10th – the basic dos and don'ts / precaution to be taken etc. State Government may advise their Secondary Boards of Education to include similar in their text books.

**MINISTRY OF HOME AFFAIRS
(NDM Division)**

DISASTER MANAGEMENT

EXISTING FRAMEWORK AND NEW INITIATIVES

Existing Framework

In the federal set up of India, the basic responsibility for undertaking rescue, relief and rehabilitation measures in the event of a disaster is that of the State Government concerned. The Central Government supplements the efforts of State Governments by providing financial and logistic support in case of major disasters. At the State level, response, relief and rehabilitation are handled by Departments of Relief & Rehabilitation. The State Crisis Management Committee is set up under the Chairmanship of Chief Secretary who is the highest executive functionary in the State. All the concerned Departments and organisations of the State and Central Government Departments located in the State are represented in this Committee. This Committee reviews the action taken for response and relief and gives guidelines/directions as necessary.

2. A control room is established under the Relief Commissioner. The control room is in constant touch with the climate monitoring/forecasting agencies and monitors the action being taken by various agencies in performing their responsibilities.
3. The district level is the key level for disaster management and relief activities. The District Magistrate/Collector/Dy. Commissioner is the chief administrator in the district. He is the focal point in the preparation of district plans and in directing, supervising and monitoring calamity relief. A District Level Coordination and Relief Committee is constituted and is headed by the Collector as Chairman with the participation of all other related government and non governmental agencies and departments in addition to the elected representatives. The Collector is required to maintain close liaison with the State Government as well as the nearest units of Armed Forces/Central police organisations and other relevant Central Government organisations like Ministries of Communications, Water Resources, Drinking Water, Surface Transport, who could supplement the efforts of the district administration in the rescue and relief operations. The District Magistrate/Collector and the Coordination Committee under him reviews preparedness measures prior to an impending hazard and coordinates response when the hazard strikes. As all the Departments at the district level report to the Collector, there is an effective coordination mechanism ensuring holistic response.
4. Each State Government has relief manuals/codes which identify the role of each Department in the State for managing the natural disasters. These are

reviewed and updated periodically based on the experience of managing the disasters and the need of the State.

Funding mechanisms

5. The policy and the funding mechanism for provision of relief assistance to those affected by natural calamities is clearly laid down. These are reviewed by the Finance Commission appointed by the Government of India every five years. The Finance Commission makes recommendation regarding the division of tax and non-tax revenues between the Central and the State Governments and also regarding policy for provision of relief assistance and the share of expenditure thereon. A Calamity Relief Fund (CRF) has been set up in each State as per the recommendations of the Eleventh Finance Commission. The size of the Calamity Relief Fund has been fixed by the Finance Commission after taking into account the expenditure on relief and rehabilitation over the past 10 years. The Government of India contributes 75% of the corpus of the Calamity Relief Fund in each State. 25% is contributed by the State. The requirement of funds for response and relief is met from the CRF. Overall norms for relief assistance are laid down by a national committee with representatives of States as members. Different States can have State-specific norms to be recommended by State level committee under the Chief Secretary. Where the calamity is of such proportion that the funds available in the CRF will not be sufficient for provision of relief, the State seeks assistance from the National Calamity Contingency Fund (NCCF). When such requests are received, the requirements are assessed by a team from the Central Government and thereafter the assessed requirements are assessed by a Central team and thereafter the requirements are placed before an Inter Ministerial Group chaired by the Home Secretary. A High Level Committee chaired by the Home Minister with the Agriculture Minister, Finance Minister and the Deputy Chairman Planning Commission take decision regarding the release of assistance from the NCCF based on the report of the Central Team and the recommendations of the IMG thereon. In brief, the institutional arrangements for response and relief are well established and have proved to be robust and effective.

Role of Central Government

6. At the national level, the Ministry of Home Affairs is the nodal Ministry for all matters concerning disaster management except drought, which continues to be handled by the Ministry of Agriculture. The Central Relief Commissioner (CRC) in the Ministry of Home Affairs is the nodal officer for coordinating relief assistance for the natural and manmade disasters. The CRC receives information relating to forecasting/warning of a natural calamity from India Meteorological Department (IMD) or from Central Water Commission of Ministry of Water Resources on a continuing basis. These forecasts are also concurrently passed on to the State by the Agencies responsible for early warning. Whenever assistance is required by the States for handling a natural calamity, the assistance is coordinated by the Ministry of Home Affairs. Nodal Officers have been appointed in each Ministry/Department responsible for emergency support functions in the event of a

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disaster. The Central Relief Commissioner coordinates with the Nodal Officers to ensure that the requisite assistance is made available to the State.

Transfer of Subject

7. The subject of disaster management (except drought and epidemics) was transferred to the Ministry of Home Affairs from the Ministry of Agriculture in 2002. The change in the Government of India (Allocation of Business) Rules, 1961 was made in February, 2002. The actual transfer of work took place only in June, 2002.

Change in Orientation

8. Prior to the transfer, the focus had been entirely on post disaster relief and rehabilitation. Very little, if any, attention was paid to mitigation and preparedness. We have brought about a radical change in orientation - emphasizing mitigation, prevention and preparedness. A strategic framework/roadmap has been drawn up with the approval of former Dy. Prime Minister and action is being taken as per the roadmap. A copy of the roadmap is at **Annexure-I**.

National Policy on Disaster Management

9. Despite the fact that we lose thousands of lives and property worth thousands of crores each year in disasters, we have not had a National Policy on Disaster Management. Where a number of Ministries or where a broad segment of Government is involved; it is useful to have a National Policy as it serves as a framework for action by all the relevant Ministries/Departments. A National Policy on Disaster Management has been drafted. In line with the changed focus, the policy proposes to integrate disaster mitigation into developmental planning.

Institutional Changes

10. The primary objective is to change the focus from relief and rehabilitation to mitigation and preparedness. MHA is working towards putting in place institutions which will reflect this holistic approach. The States have been advised (HS had written to all Chief Secretaries and the former Dy. Prime Minister has also written to all Chief Ministers in this regard) to convert their Departments of Relief & Rehabilitation into Department of Disaster Management. 10 States/UTs - Andhra Pradesh, Arunachal Pradesh, Bihar, Himachal Pradesh, Rajasthan Tamil Nadu, Uttaranchal, Nagaland, Andaman & Nicobar Administration and Lakshadweep have already acted on this.

11. The exercise of reducing vulnerabilities of mitigation or of preparedness or in fact of response is multi-disciplinary. It involves a number of
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Ministries/Departments. Unfortunately, till date all Departments have had the feeling that disaster management/response is the responsibility of the Department of Relief and Rehabilitation alone. The States have, therefore, been advised to set up Disaster Management Authorities under the Chief Minister with the Ministers of Water Resources, Agriculture, Home, Health, PWD, Animal Husbandry, Urban Development and other Ministers who may be relevant as members. 11 States and UTs – Tamil Nadu, Arunachal Pradesh, Uttaranchal, Orissa, Gujarat, Kerala, Nagaland, Delhi, Goa, A&N administration and Chandigarh Administration have notified the authority. The other States are in the process of setting up similar authorities.

12. At the National level, a National Emergency Management Agency is being set up. The proposal for setting up NEMA and building up specialised capabilities was considered by the Committee of Secretaries (COS) on 21st April, 2004. Based on the recommendations of the COS, the Note for the Empowered Group of Ministers on Disaster Management is being revised for submission to Home Minister for approval.

Disaster Management Codes

13. In line with the changed approach, we are converting the Relief Codes into Disaster Management Codes by building into it the process necessary for drawing up disaster management and mitigation plans as well as elements of preparedness apart from response and relief. A Committee constituted under the Executive Director, National Institute of Disaster Management is expected to submit the draft to the Ministry by 30th June, 2004.

MITIGATION

Twelfth Finance Commission

14. The terms of Reference of the Twelfth Finance Commission were changed from what it was for the Eleventh Finance Commission so as to cover mitigation. A Memorandum has been drawn up and sent to the Commission. In the Memorandum, we have proposed a Disaster Mitigation Fund of Rs.10,000 crores under which we will be assisting the States to take up mitigation projects.

Core Group on Earthquake Mitigation

15. A Core Group on Earthquake Mitigation has been set up having the most eminent authorities on earthquake engineering in the country as members. The States in seismic zones III, IV and V have been advised to change their building bye-laws to incorporate the BIS codes for safe construction in the seismic zones. Some States have done this already. In order to help other States, a Committee has been set up to draw up model building bye laws and development control regulation for adoption by the States/UTs. The Committee is expected to submit its report to the Ministry by 15th June, 2004.

16. Bureau of Indian Standards (BIS) is mandated to develop national codes and practices for design and construction of housing and all infrastructure projects. Structural safety of the built environment can be ensured only when these codes are observed in design and construction of all projects. These codes/documents need to be revised at regular intervals based on change in hazard zonation, building performance in past disasters and outcomes of research projects. It was observed that these codes are not revised periodically even though BIS is expected to do this once in every five years. A committee consisting of representatives of Ministry of Consumer Affairs, BIS and MHA is being constituted to review the development of codes relevant to earthquake risk mitigation and the protocol for revision by BIS. Availability to these codes in different parts of the country is also an issue as was observed in the studies post Latur[1993] and Kachhh[2001] earthquakes. BIS has been advised to develop a plan of action to streamline revision of existing codes, development of new codes/documents/commentaries and availability of codes all over the country including on-line access to codes related to earthquake risk reduction.

Training of Engineers/Architects/Masons in Seismically safe building design and construction

17. It has been observed that even where bye-laws have been amended to incorporate the BIS codes, these are not being implemented. The reason is that the engineers/architects practising in private sector are not trained in the relevant codes and neither are the engineers in the regulatory bodies (the municipality/development authority). A project costing about Rs.12.36 crore has been approved wherein the municipal engineers of all cities in the seismic zones will be trained in the BIS codes as well as revised bye-laws, and Certificate courses will be organised for engineers practising in the private sector. 11 National Resource Institutes have been selected for imparting training to the Faculty members of Civil Engineering Departments of State Resource Institutes. State Governments are in the process of nominating the State Resource Institutes (Engineering Colleges) and the Faculty Members to be trained. A six-week training module has been finalized for this purpose. The State Resource Institutes will train 10,000 engineers throughout the country in safe earthquake resistant constructions. They will also assist the State Governments in putting in place an appropriate techno-legal regime, in developing appropriate IEC materials, and in conducting the detailed evaluation of lifeline buildings and make recommendations for retro-fitting, where necessary. A copy of the approved programme for capacity building of engineers in earthquake risk management is at **Annexure-II**. A similar programme for training of 10,000 architects in conjunction with Indian Institute of Architects/Council of Architecture has been formulated and is under submission for approval.

18. Masons play an important role in construction of buildings and critical infrastructure. For most of the rural and many urban constructions, mason is the architect, engineer and builder. There is no formal system of training of masons in construction of multi-hazard resistant built environment. A programme to assist

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the States/UTs in training and certification of 30000 masons in consultation with HUDCO and MORD is under formulation. The training module for masons to include multi-hazard resistant construction is under preparation by a committee constituted and revised curriculum will be a part of the vocational training programme of MHRD.

Awareness Campaign

19. This in itself will not be sufficient unless the people living in the seismic zones are also made aware of their vulnerability as well as the means of reducing that vulnerability. A nation-wide media campaign is proposed. The Home Secretary had taken a meeting with the Secretary (I&B), DG, Doordarshan, and DG, DAVP to discuss this. In pursuance of this meeting, a Steering Committee was set up under the Chairmanship of Secretary (BM) to consider the matter in detail. The Prasar Bharti proposed to the Steering Committee that they may be given an opportunity to draw up the media plan. Prasar Bharti have made a presentation submitted a plan/proposal on the media campaign. The matter will be considered further by the Steering Committee in its next meeting scheduled to be held shortly.

Earthquake Engineering in Undergraduate Engineering Curricula

20. Up till now, earthquake engineering was not a part of the undergraduate engineering curriculum which was the reason for the structural engineers not being aware of the elements necessary for earthquake resistant construction. A draft curriculum has been finalized for incorporation in the undergraduate engineering courses to be introduced from the current academic year. A similar curriculum has been finalized for architects, to be introduced in the Schools of Planning and Architecture.

Awareness Generation for safe construction in rural areas

21 For the rural areas, where people go for non-engineered construction, the strategy is of awareness generation by distribution of pamphlets bringing out essential features, which need to be incorporated into the construction so that it is safe; and of training the masons. Samples of pamphlets/posters which could be circulated have been compiled, and have been made available to States for adoption/translation into local languages.

Retro-fitting of lifeline buildings

22. The above measures will take care of the future building stock. Insofar as existing building stock is concerned, these will need retrofitting. Since it is not possible to retrofit all the buildings, the focus is on life line buildings/buildings where people congregate – hospitals, schools, cinema halls, multi-storied complexes etc. The Home Secretary has written to the Chairman, Railway Board, Health Secretary, Secretary(Civil Aviation), Secretary (Power) and Secretary(Telecom) requesting them to have the railway stations, hospitals and airports/airport control towers, power stations and telecommunication installations located in the seismic zone, examined to see whether they need retrofitting, and, if so, to take action accordingly. They have also been requested to ensure that future

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construction in the seismic zones incorporate the features essential for safe construction as per the BIS code for that zone.

Earthquake Risk Mitigation Project

23. An Earthquake Mitigation Project has been drawn up, with an estimated cost of Rs.1039 crore. That project has been given in-principle clearance by the Planning Commission. The project is being submitted for in principle approval of Home Minister. Thereafter, the project will be appraised by the Committee on Non Plan Expenditure (CNE) before it is submitted for the approval of the Cabinet.

Urban Earthquake Vulnerability Reduction

24. Pending the clearance of the larger project, a project for earthquake mitigation in 38 identified cities which are in seismic zones III, IV and V and which have a population of more than half a million as well as in other cities/areas covered under the GOI-UNDP project in 169 districts in 17 multi-hazard prone States has been taken up. 118 Orientation courses have been organized for engineers and architects on the BIS codes for seismically safe construction in 38 cities. Awareness generation programme has been started in these cities. These cities are also being assisted to change their building bye-laws. City Disaster Management Plans are being developed under the project.

Cyclone Monitoring and Mitigation Group

25. A Cyclone Monitoring and Mitigation Group has been set up. This Group is looking at protocols for cyclone warning and also the observation/monitoring platform which need to be strengthened. A project has been taken up with the United States for upgradation of models for cyclone track prediction.

Cyclone Risk Mitigation Project

26. A project for Cyclone Mitigation (estimated cost Rs.1050 crore) has been drawn up in consultation with the cyclone prone States. This project envisages construction of cyclone shelters, coastal shelter belt plantation in areas which are prone to storm surges, strengthening of warning systems, training and education etc. This project has also been given in-principle clearance by the Planning Commission and the World Bank has agreed in principle to provide funding for the project. The project has been posed to the World Bank through Department of Economic Affairs. Counter-part funding will have to be provided in the plan budget.

GOI-UNDP Disaster Risk Management Project

27. 169 districts in seventeen multi-hazard prone States have been taken up under the GOI-UNDP project. Under this project, the States are being assisted to draw up State, district and Block disaster management plans; village disaster management plans are being developed in conjunction with the Panchayati Raj Institutions and disaster management teams consisting of village volunteers are being trained in various preparedness and response functions such as search and rescue, first aid, relief coordination, shelter management etc. Equipment needs

for district and State Emergency Operation Centres have been identified by the State nodal agencies and equipment is being provided to these EOCs. Orientation training of masons, engineers and architects in disaster resistant technology have been initiated in these districts and construction of model demonstration buildings will be started soon. A statement showing the achievements under the DRM programme from September, 2002 to March, 2004 is at **Annexure III**.

Mainstreaming Mitigation in Rural Development Schemes

28. The Ministry of Home Affairs is working with the Ministry of Rural Development for changing the guidelines so that the houses constructed under IAY or school buildings/community buildings constructed under SGRY are earthquake/cyclone/flood resistant; as also that the schemes addressing mitigation are given priority under SGRY. Ministry of Rural Development are carrying out an exercise for this purpose. The matter is being closely followed up with that Ministry.

NE States and A&N Islands

29. A special focus is being given to North-Eastern States and the Andaman & Nicobar Islands. The North-Eastern Council has been made the nodal agency for the NE States. The NEC has been provided with a resource person/advisor in disaster management. A detailed presentation on the vulnerabilities of the NE region and the need for comprehensive disaster management plan was given to the Governor of Assam and Chairman, NEC. An action plan has been drawn up by NEC, which has been discussed in the Governing Body meeting of the NEC and a declaration namely "Shillong Declaration" has been adopted by all States in the NE region for integrating disaster management with development planning. 140 officials and non-officials have been trained in disaster management to act as resource persons for the NE region.

30. For A&N Islands, a disaster management plan has been drawn up. This plan was discussed in a meeting on the 16th of October, 2003 and cleared. Draft Disaster Management Regulations for A&N Islands have also been vetted.

PREPAREDNESS

Specialist Response Teams

31. Eight battalions of CPMFs are being converted into specialist response teams for responding to emergencies/disasters as well. Two training institutions – CISF/ NISA, Hyderabad and the ITBP/BTC, Bhanu (near Chandigarh) have been developed as nodal institutions for training the trainers as well as the teams. The training centres of CRPF(CTC-II at Coimbatore) and BSF Academy, Tekanpur have also been identified to impart such training to the teams from CRPF and BSF. 16 teams have already been trained at NISA, Hyderabad and BTC, Bhanu and training of more teams is continuing. Training of trainers of CRPF and BSF will be conducted at NISA, Hyderabad in June and September, 2004 respectively.

National Emergency Response Force

32. It is proposed to constitute these eight battalions into a special Force called the National Emergency Response Force (NERF). The elements which need financial sanction have already been included in the Note for the Empowered Group of Ministers on Disaster Management.

33. The States have also been advised to set up their own specialist teams for responding to disasters. They have been advised that we will provide assistance for training of trainers. Resources have been an important constraint for the States. We have, therefore, with the concurrence of the Finance Ministry, provided that 10% of the annual inflows into the CRF can be used for the procurement of search and rescue equipment and communication equipment.

34. Apart from the eight battalions which are being developed into specialist units, it was decided that all the CPMFs should have the basic expertise in search and rescue so that they can be requisitioned for search and rescue by the States/District Administration. A curriculum for this has been drawn up and integrated into the training curricula of the CPMFs.

Fire Services as Multi-hazard Response Units

35. In order to further strengthen our capacity for response, the fire services are proposed to be developed into multi-hazard response units (as is the practice in other countries). This will require additional equipment and training. A project for this (with an estimated cost of Rs.2457 crore) has been drawn up. The Planning Commission has given in-principle clearance to the project. The project is being submitted for in-principle approval of Home Minister. A Note for the Committee on Non Plan Expenditure is being finalized.

Regional Response Centres

36. Regional Response Centres are being set up. Fourteen Regional Response Centres have been identified – these are Group Centres or battalion headquarters where a cache of essential search and rescue equipments will be stored so that they can respond to any disaster in the neighbouring States immediately. Proposals for the cache of equipments are under consideration of Finance.

Emergency Operations Centres

37. The States are being assisted to set up control rooms/emergency operations centres at the State and district level. Assistance for this is being given under the GOI – UNDP project in the States covered by the project. Assistance under the Modernisation of Police Scheme is also available for setting up EOCs.

38. The MHA Control Room has been strengthened with some additional equipment – SATPHONES and GPS and staff trained in their operation. A state
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of the art National EOC with superior structural features and communication facilities is proposed to be set up. A Committee of CPWD/BARC/DRDO has been constituted to finalize the design parameters. The project will be executed by CPWD and is scheduled to be completed by June, 2006.

Communication System

39. The communication network between the national and the state EOCs and the site of the emergency/crises is currently based on the DOT network. It has been observed that in a calamity/hazard, communication is the first casualty. It is therefore decided to put in place multi-mode and multi-channel communication systems so that enough redundancy is available. It has been decided that the POLNET will also be used for disaster management; and for this the POLNET communication facility will be extended to SDMs and Collectors as well as the Emergency Operation Centers. For emergency communications, discussions have also been held with the Department of Space (ISRO). They will be making available alternate satellite communication units to connect with State EOCs and mobile units which can be transported to the site of a disaster. A Group had been set up for drawing up a communication plan for disaster management and the said Group has submitted its report. This provides for a dedicated communication system for disaster management with built in redundancies. Phase I of the National Disaster Management Communication Plan to provide satellite based mobile voice/data/video communication between National EOC/State EOCs/mobile EOCs and remote disaster/emergency sites is under implementation and is expected to be completed by August, 2004. Phase II of the communication plan to connect National/State/District EOCs with disaster/emergency sites is proposed to be completed by March, 2006. The communication backbone to be used will include terrestrial link(DOT), POLNET, NICNET, ISDN and SPACENET.

India Disaster Resource Network (IDRN)

40. One major step towards strengthening of our response system has been the launch of India Disaster Resource Network (IDRN). This is a web based inventory of all specialist equipment required for emergency/disaster response. This will give at the touch of a button the location of specific equipment/specialist resources as well as the controlling authority for that resource so that it can be mobilized for response in the shortest possible time. This was launched on 1st September, 2003. This inventory already has about 66,000 records/entries from 534 districts in 29 States/UTs.

Handling of Hazardous Materials

41. In the light of the experience of the Bhopal Gas Tragedy, the Ministry of Home Affairs has been interacting with Ministry of Environment & Forests and new guidelines have been sent to the States for industries handling hazardous materials. It has been prescribed that onsite and offsite disaster response plans for the industries dealing with hazardous material be updated in consultation with District Administration and that this may be rehearsed once every year. It has also been prescribed that these industries will carry out awareness campaign for the population in the vicinity regarding the dos/don'ts in case of any accident involving hazardous material

Incident Command System

42. In order to professionalize the response, it is proposed to introduce the Incident Command System in the country. This system is in vogue in the United States and it provides for specialist Incident Command Teams with an Incident Commander and officers trained in different aspects of Incident Management – logistics, operations, planning, media management etc. We are working with the US experts for training of officers in this system here. The LBSNAA, Mussoorie has been designated as the mother training institution. Three programme for training of trainers has so far been held at LBSNAA. 42 officers-trainers have been trained so far in basic and intermediate ICS course and 29 officers-trainers trained in planning module.

Human Resource Development

43. In order to further professionalize our response, it was decided to incorporate elements of disaster management in the training curriculum of All India Services (IAS, IPS and Indian Forest Service). Curricula have been drawn up for this purpose and have been integrated into the training curriculum of these All India Services.

Disaster Awareness in School Education

44. It was felt that making disaster awareness a part of school curriculum would be an important step. Disaster awareness/Dos and Don'ts have been made a part of classes – VIII and IX CBSE curricula. It is proposed to incorporate the elements of disaster awareness/do and don'ts in the curriculum of class X in the coming academic year. The State Governments have been advised to take similar steps vis-à-vis their school boards. We are working with the Council of Board of School Education (COBSE) to facilitate inclusion of disaster management in public education in all 39 School Boards in the country.

Hospital Preparedness for emergencies

45. Hospital preparedness is crucial to any disaster response system. For the purpose each hospital should have an emergency preparedness plan to deal with mass casualties and should be manned by trained health managers. The existing curriculum for medical doctors does not include emergency health management. Therefore capacity building through in-service training of the current health managers and medical personnel in handling health emergencies is extremely essential. At the same time, the future health managers must acquire these skills systematically through the inclusion of health emergency management in the undergraduate and post graduate medical curricula. In consultation with Medical Council of India(MCI) Two committees have been constituted for preparation of curriculum for introduction of emergency health management in MBBS curriculum, and preparation of in-service training of Hospital Managers and Professionals. Rajiv Gandhi University of Health Sciences Karnataka have been identified as the lead national resource institution for the purpose.

46. While the Ministry of Health and Family Welfare has issued instructions to the states to evaluate the structural integrity of existing health institutions in high
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seismic zones and carry out the necessary retrofitting activities, it is also important to address the integrity of non-structural elements like essential medical equipment as part of hospital preparedness for emergencies. Handling non-structural issues in hospitals would be both part of the envisaged sensitization and training of practicing engineers and architects as well as hospital managers and administrators.

Transparency in Relief Operations

47. We are seeking to bring about transparency in relief operations. We have advised the State Governments that whenever relief material is distributed from CRF/NCCF, a list giving the details of the beneficiaries along with quantity/volume of relief distributed may be prepared ward-wise both for urban and rural areas and be made available to local representatives in Panchayats and Municipalities and should also be displayed there. The consolidated list should also be maintained at the Block level/Taluka Level and made available to the general public on demand.

Civil Defence

48. A Committee was constituted to review the set up of Civil Defence. The Committee has given its recommendation based on which draft proposals are being formulated. CNE Notes for upgradation of National Civil Defence College and National Fire Service College are also under process. A Cabinet Note for strengthening of Civil Defence Organisation is under preparation.

Status Report

49. A Status Report on Disaster Management in India was prepared in February, 2004 for presentation and circulation in the World Congress on Natural Disaster Mitigation. The Report summarizes various initiatives taken by the Ministry. A copy of the Status Report (Red Book) is enclosed.