सत्यमेव जयते

Report of the Comptroller and Auditor General of India on Performance Audit of Disaster Preparedness in India




भारतीय लेखा एवं लेखा परीक्षा विभाग ✦ INDIAN AUDIT AND ACCOUNTS DEPARTMENT

Union Government (Civil)
Ministry of Home Affairs
Report No. 5 of 2013
(Performance Audit)

Report No. 5 of 2013, Union Government (Civil), Ministry of Home Affairs

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Contents

PREFACE

This Report of the Comptroller and Auditor General of India for the year ended March 2012 containing the results of the Performance Audit of Disaster Preparedness in India has been prepared for submission to the President of India under Article 151 of the Constitution.

The Performance Audit was conducted during May 2012 to September 2012. The report emanates from scrutiny of files and documents pertaining to Ministry of Home Affairs, National Disaster Management Authority, National Institute of Disaster Management, National Disaster Response Force, eight States, one Union Territory and nodal ministries and departments viz. Ministries of Environment and Forest, Health and Family Welfare, Earth Sciences, Indian Meteorological Department, Departments of Agriculture and Cooperation, Atomic Energy and Space.

The results of audit, both at the Central level and the State level, were taken into account while arriving at the audit conclusions.

Executive Summary

The world over Disaster Preparedness or Disaster Risk Reduction (DRR) is becoming the most prominent theme for Disaster Management. It is not possible to eliminate the possibility of disasters. However, with due care and proper preparation, the risks and damages from disasters can be reduced considerably. India is prone to various natural and manmade disasters. The country has faced several devastating disasters including earthquakes, tsunamis and river floods in recent years. Accordingly India was one of the pioneering countries to establish a three level disaster management institutional set up. Considerable time has elapsed since the enactment of the DM Act in 2005. Governments at the central and state level have initiated various mitigation projects. There are also several internationally aided projects for disaster risk reduction being carried out in the country. Institutional set ups at the national, state and district levels have been formed. The nodal ministries responsible for DRR work have been designated for various manmade and natural disasters. Therefore, it is the right time to assess the level of preparation in the country to manage disasters.

In this audit, we found that despite considerable progress in setting up institutions and creating funding arrangements, there are critical gaps in the preparedness level for various disasters. The system which came into effect post the DM Act 2005 is yet to achieve its desired impact. The National Disaster Management Authority which was conceived as the apex planning and supervising body, was found ineffective in its functioning in most of the core areas. It neither had information and control over the progress of work at the state level nor was it successful in implementation of various projects. Coordination between NDMA and nodal ministries for various disasters need to be improved. Roles and responsibilities amongst the apex bodies at the national level need to be clearly specified.

What did our Performance Audit reveal?

Our Performance Audit revealed that:

Legislative and Institutional Framework	❖ National Executive Committee had not met after May 2008, although the country faced many disasters since that date. This had affected the evaluation of the disaster preparedness at all levels of Government. (Paragraph 2.5.3.6)
Planning of Disaster Preparedness	❖ The National Plan for Disaster Management had not been formulated even after six years of the enactment of the Disaster Management Act. (Paragraph 3.1.1) ❖ There were no provisions to make the National Guidelines, issued by National Disaster Management Authority, binding on states in preparation of the state plans. (Paragraph 3.2) ❖ There were significant deviations from the prescribed roles and practice of Ministry of Home Affairs, National Executive Committee and National Disaster Management Authority. (Paragraph 3.4)
National Disaster Management Authority (NDMA)	❖ There was no Advisory Committee of NDMA, since June 2010. (Paragraph 4.2) ❖ None of the major projects taken up by NDMA was completed. Due to improper planning either the projects were abandoned midway or were still incomplete after lapse of a considerable period. (Paragraph 4.3) ❖ NDMA was not performing several functions as prescribed in the DM Act. These included recommending provision of funds for the purpose of mitigation and recommending relief in repayment of loans or for grant of fresh loans. (Paragraph 4.4.2) ❖ NDMA had not started the work of systematic assessment of major national projects, to include structural requirements for disaster reduction. (Paragraph 4.4.3) ❖ Several critical posts in NDMA were vacant and consultants were used for day to day working. (Paragraph 4.6)
Resources and fund arrangements	❖ There were delays and mismanagement in respect of State Disaster Response Fund (SDRF) in states. The states were not regular in sending the details of utilisation and unspent balances under SDRF to

MHA. States did not invest the unspent balances under SDRF as per guidelines. This resulted in potential loss of interest of ₹ 477.99 crore in test checked states.

(Paragraph 5.1)

- ❖ National Disaster Response Fund was utilised for various purposes other than those stated in the GOI guidelines. 'On account' releases of ₹ 654.04 crore in case of Gujarat, Assam and Goa, from NCCF (now NDRF) were lying unspent with these States.

(Paragraph 5.2)

- ❖ National Disaster Mitigation Fund was yet to be established. Most of the states had also not established state and district level Disaster Mitigation funds.

(Paragraph 5.3)

- ❖ Due to delays by NDMA in finalizing the guidelines, National Disaster Response Reserve for maintaining inventory of items required for immediate relief after disasters was not operationalised.

(Paragraph 5.4)

Communication systems for Disaster Preparedness	❖ National Database for Emergency Management which was to be completed by August 2011, was yet to be operationalised. (Paragraph 6.1.1)
	❖ Investment of ₹ 23.75 crore was made in procurement and operationalisation of ALTM Digital Camera since April 2003. However, less than 10 *per cent* of the flood prone areas of the country was covered to generate close contour and detailed topographic information. (Paragraph 6.1.2)
	❖ Support through Synthetic Aperture Radar by acquiring aerial radar data during natural disasters could not materialize even after six years from the scheduled date of completion. The expenditure incurred so far was ₹ 28.99 crore. (Paragraph 6.1.3)
	❖ The satellite based Communication Network was not fully operational after more than six years of receipt of the communication equipment. (Paragraph 6.1.4)
	❖ The Doppler Weather Radars for surveillance and monitoring of severe weather system could not fructify after spending ₹ 35.64 crore. (Paragraph 6.1.5)
	❖ National Disaster Communication Network and National Disaster Management Informatics System projects of NDMA were still at the planning stage after several years of conceptualization. (Paragraph 6.2)

Response system for Disasters	❖ Effectiveness of the National Disaster Response Force was hampered by shortage of trained manpower, absence of required training facilities, infrastructure and equipment. The preparedness on part of NDRF was not adequate in terms of important equipment being non-functional or faulty. (Paragraph 7.1.2)
	❖ The Standard Operating Procedures for deployment of NDRF had not been approved as of September 2012 and NDRF was increasingly deployed for small or localised disasters. (Paragraph 7.1.3)
	❖ Only seven states had raised their State Disaster Response Forces. In the absence of properly trained and equipped SDRF personnel, states were sending requisitions for NDRF deployment for small and localized disasters. (Paragraph 7.2)
	❖ There was no clear policy nor guidelines for the functioning of RRCs. RRCs were ineffective and were hardly utilised in disaster response. (Paragraph 7.3)
	❖ Fire and Emergencies services were not adequately staffed in various states to provide immediate and quick response in case of any disaster. (Paragraph 7.4.4)
	❖ The medical preparedness was found lacking in terms of capacity and infrastructure at both 'central and state' level. (Paragraph 7.5)
Capacity Building for Disaster Preparedness	❖ The schemes for ensuring seismically safer habitats by training of practicing architects and engineers failed to achieve its targets. The schemes were shelved without analyzing the reasons for its failure. (Paragraph 8.1.3.1)
	❖ The scheme for extending financial assistance to the ATIs ended with huge shortfalls. (Paragraph 8.1.3.2)
	❖ India Disaster Resource Network project to build up organized information system of specialist equipment and expertise for disaster response was operational only on ad-hoc basis. (Paragraph 8.1.4)
	❖ Non filling up of critical posts at National Institute of Disaster Management had hampered the coverage of training programmes. (Paragraph 8.1.6.2)
Disaster Specific Issues	**Earthquakes:**
	❖ Indian Meteorological Department did not prepare the disaster management and mitigation plans for earthquake. (Paragraph 9.1.2)

- The National Earthquake Risk Mitigation Project taken up by NDMA was still in preparatory phase after a lapse of five years of its conceptualization.

(Paragraph 9.1.6)

Floods:

- Only eight states had prepared Emergency Action Plans for 192 large dams against the targeted 4728 large dams in 29 states as of September 2011.

(Paragraph 9.2.1.2)

- There were 4728 reservoirs and barrages in the country as on September 2011. CWC provided inflow forecasts to only 28 reservoirs and barrages. Shortcomings reported in the evaluation study of scheme for flood control was not rectified by the Ministry of Water Resources.

(Paragraph 9.2.3.1)

Cyclones and Tsunami:

- Modernization project to enhance the weather forecasting capabilities was not completed. Only 47.68 *per cent* funds could be utilized till March 2012.

(Paragraph 9.3.5 & 9.3.5.1)

- Implementation of mitigation project of upgradation of observatory network and other specific projects were either badly delayed or had not even commenced.

(Paragraph 9.3.5.2, 9.3.5.3, 9.3.5.4, 9.3.5.5, 9.3.5.6 & 9.3.5.7)

Droughts:

- The activities envisaged in the national guidelines on drought management were yet to be carried out to further strengthen disaster preparedness.

(Paragraph 9.4.2)

- There were delays in providing immediate relief to states from response fund.

(Paragraph 9.4.4.1)

Forest Fires:

- There was no laid down strategy to combat forest fires including co-ordination among various concerned departments. Only five states and one UT had submitted forest fire crisis management plans and these were also pending approval at MoEF.

(Paragraph 9.5.2)

- Despite availability of real time data on occurrence of forest fire, it was not utilized for planning at national and state level.

(Paragraph 9.5.3)

- The Central Crisis Group had been constituted with lower rank officers. There was no information available on monitoring by this group.

(Paragraph 9.5.4)

- Funds under Intensification of Forest Management scheme were released without assessment of requirement. MoUs were not signed. No evaluation was done as per the scheme guidelines.

(Paragraph 9.5.5)

Chemical Disaster:

- Chemical Accident Information and Reporting System (CAIRS) was yet to generate adequate response. Updated information of chemical accidents was not available in the country.

(Paragraph 9.6.3.5)

- The Ministry did not evolve an effective system for chemicals crisis management at the state level.

(Paragraph 9.6.6)

Biological Disaster:

- The Epidemic Diseases Act, 1897 requires reviewing and updating. There was a need for bio-security and bio-safety code to be developed.

(Paragraph 9.7.2.1)

- Integrated Disease Surveillance Project did not have regular reporting of data from all states thus defeating its purpose.

(Paragraph 9.7.3)

- The lab facilities and surveillance at national entry points like airports were found lacking in facilities.

(Paragraph 9.7.3.2 & 9.7.3.5)

Nuclear and Radiological Disaster:

- A large number of consents for transport of radioactive material for safe disposal had been given. However, there was no proper mechanism to verify whether the sources had actually been disposed off.

(Paragraph 9.8.4)

- The regulatory response mechanism to trace and discover lost or orphan radioactive sources in the country was also not effective.

(Paragraph 9.8.5)

What did we recommend?

- National Executive Committee (NEC) and Ministry of Home Affairs (MHA) should ensure that a comprehensive National Plan for disaster management is developed at the earliest.
- NDMA should follow up implementation of its National Guidelines by the ministries, departments and State Governments.
- Regular meetings of NEC should be convened to perform its assigned role in the disaster management of the country.
- Roles and responsibilities of MHA, NEC and NDMA should be specified for clear demarcation of functions of these stakeholders.

- NDMA should ensure early constitution of its Advisory Committee of experts.
- NDMA needs to review and strengthen its project execution capacities. Better coordination is required with nodal ministries to avoid duplication of efforts.
- NDMA should start the work of assessment of major national projects to include structural requirements for disaster reduction.
- NDMA should make efforts for formulation of the retrofitting policy.
- NDMA should firm up its business rules at the earliest.

- MHA should strengthen its monitoring mechanism, so that states regularly send the details of utilization and unspent balances under SDRF. It should ensure timely release of SDRF to states.
- MHA should ensure investment of the unspent balances under SDRF by the states.
- National Disaster Response Fund should not be utilized for repair and restoration activities.
- Disaster Mitigation funds at national, state and district level should be created to boost mitigation activities.
- National Disaster Response Reserve (NDRR) should be operationalised at the earliest.

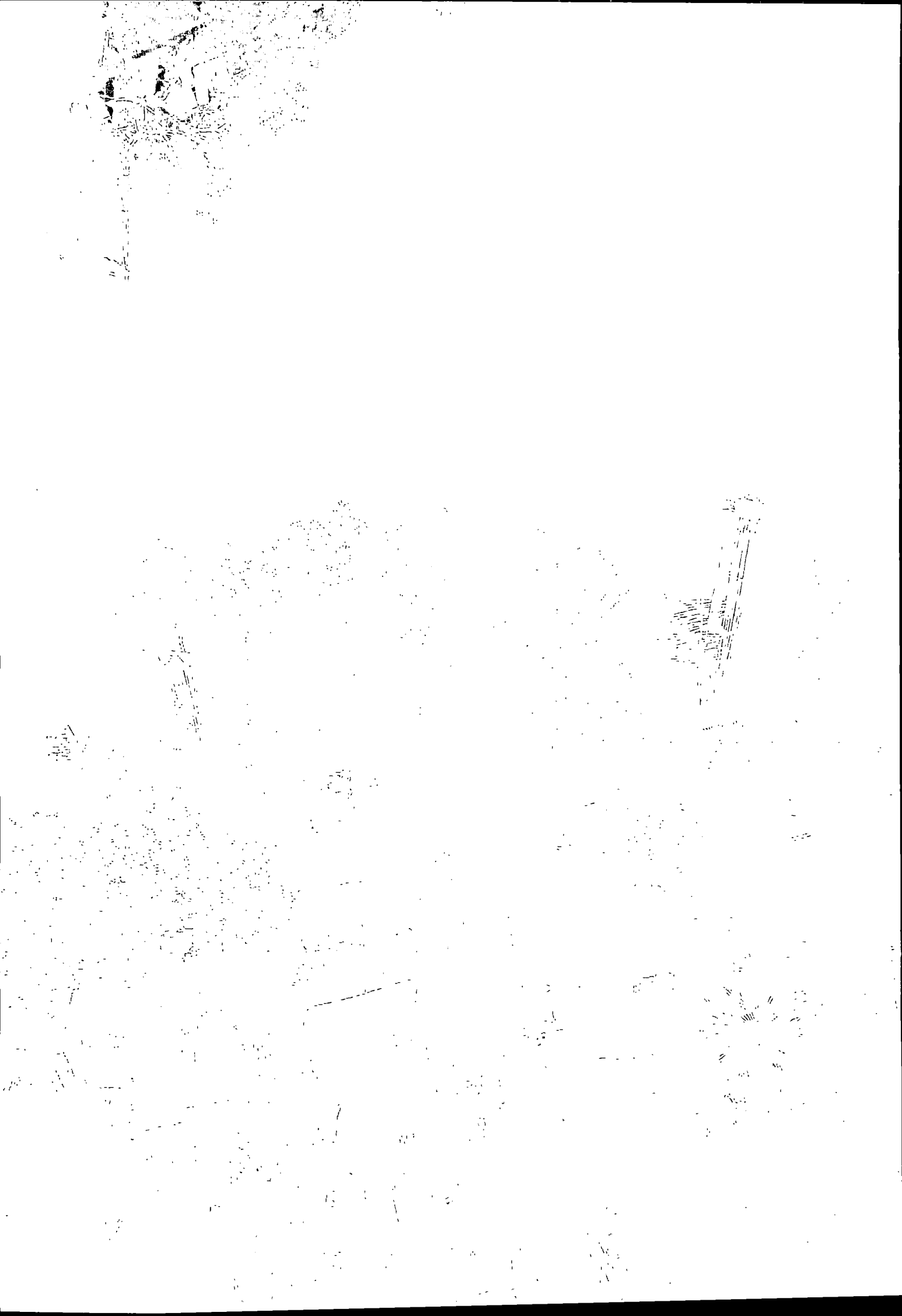
- Department of Space should ensure that the National Database for Emergency Management (NDEM) is operationalized at the earliest.
- Indian Space Research Oganisation should fully operationalise the satellite based DMS Communication Network and installation of Doppler Weather Radars at the earliest.
- NDMA should ensure completion of National Disaster Communication Network and National Disaster Management Informatics System projects.

- National Disaster Response Force (NDRF) should make concerted efforts to fill the vacant positions including specialist positions. DG, NDRF should be given better control over transfers and deployment of the NDRF personnel.

- The standard infrastructure for the NDRF battalions should be created at the earliest.
- The Standard Operating Procedures for deployment of NDRF should be firmed up and circulated to all stakeholders.
- States should be encouraged to raise their State Disaster Response Forces.
- There should be a clear policy for the functioning of Regional Response Centres so that they can be effectively utilized for disaster response.
- MHA should ensure completion of scheme for upgradation of Fire and Emergency Services.
- Capacity and infrastructure at both central and state level should be strengthened for medical response.
- The academic and training programmes of National Institute of Disaster Management need to be evaluated for providing an assurance that stated objectives and value for money had been achieved.
- The implementation of India Disaster Resource Network needs to be firmed up. The inventory data of resources needs to be updated.
- Expeditious steps are required to fill the critical vacant posts in NIDM so that adequate training programmes are conducted.
- The Ministry of Earth Sciences (MoES) should prepare the Earthquake Management Plan in consonance with National Guidelines issued in this regard.
- NDMA should complete its project on 'Vulnerability Assessment and Risk Analysis' with respect to various natural hazards.
- Ministry of Water Resources should ensure preparation of Emergency Action Plans of the states covering all the major dams.
- There is a need to ensure timely completion of various projects undertaken by Ministry of Earth Sciences for modernization of India Meteorological Department.
- Department of Agriculture & Cooperation should see to it that the activities envisaged in the National Guidelines on Drought Management are completed expeditiously to provide impetus for disaster preparedness for mitigation of droughts.
- Submission of monthly drought reports should be ensured by all stakeholders so that the project activities of the National Agricultural Drought Assessment and Monitoring System could be reviewed periodically.
- This forest fire monitoring data could be utilized in preparation of the Contingency Plan for Forest Fires.
- An effective system for chemical crisis management at the state level and to provide a link between the accident sites and expert group was required to be devised.

- **The Chemical Accident Information & Reporting System needs to update information of chemical accidents expeditiously.**
- **The central crisis group needs to play its role in monitoring the post-accident situation and suggesting measures for prevention and recurrence of forest fires.**
- **The deficiencies reported in Integrated Disease Surveillance Project need to be rectified. Surveillance at national entry points and laboratory infrastructure in the country need to be strengthened.**

PART - I



Chapter – I:

Introduction

What is a disaster?

A disaster is an event or series of events, which gives rise to casualties and damage or loss of property, infrastructure, environment, essential services or means of livelihood on a scale that is beyond the normal coping capacity of the affected community.

1.1 Introduction

Disasters disrupt progress and destroy the developmental efforts, often pushing nations, in their quest for progress, back by several decades. Thus, efficient management of disasters, rather than mere response to their occurrence, has received increased attention both within India and abroad.

The Disaster Management Act, 2005 defined disaster as a "catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or manmade causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of, property, or damage to, or degradation of, environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area."

Thus, Disaster Management[1] (DM) is a continuous and integrated process of

- planning, organising, coordinating and implementing measures which are necessary or expedient for prevention of any disaster;
- mitigation or reduction of any disaster or its severity or consequences;
- capacity building to deal with any disaster;
- prompt response to any threatening disaster situation or disaster;
- assessing the severity or magnitude of any disaster;
- evacuation, rescue and relief; and,
- rehabilitation and reconstruction.

[1] National Disaster Management Authority's National Disaster Management Guidelines on Management of Earthquakes issued in April 2007

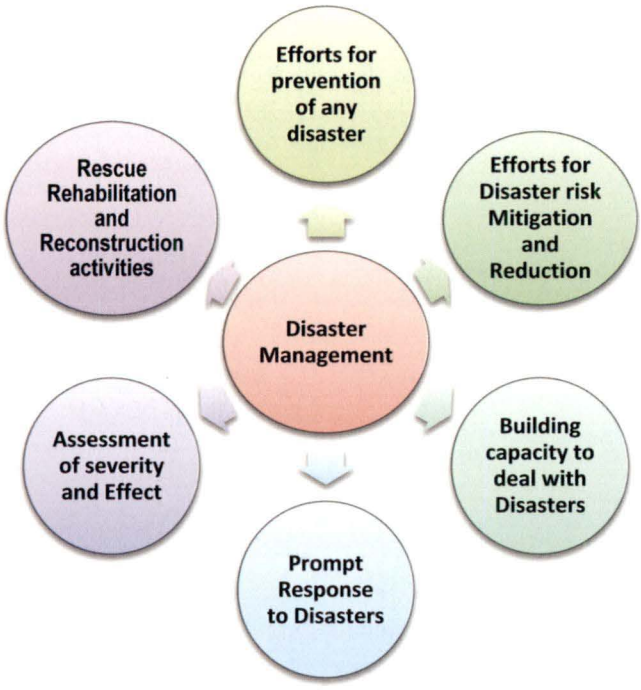


Chart 1.1: Components of Disaster Management

Disaster Preparedness includes organizational activities which ensure that the systems, procedures and resources required to confront a natural disaster are available in order to provide timely assistance to those affected, using existing mechanisms wherever possible e.g. training, creation of awareness, establishment of disaster plans, evacuation plans, pre-positioning of stocks, early warning mechanisms, strengthening indigenous knowledge, etc.

In recent years, the concept of Disaster Preparedness has emerged as an umbrella concept including risk assessment, disaster prevention and disaster mitigation. It also involves analysis of disaster response as it provides a useful testing of preparedness.

1.2 How disaster prone is India?

India is one of the most disaster prone countries in the world. This is largely due to its geo-climatic conditions combined with high population density and other socio economic factors. India is vulnerable, in varying degrees, to a large number of natural as well as man-made disasters. The risk of excessive damage of lives and property in the event of disaster is high due to spread of population and tendency of people to go back to areas prone to such disasters.

Increased vulnerability to disaster risks can be related to expanding population, urbanization and industrialization, development within high-risk zones, environmental degradation and climatic changes. Increase in terrorism around the globe has also contributed to higher risks.

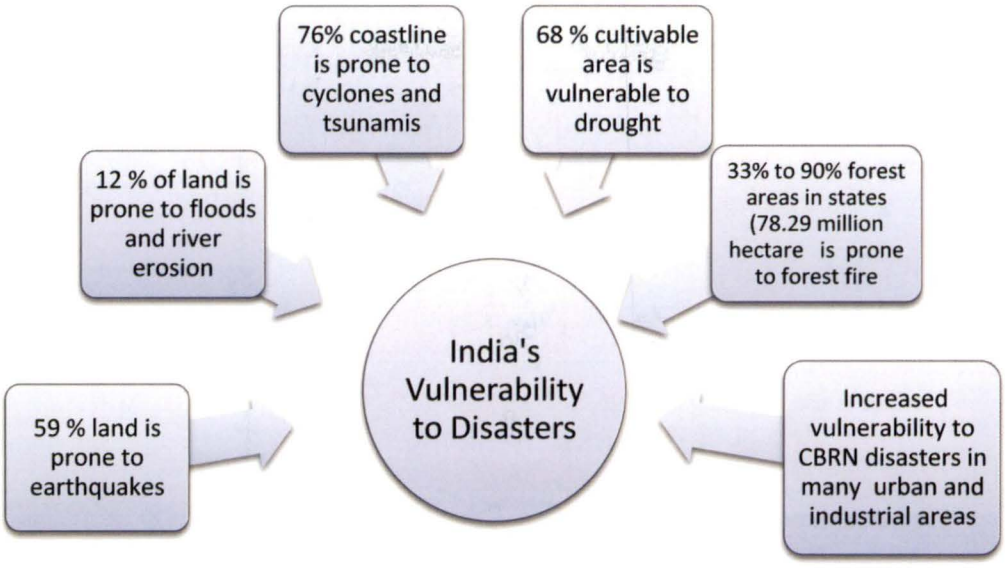


Chart 1.2: India's Vulnerability Profile

The details of India's major disasters during the last decade are given below:

Table 1.1: Major Disasters in last 10 years

Name of disaster	Year	State and area	Effect on human life
Gujarat earthquake	2001	Bhuj, Bhachau, Anjar, Ahmedabad and Surat in Gujarat state	25,000 deaths and 6.3 million people affected
Tsunami	2004	Coastline of Tamil Nadu, Kerala, Andhra Pradesh, Puducherry and Andaman and Nicobar Islands of India	10,749 deaths, 5640 missing and 2.79 million people affected
Kashmir earthquake	2005	Kashmir and surrounding Himalayan region	86,000 deaths
Maharashtra floods	2005	Maharashtra	1094 deaths, 167 injured and 54 missing
Kosi floods	2008	North Bihar	527 deaths and 3.33 million persons affected
Cyclone Nisha	2008	Tamil Nadu	245 deaths
Drought	2009	252 districts in 10 states	-
Leh cloud burst	2010	Leh, Ladakh in Jammu & Kashmir	-
Sikkim earthquake	2011	North Eastern India with epicentre near Nepal border and Sikkim	-

1.2.1 Levels of disasters in India

The levels of disasters were categorised[2] as L0, L1, L2 and L3, based on the ability of various authorities to deal with them. Various colour codes relating to level of alerts were also devised.

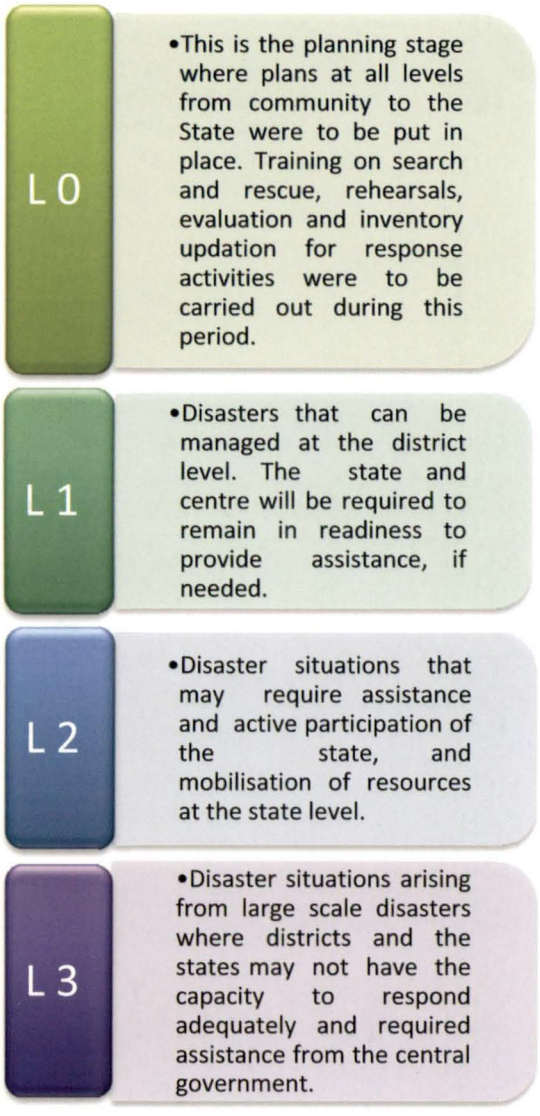


Chart 1.3: Levels of disasters

1.3 Why did we select this subject?

The world over Disaster Preparedness or Disaster risk reduction is becoming the most prominent theme for disaster management. It is not possible to eliminate the occurrence of disasters. However, with due care and proper preparation, the risk and damage from disasters can be reduced considerably. In recent years, we presented several reports[3] on the subject.

More than six years have passed since the enactment of the DM Act in 2005. During this period, the government embarked upon various mitigation projects as well as internationally aided projects for disaster risk reduction. A paradigm shift had taken place from a relief-centric approach to a more proactive regime that laid greater emphasis on preparedness, prevention and mitigation. This report attempts to assess the status of disaster preparedness in the country.

In addition, International Organisation of Supreme Audit Institutions (INTOSAI), which is the global professional organization of Supreme Audit Institutions (SAIs), is in the process of developing its guidelines for the Audit of Disaster related Aid. Under its aegis, a parallel audit of "Disaster Preparedness" by nine SAIs including India was undertaken.

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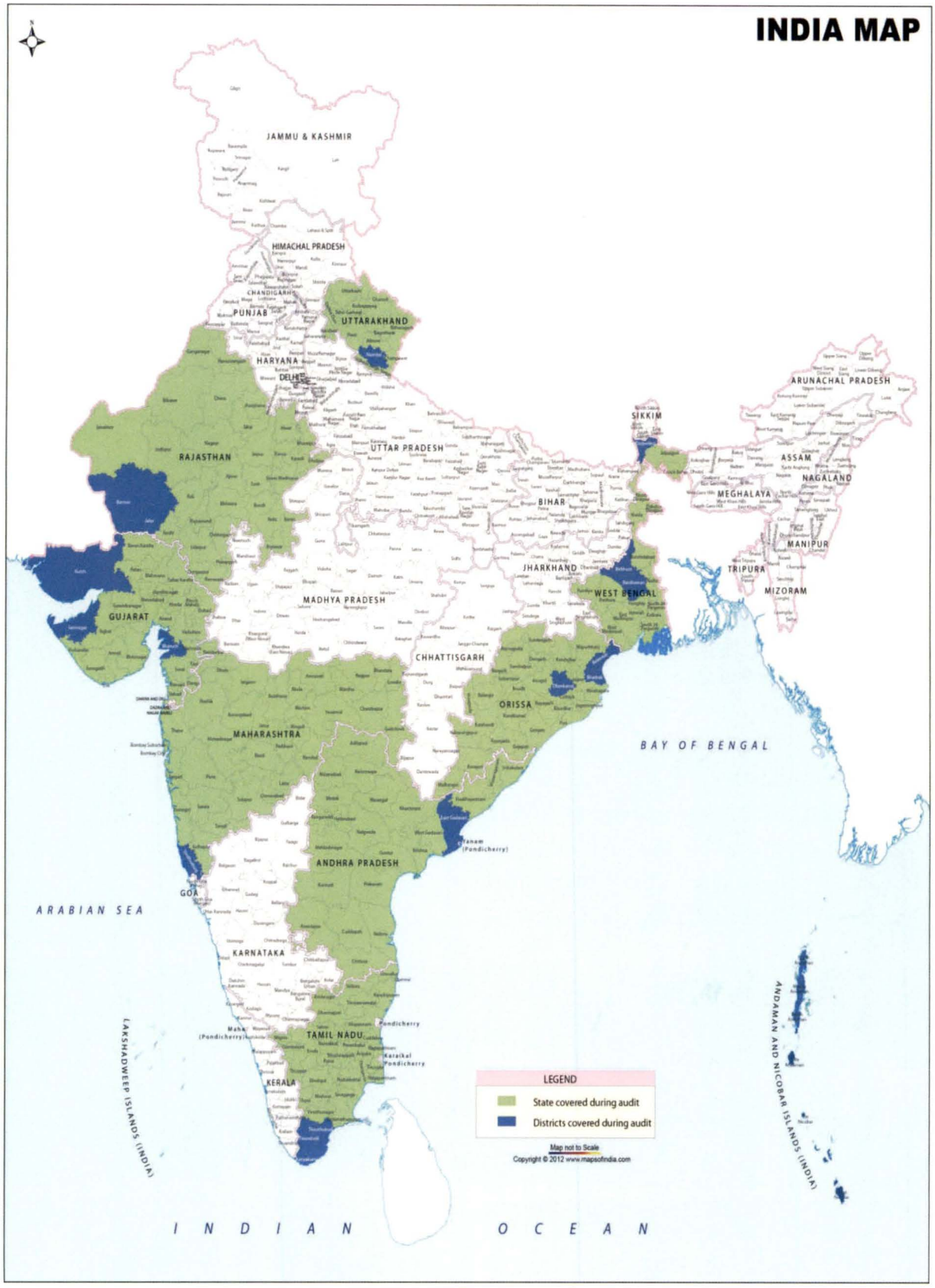
[2] National Disaster Management Authority categorised the levels of disasters and disseminated through Guidelines for preparation of State Disaster Management Plans (July 2007)

[3] -Union Report No. 20 of 2006: Performance Audit Report on Tsunami Relief and Rehabilitation
-Audit Report (Civil), Bihar for the year 2008-2009: Integrated Audit of Disaster Management Department
-Performance Audit Report No. 8 of 2008 (Railways) Chapter-1: Disaster Management in Indian Railways



Map 1.1: Sample selection of states/districts

1.4 Scope of Audit

The performance audit covered the period from 2007-08 to 2011-12. Audit scrutiny covered major disasters, both natural and man-made[4]. At the Centre, the audit scope covered the role of Central Government i.e. Ministry of Home Affairs (MHA) and nodal Ministries & Departments[5], National Disaster Management Authority (NDMA), National Institute of Disaster Management (NIDM) and National Disaster Response Force (NDRF) in Disaster Preparedness.

In the states, audit was conducted in nine (9) selected states and UT viz. Andhra Pradesh, Gujarat, Maharashtra, Odisha, Rajasthan, Tamil Nadu, Uttarakhand, West Bengal and Andaman & Nicobar Islands for presentation to Parliament and to the respective state legislatures. In every state, multi hazard prone districts were covered to assess district level preparedness. This selection of states and districts covered the range of disasters to which India is vulnerable viz. tsunami, cyclone, earthquakes and landslides, draught, floods and the manmade disasters. The selected states and districts are shown in Map 1.1.

Table 1.2: Sample of districts selected for Audit

State/UT	20 districts covered during audit
Andaman & Nicobar Islands	South Andaman, North & Middle Andaman and Nicobar Islands
Andhra Pradesh	East Godavari
Gujarat	Bharuch, Jamnagar and Kutch
Maharashtra	Sindhudurg
Odisha	Baleshwar, Bhadrak, Dhenkanal
Rajasthan	Jalore, Barmer
Tamil Nadu	Tirunelveli, Thoothukudi, Kanyakumari
Uttarakhand	Nainital
West Bengal	Darjeeling, Burdwan, Birbhum

[4] Natural disasters include earthquake, drought, flood, cyclone, tsunami, etc. whereas man-made disasters include industrial and chemical disasters, nuclear disasters, forest fire, etc.

[5] Ministries of Health & Family Welfare, Environment & Forests, Earth Sciences, Water Resources and Departments of Agriculture & Cooperation, Space and Atomic Energy.

1.5 Audit Approach

We first selected the areas of audit enquiry and framed audit questions based on feasibility study conducted at NDMA and the guidelines prepared by us. An audit plan outlining the scope and objectives of the audit assignment, the areas of concern to audit and time frames for various activities was then prepared.

An Entry Conference with Ministry of Home Affairs was held on 13 June 2012, where the audit objectives, scope of audit, audit criteria and audit methodology were shared and discussed. It was also attended by the officers from NDMA, NIDM and NDRF. After completion of audit, an Exit Conference was held on 15 October 2012 with MHA to discuss the audit findings. Similarly, Entry and Exit conferences with other entities involved were also conducted.

Responses received from the audited entities have been considered while preparing this Report and these have also been included to the extent feasible.

1.6 Audit Objectives

Performance audit was undertaken to review:

- **Planning for disaster preparedness**: If national disaster preparedness strategy, actionable plans and policies had been prepared and reviewed periodically at all levels to counter the threat of disasters and mitigate their consequences.
- **Identification of disasters and early warning system:** Whether various types of disasters, their extent of damage and requisite mitigation efforts had been identified and whether efforts had been made to make urban areas/cities disaster resilient and early warning systems and mechanisms to predict the calamities are in place.
- **Institutional mechanisms**: If institutional, legal and coordination mechanism had been instituted and an integrated approach was being followed with regard to disaster preparedness.
- **Resource utilisation and funding arrangements:** Whether the financial arrangements to govern, allocate and utilization of funds were adequate and effectively implemented and whether financial arrangements ensure timely availability of funds and their effective and economic utilization.
- **Risk assessment and mitigation efforts:** If disaster management tools for analyzing risks and planning of the disaster efforts to mitigate the impact were effective and efficient.
- **Capacity building efforts:** If training and emergency exercises for disaster preparedness had been conceived, disseminated and conducted at all levels.

1.7 What were the sources of Benchmarks and Criteria for audit

We derived our criteria from the following sources:

a. Disaster Management Act, 2005
b. National Policy on Disaster Management, 2009
c. National disaster plan, guidelines and other instructions issued by Ministry of Home Affairs and NDMA
d. Crisis management plans of different Ministries
e. Scheme, guidelines and laws for preparedness of various types of disasters
f. Policies, plans and guidelines on disaster management issued by different State Governments

1.8 Acknowledgement

We acknowledge the co-operation and assistance extended by the Vice Chairman NDMA, Secretary (Border Management), MHA, Director General, National Disaster Response Force & Civil Defence, Executive Director, National Institute of Disaster Management, Senior Officers and the staff of the other nodal Ministries and Departments (Ministries of Health & Family Welfare, Environment & Forest, Earth Sciences, Water Resources and Departments of Agriculture, Atomic Energy and Space) and staff at all levels for providing assistance during the Performance Audit.

We are also thankful to the Principal Secretaries and Commissioners of Disaster Management and Relief Departments of states & UT and officers and staff of State Disaster Management Authorities and District Disaster Management Authorities who facilitated audit and provided their valuable inputs during conduct of this audit.

Chapter – II:
Legislative and Institutional framework

2.1 Evolution of Disaster Management in India

United Nations General Assembly declared the decade of 1990s as the 'International Decade for Natural Disaster Reduction'. Following the UN Declaration, in India a permanent setup was institutionalised with the establishment of a disaster management cell under Ministry of Agriculture. This was also the decade in which the country faced a series of disasters, such as, Latur Earthquake (1993), Malpa Landslide (1994), Odisha Super Cyclone (1999), etc.

In August 1999, a High Powered Committee (HPC) was constituted to review the existing arrangements for preparedness and mitigation of natural disasters. HPC was chaired by Secretary, Ministry of Agriculture and was mandated to recommend the measures for strengthening organisational structures at the national, state and district levels. HPC was also to formulate a model plan for natural as well as manmade disasters for drawing up a systematic, comprehensive and holistic approach towards disasters.

In 2002, the disaster management division of Ministry of Agriculture was shifted to Ministry of Home Affairs and a hierarchical structure evolved for disaster management at the national, state and district levels.

2.2 Disaster Management Act, 2005

HPC submitted the report in October 2001. Following the HPC Report on Disaster Management, on 23 December 2005, the Government of India enacted the Disaster Management Act. The Act laid down institutional, legal, financial and coordination mechanisms at the national, state and district levels. This new framework led to a paradigm shift in disaster management. From a relief-centric approach, the Government moved to a more proactive regime laying greater emphasis on preparedness, prevention and mitigation.

Major Provisions of the DM Act, 2005

- **National Disaster Management Authority to be the apex body at national level for formulating disaster management policy and its monitoring (Article 3 of Act).**
- **Prime Minister to be the Chairman of NDMA (Article 3(2) (a)of Act)**
- **National Plan to be prepared by National Executive Committee and approved by NDMA (Article 10(2) (b) of Act)**

- National Policy for Disaster Management to be prepared by NDMA (Article 6(2)(a)of Act)
- State Disaster Management Authorities to be established (Article 14 of Act)
- State Governments and Central Ministries to prepare their disaster management plans(Article 23 & 37(1)(a) of Act)
- Central Government to institute a National Disaster Relief fund and National Disaster Mitigation fund (Article 46(2) & 47(1) of Act)
- To establish a dedicated force called National Disaster Response force (Article 44 of Act)

2.3 National Policy on Disaster Management

In accordance with the DM Act, National Policy on Disaster Management (NPDM) was prepared by NDMA which was approved by the Union Cabinet in October 2009. The policy envisaged a holistic approach to disaster management, encompassing the entire disaster management cycle (prevention, mitigation, preparedness, relief, response, rehabilitation and reconstruction). It also attempted to address all aspects of disaster management covering institutional, legal and financial arrangements, capacity building, knowledge management, research and development. It focused on the areas where action was needed and the institutional mechanism through which such action could be channelised.

2.4 State Legislative Acts enacted prior to DM Act

2.4.1 Gujarat State Act, 2003

Gujarat faced a major earthquake in January 2001 which resulted in massive loss of lives and property in several districts. After this disaster, need for a state wide policy and legislation was felt and accordingly, Government of Gujarat formulated a 'Disaster Management Policy' in the month of September 2002. The main objectives of the policy were:

- ✓ to develop appropriate disaster prevention and mitigation strategies,
- ✓ to provide clarity in the roles and responsibilities of all stakeholders concerned with disaster management
- ✓ to ensure arrangements for effective management of resource mobilisation, relief, rehabilitation, reconstruction and recovery from disasters.

Gujarat State Disaster Management Act (GSDMA) came into force from May 2003. Gujarat was the first state of the country to provide legal and regulatory framework for disaster management through an Act. The Act lays emphasis on moving from relief centric approach to comprehensive disaster management framework.

2.4.2 Odisha State Disaster Management Policy

Following the super cyclone, the Odisha State Disaster Mitigation Authority (OSDMA) was created in December 1999. The Authority was mandated to take up disaster mitigation as well as preparedness, relief, restoration and reconstruction. OSDMA was also vested with the responsibility of co-ordination

with line departments, multilateral aid agencies and NGOs involved in disaster management.

The state formulated its Disaster Management Policy in March 2005.

2.5 The Legal Institutional Framework for disaster management

The institutional structure for disaster management in India is in a state of transition.

2.5.1 Institutional arrangements prior to DM Act:

In the wake of a natural calamity, for effective implementation of relief measures, the Cabinet was empowered to set up a committee. On constitution of such a committee, the Agriculture Secretary was to provide all necessary information and seek directions in all matters concerning relief and take steps for effective implementation.

In the absence of this committee, all matters relating to relief were to be reported to the Cabinet Secretary.

2.5.1.1 Department of Agriculture and Cooperation (DAC)

DAC, Ministry of Agriculture was the nodal department for all matters related to natural calamities relief at the Centre up to 2002. Relief Commissioner, DAC was the nodal officer to coordinate relief operations. In 2002, DM division was shifted to MHA.

Chart 2.1 shows how relief work was monitored at the central level prior to enactment of the DM Act:

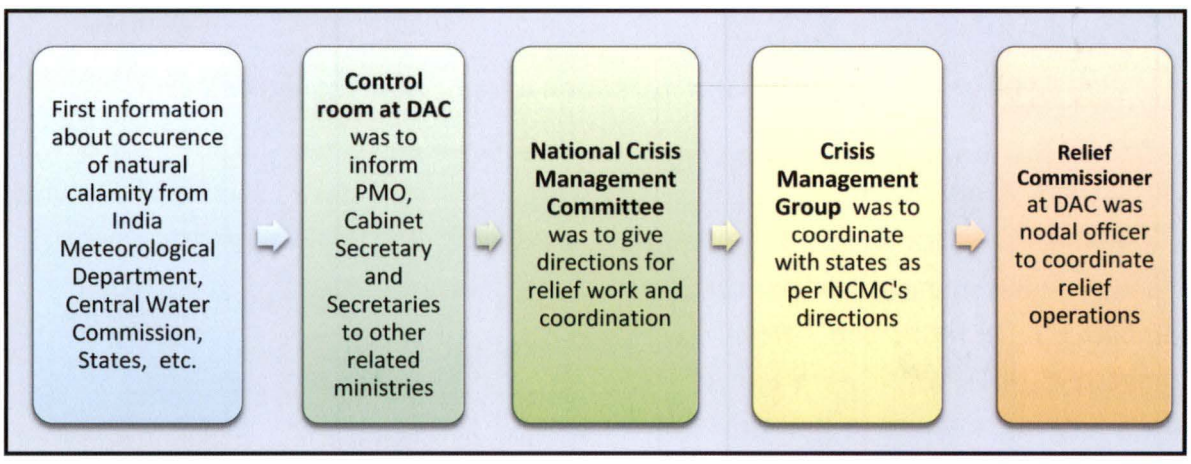


Chart 2.1: How relief work was monitored at Central Level (Prior to DM Act)

2.5.2 Present institutional arrangements

The DM Act, 2005 provided for setting up of a National Disaster Management Authority under the Prime Minister, State Disaster Management Authorities (SDMAs) under the Chief Ministers and District Disaster Management Authorities (DDMAs) under the Collectors/District Magistrates/Deputy Commissioners.

The Act also provided for the constitution of different Executive Committees at national and state levels. Under its aegis, the National Institute of Disaster

Management for capacity building and National Disaster Response Force for response purpose were set up.

We noted that at present, the earlier structure and the new set up, which is still evolving, co-exist.

Chart 2.2 depicts the legal institutional framework based on the provisions of the Act.

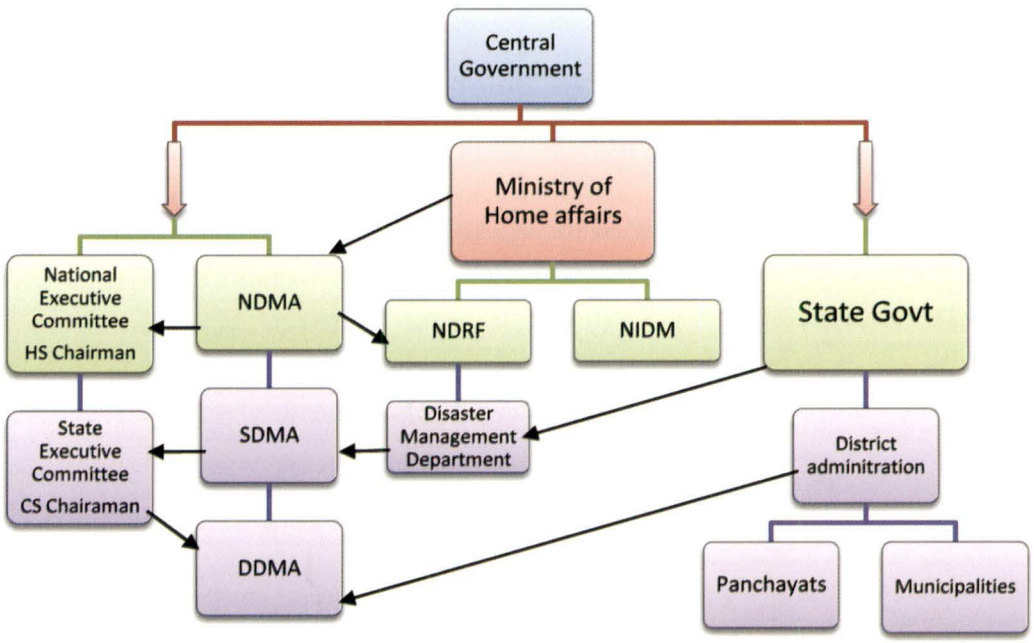


Chart 2.2: Details of legal institutional framework as per DM Act

2.5.3 Institutional arrangements at the National level:

In addition to the three tier institutional structure, the National Crisis Management Committee (NCMC) and High Level Committee (HLC), which were part of the earlier set up, continue to function at the Centre.

2.5.3.1 National Crisis Management Committee

NCMC was constituted in the Cabinet Secretariat comprising Cabinet Secretary as Chairman and Secretaries of concerned Ministries and Departments as members. As an apex body for dealing with major crisis, it provided directions to the Crisis Management Group (CMG) as and when deemed necessary. Secretary (Security), Cabinet Secretariat was its convener.

2.5.3.2 Crisis Management Group

CMG headed by the Union Home Secretary and comprising senior officers from various Ministries and concerned Departments was constituted by MHA. Its function was to review contingency plans formulated by the Central Ministries and Departments and the measures required for dealing with a natural disaster. Joint Secretary (DM) in MHA was the convenor of CMG for natural disasters.

2.5.3.3 High Level Committee (HLC)

HLC was chaired by the Union Finance Minister, and Home Minister, Agriculture Minister and Deputy Chairman, Planning Commission were its members. Vice Chairman, NDMA was also a special invitee to HLC.

2.5.3.4 Ministry of Home Affairs (MHA)

Ministry of Home Affairs was the nodal agency at the national level for coordination of response and relief in the wake of natural disasters[6] from 2002 onwards. MHA provided financial and logistic support to the State Governments, keeping in view, their resources, the severity of the natural disaster and the capacity of the State Governments to respond in a particular situation.

2.5.3.5 National Disaster Management Authority(NDMA)

NDMA was initially constituted in May 2005 through an executive order. Following enactment of the DM Act, NDMA was reconstituted formally in accordance with Section 3(1) of the Act on 27 September 2006.

NDMA was responsible for laying down policies on disaster management and guidelines to be followed by different Ministries, Departments of the Government of India and State Government for disaster risk reduction. It was also to lay down guidelines to be followed by the State Authorities in drawing up the state plans.

NDMA was a central agency to deal with all types of disasters, natural or man-made. However, certain specific emergencies viz. those requiring close involvement of the security forces or intelligence agencies such as terrorism (counter-insurgency), law and order situation, serial bomb blasts, hijacking, air accidents, chemical, biological, radiological and nuclear (CBRN) weapon systems, mine disasters, ports and harbour emergencies, forest fires, oil field fires, and oil spills continued to be handled by NCMC of the earlier set up.

2.5.3.6 National Executive Committee (NEC)

NEC was the executive committee of NDMA and was mandated to assist NDMA in the discharge of its functions. NEC was constituted in September 2006. It was chaired by the Union Home Secretary and 14 Secretaries to the Government of India and Chief of the Integrated Defence Staff were its members.

NEC was to coordinate the response in the event of any threatening disaster situation or disaster. NEC was also responsible for preparing the National Plan for Disaster Management based on the National Policy of 2009. NEC was also expected to monitor the implementation of guidelines issued by NDMA.

As per NEC Rules 2006[7], NEC was to meet as often as necessary but at least once in three months. However, we noted that

[6] except drought, pest attack & hailstorm, for which Ministry of Agriculture and Cooperation is the nodal Ministry

[7] Rule 3(6) of NEC Rules 2006

NEC met only on three occasions[8] since its inception (September 2006).

NEC did not meet after May 2008, although the country faced many disasters subsequently. This affected the progress of implementation of the national policy, national plan, guidelines and evaluation of the preparedness at all government levels.

MHA informed (December 2012) that fourth meeting of NEC was held on 10 December 2012. It further added that it was not a fact that NEC was not coordinating the response to various disasters since its last meeting held in May 2008. MHA under the Union Home Secretary remained the coordinating Ministry for all the disasters occurring in the country.

However, we noted that NEC was a committee of 14 secretaries and not the Union Home Secretary alone. The coordination work assigned to NEC was being done by MHA.

2.5.3.7 National Institute of Disaster Management

For the purpose of capacity building, the DM Act provided for establishment of a statutory organization with responsibilities to develop training modules, undertake research and documentation in disaster management and organise training programmes to promote and institutionalise disaster management.

A National Centre for Disaster Management was functional at the Indian Institute for Public Administration since 1995. This Centre was upgraded as the National Institute of Disaster Management in October 2003. It was given the status of the statutory organisation under the DM Act.

2.5.3.8 National Disaster Response Force (NDRF)

The DM Act mandated constitution of a Specialist Response Force to a threatening disaster situation or a disaster.

NDRF was accordingly formed in 2006. NDMA was vested with its control, direction and general superintendence. It was a multi-disciplinary, multi-skilled, high-tech force to deal with all types of disasters and capable of insertion by air, sea and land.

The headquarters of the Force was in New Delhi and it was composed of 10 battalions spread all over the country. Each battalion provided specialist search and rescue teams. The battalions were equipped and trained for all natural disasters including four battalions in combating nuclear, biological and chemical disasters. During the preparedness period or in a threatening disaster situation, proactive deployment of these forces was to be carried out by NDMA in consultation with the State Authorities.

2.5.3.9 Central Ministries and Departments

Central Ministries and Departments were to have key roles in disaster management. The Ministries and Departments of Government of India were designated as nodal Ministries or Departments to address the specific disasters assigned to them.

[8] on 8.01.2007, 18.05.2007 and 13.05.2008

The concerned Central Ministries, Departments and organisations rendered emergency support functions wherever Central intervention and support were needed by the State Governments.

Table 2.1: Nodal agencies at Central level

Nodal ministries at central level for dealing with different types of disasters:			
Disaster	**Disaster managed by**	**Nodal Ministry**	**Member Ministries of Mitigation Plan Committee**
Earthquake	MHA	Ministry of Earth Sciences	Ministries of Science & Technology, Urban Development, Rural Development, Health & Family Welfare, Panchayati Raj, Youth Affairs and sports, Women and Child Development, Human Resource Development, Information & Broadcasting and Departments of Space and IT & Telecommunication
Flood	MHA	Ministry of Water Resources	Departments of Space and Telecommunication
Drought, Hailstorm & Pest Attack	Department of Agriculture & Cooperation, Ministry of Agriculture		-
Landslide	MHA	Ministry of Mines	Ministry of Road Transport and Highways & Shipping
Avalanche	MHA	Ministry of Defence	Ministry of Road Transport and Highways & Shipping
Forest Fire	Ministry of Environment & Forest		-
Nuclear	MHA/ DAE	Department of Atomic Energy (DAE)	Ministries of Defence and Health & Family Welfare
Industrial and Chemical	Ministry of Environment & Forest		-
Biological	Ministry of Health & Family Welfare		Ministries of Defence, Environment & Forests, Agriculture & Co-operation, Animal Husbandry, Dairying & Fisheries; and Chemicals & Fertilizers
Cyclone	MHA	India Meteorological Department	-
Tsunami	MHA	Ministry of Earth Sciences	-
Urban flooding[9]	MHA	Ministry of Urban Development	-

[9] Urban flooding was added in July 2012

2.5.4 Institutional arrangements at the state and district Level:

In compliance with the DM act, the same structure as at the Centre was replicated at the state and district levels. There are state and district level disaster management authorities and executive committees.

The Commissioner[10] of Revenue Administration, Disaster Management and Mitigation (earlier State Relief Commissioner) continued to be responsible for preventive, relief and rehabilitation activities in the state. The following departments were instrumental at state level to prevent and mitigate the impact of various types of disasters:

Table 2.2: Nodal departments at the state level

Department	Disaster being handled
Revenue Administration & Disaster Management Department	Nodal department in disaster management– responsible for preventive, relief and rehabilitation activities in the state, co-ordination with other departments
Agriculture Department	Drought, pest attack
Department of Environment and Forest	Industrial and chemical disasters, forest fire and nuclear explosion
Department of Health	Epidemic outbreak of diseases
Police Department	Terrorism, road accidents
Fire Service Department	Major fire accidents

[10] In different states it was named differently viz. Commissioner for DM & Ex-officio Principal Secretary or State Commissioner of Relief or Principal Secretary or Special Relief Commissioner cum Special Secretary

2.5.4.1 State Disaster Management Authority (SDMA)

SDMA was headed by the Chief Minister of the state, and laid down policies and plans for disaster management in the state. It approved the state plan in accordance with the guidelines laid down by NDMA, coordinated implementation of the state plan, and recommended provision of funds for mitigation and preparedness measures. SDMA also reviewed the developmental plans of the different departments of the state to ensure integration of prevention, preparedness and mitigation measures.

We noted that Gujarat had constituted (September 2003) its SDMA under their State Act of 2003 and Daman & Diu constituted SDMA (March 2005) prior to enactment of DM Act 2005. The remaining 33 states and UTs constituted their SDMAs between February 2006 and December 2010 as per the provisions of the National Act.

2.5.4.2 State Executive Committee

The State Executive Committee (SEC) assisted SDMA in the performance of its functions and was headed by the Chief Secretary to the State Government. SEC coordinated and monitored the implementation of national policy, national plan and state plan. It also provided information to NDMA relating to different aspects of disaster management.

We noted that under the provisions of DM Act, 32 states and UTs constituted their SECs between February 2006 and May 2011. Gujarat and UTs of Chandigarh and Daman & Diu had not formed SECs (June 2012).

2.5.4.3 State Advisory Committee

As per DM Act, SDMA was to constitute a State Advisory Committee (SAC), consisting of experts having practical experience of disaster management to make recommendations on different aspects of disaster management.

Effectiveness of the state level institutions

We noted that in three test checked states[11], **SDMA** in states never met after their constitution. In four other states/UT[12] they met only once or twice during the last five years.

State Advisory Committee was not constituted in seven[13] out of nine test checked states/UT. In the remaining two Uttarakhand and West Bengal, it was constituted but in the case of Uttarakhand it met only once and in the case of West Bengal it did not meet at all, in the last five years.

State Executive Committee in Andhra Pradesh, Odisha, Tamil Nadu and UT of Andaman and Nicobar met on one to three occasions during the last five years and it did not meet at all in Uttarakhand. In the case of Gujarat, it was not constituted.

Thus, it was evident that, by and large, State Authorities were non functional and ineffective. In the absence of assigned roles being played by State Authorities, disaster preparedness was handled by the State Departments without due guidance and monitoring. Details are in **Annex 2.1.**

[11] Tamil Nadu, Uttarakhand and Odisha

[12] Andaman and Nicobar Islands, Andhra Pradesh, Gujarat and West Bengal

[13] Andhra Pradesh, Gujarat, Maharashtra, Odisha, Rajasthan, Tamil Nadu and UT of Andaman and Nicobar Islands

2.5.4.4 District Disaster Management Authority (DDMA)

DDMAs were headed by the District Collectors with the elected representative of local authority as the Co-Chairperson. DDMAs act as planning, coordinating and implementing bodies for disaster management at the district level. It was to prepare the District Disaster Management Plan and monitor implementation of the policy and disaster management plans.

Under the provisions of the DM Act, 33 States and UTs established their DDMAs between February 2006 and January 2012 and UT of Daman & Diu had established DDMA prior to DM Act. Gujarat had not formed DDMAs.

2.5.4.5 District Advisory Committee

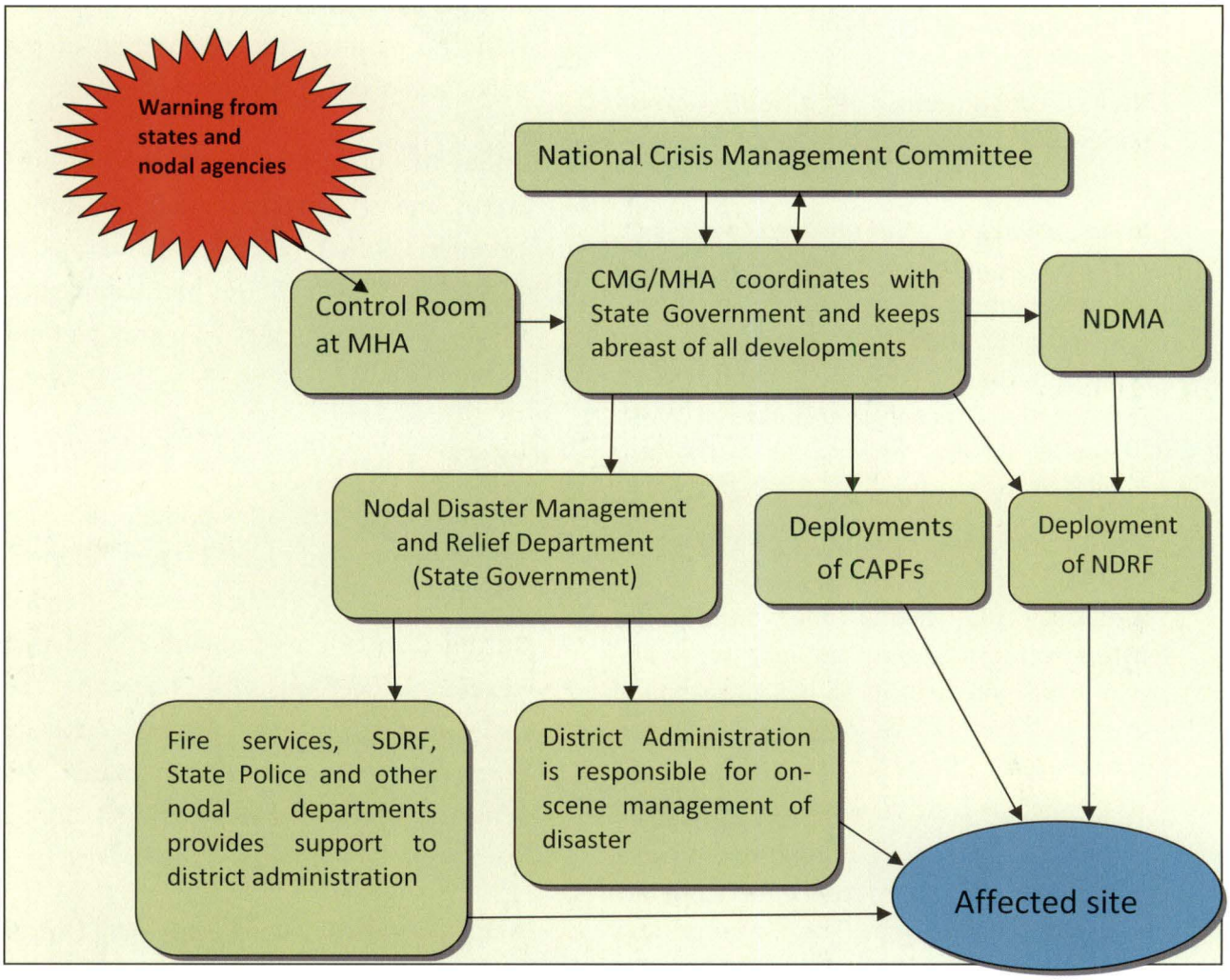
In each district, the apex body for disaster management was called District Advisory Committee. The Committee was headed by the District Collector and the District Revenue Officer was Vice-Chairman. The main function of the District Advisory Committee was to co-ordinate the activities of various departments during the times of emergency in the district.

Similarly, the Revenue Divisional Officer and the Sub-Collector were responsible for relief operation at the division level. Local bodies too played an important role in disaster relief measures at local levels.

2.6 Response set up across the country

Response is the most perceptible and vital element of the disaster management cycle. The efficacy of the government's role is judged largely by the quality of response and its effectiveness. It minimises the loss of lives and property at the time of a disaster. We noted that co-ordination at the central and the state level was achieved through various committees and departments associated with disaster management. A response set-up across the country at the time of disaster is shown in Chart 2.4.

Chart 2.4: Response set up across the country at the time of disaster



(CMG: Crisis management Group, NDMA: National Disaster Management Authority, CAPFs: Central Armed Police Forces, NDRF: National Disaster Response Force, SDRF: State Disaster Response Force)

Chapter – III:
Planning of Disaster Preparedness

Planning for disaster management is the first stage of the disaster management cycle, on which the effectiveness and success of the remaining components largely depend. Multi level planning system was established for disaster management. Significant gaps and delays in the implementation of the laid down system existed in the country.

3.1 National Plan for Disaster Management

3.1.1 Absence of National Plan for Disaster Management

National Executive Committee (NEC) was to prepare the National Plan for disaster management of the country and this was to be approved by NDMA. The Plan was to be then circulated to the Ministries and Departments which were to draw up their own plans in accordance with it.

The National Plan was to include:

i. measures to be taken for prevention of disasters, or the mitigation of their effects;

ii. measures to be taken for the integration of mitigation measures in the development plans;

iii. measures to be taken for preparedness and capacity building to effectively respond to any threatening disaster situations or disaster; and

iv. roles and responsibilities of different Ministries/Departments of the Government of India in respect of measures referred above.

NEC constituted a Working Group (February 2007) for assisting them in preparation of the Plan. The first meeting of the working group was held in March 2007, which finalised the format for obtaining inputs from various Ministries and Departments.

We noted that information had been submitted by all the Ministries and Departments by August 2007 but no action had been initiated by either NEC or the Working Group. The Working Group, in fact, never met again after its first meeting in March 2007.

We noted that NEC in its 3rd meeting held in May 2008 decided that:

i. the Ministry and Department may designate a nodal officer at the level of JS for preparation of the National Plan and coordination with all the stakeholders; and

ii. institutional mechanism for preparation of the National Plan may be worked out.

To implement these decisions, MHA structured the National Plan into three parts:

MHA constituted (September 2008) three different committees to prepare the three parts and also a facilitation committee to act as coordinating and monitoring body on behalf of NEC. In a meeting of the facilitation committee, it was decided (April 2009) that the National Response Plan should be prepared by MHA in respect of disasters under its purview. MHA was also to review the progress of National Mitigation Plan prepared by various Ministries and Departments.

Audit noted that till December 2009, no work on the Response Plan was initiated by MHA. In December 2009, National Institute of Disaster Management (NIDM) was directed by MHA to undertake the work relating to preparation of the Response Plan. However, after six months, MHA passed on (June 2010) the complete responsibility for the preparation of National Plan to NIDM, to be prepared by September 2010. Status of the National Plan was as follows:

(a) National Mitigation plan

Ten identified nodal central Ministries for various disasters were to prepare their disaster specific Mitigation Plans. Seven ministries[11] had sent their plans to MHA, which were pending with NDMA for comments. We noted that the Ministries of Environment and Forests, Earth Sciences and Health & Family Welfare had not sent their plans (September 2012).

(b) National Response Plan

NIDM submitted the draft National Response Plan in April 2012. MHA stated (September 2012) that the draft plan was circulated to all the concerned Central Ministries, States and UTs for their comments before its finalization.

(c) National Capacity Building Plan

Preparation of this Plan was assigned to NIDM in September 2008. It was still under preparation (August 2012).

We noted that NEC and MHA had not developed the National Plan for disaster management even after a lapse of more than six years of the enactment of the Disaster Management Act. Absence of disaster management plan at the national level had a trickledown effect on the states as they did not have a framework of reference to base their plans. Without these plans, it would be difficult to control, organise, direct and coordinate the activities of the disaster management at the national and state levels.

It would also be difficult to measure the extent to which the mitigation and preparedness facets of disaster management had been incorporated into the development planning, as intended in the National Act.

[11] Ministries of Water Resources, Agriculture, Defence, Railways, Mines, Civil Aviation and Department of Atomic Energy

MHA stated (December 2012) that different components of National Plan such as National Response Plan, National Mitigation Plan and National Capacity Building Plan were being developed with other mitigation plans by concerned Ministries. It further added that preparation of National Plans covering aspects of response, mitigation preparedness and capacity building for a vast country like India was a complex and gigantic task involving multiple governments, departments and agencies. Though, it was a one-time activity but involved series of ongoing activities, which needed to be synergized.

We are of the opinion that a framework should be devised at the earliest to provide various stakeholders the much needed impetus for disaster preparedness as a considerable time has already been elapsed and still the legal framework for disaster preparedness is in transition phase.

3.2 State Plans for Disaster Management

Section 23 of the DM Act provides that there should be a disaster management plan for every state. It also directs the departments of the State Governments to draw up their own plans in accordance with the state plan.

The plan preparation process essentially aimed at strengthening the communities, elected local bodies and state administration's preparedness and response. The state plans were to be prepared by the State Executive Committees (SECs) in conformity with the guidelines to be issued on related matters by SDMA. The state plans prepared by SECs were to be approved by the respective SDMAs.

As per the Act, NDMA was also to lay down guidelines to be followed by the State Authorities in drawing up the state plans. It was noted that NDMA had issued guidelines for preparation of State Disaster Management Plan in July 2007. However, there were no provisions to make the National Guidelines binding on states in preparation of the state plans.

We noted that till May 2012 only 14 states[12] had shared their draft or final State Disaster Management Plans (SDMPs) with NDMA. NDMA could not provide the updated position of state plans available with them to audit. There were no uniform data on submission of various state plans to NDMA and action taken thereon. Thus, it would be evident that NDMA failed to coordinate the efforts of State Governments in finalizing the state plans for disaster management effectively.

MHA stated (December 2012) that through a Principal Secretaries and Relief Commissioners level workshop, and financial assistance through NDMA, efforts were made to encourage the states for preparing their plans. As a result of these proactive initiatives, 14 states/UTs

[12] Andhra Pradesh, Arunachal Pradesh, Chhattisgarh, Goa, Gujarat, Jharkhand, Karnataka, Mizoram, Punjab, Sikkim, Tamil Nadu, Tripura, West Bengal and Uttar Pradesh

had shared their draft disaster management plans with NDMA.

We nevertheless noted that despite National Guidelines of July 2007 the State Disaster Management Plans could not be finalised.

3.2.1 Grants-in-aid for preparation of SDMPs

NDMA decided (February 2009) to introduce a new scheme to release grants-in-aid for preparation of Disaster Management Plans to all the states, UTs, Ministries and Departments. For this purpose, NDMA prepared two Standing Finance Committee (SFC) notes for release of ₹ 1.98 crore to 35 states/UTs and ₹ 1.96 crore to 16 Ministries/Departments.

However, subsequently, NDMA decided (June 2009) not to follow the SFC route. Accordingly, the proposal for release of grants-in-aid of ₹ 4.99 crore to 35 states/UTs and 16 Ministries and Departments were approved by Vice Chairman, NDMA in June 2009. In terms of the sanction order, each beneficiary was to complete and publish the plan and the NEC was to get the National Plan ready within six months i.e. by June 2010.

NDMA sanctioned grants-in-aid of ₹ 3.52 crore to all the states and UTs in October 2009. Funds were released in January and February 2010.

We noted that the beneficiary states, UTs, Ministries and Departments could not complete and publish their plans. Thus, the purpose of the scheme was defeated despite an expenditure of ₹ 3.52 crore.

MHA stated (December 2012) that the scheme was not taken up with the Planning Commission for inclusion in the Eleventh Plan as this was initially proposed as scheme for financial assistance. However, the proposal for post-facto approval was under consideration.

3.3 National Disaster Management Guidelines

As per the DM Act, NDMA was to prepare guidelines on various aspects of disaster management to be followed by the different Ministries and Departments of the Government of India. NDMA formulated and issued 17 National Guidelines on various types of disasters and related issues (October 2012). The prime aim of these guidelines was to ensure integrated disaster management. The guidelines also aimed at institutionalizing the implementation of initiatives and activities covering all the stages of disaster management cycle.

NDMA had been circulating various National Guidelines since April 2007 but there was no information as to whether these were being adopted and used by Ministries, Departments and State Governments.

The guidelines also provided a chapter on action points with specific timelines. It was however, noticed that NDMA had no information on follow up of the deliverables mentioned in the action points and achievement thereof, thus, rendering their monitoring ineffective.

On this being pointed out, NDMA stated (July 2012) that once the deliverables and

timelines were mentioned in the guidelines, it was up to NEC, State Governments/Ministries and districts to account for it and not NDMA.

MHA also stated (December 2012) that the timelines indicated in the guidelines were indicative for the various stakeholders and they were expected to come out with their own plans and coordination mechanisms for the management of disasters pertaining to their domains. Adherence of the Ministries, Departments and State Governments to the guidelines was a continuous and evolving process.

In our opinion, NEC was the executive arm of NDMA and it was the responsibility of NDMA to ensure compliance on the guidelines issued by it.

3.3.1 As per the summary records of discussions at the meeting of NDMA held in January 2010, the Vice-Chairman, NDMA made a presentation on 'Present status and road ahead'. It was reported that the following guidelines were under finalisation:

- Community Based Disaster Management
- Micro Finance & Risk Insurance
- Post Disaster Reconstruction, and
- Protection of Cultural Heritage & Monuments

There was no time frame fixed for finalising these guidelines and even after a lapse of more than two years, the guidelines were yet to be finalised. In the absence of these guidelines impetus to institutionalise the implementation of initiatives and activities for disaster preparedness could not be extended to the stakeholders in these areas.

3.4 Demarcation of roles and responsibilities

As per section 75 of the DM Act, the Central Government was to make rules for carrying out the provisions of the Act.

In order to formulate and notify various rules as envisaged in the DM Act 2005, Prime Ministry Office in February 2006, issued directions to carry out an exercise to evolve a working arrangement for the NDMA. The recommendation of this exercise was to be placed before a Group of Ministers (GoM). Thereafter, MHA was required to incorporate the guidelines as finalised by GoM. We noted that the rules and regulations for NDMA were yet to be framed and notified.

NDMA was constituted in September 2006 under the DM Act but business rules pertaining to internal conduct of NDMA were yet to be framed. In February 2011, MHA directed NDMA to prepare the business rules followed by reminders. However, NDMA had not submitted these rules for approval as of August 2012. We also noted that the role of MHA in relation to NDMA lacked clarity.

In the absence of regular NEC meetings, MHA functioned as an executive arm of NDMA.

On the other hand, MHA also acted as an administrative Ministry, in so far as the approval of the Government was concerned for various mitigation projects of NDMA.

MHA stated (December 2012) that NDMA was in the process of framing business rules pertaining to its internal conduct.

This was indicative of ambiguity in demarcation of roles and responsibilities between NEC, NDMA and MHA. The lack of clarity and overlapping roles and responsibilities amongst these are detailed in Table 3.1.

MHA accepted the facts and stated (December 2012) that a Task Force had been constituted. The Government would take appropriate decisions on the recommendations of the Task Force, which would address some of the suggestive issues observed by Audit.

Table 3.1: Lack of clarity in roles and responsibilities

Mandate/work area	Role assigned to (as per DM Act)	Work done by (In practice)	Area of concern
NEC was to assist NDMA in the discharge of its functions, ensure compliance of the directions issued by the Central Government and coordinate the response in the event of any disaster.	NEC	NEC only recommended three sub-committees to prepare national plan in its last meeting. But other roles of NEC were performed by MHA.	NEC had proved ineffective in coordination during response to any disaster since it had not even met since May 2008, whereas this period witnessed disasters of severe nature.
National Disaster Response Fund is to be placed at the disposal of NEC to be applied towards meeting the expenses for emergency response, relief and rehabilitation	NEC	The second stage of processing the National Disaster Response Fund proposals of the state was performed by IMG of MHA and Ministry of Agriculture	IMG process existed prior to the inception of National Disaster Response Fund and NEC which were being continued by MHA. NEC was not activated as required under the Act.
General superintendence, direction and control of National Disaster Response Force	NDMA	MHA deals with the deployment of battalions and other administrative matters of the force.	Force works under dual command of NDMA and MHA despite having their own DG Hqrs. office.
Response, Relief and Rehabilitation	Not defined in the Act.[13]	Central Government (MHA, nodal Ministries and Departments)	NDMA was also found carrying out the response activity, such as Operation Centre at NDMA and other works relating to rehabilitation in the recent disasters at Leh (cloud burst) and Odisha (cyclone Aila).
Response to Chemical, Biological, Radiological and Nuclear (CBRN) related disaster	Not defined in the Act.	National Crisis Management Committee	CBRN required close involvement of security forces and intelligence agencies, were dealt with by NCMC. NDMA, however, formulated guidelines, facilitated training and preparedness activities in respect of CBRN emergencies.

[13] Only provided under section 6(1) and 6(2) (f), which reads, 'coordinate the enforcement and implementation of policies and plans for disaster management', are with NDMA

Recommendations:

- NEC and MHA should ensure that a comprehensive National Plan for disaster management is developed at the earliest.
- NDMA should follow up implementation of its National Guidelines by the Ministries, Departments and State Governments.
- Roles and responsibilities of MHA, NEC and NDMA should be specified for clear demarcation of functions of these stakeholders.

Chapter – IV:
National Disaster Management Authority

The National Disaster Management Authority (NDMA) was constituted in May 2005 as an apex body for laying down policies and guidelines on disaster management. Following the enactment of the DM Act, NDMA was formally constituted in accordance with Section 3 (1) of the Act on 27th September 2006. NDMA was mandated to deal with all types of disasters, natural or man-made.

Major functions and responsibilities of NDMA

- lay down policy on disaster management;
- approve the National Plan;
- approve Disaster Management Plans prepared by the Central Ministries or Departments;
- lay down guidelines to be followed by the Central Ministries and State Authorities;
- coordinate the enforcement and implementation of the policy and plan for disaster management;
- recommend provision of funds for the purpose of mitigation;
- provide such support to other countries affected by major disasters;
- take other measures for the prevention of disaster, or the mitigation, or preparedness and capacity building for dealing with the threatening disaster situation or disaster; and
- lay down broad policies and guidelines for the functioning of the National Institute of Disaster Management.

4.1 Organisational structure

NDMA was constituted with the Prime Minister as its Chairperson and nine other members. Each member headed disaster-specific divisions and one member was to be designated as Vice-Chairperson. Each member had also been given the responsibility of specified states and UTs for close interaction and coordination. NDMA Secretariat, headed by a Secretary provided secretarial support and continuity.

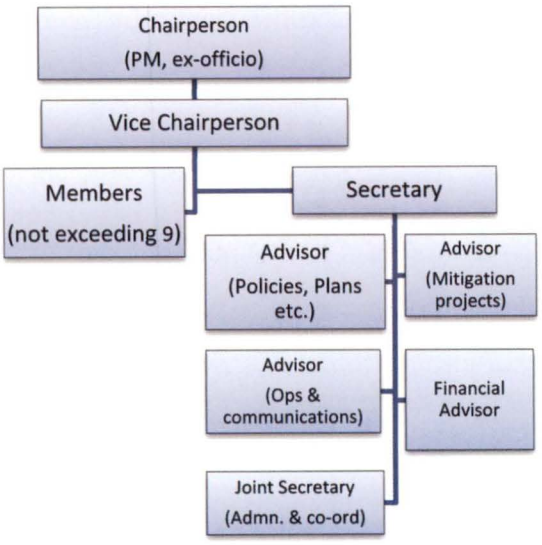


Chart No. 4.1: Organogram of NDMA

4.2 Delay in constitution of Advisory Committee of NDMA

DM Act provided for the NDMA constituting an Advisory Committee consisting of experts in the field of disaster management and having practical experience of disaster management at the national, state or district level to make recommendations on different aspects of disaster management.

The Advisory Committee was constituted in June 2007. The term of Advisory Committee was initially fixed for a period of two years followed by an extension of the term of the Committee for one year. Thus, the extended term of the Committee expired on 14th June 2010.

In June 2010, NDMA initiated the proposal for constitution of the 2nd Advisory Committee. Following the suggestions of the Prime Minister Office (PMO) given during the constitution of the first Advisory Committee, NDMA had approached various Ministries for nomination of experts of different fields.

We noted that NDMA had received names of three experts from Ministry of Earth Sciences and no response from other Ministries and Departments (May 2012). Thus, NDMA functioned without the services of the Advisory Committee since June 2010.

MHA stated (December 2012) that names of experts from several institutions had been received and the same were being processed for approval of PMO.

4.3 Implementation of projects by NDMA

The Working Group of Planning Commission (December 2006) recommended various projects to be taken up by NDMA during the Eleventh Five Year Plan for disaster management. For the purpose of audit, the projects undertaken by NDMA were categorised as:

i. projects on vulnerability assessment and microzonation of major cities,
ii. mitigation projects,
iii. communication network projects ***(discussed in chapter-6)***, and
iv. other projects.

The performance of NDMA in terms of project implementation had been abysmal. So far, no major project taken up by NDMA had seen completion. It was noticed that NDMA selected projects without proper ground work and as a result either the projects were abandoned midway or were incomplete after a considerable period. In many cases, NDMA realised midway that some other agency was already executing project with similar objectives.

NDMA experimented with varying strategies to undertake projects. All agencies appointed to execute the work, were appointed on nomination basis. The project designs and scope were revised midway. Timelines were mostly absent and wherever timelines were given, they were not adhered to.

Chart 4.2: Project Implementation by NDMA (At a glance)

Vulnerability Atlases projects	•**Incomplete** for earthquake, flood and landslides. •Not started for cyclone and tsunami.
Microzonation of Major cities	•**Left Midway** •Probabilistic Seismic Hazard Analysis Maps completed after a delay of six months. •Geotechnical Investigations left midway. •NDMA noticed overlap with Ministry of Urban Development and states after Phase-I of the project.
National Earthquake Risk Mitigation Project	•**Incomplete** •Project approved in August 2007. • December 2008- PricewaterhouseCoopers appointed consultant. •May 2010- Expenditure Finance Committee note sent by NDMA, not approved by MHA. •May 2012- Revised proposal only for preparatory phase.
National Landslide Risk Mitigation Project	•**Being Redesigned** •Project initiated in 2007. •September 2008-decision to appoint a project specific consultant. •August 2011- project shelved. •November 2011- Task force for site specific studies constituted.
National Flood Risk Mitigation Project	•**Being Redesigned** •2007- Detailed Project Report preparation started •2008-Consultant appointed to select project consultants •January 2009- Draft Request For Proposal submitted •NDMA noticed Ministry of Water Resources already has a scheme for this work •Scheme being redesigned with narrowed scope
National School Safety Programme	•**Incomplete** •Project conceived in 2008. •Project approved in June 2011. •2012- many core activities yet to start
Mobile Radiation Detection System	•**Incomplete** • In principle approval of project in May 2011. •Procurement of equipment yet to begin.
National Disaster Communication Network*	•**Incomplete** •Concept paper sent to MHA in October 2007. • PricewaterhouseCoopers appointed as consultant in April 2009. •Detailed Project Report and Expenditure Finance Comittee memo were sent to MHA in December 2011 after several revisions.
National Disaster Management Informatics System*	•**Incomplete** • Project conceived in March 2008. •Concept note prepared in April 2010. •January 2012- National Remote Sensing Centre became the implemneting agency to avoid duplication with National Database for Emergency Management. •Project was yet to be approved by MHA.
National Cyclone Risk Mitigation Project	•Phase-I was approved in January 2011 at a cost of ₹1496.71 crore and financed through World Bank assitance in cyclone prone states/UTs. •Project was under implementation.

*- details in chapter 6

The details are as follows:

4.3.1 Vulnerability Analysis and Risk Assessment (VA&RA)

Vulnerability analysis and risk assessment were based on two parameters viz. the demand for survival of the buildings and infrastructure against the hazard profiles (the damaging forces) and their physical capacity to withstand the same.

In terms of the Yokohama strategy for a safer world in 1994, GoI had constituted an Expert Group to identify vulnerable areas with reference to natural hazards and prepare 'Vulnerability Atlas' showing areas vulnerable to natural disasters.

Building Materials & Technology Promotion Council (BMTPC) under Ministry of Urban Development prepared the vulnerability atlas of India in 1997. The atlas was revised by BMTPC in 2006 and was further proposed to be revised in 2011. In addition, NDMA was also engaged in preparing the upgraded hazard maps and atlases of the Indian land mass with respect to various natural hazards like earthquake, landslide, flood and cyclone.

We noted the following:

4.3.1.1 Earthquake hazard map & atlas

In January 2011, NDMA took estimates from BMTPC for the preparation of earthquake hazard maps as well as atlases of the country, states/UTs and districts. It took NDMA 10 months to sign an MoU with the nominated agency, BMTPC and award the work at a cost of ₹ 76.83 lakh. The project was to be completed in nine months. NDMA stated (July 2012) that BMTPC had prepared the upgraded hazard maps for the whole of India, two states (Andhra Pradesh and Bihar) and district level maps for Bihar. The earthquake hazard maps of the remaining states and districts in the country were under preparation.

4.3.1.2 Landslide hazard map

The existing vulnerability map for landslides in the country did not include the landslide inventory data already available with organisations like the Geological Survey of India, Central Road Research Institute, National Remote Sensing Centre, Defence Terrain Research Laboratory, etc. Further, information for landslide hazard was incomplete due to the non-availability of data from the North-Eastern States.

NDMA constituted (March 2011) working committee of experts for the task of up-gradation of landslide hazard map of the country. In July 2011, Working Committee of Experts on landslides decided that NDMA should obtain the landslide data from different national agencies for incorporation into the landslide hazard map. NDMA stated (July 2012) that data for preparing the map had been received from most of the agencies and working committee of experts would start working on the data to prepare basic input for preparation of upgraded landslide hazard maps/atlases.

4.3.1.3 Flood hazard map

NDMA constituted (January 2009) an Expert Committee for the identification of flood affected districts in India. The expert committee was to establish the parameters for proper categorisation of

the flood prone districts in India and to prepare the upgraded list of flood affected districts.

We noted that the flood hazard map was completed only for Assam and that for Bihar was nearing completion. However, for the states of Odisha and West Bengal, the work was not taken up (July 2012).

The atlas needed to be revised (i) by incorporating latest boundaries of states and districts (ii) latest data on various disasters and (iii) census data of 2011 and extending it up to district level and delineating Taluka boundaries.

However, the upgradation of various hazard atlases had not been completed. The hazard maps of other disasters like cyclone, tsunami etc. were yet to be taken up.

Absence of upgraded hazard maps was a risk associated with informed decision making of stakeholders in disaster mitigation and response.

MHA stated (December 2012) that:

- Data work for preparation of Cyclone Hazard Maps was nearing completion in SERC, Chennai. The work for preparation of Cyclone Hazard Maps was envisaged to be taken up thereafter through BMTPC once the work relating to preparation of Upgraded Earthquake Hazard Maps was completed by them.

- As regards Tsunami, Indian National Centre for Ocean Information Services (INCOIS) established by the Government of India under MoES had already carried out advance work in this regard especially on Tsunami modeling and Early Warning System.

- For floods and landslides, hazard maps were being prepared along with NRSC, GSI, etc. in consultation with the concerned State Authorities.

It further added that upgradation work was to be carried out in a systematic way and in a phased manner with the involvement of various relevant stakeholders and following a scientific approach.

4.3.2 Microzonation of major cities

Microzonation of cities enables the characterization of potential seismic vulnerability/risk that needs to be taken into account when designing new structure or retrofitting existing ones. The Planning Commission recommended a project for the "Microzonation of Major Cities" to be taken up by NDMA/MHA during Eleventh Five Year Plan. The objective of the project was to carry out microzonation of High Risk Cities in Seismic Zones-IV and V to prepare strategies to reduce earthquake risk and vulnerability in the high risk districts.

The Working Committee of Experts at NDMA divided the task in two parts viz: Development of Probabilistic Seismic Hazard Analysis (PSHA)[1] Map of India and Probabilistic Seismic Hazard Analysis & Geotechnical Investigations of the soil mass above bedrock.

[1] PSHA map: quantifies the rate (or probability) of exceeding various ground motion levels at a site given all possible earthquakes.

We noted the following in respect of the two components:

4.3.2.1 Development of PSHA Map of India at the bedrock level

NDMA awarded the work for developing PSHA maps to Structural Engineering Research Centre (SERC), Chennai in August 2008 at a cost of ₹ 56.14 lakh. The entire amount was released in three instalments to SERC. The project was completed in March-April 2011, after a delay of more than six months. The PSHA reports were sent to NDMA (February 2012). These reports were, however, not printed and sent to stakeholders till completion of audit (June 2012).

MHA stated (December 2012) that initially it was envisaged to have the PSHA report in soft form only. Subsequently it was felt that the printed version might also be useful for academic purposes. The reports were then printed and sent to all concerned.

4.3.2.2 Geotechnical investigations of the soil mass above bedrock

The objective of geotechnical investigations was to assist design engineers and town planners to understand general site conditions on the basis of site classification leading to building of safe and economical habitats. This Project was divided in two phases:

Phase-I: Preparation of (i) TECH DOC[2], which was to provide geotechnical inputs needed by structural engineers for design, retrofitting and construction work at a given site and (ii) preparation of Detailed Project Report (DPR) showing the details of plan as well as resources required, the expected time line etc for successful completion of the task involved in Phase-II.

Phase-II: Pilot Scale Studies on Seismic Microzonation of two cities for validation of the recommended prescription of various tests spelt out in TECH DOC.

NDMA signed (July 2009) an MoU with the India Institute of Science (IISc), Bangalore to prepare the technical document on geotechnical/geophysical investigations for Seismic Microzonation of Indian landmass. It was also proposed to prepare Detailed Project Report for carrying out Seismic Microzonation of two identified urban centres in the country. The cost of the project was ₹ 59.63 lakh and NDMA released first instalment of ₹ 41.35 lakh in October 2009. The project was to be completed within 18 months from the release of first instalment i.e. April 2011. However, the final version of the TECH-DOC was submitted by IISc in November 2011 after a delay of seven months.

As per Phase-I, IISc was to prepare DPR for carrying out seismic microzonation of two identified urban centres in the country under Phase-II of the project. IISc submitted (November 2011) a proposal involving an amount of ₹ 19.78 crore to carry out seismic Microzonation of the cities of Noida and Thane area. However, this was not approved by NDMA.

MHA stated (December 2012) that Phase-I of the project had successfully established the procedures for carrying out microzonation of urban centres in the entire country. Phase-II of the project

[2] Technical Document

proposal envisaged carrying out of seismic microzonation of Noida and Thane cities for demonstrative purposes, if felt necessary. As some of the states had already taken up microzonation of certain cities on their own, it was therefore, not considered necessary to undertake phase-II of the proposal.

Thus, there was poor conceptualization of the project as Phase-II was not pursued and NDMA left it to states.

We noted that all agencies to execute these works relating to hazard atlases and microzonation were nominated by NDMA. We were, therefore, unable to derive assurance on whether NDMA received the most competitive offer both in terms of cost and efficiency.

MHA stated (December 2012) that the agencies identified to undertake the works related to Hazard Atlases and Geotechnical Investigations were the apex Government institutions of the country with the requisite capability and expertise and were governed by financial regulations of Government of India.

The reply did not explain that in the absence of bidding process, how were the cost and quality ensured.

4.3.3 Mitigation Projects:

DM Act envisaged a shift from relief-centric response to a proactive prevention, mitigation and preparedness-driven approach for conserving developmental gains and also to minimise losses of life, livelihoods and property. Mitigation involved reduction of risk of any disaster or its severity or consequences. NDMA was carrying out several mitigation projects. We noted the following in respect of these projects:

4.3.3.1 National Earthquake Risk Mitigation Project (NERMP)

The Planning Commission had accorded in principle approval (October 2003) to the proposal of 'Earthquake Preparedness and Mitigation Project' to be implemented by MHA. After establishment of the NDMA, all the mitigation projects were transferred to it in August 2006. The draft proposal of the NERMP was approved in August 2007.

In December 2008, NDMA appointed a consultant[3] for preparation of the DPR for NERMP at a cost of ₹ 1.74 crore. The consultant submitted the draft Detailed Project Report (DPR) after a delay of eight months which was forwarded to MHA alongwith the draft Expenditure Finance Committee Memo in May 2010. The overall cost of the project was estimated at ₹ 1850.21 crore. MHA asked for a review of the project and suggested that it may be taken up in a phased manner.

A revised proposal only for the preparatory phase was circulated in December 2011 for comments and concurrence of stakeholders. There was no further progress since then.

Due to non-implementation of the project, NDMA could utilise only ₹ 0.18 crore till March 2012 against the projected plan outlay of ₹ 27 crore for the Eleventh Five Year Plan.

MHA stated (December 2012) that initially a detailed project report for ₹ 1850.21 crore was prepared by NDMA for the project. It further added that not much expertise was available in the country in

[3] M/s PricewaterhouseCoopers

many of the relevant domain areas, i.e. seismic retrofitting of infrastructure was almost a virgin and BIS codes for such subjects were still evolving. There was lack of consensus on many issues among the experts, academicians and practitioners. After due deliberations, a pilot project for ₹ 24.87 crore had been prepared which was under examination in the Ministry for its approval.

We noticed that since October 2003, the project did not make meaningful progress. Actual work on the earthquake risk mitigation was yet to start despite the DM Act laying emphasis on mitigation.

4.3.3.2 National Landslide Risk Mitigation Project (NLRMP)

NLRMP aimed at strengthening the structural and non structural landslide mitigation efforts. It also aimed to minimise the risks arising out of disasters caused by landslides.

We noted that a self contained note on NLRMP was sent by the NDMA to MHA in September 2007, which was not found very convincing and MHA asked (June 2008) for a revised note for preparation of the DPR.

NDMA decided (September 2008) to appoint project specific consultant for preparation of this DPR. The consultant was not appointed even after a lapse of more than two and half years (June 2011). In the meanwhile, NDMA had organised a National Seminar on Landslide Mitigation Management in June 2011, as a follow up of which, Member NDMA had approved (August 2011) the following:

- National landslide risk mitigation project may not be further pursued.
- Site specific studies of landslides should be initiated by reputed institutions to pave the way for site/region specific mitigation projects; and
- A Task Force would be formed chaired by Geological Survey of India, the nodal agency for landslides, for recommending further action to be taken on landslide management in the country.

The Task Force of experts was constituted in November 2011 for identifying a clear roadmap for landslide management in the country. So far, the Task Force had held only one meeting (January 2012).

MHA stated (December 2012) that drawing up a single project for various landslides at the national level would be a long drawn process involving huge funds and delay, and the project was being formulated for the first time in the country. The scheme for providing financial support to the State Governments for site specific mitigation was in final stages of preparation with NDMA.

Thus, NDMA despite handling the matter for four years could not ascertain the approach to be followed for this project. After a lapse of five years the project was still at the planning stage (December 2012). In the absence of a national project on landslide risk mitigation, various stakeholders were deprived of support and technical assistance from the National Authority.

4.3.3.3 National Flood Risk Mitigation Project (NFRMP)

NFRMP aimed at assisting the Central Ministries and Departments, and the State Governments to address the issues of preparedness and mitigation of floods with a view to minimise vulnerability to floods and consequent loss of lives, livelihood systems, property and damage to infrastructure and public utilities.

In August 2007, NDMA started the preparation of DPR for NFRMP. Engagement of Consultancy Development Centre (CDC) to select the project management consultants was approved by Vice Chairman, NDMA in August 2008. The Centre submitted draft Request For Proposal (RFP) for the selection of lead consultant in January 2009. At this advanced stage, NDMA decided to ascertain from the Ministry of Water Resources (MoWR) as to whether there was any overlap of the proposed NFRMP with the Flood Management Programme of MoWR for which an outlay of ₹ 8000 crore was made in the Eleventh Five Year Plan. In its response, MoWR intimated (May 2009) NDMA that all major activities proposed under NFRMP were already being handled by the Ministry.

We noticed that NDMA's interaction with nodal Ministries needs to be improved as in two major projects, only after spending considerable time and effort did NDMA realised that these were already being taken up under some scheme/project by the line Ministries.

We noted that:

(i) In July 2011 the Government decided that it was not feasible to have one large National Flood Risk Mitigation Project. Therefore, in order to avoid duplication of work and to productively utilise the available resources, the National Flood Risk Mitigation Project was rechristened as Flood Risk Mitigation Project (FRMP).

(ii) National Landslide Risk Mitigation Project had also been changed to Landslide Risk Mitigation Project (LRMP).

The concept notes of the revised schemes were issued in November 2011. NDMA had not finalised the SFC/EFC note on these revised schemes (May 2012).

MHA stated (December 2012) that due to inadequate in-house expertise in flood management, the services of CDC were sought to identify suitable consultants for preparing the DPR. However, this could not materialise and NDMA with its own efforts drew a scheme by avoiding overlaps and proposing action in areas where not much work had been carried out to mitigate the risk of floods. MHA further added that since MoWR was already executing a Flood Management Programme, it was considered appropriate to revise the project to avoid duplication of efforts. The reply confirmed that planning was inadequate which resulted in inordinate delays in finalising the scope of the project and ensuring its completion.

Thus, all the major risk mitigation projects initiated by NDMA were at various stages of implementation. The time limits were either without any basis or absent altogether. NDMA was still re-

conceptualizing these projects with reduced scope which indicated significant gaps at the planning stage leading to delay in establishing vulnerability assessment and mitigation efforts.

MHA stated (December 2012) that because disaster risk mitigation schemes were being prepared for the first time in the country, the project formulation had taken some time. However, two of the risk mitigation projects i.e. National Cyclone Risk Mitigation and School Safety were already approved and being executed.

4.3.4 Other Projects:

4.3.4.1 Mobile Radiation Detection System (MRDS)

In May 2011, MHA conveyed 'in principle' approval for establishment of Mobile Radiation Detection System. MRDS was to have a mobile monitoring van equipped with radiation detection system and protective gear to carry out the assessment of the radiological impact. On detection of any enhanced level of radiation or presence of radioactive substance the police personnel of MRDS were to immediately report the matter to the nearest Emergency Response Centre (ERC) already set up by Bhabha Atomic Research Centre.

A network of 20 units of Emergency Response Centers (ERCs) had been established by Bhabha Atomic Research Centre (BARC), Department of Atomic Energy in the country. ERCs were equipped with radiation monitoring instruments, protective gear and other supporting infrastructure. The main function of ERCs was to detect any radiation related abnormal situation in a suspected area by detection and monitoring of radiation and to continuously assess the situation further.

The establishment of MRDS including procurement of necessary monitoring instruments and training of the first responders from the police force was to be completed by NDMA within a period of three years. The State Governments were responsible for setting up MRDS within the State police.

In November 2011, Secretary NDMA recommended the MRDS proposal at an estimated cost of ₹ 7.49 crore. The project envisaging setting up of 960 MRDS was sanctioned by VC, NDMA in January 2012.

We noted that the project was initially proposed to be implemented through BARC on turnkey basis. During SFC stage, BARC clarified that it would only provide technical support. Thereafter it was decided by MHA and NDMA that the procurement of equipment would be carried out by the 'Procurement Wing' of MHA. We noted that due to unwillingness expressed by the concerned wing of MHA, no procurement was made (May 2012).

MHA stated (December 2012) that NDMA had now approached BARC, Mumbai for procurement of equipment.

4.3.4.2 National School Safety Programme (NSSP)

NDMA decided (July 2008) to take up a pilot project on school safety and formed a core group for the purpose. Accordingly, the National School Safety Programme (NSSP) was conceived with a total cost of ₹ 48.47 crore. The programme aimed at promoting a culture of disaster preparedness within the school environment and was taken up by NDMA

as a Centrally Sponsored Scheme in 22 states and Union Territories.

NSSP was approved in June 2011 and was to be completed by June 2013. We found that the implementation of NSSP was lagging behind as several important activities, which were to be conducted during 2011-12, were yet to be started. Those were:

- formulation of draft National School Safety Policy,
- non structural mitigation measures in 22 states,
- demonstrative retrofitting workshops to formulate guidelines on retrofitting, and
- circulation of information, education and communication material.

Three states were yet to finalise the list of schools to be covered under NSSP.

Total expenditure on NSSP during 2011-12 was ₹ 4.90 crore as against the target of ₹ 14.12 crore.

MHA stated (June 2012) that initiation for school safety was being implemented for the first time in the country and a lot of consultation was required with all the stakeholders. It took considerable time to finalise the financial guidelines.

4.4 Miscellaneous issues:

4.4.1 Efforts for disaster planning in urban areas

In January 2004, an Expert Committee of MHA suggested model amendments in town and country planning acts, land use zoning regulations and building regulations to include the elements of safe construction, retrofitting of lifeline and critical buildings and other key infrastructure. The model amendments were circulated to all states and UTs in September 2004 to review and adopt the recommendations as per the prevailing disaster vulnerabilities. Neither NDMA nor MHA had information on action taken by the states on these model amendments.

After the earthquake in Japan in April 2011, NDMA took up this matter again and requested states to furnish action taken report. NDMA had requested 16 states and UTs (particularly falling in Zone IV and V) to furnish the status reports on action taken especially in the areas of institutional strengthening for disaster management. Replies were received only from six states (June 2012).

MHA stated (December 2012) that primary responsibility of enforcing building bye-laws and building codes rested with respective State Governments/UTs with monitoring and co-ordination by the Ministry of Urban Development. NDMA had been pursuing with the State Governments/UTs with regard to enforcement of building bye laws and building codes as per the model amendments in building bylaws and town planning acts prepared by the Committee of Experts.

Thus, the model amendments in the existing regulations were yet to be carried out.

4.4.2 NDMA functions not being performed

As per the DM Act, NDMA was mandated to perform the following tasks:

- Section 6 (2) (g) of the Act provides for recommending provision of funds for the purpose of mitigation.
- Section 13 provides that in cases of disasters of severe magnitude, NDMA recommend relief in repayment of loans or for grant of fresh loans to the persons affected by disasters on such concessional terms as may be appropriate.

MHA stated (December 2012) that Reserve Bank of India had issued instructions in July 2009 to all Scheduled Commercial Banks to take necessary action in this regard. It included grant of fresh loans, consumption loans and restructuring of existing loans. The banks are guided by these guidelines; there is nothing more that NDMA can add at this stage.

Till 2012, NDMA had not initiated any action for recommending relief in repayment of loans or for grant of fresh loans to the persons affected by disaster. We also noticed that RBI guidelines existed on this subject since 1984 and were being updated regularly. The intention of the legislature as contained in the said provision of the DM Act was clearly for NDMA to play a pivotal rather than a peripheral role, being the nodal agency.

4.4.3 Review of major national projects

According to the Cabinet Note on "Organisational Structure of the NDMA", it was to review all major on-going national projects[4], to include structural requirements for disaster reduction. We, however, noted that NDMA had not been performing the task assigned to it by the Cabinet.

[4] In sectors of education, housing, rural development, urban development and other infrastructural projects of roads, bridges, etc.

4.5 Case study on NDMA's response to Leh Cloudburst:

In August 2010, a cloudburst in Leh resulted in large scale damage to houses rendering many families homeless. The Prime Minister visited Leh on 17th August 2010 and announced relief packages for the victims.

Prime Minister Office (PMO) chose NDMA to construct 20 community shelters at 10 different locations on sites identified by the State Government. As per the directions of the PMO, the prefab community shelters should withstand temperature as low as minus 30^0 Celsius and be set up before the onset of severe winter i.e. by October 2010.

NDMA received quotations from various Public Sector Undertakings with a validity period of 10 days in September 2010. The lowest rates were offered by NBCC[5]. After a gap of 20 days (i.e. after the expiry of the validity of the bids), NDMA on 29th September 2010 accepted NBCC's bid and asked for the final cost and completion date of the project.

NBCC replied (October 2010) that the total cost of the project had increased from ₹ 6.68 crore to ₹ 10.85 crore with the tentative date for completion of the project as 15th November 2010. NDMA approached PMO for approval which agreed and released an amount of ₹ 5 crore from Prime Minister's National Relief Fund (PMNRF) as 1st tranche of the costs involved.

NDMA requested NBCC to start the construction and to execute a MoU in this regard. NBCC stated (13.10.2010) that it would be difficult to adhere to the target dates since the suitable period[6] for construction had already lapsed. Finally, on 21st October 2010 NDMA cancelled the offer of NBCC.

After this, a team of NDMA visited Leh to explore the possibility of contacting some firms already working at Leh. Thereafter, it was decided to execute MoU with Hindustan Prefab Ltd. and setting up of all the shelters by 15 November 2010. The work was finally completed in December 2010. Thus, the facility of community shelters could only be extended to the victims of such calamity after the onset of extreme weather conditions.

[5] National Building Construction Corporation

[6] conducive period for construction work is very limited in Leh

Against the projected cost of ₹ 10.85 crore for setting up of 10 shelters, NDMA erected 16 community shelters by incurring a sum of only ₹ 2.92 crore. The balance amount of ₹ 2.08 crore was returned to PMNRF in September 2011. Evidently, the initial projection of funds was faulty and rates were adopted on ad-hoc basis. NDMA could not utilise even the 1st tranche of funds released and retained the funds for almost nine months outside PMNRF.

On this being pointed out MHA stated (December 2012) that since NDMA had no technical unit, it was decided to engage the PSUs specializing in construction. The project was executed in harsh weather conditions within a very short time period.

Lesson learnt: NDMA had no mandate to execute emergency response works, neither did it have any experience and expertise in this area. The role of NDMA was not envisaged as an executing agency for reconstruction projects.

4.6 Manpower management in NDMA

4.6.1 Vacancies in NDMA

As per the Cabinet Note on "Organizational Structure of NDMA" it was to have 124 posts. However, we noted 33 to 60 *per cent* vacancies at the end of each financial year covered by audit. The details are in **Annex - 4.1**.

Further, many 'critical posts' like Advisor (Operations & Communication), Assistant Advisor (IT), Duty Officer (Operations centre) etc. were not filled up since 2008.

MHA stated (December 2012) that out of 124 posts, 92 posts were filled and advertisement to fill the remaining posts had been published in local dailies.

4.6.2 Appointment of consultants

As per extant Government of India rules for appointing consultants, the terms of reference of consultants should be prepared including precise statement of objectives, tasks to be carried out; schedule for completion of tasks and final outputs required of the them.

The cabinet note provided that the services of specialists would be outsourced as and when the requirement arose. We noted that NDMA appointed 13 consultants in different area of specialization, who were attached with the concerned Members' Secretariat. We further noted that these consultants were engaged in day to day work of NDMA and no specific tasks were assigned to them. Their tenures were also renewed routinely.

MHA stated (December 2012) that consultants were being appointed as per the revised guidelines and detailed Terms of Reference with specific tasks to be assigned to them.

Recommendations:

- NDMA should ensure early constitution of its Advisory Committee of experts.
- NDMA needs to review and strengthen its project execution approach. Better coordination is required with nodal Ministries to avoid duplication of efforts.
- NDMA should start the work of assessment of major national projects with a view to include structural requirements for disaster reduction.
- NDMA should make efforts for formulation of the retrofitting policy.

Chapter – V:
Resources and Funding arrangements

Provision of timely and adequate funding is a crucial aspect in disaster preparedness. Even the most well designed mitigation or response program can fail to get results for want of sufficient funds. For emergency response, it is important that funding is available in time and reaches the affected people quickly.

Ministry of Home Affairs (MHA) is the nodal Ministry responsible for providing financial assistance in the wake of natural calamities. Based on the recommendations of the Thirteenth Finance Commission, the schemes of State Disaster Response Fund and National Disaster Response Fund were made operative for a five year period (1 April 2010 to 31 March 2015). The budgetary provision of the relief funds was to be dealt with by the Ministry of Finance (MoF), while the processing of request of the State Government for these funds was to be done by the DM Division of MHA.

The guidelines for administration of the funds were issued by MHA in September 2010. The guidelines prescribed that the State Disaster Response Fund and National Disaster Response Fund were to be used only for meeting expenditure for providing immediate relief to the victims of cyclone, drought, earthquake, fire, flood, tsunami, hailstorm, landslide, avalanche, cloud burst and pest attack. The expenditure on disaster preparedness, restoration, reconstruction and mitigation were not to be met from National Disaster Response Fund. These were to be met from the plan funds of the states.

DM Act also provided that the Central Government could, by notification in the official gazette, constitute a fund to be called the National Disaster Mitigation Fund (NDMF) for funding the projects geared exclusively for the purpose of disaster mitigation. The fund was to be placed at the disposal of NDMA.

We noticed several deficiencies in allotment and utilisation of these funds.

5.1 State Disaster Response Fund

The State Disaster Response Fund was constituted under section 48(1) (a) of the Disaster Management Act, 2005. It came into force from 2010-11 onwards. Till 2010, there was a Calamity Relief Fund (CRF), the balance of which was merged into the State Disaster Response Fund from 2010-11.

The amount of annual contribution to the State Disaster Response Fund of each state for each of the financial years 2010-11 to 2014-15 were recommended by the Thirteenth Finance Commission. Accordingly, the Government of India (GoI) approved allocation of ₹ 33580.93 crore to all the states under State Disaster Response Fund for the five year period.

Government of India was to contribute to these funds, 75 *per cent* of the total yearly allocation for general category states and 90 *per cent* for special category states[1] in the form of non-plan grant. The balance 25 *per cent* in the case of general category states and 10 *per cent* in case of special category states was to be contributed by the respective State Governments.

The scheme provided for release of central share under State Disaster Response Fund in two equal instalments, in the months of June and December. The first instalment of central contribution to State Disaster Response Fund for 2010-11 was to be released unconditionally. The second instalment for 2010-11 and subsequent instalments were to be released on receipt of confirmation of accounting procedure and compliance with other conditions of the guidelines.

The year-wise shares of the Government of India and the State Governments of 2010-11 and 2011-12 are given in Table 5.1.

[1] Special category States includes Jammu & Kashmir, Himachal Pradesh, Uttarakhand, seven North-Eastern States and Sikkim

Table No.5.1 Allocation and release of centre share (₹ in crore)

Financial Year	Allocation		Total allocation	Release of Central share		Total Central Release
	Centre's share	States' share		Ist instalment	II instalment	
2010-11	4677.82	1399.48	**6077.30**	2338.91	1998.72	**4337.63**
2011-12	4911.70	1469.48	**6381.18**	2500.83	1778.63	**4279.46**

5.1.1 Monitoring by MHA

All states had constituted State Disaster Response Fund except Jammu and Kashmir. The progress of constitution of State Disaster Response Fund in the State of Jammu and Kashmir was not available with MHA.

As per Para 11(iv) of guidelines, the State Governments were to furnish certificates to MHA and MoF in the months of April and October every year indicating that the amount received earlier had been credited to the State Disaster Response Fund along with the state's contribution. This was to be accompanied by a statement of up-to-date expenditure and the balance available in the State Disaster Response Fund, in a prescribed format.

We noticed that states were not sending the details of utilisation and balances regularly. Details of State Disaster Response Fund as of March 2012 were not received in the Ministry from 10 states[2] (August 2012). Thus, crucial information for regulating further release of funds to states from State Disaster Response Fund and National Disaster Response Fund was not available with MHA.

MHA stated (September 2012) that it had withheld further releases to Jammu and Kashmir government as they had not yet constituted State Disaster Response Fund. It further stated that efforts would be made to ensure that State Governments submitted the requisite certificates in time.

5.1.2 Non investment of balances available under State Disaster Response Fund /CRF

As per the guidelines, the accretion to the State Disaster Response Fund/CRF together with the income earned on the investment of unspent amounts was to be invested in:

- ✓ Central Government securities,
- ✓ Auctioned treasury bills and
- ✓ Interest earning deposits and certificates of deposits with scheduled commercial banks.

We noted that five of the test checked states had not invested unspent balances in their State Disaster Response Funds/CRFs resulting in potential loss of interest of ₹ 477.99 crore. Details of loss of interest in the states are shown in table 5.2.

[2]Chhattisgarh, Goa, Gujarat, Haryana, J&K, Manipur, Meghalaya, Mizoram, Sikkim, Tripura

Table No 5.2: Loss of interest due to non investment of State Disaster Response Fund/CRF

State	Period	Amount involved (unspent balances ranging)	Interest loss*
		(₹ in crore)	
Gujarat	2010-11 to 2011-12	62.76 to 1231.56	189.86
Odisha	2008-09 to 2011-12	239.69 to 1472.47	25.16
Rajasthan	2008-09 to 2009-10	531.47 to 555.28	65.21
Uttarakhand	2007-08 to 2011-12	5.91 to 67.20	9.96
West Bengal	2005-06 to 2011-12	119.85 to 740.05	187.80
Total			**477.99**

(*calculated at the rate of six *per cent* per annum)

5.1.3 Inadmissible expenditure from State Disaster Response Fund

We noted that states incurred an expenditure of ₹ 345.03 crore on inadmissible components in violation of the guidelines of the State Disaster Response Fund during 2007-08 to 2011-12. Details of inadmissible expenditure in the selected states are shown in Table 5.3.

Table No. 5.3: Inadmissible expenditure

State	Inadmissible amount (₹ in crore)	Amount utilised for
Andhra Pradesh	3.29	Supply of drinking water during summer and other inadmissible items
Gujarat	236.95	Expenditure incurred on relief even when there was no disaster in the state
Maharashtra	3.26	Operation and maintenance of machinery and equipment
Odisha	53.83	Expenditure other than relief and restoration as well as expenditure on ex-gratia for lightening
West Bengal	47.70	Creation of spot sources of drinking water and non prescribed items for police etc.
Total	**345.03**	

5.1.4 Incorrect accounting of State Disaster Response Fund

State Disaster Response Funds were to be classified under 'Reserve funds bearing interest' in the public accounts of the State Governments concerned.

We noted that in **Andhra Pradesh,** out of ₹ 78.22 lakh drawn (May 2010) from State Disaster Response Fund, ₹ 57.65 lakh was spent and the balance amount of ₹ 20.57 lakh was remitted to departmental receipts on the orders of Director of Animal Husbandry, Hyderabad.

We also noted that ₹ 25.82 lakh was drawn (August-November 2010) for relief measures during floods and Jal Cyclone. This amount was not remitted back to State Disaster Response Fund account.

5.1.5 Other areas of concern:

- In **Andhra Pradesh**, funds were released by the SDMA with delays ranging from three months to one year from the date of occurrence of disasters.
- In **Gujarat**, there were delays of two to eight months in actual remittance of central share to State Disaster Response Fund. There were also delays of three to nine months in actual remittance of State share.
- In **Odisha**, utilisation certificates for ₹ 526.42 crore had not been submitted by the agencies, departments, Odisha State Disaster Management Authority etc. for periods ranging from one to five years (March 2012).
- In **Uttarakhand**, there were delays in submission of utilisation certificates resulting in delays ranging from 80 days to 184 days in the release of central share during 2007-11. The department stated that district authorities never submitted utilisation certificates in time and GoI did not release funds for the year 2011-12 for want of utilisation certificates and other requisite documents.

It is evident from the above audit findings that the states need to be more vigilant and prompt in management of State Disaster Response Fund. Delay in release of funds after occurrence of a disaster defeats the purpose of establishment of a separate fund for emergency relief activities.

5.2 National Disaster Response Fund

National Disaster Response Fund was constituted under Section 46 of DM Act in the Public Account of India under 'Reserve funds not bearing interest' (September 2010). The existing National Calamity Contingency Fund (NCCF) was merged with the National Disaster Response Fund and fresh guidelines for administration of the fund, issued by MHA, came into force from 2010-11 onwards. Natural calamities, considered by the GoI to be of severe nature and requiring expenditure by a State Government in excess of the balances available in their own State Disaster Response Fund, qualified for immediate relief assistance from National Disaster Response Fund.

As per the DM Act, National Disaster Response Fund was to be placed at the disposal of NEC to be used for emergency response, relief and rehabilitation expenses. We noted that National Disaster Response Fund was not made available to NEC and was operated by MHA in contravention of the DM Act.

5.2.1 Fund allocation and release under National Disaster Response Fund

National Disaster Response Fund was funded through transfers from "National Calamity Contingent Duty" (NCCD) imposed under Section 134 of the Finance Act, 2003 on imported multi-utility vehicles, motor car, petroleum crude, etc. Details of funds transferred to and amount released under National Disaster Response Fund /NCCF for the last five years are shown in Table 5.4.

Table 5.4: Release of amount under NCCF /National Disaster Response Fund

(₹ in crore)

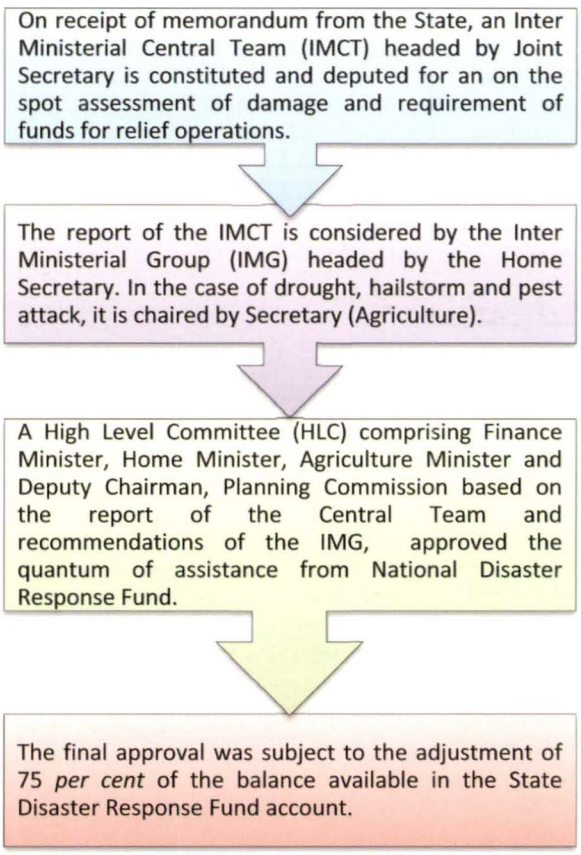
Financial Year	Opening Balance	Amount transferred to NCCF /NDRF	Amount released under NCCF/NDRF to States	Closing Balance NCCF/NDRF
2007-08	538.07	1800	373.38	1964.69/Nil
2008-09	1964.69	1800	2279.92	1484.78/Nil
2009-10	1484.78	3160	3160	1484.78/Nil
2010-11	1484.78	3560/340.01	3560/340.01	1484.78/Nil
2011-12	1484.78	Nil/3997.92	Nil/2458.92	1484.78/1539

5.2.2 Procedure for release of funds

In order to seek central assistance in the event of a calamity of a "severe nature" the State Government is required to submit a memorandum indicating the sector-wise damage and requirement of funds. Procedure for release of funds under National Disaster Response Fund is depicted in Chart 5.1.

As per the guidelines, the report of the Inter Ministerial Central Team (IMCT) was to be examined by NEC to assess the extent of assistance and expenditure required. We, however, found that the earlier arrangement continued and the role of NEC was still performed by the IMG as indicated in Chart 5.1.

Chart 5.1: Procedure of release of fund under National Disaster Response Fund



5.2.3 Unspent funds lying with States

National Disaster Response Fund guidelines provide that the National Fund was to be used only when the requirement of fund could not be met from the balances available in State Disaster Response Fund. We noticed

cases where HLC approved release of funds from National Disaster Response Fund despite balances being available in the State Disaster Response Fund account of the concerned state. Such situations arose due to release from National Disaster Response Fund, pending the consideration of the state's memorandum and approval of exact amount required by the state.

We noted that an amount of ₹ 654.04 crore in case of Gujarat, Assam and Goa, identified as excess against the 'on account[3]' release made from NCCF (now National Disaster Response Fund), was lying with these states (September 2012).

State	Year of release	Amount (₹ in crore)
Gujarat	2006-07	350.00
Assam	2008-09	300.00
Goa	2009-10	4.04

HLC in its meeting held in May 2010 decided that the excess amounts should be adjusted against their future requests of assistance from National Disaster Response Fund.

We noted that after the decision of HLC, no assistance from National Disaster Response Fund was released for calamities in these states, as there were balances in their State Disaster Response Fund accounts. Thus, the extra amounts released to these states were not restored to the National fund.

MHA stated (September 2012) that these amounts were released in pursuance of the announcement of the Prime Minister and would be adjusted against future assistance to these states.

[3] Interim releases pending processing of proposal and subject to adjustment against further assistance under National Disaster Response Fund

Thus, to this extent, less funds would be available in the central fund which caters to the requirement of all the states.

5.2.4 Inadmissible releases under National Disaster Response Fund

We noted that out of ₹ 9208.30 crore approved for release by HLC during September 2010 to March 2012 funds amounting to ₹ 3090.43 crore were provided to states for repair and restoration in various sectors. This accounted for 34 *per cent* on inadmissible items of total approval.

MHA stated (September 2012) that the funds released under National Disaster Response Fund were based on the guidelines issued for the operation of State Disaster Response Fund / National Disaster Response Fund towards meeting the expenditure on this account. The rescue and relief operations include the repair and restoration of damaged infrastructure as given in the guidelines.

We did not find the reply correct as the guidelines explicitly restricted expenditure under this activity. The norms of assistance formulated by MHA in January 2012 allowed such releases from National Disaster Response Fund. This was not in consonance with the guidelines based on the recommendations of Finance Commission.

As per the stated policy of GoI, the repair and restoration activities after any calamity were to be funded from the state plan under its various schemes and not from the response fund i.e. National Disaster Response Fund, which was meant for immediate relief.

5.2.5 Inappropriate release on account of unseasonal rains

An amount of ₹ 1245.78 crore was released/adjusted[4] during 2010-11 to the states of Gujarat, Maharashtra and Odisha for the damages due to unseasonal rains. Damages due to unseasonal rains were not categorised as calamity to be covered under guidelines of National Disaster Response Fund & State Disaster Response Fund releases and thus the release was not in compliance with the guidelines.

Ministry of Agriculture stated (November 2012) that although unseasonal rain was not mentioned in the list of natural calamities eligible for National Disaster Response Fund assistance, unseasonal rains are primarily due to cyclones. Cyclone was covered as a natural calamity eligible for National Disaster Response Fund assistance. The fact remains that unseasonal rain was not categorised as calamity of severe nature as per the guidelines but covered for providing central assistance by treating the same as cyclones.

[4] The amounts were released from National Disaster Response Fund subject to adjustment of 75 *per cent* of the balances available in the State Disaster Response Fund of the state.

5.3 Non constitution of Mitigation Fund

5.2.6 National Disaster Mitigation Fund

The modalities for constitution of NDMF were discussed by MHA with MoF, Planning Commission and NDMA from time to time. The Thirteenth Finance Commission had also recommended (December 2009) that mitigation and reconstruction activities should be kept out of the schemes funded through Finance Commission grants and met out of overall development plan funds of the Centre and States.

We noted that even after a lapse of more than six years of the enactment of the DM Act, NDMF had not been constituted. In the absence of a dedicated fund, mitigation related works were also being financed through plan funds.

MHA stated (December 2012) that several Ministries had been taking steps as part of their Plan Schemes for last few plan periods on what was now considered as 'mitigation work'. However, the proposal for creation of mitigation fund was under active consideration of the Government.

5.3.1 State Disaster Mitigation Funds

According to the DM Act, the State Governments were to create State Disaster Mitigation Fund (SDMF) and District Disaster Mitigation Fund (DDMF) immediately after the constitution of SDMA and DDMA.

In the test checked states, we noted that Odisha, Rajasthan, Tamil Nadu and West Bengal had not created SDMF and DDMF. Andhra Pradesh had not created SDMF but created DDMF during 2008-09, which was not operational. Only Maharashtra had created both SDMF and DDMF and Uttarakhand had created SDMF.

Creation of a separate Disaster Mitigation fund at national, state and district levels, as envisaged in the DM Act, would give boost to the mitigation activities at every level.

5.4 National Disaster Response Reserve

National Disaster Response Force was to provide relief to the affected people at short notice. Thirteenth Finance Commission, in its report, in December 2009 had observed that relief material to be provided by the Force in such situations was often required to be procured at high prices and by compromising on quality. The Finance Commission, therefore, recommended (December 2009) an initial grant of ₹ 250 crore in the form of revolving fund named National Disaster Response Reserve (NDRR) to the Force to maintain an inventory of items required for immediate relief. A national inventory of equipment and material such as tents, blankets, folding beds, sleeping bags, inflatable lighting tower, life jackets, life buoy, etc. purchased from this Fund was to be maintained. These articles were to be used for responding to a calamity.

MHA in August 2010 directed NDMA to submit the proposal for creation of the national inventory of equipment

purchased from the said Fund. NDMA submitted the proposal in September 2010 and MHA instructed (November 2010) that NDMA should prepare the list of inventory of equipment and material in consultation with the Force.

NDMA was also to prepare detailed guidelines for procurement of these items, mechanism for recovering charges from states for use of these items and a monitoring mechanism. As per the timeline decided, NDMA had to submit these guidelines by December 2010. We noted that the guidelines for procurement and recovery of charges for items of NDRR could not be finalised even after a lapse of more than one and half years.

MHA stated (September 2012) that the proposal for creation of National Disaster Response Reserve was under active consideration of the Government.

With delay in operationalisation of National Disaster Response Reserve and consequent absence of necessary relief material, the Force cannot be said to be fully equipped in responding to disaster situations at short notice.

Recommendations:

- ***In order to ensure timely release of State Disaster Response Fund to states, MHA should strengthen its monitoring mechanism to obtain details of utilization and unspent balances under State Disaster Response Fund from states regularly.***
- ***MHA should ensure investment of the unspent balances under State Disaster Response Fund by the states.***
- ***Repair and restoration activities should be funded from plan funds and not from National Disaster Response Fund which was needed to be utilised for relief works as recommended by the 13th Finance Commission.***
- ***Disaster Mitigation funds at national, state and district level should be created to boost the mitigation activities.***
- ***National Disaster Response Reserve should be operationalised at the earliest.***

Chapter – VI:
Communication Systems for disaster preparedness

With advancements in information technology and communication, disaster forecasting and quick response have become possible. Timely deployment and use of telecommunication resources play a crucial role in saving life, mitigating disaster and relief operations.

Forecasting and early warning is essential for minimizing loss of life and property and enabling the agencies concerned to plan rescue and relief measures. Effective early warning systems can also significantly reduce the impact of disaster on human life.

Our findings on implementation and performance of the communication networks of the country are discussed in the succeeding paragraphs.

6.1 Disaster Management Support Programme

Department of Space (DOS) in March 2003 started the Disaster Management Support (DMS) programme to harness the benefits of the space based technology for applications in disaster management in the country.

DMS programme aimed to provide timely support and services from aero-space systems, both imaging and communications, towards efficient management of natural disasters.

It included creation of digital data base for facilitating hazard zonation, damage assessment, monitoring of major natural disasters using satellite and aerial data, establishing satellite based reliable communication network and deployment of emergency communication equipment.

Under this programme, a Decision Support Centre (DSC) was set up at the National Remote Sensing Centre. DSC constantly monitored flood events and tracked intensity of cyclones originating in the Indian Ocean region. It also monitored the prevalence and severity of agricultural drought in 13 states during the kharif crop season[1] every year, active forest fires on a daily basis[2], and all the major earthquakes and landslides in India and the adjoining region. The status of various components of DMS programme is given in Chart 6.1.

[1] June to October
[2] from February to June

Chart 6.1: Status of various components of Disaster Management Support programme and other communication networks

National Database for Emergency Management (NDEM)	•Incomplete •Project started in 2006. •Many departments and states, yet to appoint nodal officers. • Most of the data given by stakeholders was not in usable form. •No steering committee meeting was held since 2007. •Expenditure of ₹ 16.02 crore had been incurred as of July 2012.
Airborne Laser Terrain Mapping and Digital Camera System	•Incomplete •Procurement of equipmment took place in 2004. •Expenditure incurred - ₹ 23.75 crore (April 2003 to June 2012). •Less than 10 *per cent* of the flood prone area was covered as of June 2012. •No survey were conducted after August 2010.
Disaster Mangement Synthetic Aperture Radar	•Incomplete •Project approved in February 2003. •Expenditure incurred - ₹ 28.99 crore (upto July 2012). •After October 2008, no aeriel surveys were conducted.
Satellite Based Communication Network for Disaster Management	•Incomplete •Proposed date of completion was December 2005. •Equipmment were procured in 2006. •Expenditure incurred was ₹ 6.77 crore (upto July 2012). •Many nodes were non-opertaional, including these at PM's Office and residence.
Doppler Weather Radars	•Incomplete •Project planned in 2006. •Expenditure incurred - ₹ 35.64 crore (upto March 2012). •Radars yet to be set up, delivery of equipment not taken.
National Disaster Communication Network	•Incomplete •Project conceptualised - October 2007. •Detailed Project Report and Expenditure Finance Committee memo were sent to MHA in December 2011 after several revisions. •Project was in the preparation stage as of June 2012.
National Disaster Management Informatics System	•Incomplete •Project conceived in March 2008. •Concept note prepared in April 2010. • In January 2012, National Remote Sensing Centre became the implemneting agency to avoid duplication with NDEM. •Project was yet to be approved by MHA.

6.1.1 National Database for Emergency Management (NDEM)

Department of Space had undertaken a project to develop National Database for Emergency Management. The mirror image of the database was to be maintained in MHA under a team of experts located there.

NDEM was conceived as a Geographic Information System (GIS) based repository of data to support disaster management in the country.

The NDEM activity envisaged the timely provision of necessary geospatial information to the stakeholders. The scope of NDEM encompassed all possible disasters, natural as well as human-induced and technological. Developing a GIS based national database and application of geospatial technologies were considered central to the effective realization of NDEM goals.

6.1.1.1 Implementation of the project

During the period 2006-12, DOS made a budget provision of ₹ 22.30 crore for the NDEM project under Disaster Management Support programme, out of which only ₹ 6.34 crore were spent (2006-07 to June 2012). In addition, ₹ 9.68 crore were spent on civil works for constructing facility for housing NDEM project.

Project was to be completed by 2011 but it had not become operational till July 2012.

We noted serious gaps in data collection, its storage and utilisation. Details are provided in **Annex - 6.1.**

DOS stated (July 2012) that the implementation of NDEM project was planned as a multi-institutional coordinated effort. Different datasets ingested into NDEM project were generated and were available with different organizations. It however, added that the database implementation was delayed as response from nodal departments was not encouraging.

6.1.1.2 Non identification of nodal officers

In August 2007, MHA instructed all states, nodal Ministries and Departments to identify a nodal officer to act as a single point of contact with National Remote Sensing Agency (NRSA) for sharing geospatial data sets for NDEM project. However, 6[3] out of 37 central departments and organizations and 8[4] out of 35 states and UT Governments had not identified nodal officers for providing geospatial data for NDEM server (May 2012).

6.1.1.3 Data for NDEM

The technical document for NDEM project was sent to nodal Ministries and states by NRSA (March 2008). They were required to provide the details of database available with them. Only 5[5] out of 37 central organizations and departments had

[3] Election Commission of India, National Hydrographic Organisation, Ports Authority of India, Ministries of Shipping & Surface Transport, Water Resources and Rural Development

[4] Himachal Pradesh, Jammu & Kashmir, Nagaland, Odisha, Uttarakhand, Chandigarh, Dadra & Nagar Haveli and Lakswadeep

[5] Airports Authority of India, Ministries of Steel and Railways, Department of Space and National Bureau of Soil Survey & Land Use Planning

supplied the data as of July 2012, of which, only four had supplied data in usable form.

Similarly, only 3[6] out of 35 states and UTs had supplied the data, of which, data from one state i.e. Punjab was in usable form and was ingested in NDEM.

6.1.1.4 Steering committee meetings

The steering committee was to oversee the implementation of NDEM project at the apex level. We noted that the last meeting of the steering committee was held in June 2007 and no meeting was conducted during the last five years.

6.1.1.5 Mirror image of the database

Mirror image of database was to be maintained in MHA by a team of experts. This could not be done as MHA was yet to finalize the mirror site (July 2012).

We noted that after making efforts for more than seven years and expenditure of ₹ 16.02 crore, the critical facility of NDEM project had not been created due to ineffective coordination by the implementing agencies.

6.1.2 Airborne Laser Terrain Mapping and Digital Camera (ALTM-DC) system

Indian Space Research Organisation (ISRO) formulated a programme for creation of a digital, thematic and cartographic data base for hazard zonation and risk assessment. Under this programme ISRO and National Remote Sensing Agency (NRSA) planned to cover one lakh sq km every year for the development of close contour information of ground using the Airborne Laser Terrain Mapper (ALTM) system, thereby envisaging coverage of all the priority flood prone areas (five lakh sq. km.) in a period of five years.

The system was proposed to be used to generate close-contour data[7] for disaster prone regions of the country. Based on this, frequency of floods/cyclones, and demographic information, hazard zonation and risk maps were to be generated.

DOS/ISRO spent ₹ 23.75 crore from April 2003 to June 2012 for procurement and operationlisation of ALTM-Digital Camera. The system arrived at NRSA in May 2004.

CAG's Performance Audit Report on the activities of National Remote Sensing Centre (Department of Space), No. 21 of 2010-11 also highlighted that there was a delay in implementation of the project due to delay in obtaining clearance from Ministry of Defence and non availability of pilots.

We noted that an action plan was prepared by NRSA for ensuring systematic acquisition of ALTM data during 2007-11. However, the survey work was conducted only up to August 2010. By then, data acquisition for only 38,020 sq km was completed against the target of 60,000 sq km[8] (let alone the original objective/plan of covering five lakh sq km in five years).

[6] Punjab, Tripura and Mizoram

[7] NDMA envisaged maps to scale 1:10000 with contours at an interval of 0.5/1.0 m

[8] This target was as per plan of action for acquisition of ALTM data for priority areas during 2007-11

Thus, after investment of ₹ 23.75 crore in procurement and operationlisation of ALTM-Digital Camera, less than 10 *per cent* of the flood prone area of the country was covered to generate close contour and detailed topographic information.

6.1.3 Disaster Management Synthetic Aperture Radar

Disaster Management Synthetic Aperture Radar (DMSAR) operating in C-Band[9] was used to acquire aerial radar data during natural disasters when no satellite data coverage was available. It was used for purposes like flood mapping, damage assessment, etc. The system was to be developed by Space Applications Centre, Ahmedabad and operated by National Remote Sensing Agency (NRSA), Hyderabad. The project was approved in February, 2003 with a total budget estimate of ₹ 20.20 crore.

We noted that DMSAR surveys including (i) test flights (ii) pre-flood sorties, and (iii) flood sorties were carried out during the year 2007 and 2008 in different parts of the country by using the prototype developed by NRSA. However, after October 2008 no aerial survey was carried out using DMSAR equipment.

Aircraft and ASAR instruments

National Remote Sensing Centre suggested a triggering mechanism for DMSAR data acquisition in November 2009. Demonstrations and trainings were to be provided by ISRO to State Governments to build capacity for aerial data acquisitions.

We noted that no action had been taken by ISRO/DOS for establishment of such trigger mechanism. No demonstrations and trainings were provided to the states' agencies (July 2012). Thus, even the developmental model of DMSAR could not be used and the system remained idle.

Support through DMSAR under ISRO's Disaster Management Support programme by acquiring aerial radar data during natural disasters could not be materialized even after incurring an expenditure of ₹ 28.99 crore[10] and a lapse of six years from the scheduled date of completion.

[9] C-band is a name given to portions of the electromagnetic spectrum, including wavelengths of microwaves that are used for long-distance radio telecommunications. DMSAR operates in C- band at 5.35 GHz.

[10] The additional amount was spent from DMS overall budget.

6.1.4 Satellite based communication network for disaster management

For providing emergency communication, at the behest of MHA, ISRO was to set up a satellite based Virtual Private Network (VPN) facilitating secure data access through a dedicated electronic network connecting all the key players of disaster management. The VPN was to be set up in three phases. In the 1st phase, MHA, Cabinet Secretariat, NDMA, PMO, other key data providing agencies[11], and NRSA were to be connected with 20 multi-hazard prone State Emergency Operation Centres (SEOCs). The subsequent phases were to see expansion of the network to link the multi-hazard prone District Emergency Operations Centre (DEOCs) in the country.

The network was proposed to be ready for regular operation from December 2005. We noted the following:

The communication equipment was procured and delivered to the states by the middle of 2006.

The Disaster Management Support-VPN was made functional using a full transponder on Edusat satellite in September 2006. However, VPN services were not provided from 28 September 2010 to 31 March 2011 as the satellite stopped working. In October 2010, 13 MHZ on INSAT 3E were allocated for DMS-VPN but the re-orientation of hub towards INSAT 3E could only be completed in June 2011. Subsequently a request was made in February 2012 to re-orient the network to GSAT 12.

As of July 2012, the status of operationlisation of VPN network was as under:

- Out of 10 primary nodes, one node at IMD, Delhi was not fully operational.
- Out of five monitoring nodes, two[12] were not operational.
- Out of 20 state nodes, two nodes[13] were not operational.

The reasons provided for non-operationlisation of the nodes are given in **Annex - 6.2**.

MHA stated (December 2012) that Satellite Base Virtual Private Network (VPN) for disaster management support was launched by Department of Space to strengthen the communication backbone. Due to flooding of the building where it was located, the same was shifted to DCPW Campus. However, its formal transfer to DCPW was in the pipeline. Out of 37 nodes, 32 are functioning presently.

Thus, DMS Communication Network which was to become functional by December, 2005 was not fully operational even after six years of receipt of the communication equipment and incurring expenditure of ₹ 6.77 crore.

6.1.5 Doppler Weather Radars

For the surveillance and monitoring of severe weather system such as cyclones, ISRO planned to develop and establish Doppler Weather Radars (DWRs). The DWR systems were to substantially increase the lead-time for cyclone warning by providing quantitative information on

[11] IMD, CWC, GSI, SOI, INCOIS and NIDM

[12] At the Prime Minister's Office, Delhi and the Prime Minister's residence, Delhi

[13] At Shimla and Mumbai

the intensity and radial velocities of cyclones. These were also to improve the understanding and forecasting of thunderstorms, hailstorms, tidal waves, wind turbulence and shear[14].

These radars were to be set up jointly by India Meteorological Department (IMD) and DOS with the available indigenous technology on data and cost sharing basis. The Cabinet Secretary directed (November 2005) IMD and ISRO to work towards setting up of DWR's in Assam by 30 June 2007. In March 2006, a draft MoU was prepared jointly and IMD was requested to approve the same. But no response from IMD was received (July 2012).

Doppler Weather Radar

Pending finalization of MoU with IMD, in April 2006, ISRO decided to proceed with the development of two S-band radars for the North-Eastern region on its own. ISRO also initiated the process of development of two more S-band radars in the Himalayan region with participation by DRDO in February 2008. Later ISRO decided to develop C-band Radar at Thiruvananthapuram in January 2009. These radars were to be supplied, installed and commissioned by M/s Bharat Electronics Limited[15], Bangalore. Against a budget of ₹ 47.15 crore for these works, ₹ 35.64 crore was spent (March 2012) but the radars were yet to be set up.

DOS stated (July 2012) that all the four S-Band DWRs were ready for delivery at BEL. They further stated that DOS (ISTRAC[16]) had not taken the delivery of these radars officially as there were inter-departmental issues regarding diverting the radars.

We noted that IMD had requested BEL in July 2010 to explore the possibility of diverting the radars manufactured for ISRO to meet their emergent requirements at Goa, Kochi, Karikal and Paradeep. ISRO agreed for diversion in September 2010 but four radars were yet to be set up (July 2012).

Under construction building for S-Band DWR at Cherrapunji

[14] Wind shear is a difference in wind speed and direction over a relatively short distance in the atmosphere.

[15] BEL is industrial partner of DOS in development of radars

[16] ISRO established a comprehensive network of ground stations to provide Telemetry, Tracking and Command support to satellite and launch vehicle missions known as ISRO Telemetry, Tracking and Command Network

Thus, an amount of ₹ 35.64 crore spent by DOS under DMS programme for setting up of the five radars was blocked without yielding any fruitful results due to lack of effective co-ordination with IMD. Out of five sites, only two sites i.e. Cherrapunji for one S-Band DWR and Thiruvananthapuram for C-Band DWR were finalized. Civil works were in progress and hence these were yet to be made operational (July 2012).

Thus, despite an expenditure of ₹ 111.17 crore, none of the five components under DMS programme were fully operational (July 2012).

6.2 Other communication networks:

6.2.1 National Disaster Communication Network

During a disaster, the existing terrestrial communication networks are prone to failure. To address this risk, NDMA decided to set up the National Disaster Communication Network (NDCN).

NDCN was planned as a network of networks by providing appropriate connectivity to the existing communication networks viz. NICNET, State Wide Area Networks (SWANs) and POLNET, etc., to various Emergency Operation Centres. The concept paper for the project was sent by NDMA to MHA in October 2007. We noted delays at various stages involved in the preparatory work of the project, since the submission of the concept note. As a result, the ambitious project of NDMA to provide networking for integration of various disaster management tools in the country was still at the preparation stage even after a lapse of more than four years (June 2012).

MHA stated (December 2012) that NDCN Project was very comprehensive and important, detailed consultations with various stake holders had to be held and accordingly the project was formulated to bring about effective coordination among various communication networks presently working in the field of Disaster Management.

6.2.2 National Disaster Management Informatics System

NDMA in March 2008 proposed to establish the National Disaster Management Informatics System (NDMIS) for utilizing the GIS platform tool in disaster management. NDMIS was to host the core database and disaster specific database for carrying out vulnerability analysis and risk assessment.

We noted that when NDMIS was proposed, NRSC was already developing NDEM for MHA. To avoid duplication of work, NRSC on request of NDMA made a presentation in March 2008 for establishment of NDMIS. NRSC submitted the project proposal for NDMIS in September 2009. Based on the project proposal, NDMA submitted the concept note to MHA in April 2010. MHA however, had concerns regarding data availability and justification for a separate project other than NDEM.

We noted that even after four years, the development of NDMIS was yet to be

approved by MHA (May 2012) and the project was still in the conceptualization stage. The project was delayed in the process of resolution of the issue of duplication of the efforts for NDEM and NDMIS.

MHA stated (December 2012) that the project had been carried out for the first time in the country, its preparation had taken some time as it was evaluated with National data for emergency management to avoid duplication.

Audit noted that both NDEM and NDMIS projects had not been operationalised. This had affected the development of a GIS based national database and application of geospatial technology for disaster management in the country.

6.3 State disaster preparedness:

6.3.1 Communication network

- In ANI, Indian Space Research Organisation (ISRO) installed a V-SAT system (DMS Node) under Disaster Management Support programme at Port Blair in 2006 which was non functional for several years. We further noted that there were 13 Emergency Operation Centres (EOCs) but only seven Video Conferencing Systems were procured in two batches in March 2007 and March 2012. Further, the installation was completed at only three EOCs. Thus, connectivity between State Control Room and the remaining ten EOCs was yet to be established through VSAT.

- DDM, ANI proposed (March 2011) to establish a dedicated "Ocean Information Dissemination System" through Indian National Centre for Ocean Information Services (INCOIS) in SCR In April 2011. DDM requested INCOIS to make necessary arrangements to install the dedicated system alongwith a hotline, which was yet to be made functional.

- State Disaster Management Plan of West Bengal proposed an ambitious central communication network for disaster management connecting SEOC to DEOC and DEOCs to Block Emergency Operation Centres (BEOCs) through VSAT etc. However, no progress was noted in the development of this network.

- GoI had sanctioned two Doppler Radars (June 2008) for Uttarakhand to strengthen early warning indicators related to disasters. The Doppler Radars were to be purchased, installed and manned by IMD and the State Government was to make available land for this purpose. These radars were proposed to be installed in Nainital and Mussoorie but were not installed due to non availability of land (August 2012).

6.3.2 Communication equipment

- In the test checked districts of Odisha, we noted that timely action was not taken for repair of the communication equipment after reporting of defects. The Annual Maintenance Contract for 35 satellite phones provided to the District Emergency Operation Centres (DEOCs) and other offices had not been renewed. Further, the Annual Maintenance Contract of 414 VHF sets provided to various DEOCs and other offices had expired on 7

September 2011 and had not been renewed (August 2012).

- In Rajasthan, High Band Frequency (HBF) wireless sets were supplied (September 2009) to Superintendent of Police (SP), Barmer and Jalore districts for easy and early communications in case of any disaster. We noted instances of wireless sets lying uninstalled (May 2012) in these districts. The SP, Barmer stated (May 2012) that uninstalled wireless sets were lying in sub store, Barmer and process of their distribution would be started soon.

- An Expert Committee in ANI resolved (January 2010), to strengthen the communication network between the islands by means of Satellite Communication System. Directorate of Disaster Management (DDM) found (July 2010) that only five satellite phones were available in the Islands and thus a proposal was mooted to purchase 13 satellite phones for different locations. The satellite phones were yet to be supplied as of May 2012.

6.3.3 Other issues of concern

- In West Bengal, we noted that warning to the public was given through public address systems, radio, television, etc. Apart from this, no independent communication network for disaster management existed at the state level. The department accepted that the system in place was not fully reliable. We could not ascertain the delays in dissemination of warning as data was not maintained indicating the message in and out times.

- In Uttarakhand, no risk management plan was prepared for early warning. Requisite tools and mechanism for providing early warning indicators in regard to disaster were also not in place. Reliable communication system was inadequate as the sharing of disaster information was delayed by more than three hours in 50 to 86 *per cent* cases.

Recommendations:

- ***DOS should ensure that National Database for Emergency Management (NEDM) is operationalised at the earliest.***
- ***Digital, thematic and cartographic data base is required for hazard zonation and risk assessment for development of close contour information of ground. ISRO and NRSA should ensure timely completion of this activity.***
- ***ISRO should fully operationalise the satellite based DMS Communication Network and Doppler Weather Radars at the earliest.***
- ***NDMA should ensure implementation of NDCN and NDMIS projects.***

Chapter – VII:

Response System for Disasters

The efficacy of the government's role in disaster management is judged largely by the quality of 'response' and its effectiveness in minimizing loss of life and property of affected people. The response to disasters also tests the level of preparedness and provides valuable lessons for future planning.

NDRF Battalions at the disaster site

7.1 National Disaster Response Force

National Disaster Response Force (NDRF) was formed in 2006 as a specialist force with the capability to deal with all types of natural and man-made disasters. The headquarters was located at New Delhi and it had 10 battalions spread all over the country.

7.1.1 Formation of NDRF

A steering committee, headed by Home Secretary was formed in 2003 to review the progress of disaster response. The Committee decided to earmark eight battalions of Central Armed Police Forces (CAPFs) as specialised force for disaster response.

NDRF was raised in January 2006 by up-gradation and conversion of eight standard battalions of CAPFs[1] only after enactment of DM Act in 2005. Two additional battalions of NDRF were raised in October 2010. Thus, a total of 10 NDRF battalions were raised (May 2012).

[1] two each from Border Security Force, Central Reserve Police Force, Indo-Tibetan Border Police and Central Industrial Security Force

As per Section 45 of DM Act, NDRF was to function under the general superintendence, direction and control of NDMA. Accordingly, a separate NDRF headquarter was established in July 2009. Till then, though NDRF was functioning directly under NDMA, its deployment was being done by MHA.

7.1.2 Efficiency and effectiveness of response by NDRF

Audit findings are discussed below:

7.1.2.1 Manpower management

We noted critical gaps in the required efficiency and available resources of NDRF.

- In terms of the administrative orders issued (October 2010) by MHA, each battalion was to have a strength of 1149 posts including specialised posts such as medical officers, engineers, paramedics, technicians, electricians and other technical staff. Deficiency of 3071 personnel (27 *per cent)* was noted in audit (May 2012), of which specialised posts constituted 43 *per cent* (1318). MHA stated (December 2012) that the vacancy position was regularly forwarded to the concerned CAPFs on monthly basis to fill up the vacant posts. Efforts were being made to fill vacant posts on contract basis.

- We also noted shortage of manpower in NDRF Headquarters. NDRF stated that they had requested the concerned CAPFs several times but due to deficiency of personnel in CAPF itself, the vacancies could not be filled up.

We noted that during 2009-12, 18 to 27 personnel were attached from various battalions to Headquarters without the sanction of MHA.

NDRF stated that functioning of a full-fledged headquarter with all the required branches was not possible with available staff of 11 personnel. It also added that a proposal for creation of 33 posts was pending with MHA for sanction since 2009 and the headquarter was functioning by attaching personnel from NDRF units.

- We noted that 73 personnel of NDRF were attached with various CAPFs and there were 190 Lower Medical Category (LMC)[2] personnel in NDRF. Attachment of NDRF personnel with CAPF depleted its strength and presence of LMC personnel could impact the efficiency of the Force during disaster response. MHA stated (December 2012) that out of 73 personnel of NDRF, 35 personnel were de-attached by the respective force. Efforts were being made to detach remaining personnel from CAPFs formations. So far as LMC personnel were concerned, the CAPFs were asked to take back LMC personnel from NDRF.

- According to the NDRF Rules, 2008 personnel of a CAPF battalion deputed to NDRF were to remain posted in such battalion ordinarily for a period of five years. It was also decided (May 2011) that NDRF battalions should have a minimum 10 *per cent* of its personnel to constitute 'Core Group'. We noted that the list of such personnel were not finalised by MHA (July 2012).

- NDRF was constituted for disaster response with a single chain of command. We noted that the inter-battalion transfers of personnel were executed by concerned Directors General of CAPF only and not DG, NDRF. The matter was under consideration in MHA (December 2012).

[2] LMC: Force personnel with less than perfect physical requirements

7.1.2.2 Deficient system of training for NDRF personnel

NDRF required skill intensive, operation oriented training with demonstration and hands-on contents to effectively respond to disaster situations. NDMA had prepared the 'Training regime for disaster management' which was a detailed report on the training requirements of NDRF. We noted the following:

- There were constraints in providing specialised training to NDRF personnel. For advance courses training, NDRF personnel were sent to other government and private institutions such as DRDO[3] (for chemical emergency), BARC (for radiological emergencies)[4], HMI[5] Darjeeling (for mountain rescue) and defence establishments (Heli-slithering) etc. However, the training slots made available in these institutions for NDRF personnel were insufficient.
- NDMA decided (2006) to establish a 'National Institute of Disaster Response (NIDR)' to cater to the training needs of NDRF and also other stakeholders such as SDRF, CAPFs, Civil Defence personnel etc. The proposed Institute had not been set up so far despite government of Maharashtra having offered (November 2007), 110 acres of land for it at Nagpur and NDMA accepting it (July 2008).

7.1.2.3 Deficient infrastructure in NDRF

Three (2nd, 5th and 6th) out of 10 battalions located at Kolkata, Cuttack and Gandhinagar respectively were sharing accommodation with other CAPFs and even temporary infrastructure (pre-fabricated huts) for office, residential and storage accommodation could not be established for them. We further noted that MHA approved (November 2009 and April 2010) the infrastructure norms for each battalion of NDRF. Despite a proposal of ₹ 3171.58 crore being under consideration of MHA since December 2011, the standard infrastructure was yet to be created for the NDRF battalions (December 2012).

- NDRF headquarter was accommodated by constructing temporary huts at the roof-top of Civil Defence Secretariat Building. Similarly, a control room for NDRF operations was also housed in a temporary accommodation at the roof top of the Civil Defence Secretariat Building. However, this room was functioning without any power back up due to objection by 'Central Public Works Department' exposing it to disruption in operations. The proposal for provision of suitable accommodation was under consideration of MHA.

Temporary accommodation of NDRF headquarters created at roof top of Civil Defence Secretariat Building

MHA stated (December 2012) that NDRF had identified a suitable building for accommodating NDRF HQ and two teams of NDRF, and the matter was being processed. The Control Room of this HQ would be made fully operational after hiring of this accommodation.

[3] Defence Research and Development Organization
[4] Bhabha Atomic Research Centre
[5] Himalayan Mountaineering Institute

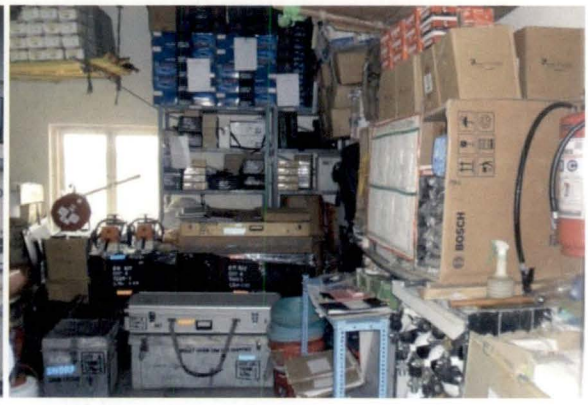
Field Inspection of 8th battalion of NDRF:

We conducted an inspection of the base of the 8th battalion to visually assess the infrastructure facilities at the location of the battalion situated at Kamla Nehru Nagar, Ghaziabad. This battalion was raised in 2006 and is situated at this location since November 2011.

Fuel stored in open

We noted that there was no boundary wall surrounding the allotted land. The equipment and other material were stored in temporary rooms. There was lack of adequate space for storing these materials which led to their stacking. Certain equipment like portable generators and even the fuel for vehicles were stored in the open space. The NDRF personnel were accommodated in temporary tents at the site and the dwelling units lacked basic facilities.

Portable generators stored in open



Equipment stored in temporary rooms

NDRF stated that location of 8th battalion falls under the green belt as per Ghaziabad Development Authority (GDA) master plan 2021 and thus permanent building structures cannot be built. The matter was being pursued by them with Ministry of Urban Development and GDA for settlement. NDRF further added that construction of boundary wall and permanent infrastructure would start only after clearance from GDA.

7.1.2.4 Non procurement of equipment for NDRF battalions

MHA in September 2006 approved procurement of 310 items for making NDRF battalions operational. Out of the 310 items, 198 items were to be procured by the respective DsG and 112 items were to be procured centrally. We noted that as of June 2012, 17 items could not be procured. Of these, procurement was in progress for 9 items, tender had been awarded for 5 items and 3 items were put on hold. The procurement of these items was delayed due to repeated re-tendering attributed to equipment not fulfilling the required technical specifications. This critical equipment, such as satellite phones[6] and hydraulic jack, is expected to play a pivotal role in rescue operations during a disaster.

We noted that the specifications decided by MHA were changed frequently by Specification Review Committee (SRC) constituted by NDMA, adding to the delay.

7.1.2.5 Idling of equipment

- Portable ultra sound machines were approved by MHA (September 2006) to provide medical relief during disaster response. Regular radiologist or trained General Duty Medical Officer (GDMO) in ultra sonography technique was required for installation of these machines. Six portable ultra sound machines were procured by DG, ITBP for NDRF units at a total cost of ₹ 36.66 lakh (March 2009). We however, noted that there was no regular radiologist or trained GDMO in ultra-sonography technique with NDRF. Therefore the machines were not installed even after two years of their procurement. Subsequently, two doctors of NDRF underwent ultra-sonography course after which these machines were installed in 2011-12 but were never put to use (July 2012) despite NDRF being deployed for various disasters like earthquake and floods. Further, only two doctors were available (July 2012) for operating these six ultra sound machines located at six different units of NDRF. The present arrangement had a risk of rendering the machines futile due to sub optimal utilisation. NDRF stated that efforts were being made to retain qualified doctors till other doctors get qualified in ultra-sonography. MHA stated (December 2012) that two NDRF doctors were already qualified in sonography and steps were taken to detail other doctors for the sonography course.

- NDMA purchased four Chemical, Biological, Radiological and Nuclear (CBRN) Hazmat vehicles for ₹ 16.04 crore in September 2010. Further, two Integrated CBRN Surveillance Vehicles and six Integrated CBRN Monitoring Systems were also procured by NDMA in September 2010 at a cost of ₹ 12.64 crore for use during CWG-2010. These CBRN vehicles and equipment were handed over to NDRF after completion of CWG-2010 and were stationed at 8th NDRF battalion, Ghaziabad.

CBRN Vehicles at 8th NDRF battalion

[6] The need for satellite phone was felt during response by NDRF in the aftermath of Sikkim earthquake in September 2011

We noted that there were technical deficiencies in these vehicles which had not been rectified by the supplier. Against an amount of ₹ 16.04 crore, NDRF had released ₹ 6.42 crore for Hazmat vehicles. Similarly, against an amount of ₹ 12.64 crore, NDRF had released ₹ 5.06 crore for Integrated CBRN Surveillance Vehicles and Integrated CBRN Monitoring System (June 2012). If the deficiencies in these CBRN vehicles and equipment were not rectified, they could serve no purpose in the eventuality of CBRN disasters. MHA stated (December 2012) that repair work of Integrated CBRN Monitoring System had been completed and repair work of CBRN Vehicles (Hazmat Vehicles) would be started soon.

- Under the National Emergency Communication Plan (NECP) – Phase-I, MHA procured VSAT equipment in January 2005 for various users including NDRF. We noted that the equipment were supplied to DCPW[7] by May 2006 but were installed between October 2008 and March 2009 after a delay of more than two years.

VSAT for NDRF headquarters was received by them in November 2009 but was not installed due to non availability of space and was stationed at 8th NDRF battalion. Thus NDRF headquarters was not using the system to communicate with its battalions.

Mobile VSAT

Further, a VSAT mounted on a vehicle to be used as Mobile Emergency Operation Centre was also stationed at 8th battalion NDRF from December 2011. It had not been made operational due to technical reasons (June 2012). MHA stated (December 2012) that at present sufficient space was not available to install VSAT at HQ, NDRF location and it would be installed after allocation of new accommodation.

7.1.3 Deployment of NDRF battalions

7.1.3.1 Standard Operating Procedures

Prior to January 2011, there were no Standard Operation Procedures (SOPs) for the deployment of NDRF and the deployment was done on behest of NDMA and MHA. We noted that NDRF battalions were deployed even for election duties till 2009-10.

In January 2011, SOPs on deployment of NDRF was prepared and sent to MHA for approval. MHA conveyed (February 2011) that the "SOP was for the use of concerned agencies and its constituents for effectiveness and efficiency of an activity to be carried out. As such, circulation of SOP of NDRF to the states and UTs was not advisable".

[7] Directorate of Coordination Police Wireless

NDRF deployed during a building collapse incident

As the SOPs prepared by NDRF had not been circulated amongst State Governments and UTs, there was no clarity regarding deployment of NDRF and the magnitude or intensity of disasters for which NDRF was to be deployed.

We found that NDRFs were being deployed even for small and localised disasters such as drowning cases, collapsed structures, car accident, etc.

MHA stated (December 2012) that deployment of NDRF would be done after consultation with respective Commandant under intimation to MHA and NDMA. In case of the requisition placed directly to NDRF battalions due to emergent nature of situation the Commandants would deploy NDRF personal immediately and intimate the same to DG, NDRF/MHA/NDMA.

7.1.3.2 Case study: Deployment of NDRF for the Sikkim earthquake

On 18 September 2011 at about 1812 hrs, there was an earthquake in Sikkim. MHA decided to send NDRF battalion on the same day for search and rescue operation. NDRF teams consisting of 403 personnel were airlifted from Hindon and Kolkata to Bagdogra air field on the night of 18 September 2011. From Bagdogra to Lauchan and Chungthan (North Sikkim), two teams were airlifted by Indian Air Force helicopters. NDRF was also deployed in Mangan area from Bagdogra in vehicles provided by civil administration.

Deployment of NDRF was in an area where there was already huge presence of Army and Indo-Tibetan Border Police engaged in rescue and relief work. NDRF was deployed by the State Government in those areas where dead bodies were trapped and could not be extricated. We found that NDRF team could extricate two dead bodies at Chungthan, two in Mangan area and one in Gangtok town.

Deficiencies noticed:

- A Post Emergency Response Team (PERT) which visited Sikkim after the earthquake stated in its report that NDRF battalions were not self-contained in respect to the food, water and shelters. NDRF personnel had to depend on local administration for essential items on the first day of reaching Sikkim till the time vehicles from Kolkata with supply of essential items reached Sikkim.

- There was no clear policy or procedure regarding the airlifting of NDRF personnel and material during disasters. Central Government provided airlift facilities in case of any disaster. Though each NDRF battalion was authorised to carry 140 tents along with it during deployment, due to paucity of airlift facility, 8th NDRF battalion of Ghaziabad could carry only 16 tents.
- When teams were air lifted by the Air Force, essential items like LPG, kerosene oil, etc. were not permitted to be loaded. Thus, NDRF battalion reached the disaster site without these essential items and remained dependent on civil agencies for these items.
- There was no clarity regarding mechanism for movement of vehicles for transportation of men and heavy equipment to the incident site. NDRF again depended on civil administration for transportation. NDRF team from Bagdogra air field moved in vehicles of the civil administration to the disaster site. Thus, instead of being self contained, they added more logistical responsibilities to the civil agencies already busy with rescue work.
- NDRF was deployed without identifying the extent of damage and areas for deployment causing confusion.
- Communication system was paralysed and the lack of satellite phones impaired the rescue operation at the time of earthquake.

From the above, it was evident that the NDRF battalion was ill equipped to deal with the situation. MHA attributed these deficiencies to mode of transport which created the hindrance.

Lessons learnt: These limitations in the working of NDRF were communicated by NDRF to MHA in October 2011 but even now SOPs for deployment had not been finalised and there were no prescribed protocols. Thus, no lessons were learnt from the limitations noticed during this disaster.

MHA stated (December 2012) that approval for procuring the ready to eat meal for NDRF Bns had been conveyed and same was now being procured by the Commandants of unit to avoid such dependence during the emergency response. It further added that NDMA had been approached to finalise the SOP and forward the same to all the states for better coordination during operation.

7.2 State Disaster Response Forces

National Policy on Disaster Management 2009 provided that the primary responsibility for disaster management rested with the states. Under the policy, the states were encouraged to create response capabilities from within their existing resources. To begin with, each state was to aim at equipping and training one battalion equivalent force known as State Disaster Response Force (SDRF). NDRF battalions and their training institutions were to assist the states and UTs in this effort. The states and UTs were also encouraged to include disaster management training in their respective Police Training Colleges and basic in-service courses, for officers.

In accordance with the policy, the Central Government had provided assistance for training of trainers. The State Governments were advised to utilise 10 *per cent* of their State Disaster Response Fund and Capacity Building Grants for procurement of search and rescue equipment and training of the Response Forces.

7.2.1 Raising and training of SDRF

We noted that till June 2012 only seven states[8] had constituted SDRF in their respective states.

SDRF- Jammu & Kashmir

We also noted that SDRF personnel were trained by NDRF battalions and the master trainers of the State Police were trained by NDMA. However, NDMA was not aware of the strength of SDRF battalions in the states. Till June 2012, only 244 Master Trainers and 714 SDRF personnel were trained by NDMA and NDRF.

[8] Bihar, Odisha, Rajasthan, Gujarat, Maharashtra, J&K, Nagaland

7.3 Regional Response Centre

The decision to establish Regional Response Centres (RRCs) was taken in October 2003 in the first meeting of the Steering Committee of MHA to review the creation of capacities for disaster response. The RRCs were to be manned and operated by Central Armed Police Forces established at various locations in the country. These Centres were to provide links for enabling NDRF battalions to respond to local flood, cyclone and other natural disaster situations.

MHA in 2004 sanctioned setting up of eight RRCs and seven Nodal Centres (in high altitude and hilly areas). We noted that three RRCs at Guwahati, Mundali and Arakkonam were manned and operated by NDRF as they were co-located with NDRF battalions. The remaining were manned and operated by CAPFs.

The following issues were observed regarding the operation of RRCs:

7.3.1 Equipment for RRCs

CAPFs were authorised to purchase 40 items of identified necessary equipment (@ ₹ 75.24 lakh per centre) to be kept in the RRCs to save time in carrying them to affected areas and make it easy to respond in case of emergency. However, CAPFs did not make their respective RRCs functional, despite the sanctions issued by MHA. The equipment which were procured and kept at respective locations were lying unused for want of proper guidelines.

CAPFs attributed (September 2010) the non-formation of RRCs and idling of equipment to shortage of accommodation and manpower, non-receipt of requirements from State Governments and lack of deployment of trained personnel of NDRF. MHA stated (December 2012) that the equipment would be utilised as and when these RRCs were deployed for disaster response.

7.3.2 Manpower for RRCs

RRCs were to be manned and operated by CAPFs as these centres were to be utilised for immediate response to a disaster till NDRF reached the affected area.

In January 2011, there was a proposal for deployment of suitable number of trained personnel of NDRF in the 12 RRCs/Nodal Centres. We noted that NDMA was of the view that manning of all RRCs by NDRFs would deplete their manpower and adversely affect its command and control during an emergency.

In the absence of clear policy through SOPs and guidelines for the functioning of RRCs, and also in the absence of clarity regarding running of these Centres, their effective use during a disaster was uncertain. Thus, there was no monitoring mechanism to oversee the proper utilization of equipment lying with RRCs.

MHA stated (December 2012) that it had been decided to keep the RRCs with CAPFs.

7.4 Civil Defence and Fire Service

In 2009 MHA formulated schemes relating to civil defence and fire services and Director General Civil Defence (DGCD) was designated as the implementing agency. These schemes were the pilot projects of MHA for formulating a full fledged scheme for fire services and civil defence in the country by transforming the fire services into a multi-hazard response force capable of acting as the first responder in all emergency situations.

Civil Defence (CD) in the country operated under the Civil Defence Act, 1968. Civil Defence included any measures, not amounting to actual combat, for affording protection to any person, property, place or thing in the country against any hostile attack (internal disturbances as well as external aggression) which endangered the security of any life, property, place or thing.

7.4.1 Revamping of Civil Defence set up in the country

MHA proposed a scheme for revamping Civil Defence by strengthening it, so that it could play a significant role in disaster management and assist the police in internal security and law & order situations, while retaining its primary role. The scheme was approved in April 2009 with an outlay of ₹ 100 crore as a Centrally Sponsored Scheme and was to be completed by March 2012. The expenditure was to be shared between the centre and the states[9] and the scheme was to be managed by DGCD.

MHA released an amount of ₹ 70.25 crore during 2009-12 against which utilisation certificates amounting to ₹ 48.91 crore were pending (June 2012). The scheme was extended by MHA up to 31 March 2013 on the ground of delay in release of funds during 2009-10[10]. We noted that the utilisation of funds amounting to ₹ 11.05 crore out of ₹ 14.72 crore released during 2009-10 was revalidated by MHA in September 2010. Thus, despite availability of funds, the scheme was not completed.

MHA stated (September 2012) that implementation of the scheme was with the State Governments and the Ministry was only releasing funds. However, due to tardy implementation of the scheme in various states, the entire budgetary provisions could not be released. The scheme was expected to be completed by March 2013.

We further noted the following issues in implementation of the scheme in the test checked states:

[9] Up-gradation of existing institutions, construction of new institutes, transport and equipment to 100 CD towns, pilot project, monitoring & evaluation and publicity under the scheme were fully funded by central government. Expenditure on training camps was to be shared with states on 50:50 basis and the states were to bear the recurring expenditure.

[10] States received funds during Jan/Feb 2010

7.4.1.1 Utilisation of funds by the States

- In Rajasthan, allocation under the scheme was ₹ 324 lakh for the financial year 2009-10 to 2011-12. Out of the budget allotment of ₹ 230.60 lakh, the State Government utilised ₹ 164.48 lakh under the scheme and ₹ 66.12 lakh remained unutilised (March 2012). Due to non furnishing of utilisation certificates by the state, the GoI did not release the balance amount of ₹ 93.40 lakh.
- In West Bengal, allocation under the scheme was ₹ 7.29 crore for the financial years 2009-10 to 2011-12. The State Government received ₹ 5.52 crore till July 2012. Utilisation Certificates were pending (July 2012) for ₹ 37.60 lakh. We further noted that the state did not provide its share and hence it had to forego the Central grant of ₹ 58 lakh for organising training camps and exercises and demonstrations. The state also diverted ₹ 15 lakh in March 2010 for construction of a new training institute at Kalyani in violation of the scheme guidelines.
- We also noted that in West Bengal, funds amounting to ₹ 1.40 crore meant for creation of physical infrastructure at 10 multi-hazard prone district towns were diverted to purchase (January to February 2012) rescue vehicles, ambulances and other equipment. False utilisation certificate was furnished in April 2012 indicating the amount as having been expended on upgradation and renovation.

7.4.1.2 Other issues of concern

- We noted that Government of India released funds of ₹ 8 lakh in June 2011 to Rajasthan but the State Government had allotted funds only in February 2012 to meet the expenditure towards camps, exercises and demonstration. Thus, only 1087 persons could be trained out of 1485.
- MHA envisaged (April 2009) setting up of new training institutes in 10 states and UTs which did not have a Civil Defence formation. In September 2009, Directorate of Disaster Management, ANI requested the Department of Civil Defence, Government of West Bengal to provide necessary guidelines, and Action Plan for establishing similar Institute in ANI. Nothing tangible was sent the Government of West Bengal. As a result, the project had not been taken forward.
- In West Bengal, the Civil Emergency Force under Civil Defence has a sanctioned strength of 533 under Group B and C categories of staff who were directly involved in rescue operations. We noted that the men in position decreased from 326 in April 2007 to 147 in March 2012.

7.4.2 Upgradation of National Civil Defence College

The objective of the scheme was to create an "Institution of Excellence" at the national level to train a professional cadre of trainers for disaster response and

recovery management. We noted delays at various stages of the project as detailed below:

October 2004	MHA approved a proposal for up-gradation of the National Civil Defence College, Nagpur at a cost of ₹ 15.01 crore.
March 2007	Target date of completion but extended up to March 2008.
April 2009	Target date was further extended up to 2009-10 with cost escalation of ₹ 3.94 crore.
March 2010	Target date again extended up to March 2011.
May 2012	Target date again extended up to March 2013 without any financial implications. Reasons for extension were non procurement of certain equipment.

The cost escalation was mainly due to delay at various stages and lack of monitoring by MHA and National Civil Defence College.

MHA stated (December 2012) that the cost escalation was mainly due to sufficient funds not been made available by the Ministry of Finance and the upgradation was expected to be completed by March 2013.

7.4.3 Strengthening of Fire and Emergency services

As per the report of Thirteenth Finance Commission, deficiencies of fire services in the country were:

- Fire stations - 97.54 *per cent*
- Fire fighting & rescue vehicles - 80.04 *per cent*
- Fire personnel - 96.28 *per cent*

In order to fill these alarming gaps in fire fighting and rescue capabilities, a scheme called 'Strengthening of Fire and Emergency services in the country' with an allocation of ₹ 200 crore was sanctioned by MHA in October 2009. This was to be completed by 2011-12. The main objective of the scheme was to strengthen the fire and emergency services in the country and progressively transform the fire services into multi-hazard response force capable of acting as first responder in all emergency situations.

The scheme involved capital expenditure for procurement of equipment worth ₹ 178.12 crore and training, advertising, monitoring & evaluation amounting to ₹ 21.88 crore. The scheme was launched in November 2009.

We noted that:

MHA released ₹ 134.56 crore out of sanctioned ₹ 178.12 crore to states for procurement of equipment during 2009-12.	• The states could utilise only ₹ 41.14 crore for procurement of equipment as of June 2012 • Rajasthan and Uttarakhand had not fully utilised the amount released during 2009-10. • MP, Meghalaya, Punjab, UP and WB had incurred 'nil' expenditure against the releases of 2010-11.

Out of ₹ 21.88 crore sanctioned for training, advertising, monitoring and evaluation, ₹ 16.58 crore was released during 2009-12.	• DGCD could utilise only ₹ 12.56 crore as of June 2012. • Study on "Fire and Hazard Analysis in the country" awarded in June 2011 at a cost of ₹ 5.74 crore was also not completed as of May 2012.

MHA admitted the savings under various components of the scheme. It added that as the study was a novel concept and was being carried out for the first time in the country covering both urban and rural areas, it took considerable time and hence the period had to be extended.

The scheme of strengthening Fire and Emergency Services could not be completed within the time schedule due to:

(i) delayed releases and less release of funds to states by MHA,
(ii) procedural delays in provisioning of funds to the states, and
(iii) delay in signing of memorandums with states.

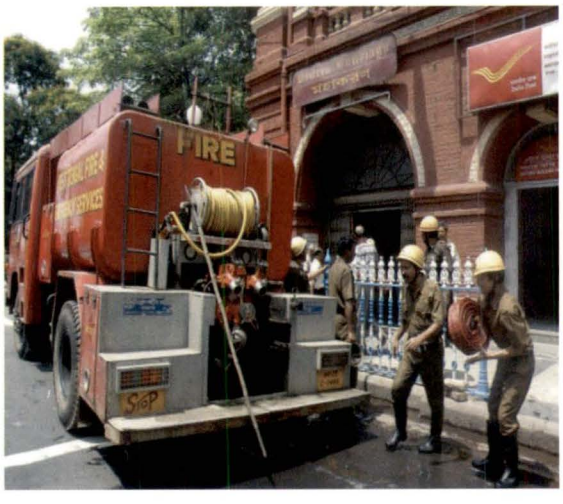
MHA in May 2012 extended the scheme up to 31st March 2013 without additional financial implications.

Thus, benefits of modern technology in fire fighting and rescue capabilities were not extended to stakeholders as conceptualised in the scheme. It had also delayed the future plans for up-gradation of fire services and to fill the gaps in fire fighting and rescue capabilities in the country.

On this being pointed out, DGCD stated (July 2012) that there were delayed releases and even funds could not reach the State Fire Departments in time. It further added that signing of MoU with Jharkhand and Tripura was also delayed which led to extension of the scheme for another year.

MHA stated (December 2012) that there was neither any procedural delay in provisioning of funds to the states nor much delay in signing of the memorandums with the states. Considering that the scheme was being carried out for the first time in the country and the money was released to the states progressively considering their utilisation capacity, the scheme had to be extended for a year so that benefits of modern technology in fire fighting and rescue capabilities could be extended to the stakeholders.

7.4.4 Fire services in states:



- In Andhra Pradesh, out of 22 fire fighting vehicles at various fire stations in Kakinada, East Godavari district, 14 vehicles did not have fitness certificate to ply on the roads. Many items of fire fighting equipment in the district required repairs and were not in working condition and were to be condemned.

- In the three selected districts of Bharuch, Jamnagar and Kutch of Gujarat, we noted that there were 57 men-in-position against the sanctioned strength of 112 personnel in the Fire and Emergency Services wing of Municipality and Municipal Corporation. Of these 23 were on daily wages and contractual basis. Many of the critical posts such as Chief Fire Officer, Assistant Fire Officer and Firemen were also vacant.
- In Rajasthan, we noted that out of the total allotted funds of ₹ 21.35 crore, the state could utilise only ₹ 6.18 crore for procurement of equipment as of March 2012.

7.4.5 Upgradation of National Fire Service College

The National Fire Service College (NFSC) was established at Nagpur in 1956 to conduct training for the officers. No expansion in the original capacity of NFSC was made since its inception. Keeping this in view, a scheme on 'Upgradation of National Fire Service College' was approved by the Cabinet in March 2005 at an estimated cost of ₹ 103.95 crore. The scheme was to be implemented within three years and managed by DGCD. The objective of the scheme was to enhance the capacity of the NFSC to meet the requirements of specialised professional training aspects.

The scheme involved execution of civil works of buildings, procurement of training aids and equipment and purchase of lab items. The civil work was entrusted to CPWD.

We noted delays in various stages of the project as detailed below:

2006	NDMA opined that the scheme should be held in abeyance as CPWD did not possess the contemporary know-how.
October 2006	NDMA constituted a core group which recommended appointment of consultant to prepare a Master Plan.
December 2009	Cost estimate of ₹ 200.57 crore was approved by Home Secretary.
April 2010	Approval of 'Committee on Non-Plan Expenditure (CNE)' for the scheme at an estimated cost of ₹ 205 crore to be implemented in three years was accorded.
September 2012	Upgradation work was in progress.

MHA stated (December 2012) that because upgradation of NFSC was approved in 2005 it was revised in 2010 to construct specialised and modern technical state of the art facilities. Presently, the construction of building by the construction agency (CPWD) was progressing well as per the availability of funds.

Thus, even after six years of initiating the project, the up-gradation had not been completed. This was affecting the disaster preparedness capacities and obstructed the transformation of fire services into a multi hazard response force.

7.5 Medical preparedness

Medical preparedness for disasters aims to create an institutional mechanism and systems that would result in the coordinated working of emergency responders, hospital managers and local and regional officials.

7.5.1 Institutional arrangement for medical preparedness

The programmes and procedures suited to the needs of the people in the state are formulated and implemented by the State Governments. At the national level, health programmes are implemented by the Ministry of Health & Family Welfare (MoH&FW) which also plays a key role in augmenting the capacities at all levels including extending necessary help during disasters and emergencies. In the MoH&FW, the Directorate General of Health Services (DGHS) is responsible for framing technical guidelines to guide the states for implementation of health programme strategies.

In disaster settings, the Emergency Medical Response (EMR) division of DGHS is the focal point for the Emergency Support Function (ESF) plan. It includes identification of nodal officers for coordination, crisis management committee and quick response teams at headquarters and field level. The decision making body is the Crisis Management Group under the Secretary, Health and Family Welfare.

7.5.2 Absence of Command and Control Centre

We noted that MoH&FW which supports other Ministries for medical response for other disasters does not have a 'Command and Control Centre' for effective coordination among various stakeholders for medical response during disasters. The report of the Working Group on Disease Burden for the Twelfth Five Year Plan had also recommended (July 2011) establishment of such Centre. However, MoH&FW in November 2012 stated that a control room in DGHS with basic communication equipment was activated as and when required during response to disasters. The fact remains that although MoH&FW opted for ad-hoc arrangements, there was no permanent Command and Control Centre for coordinating medical response during disasters.

7.5.3 CBRN facility

NDMA guidelines while recognising the lack of medical facilities for Chemical, Biological, Radiological and Nuclear disasters, emphasised the need for specialised facilities for protection, detection, decontamination, antidote administration along with usual care required for other injuries in case of CBRN emergencies. The guidelines also mentioned that medical facilities for CBRN disasters were lacking in the country.

Based on a prototype CBRN medical centre model by DRDE[11], DGHS initiated the process for setting up this facility in Delhi in September 2009. MoH&FW provided

[11] Defence Research Development Establishment

in-principle approval in March 2012 to carry out the pre project activities but no agreement was signed (July 2012).

MoH&FW cited (November 2012) lack of expertise in civilian sector within the country for establishing such a facility as reason for delay.

7.5.4 Mobile hospitals

Hospitals are also prone to seismic hazards. Thus, alternative modalities must be in place for a prompt and effective disaster response. One such modality is a Mobile Hospital[12].

EMR division noticed that one of the impediments to quick medical responses during the disasters witnessed by country was non-availability of dedicated medical facilities near the disaster site due to damage to regular health facilities. The mobile hospital provided at the disaster site by the international agencies during Gujarat earthquake proved vital in saving many lives.

A High Powered Committee (HPC), set up in August 1999 on global best practices for disaster management, in its report submitted to MHA, recommended setting up of five to six mobile hospital units. The report was accepted by MHA. The proposal for setting up of one mobile hospital by MoH&FW at RML Hospital, New Delhi was approved in 2003. NDMA in its guidelines have also recommended procurement of adequate number of mobile hospitals.

[12] A mobile hospital is a prefabricated, self contained; container based hospital which can be deployed by road, rail or air. This can be rapidly deployed to provide medical care to disaster victims.

We found that MoH&FW had not been successful in procuring any mobile hospital during last nine years. On three occasions bidders failed to comply with the terms and conditions of technical and commercial requirements of bid documents. However, the process of procurement was underway since 2010.

7.5.5 Non setting up of three mobile hospitals by MHA

The Committee of Secretaries approved MHA's proposal for building specialised capabilities for rapid intervention in case of disaster in February 2005. This proposal also included setting up of three mobile hospitals at a cost of ₹ 57.00 crore (non-recurring) and ₹ 3.13 crore (recurring). Three of these fully containerised mobile hospitals were so envisaged that these could be flown to the site of disaster, quickly. As per the cabinet note, one hospital was to be attached to National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore, one with CRPF Hospital, Guwahati and third was to be decided in consultation with Ministry of Health and Family Welfare (MoH&FW).

Subsequent events are summarised below:

April 2006	MHA decided that the modalities for procurement of these hospitals would be decided after the finalization of specification by MOH&FW.
June 2008	After more than two years, Secretary level talks were held between MHA and MoH&FW on finalization of specifications.
December 2010	MoH&FW intimated that the finalization of specifications would be completed by the end of January 2011.

July 2011	MHA sought the status of the proposal from MoH&FW.

We noted that even seven years since approval of the proposal, the hospitals had not been in place as MHA depended for its proposal on the MoH&FW. The specifications could not be finalised till August 2012.

MHA stated (December 2012) that setting up of mobile hospitals was directly linked to the finalization of procurement of a mobile hospital by MoH&FW as they had the expertise in the area. However, it would be able to setup the mobile hospitals only after MoH&FW finalises the procurement of hospital for itself.

We noted that both MHA and MoH&FW were involved in procurement of mobile hospitals with the latter being responsible for providing technical specifications to MHA. Due to delay in procurement of mobile hospitals, the country faced critical gaps in the medical preparedness for disasters. Thus, the procurement process needs to be streamlined with clear responsibilities.

7.5.6 Trauma life support training

During the Eleventh Five Year Plan, a scheme for National Trauma Care Programme was implemented. The aim of the programme was to have trauma centres and pre-hospital care centres along the highways passing through some of the most vulnerable disaster prone districts. An assistance of ₹ 281 crore was provided under the programme during Eleventh Plan.

Training of physicians to serve effectively in emergency rooms is a pre-requisite for management of trauma cases brought to hospital emergency departments. However, there was no structured and accredited course for trauma life support in the country till 2009.

JPN Trauma Centre at AIIMS was provided financial assistance by MoH&FW to begin Advance Trauma Life Support (ATLS)[13] training in the context of Commonwealth Games 2010. MoH&FW in November 2011 identified that there was a need to train 65000 doctors working in government hospitals in trauma support. Audit noticed that ATLS course were conducted in JPN Trauma Centre at AIIMS and RML hospital under agreement with American Association of Surgeons. Under the current arrangement there was about 100 US $ outflow per candidate for training material cost [14] to American College of Surgeons.

MoH&FW stated (September/November 2012) that the response for disaster gaps which existed in the health system was known and remedial measures were being instituted as there was requirement to train substantial number of doctors for emergency care in the country.

7.5.7 Medical preparedness in states

7.5.7.1 Emergency Casualty Management Plan

As per NDMA guidelines, an Emergency Casualty Management Plan aimed to

[13] ATLS is a training course introduced by American Association of Surgeons which provides training in managing airway, breathing and circulation to save lives in emergency department trauma rooms.

[14] Study material being the proprietary item

address post disaster disease surveillance, networking with hospitals, referral institutions and facilities such as availability of ambulances and blood banks. In the test checked states we noted the following:

- In the test checked districts of West Bengal, the Emergency Causality Management Plans were not prepared and procedures for treatment of casualties by private hospitals during disasters had not been laid down.
- The Crisis Management Plan of Uttarakhand had not been approved by the State Authority. No appropriate procedures had been laid down for treatment of casualties by private hospitals during disasters.
- In ANI, SOPs of Directorate of Health Services (DHS) outlining the contingency plan for management of mass casualties arising out of disasters were yet to be approved. In May 2012, DHS issued instructions to all the hospitals to prepare the SOPs in terms of manpower and logistics available locally and to keep the logistics indicated in the SOPs ready for any emergency situation. Only two institutions submitted their revised SOPs to the DHS while the SOPs were yet to be prepared by the other 18 hospitals.
- In the test checked Sindhudurg district of Maharashtra, the Emergency Casualty Management Plan had not been drawn up.
- In the test checked Jalore district of Rajasthan no procedure had been laid down for treatment in these hospitals in case of casualties during disasters.

7.5.7.2 Training for medical preparedness

- In the test checked Sindhudurg district of Maharashtra, training in paramedics, capacity building, trauma, etc. was not organised since 2009-10.
- In Uttarakhand, no training programme was organised in the state for trauma life support.
- In Darjeeling, Burdwan and Birbhum districts of West Bengal, we noted that development and training of medical teams and paramedics, capacity building, trauma and psycho-social care, mass casualty management, etc, had not been addressed.
- In ANI, during 2007-08 to 2011-12, only three doctors were trained in management of mass casualty. No training programmes on paramedics, capacity building and trauma, etc., at UT or district level were conducted.

Recommendations

- ***National Disaster Response Force should make concerted efforts to fill all the vacant positions including specialist positions. DG, NDRF should be given better control over transfers and deployment of the NDRF personnel.***
- ***The standard infrastructure for the NDRF battalions should be created at the earliest.***

- *SOPs for deployment of NDRF should be formulated and circulated to all stakeholders. Deployment of NDRF for small or localised disasters needs to be discouraged.*
- *States should be encouraged to raise their State Disaster Response Forces. SDRF personnel should also be properly trained and equipped.*
- *There should be a clear policy for the functioning of RRCs so that they can be effectively utilised for disaster response.*
- *MHA should ensure that upgradation work of 'National Civil Defence College' and 'National Fire Service College' is completed at the earliest.*
- *MHA should ensure completion of scheme for up-gradation of Fire and Emergency Services so that benefits of modern technology in fire fighting and rescue capabilities are extended to stakeholders.*
- *Capacity and infrastructure at both Central and state level should be strengthened for medical response.*

Chapter – VIII:
Capacity Building

Effective disaster management requires trained manpower to deal with complex situations effectively and rapidly to reduce the impact of disaster on human life and property. It is necessary to continuously undertake measures to build capacity amongst those who are handling disaster prevention, mitigation, preparedness, response, reconstruction and also create awareness amongst the people. In terms of the national policy 2009, the approach to capacity building includes awareness generation, education, training, research and development.

8.1 National Institute of Disaster Management (NIDM)

In the backdrop of the International Decade for Natural Disaster Reduction, a National Centre for Disaster Management was established at New Delhi in 1995. It was re-constituted as National Institute of Disaster Management in February 2007. NIDM had four academic divisions viz. Geo-Hazard Division, Hydro-Met Hazard Division, Policy Planning & Cross Cutting Issues Division and Response Division.

8.1.1 Mandate of NIDM

NIDM is the apex body for training and research in the area of Disaster Management. It is also responsible for documentation and development of national level information base relating to Disaster Management policies, prevention mechanisms and mitigation measures.

8.1.2 Disaster Management Centres in states

Government of India through NIDM supported the Disaster Management Centers (DMCs) of the Administrative Training Institutes (ATIs) and other nodal institutes nominated by the states. The training programmes of these centers and NIDM were developed through an annual training conference attended by the Relief Commissioners of the states, Director Generals of the ATIs, and representatives of the concerned nodal Ministries and Departments of the Government of India.

8.1.3 Training programmes of NIDM

NIDM imparted training to Central and State Government officers, engineers, architects, civil defence volunteers, public health workers, grass root level functionaries, teachers and school children, etc. The different format in which training was imparted by NIDM included:

- face-to-face training,
- web- based training,
- satellite based training, and
- capacity building programme for engineers and architects in earthquake risk management.

During 2007-08 to 2011-12, NIDM conducted 375 in-house training programmes covering 10413 participants. Under the capacity building programme on earthquake risk management, 1361 architects and 2528 engineers were imparted training. Similarly, 106448 participants were

imparted training by DMC of Administrative Training Institutes of states.

We noted the following deficiencies in the functioning of NIDM:

8.1.3.1 Implementation of capacity building programmes

During 2004-05, MHA launched programmes of National Programme for Capacity Building of Engineers in Earthquake Risk Management (NPCBEERM) and National Programme for Capacity Building of Architects in Earthquake Risk Management (NPCBAERM).

Capacity Building of Architects in Earthquake Risk Management:

Purpose: The project was to ensure seismically safer habitats by training of practicing architects.
Duration of the project: June 2004 to May 2007.
Target: Training to 250 faculty members at National Resource Institutes (NRIs). These institutions were to undertake training programme for 10000 architects.
Project Cost: ₹ 4.51 crore.

Capacity Building of Engineers in Earthquake Risk Management:

Purpose: The project was to ensure seismically safe construction by training of the civil and structural practicing engineers.
Duration of the project: April 2004 to March 2007.
Target: 420 faculty members of various State Resource Institutes (SRIs) to be trained at NRIs. These SRIs were to undertake training programmes for 10000 engineers.
Project Cost: ₹ 12.36 crore.

The programme was reviewed by the MHA in February 2007. Due to significant shortfalls in achievement of the targets, the programme was extended for three more years but implementation was transferred to NIDM from June 2008.

We noted that MHA and NIDM failed to successfully implement the projects as the physical and financial targets were not achieved. Only 349 architects and 1171 engineers were trained (June 2008) as against 10000 of each category targeted.

In December 2010, MHA decided not to extend the programme any further and asked for refund of unspent balance. At that time there was a shortfall of 86 *per cent* and 75 *per cent* shortfall in the training of practicing engineers and architects respectively.

We noted that initially funds were released to the Relief Commissioners but there was no coordination with them. Out of total releases of ₹ 9.05 crore utilisation certificates amounting to ₹ 3.13 crore were pending (August 2012). It might have been more useful to have modules of Earthquake Risk Management in the course content of Civil engineering and architectures colleges in consultation with professional bodies concerned.

MHA stated (September 2012) that the programme could not run successfully due to non availability of engineers and architects for training. They stated that future training programmes for capacity building would be designed keeping in mind the availability of the trainees and the lessons learnt from the schemes.

8.1.3.2 Deficient functioning of ATIs

In February 2008, MHA approved a non-Plan scheme for extending financial assistance to the Administrative Training Institutes (ATIs) and State Training Institutes. Under the scheme, assistance of ₹ 25 crore was released over a period of five years to develop Centre of Disaster Management in these institutes. NIDM was to implement it up to 31 March 2012. Thereafter the State Governments/UT Administrations and institutes concerned were to take over the responsibility of operation of the Centres.

The Disaster Management Centre (DMC) was to act as focal point at the state and UT level for imparting training in the field of disaster management. Each institute was to conduct a minimum of 20 training programmes with an average of 20 participants in each programme, in consultation with NIDM with total duration of not less than 100 working days a year.

We noted that NIDM had released only ₹ 17.08 crore, of which, ₹ 15.89 crore was utilised by ATIs and utilisation certificates amounting to ₹ 1.20 crore were pending (August 2012).

We further noted that during 2007-08 to 2011-12, 106448 participants were imparted training under the scheme. In the five years of its execution, percentage of shortfall ranged from 45 to 76 *per cent*, with 2 to 10 ATIs not conducting any training program at all. Details are in **Annex - 8.1**.

Despite annual meeting of NIDM with the ATIs, successful implementation of the scheme could not be ensured. There was no impact and evaluation study to ascertain the extent of targeted benefits delivered at the closure of the scheme.

MHA stated (December 2012) that the scheme did not provide assistance/support for creation of faculty positions on regular basis in the Centres of the State ATIs. As a result many of the Centres were not able to fill in the faculty positions which led to poor performance in conducting training programmes and also less expenditure on pay and allowances.

8.1.4 Poor implementation of IDRN portal

MHA developed India Disaster Resource Network (IDRN) portal with the support of UNDP and launched it in 2004 through National Informatics Centre (NIC).

India Disaster Resource Network

IDRN was a web portal designed to systematically build up an organised information system of specialist equipment and expertise for disaster response. This was to enable disaster managers to identify the location of the resources and access it for disaster response with the minimum loss of time.

The nodal authorities (District Collector or DDMA) were responsible for updating the inventory data. It was a live system and was to serve as a useful tool for disaster preparedness and response.

MHA entrusted (June 2008) NIDM with the responsibility of updating and maintaining the portal but two posts that were created in MHA were not transferred to NIDM. We noted that the portal was being managed without any dedicated staff. We also noted that the states encountered problems in

logging into the portal and uploading their databases.

It was mandatory to carry out a security audit of the portal periodically by a specialised external agency. We found that no such audit had taken place after 2004, despite repeated warnings by NIC. The red flag raised by the NIC regarding serious threats to the portal had also not been addressed (August 2012).

MHA stated (December 2012) that NIDM had recruited one computer programmer on contract basis to maintain IDRN portal and services of NIC were being requisitioned.

The inventory of resources was thus vulnerable and its reliability in a disaster situation was uncertain.

8.1.5 Evaluation of academic and training programmes

The academic and training programmes of NIDM had never been evaluated by an independent agency.

MHA stated (December 2012) that Governing Body of the NIDM in its meeting held in July 2012 had directed to NIDM explore possibilities of engaging Institutions/experts for impact evaluation of training programmes of NIDM, and action was being taken accordingly.

8.1.6 NIDM related issues

8.1.6.1 Shortfall in meetings

As per NIDM Rules and Regulations 2006, the Institute[1] was to meet at least once in every year. The Governing Body[2] was to hold its meetings at least once in three months.

We noted that the Institute met only once in April 2007 and the Governing Body met six times during June 2007 to July 2012 as against requirement of 24. Shortfall in the meetings delayed the adoption of Service Rules, finalisation of Recruitment Rules and engagement of an agency for evaluation of training programmes and overall impact assessment.

8.1.6.2 Manpower management in NIDM

NIDM was sanctioned 57 posts to carry out its mandated work of capacity building. A detailed analysis of sanctioned strength and year-wise men in position disclosed that NIDM had never functioned with its full capacity as many of the critical posts of Professors, Associate Professors, Assistant Professors and Researchers were lying vacant at the end of each financial year. This impacted the completion of the targeted programmes. The details are in **Annex - 8.2**.

Restructuring NIDM:
In the Governing Body meeting (July 2012) the need to restructure NIDM was expressed as there was no representation of experts dealing with forest fires, coastal hazards, and biological disasters in the academic structure.

[1] Institute is the apex body of NIDM. It comprises the Minister in charge of MHA as ex-officio president, vice chairman of NDMA as vice president ex-officio, one member of NDMA, chairperson of NEC and secretaries of different Ministries/Departments as ex-officio members, etc.

[2] Governing body of NIDM comprises 16 members chaired by Vice Chairperson of NDMA.

MHA stated (December 2012) that draft recruitment rules were being framed to fill the faculty position.

8.2 Pilot project on capacity building in disaster management

A pilot project on "Capacity Building in Disaster Management" for government officials and representatives of local bodies at district Level was implemented through an MoU between Indira Gandhi National Open University (IGNOU) and NDMA in February 2010 at an estimated cost of ₹ 2.18 crore. The duration of the project was 12 months.

This project was to be undertaken in 55 districts of selected 11 states identified on the basis of their vulnerability to various natural and manmade hazards. Since the project was not completed in time, NDMA, at the request of IGNOU, extended the project timelines thrice between September 2011 and September 2012. The project was still in progress (September 2012).

We noted that NDMA awarded the project through an agreement without a penalty clause, thereby giving undue advantage to IGNOU. Delay in implementation of this project had also affected the future plans of capacity building in disaster management across the country.

MHA stated (December 2012) that it was a pilot project without having much knowledge on various activities. As various inputs were added in the project at various stages by different stake holders, as it advanced during its execution, these added delays in the project. Delay in the project did not derail the capacity building efforts rather it enhanced the capacity building efficiency of the project. It further added that the pilot project was an educational endeavour and IGNOU not being a commercial organization they did not insist on 'Liquidated Damages' clause. However, future projects would be designed based on the experience of this pilot project.

8.3 Capacity Building efforts in states

The audit findings relating to capacity building efforts at the state level are described below:

8.3.1 Utilisation of capacity building grants by the states

Thirteenth Finance Commission had recommended a grant of ₹ 525 crore for building capacity within the administrative machinery for better handling of disaster response and for preparation of state and district level disaster management plans. Guidelines of the scheme for release and utilisation of grant-in-aid for capacity building for disaster response was issued by Ministry of Finance in October 2010.

'On account' payment of first instalment of grant-in-aid amounting to ₹ 105 crore to 28 states was released in October 2010.

We noticed shortcomings and critical gaps in capacity building efforts undertaken in the states selected for test check.

- Ministry of Finance had released ₹ 6 crore to Rajasthan (October 2010) under the scheme. The State Government debited this central grant under "Search and Rescue" to credit the previous expenditure of ₹ 6.75 crore and show the grant as utilised to avoid lapse. During 2011-12, funds amounting to ₹ 6 crore were released by MoF of which only ₹ 3.47 crore was utilised, again by making a transfer entry to credit the previous expenditure incurred for "Search and Rescue", and funds of ₹ 2.53 crore remained unutilised. Disaster Management & Relief Department of Rajasthan Government stated (July 2012) that grant of ₹ 2.53 crore remained unutilised due to late issue of new parameters by Government of India. The reply is not relevant as the department debited the central grant of ₹ 9.47 crore (2010-11 and 2011-12) to avoid lapse of grant through transfer entry to meet the excess expenditure of some other head instead of spending it on capacity building.

- In Andhra Pradesh, funds amounting to ₹ 6 crore receivable during 2011-12 under the scheme were not received till March 2012 due to non approval of plans by Government of India. Reasons for non approval were mismatch of funds among different components and delay in submission of plans/ proposals.

- West Bengal was provided grants of ₹ 5 crore, from the year 2010-11 under the scheme. The three test checked districts received (February 2011) ₹ 1.40 lakh each for various training programmes. In Birbhum, school safety training was not conducted while in Darjeeling, funds were kept in the accounts and no training was conducted.

8.3.2 Training and mock drills

- In West Bengal, capacity building was taken up under Disaster Risk Mitigation Programme-II which was in operation in six districts (out of which two were test checked districts-Birbhum and Darjeeling). Though the programme implemented from April 2008 was to be completed by March 2011, it lagged behind and was still in operation. Training, however, was not conducted for vulnerable sections of society like patients, students, fishermen and farmers in any of the three test checked districts. Further, students could have been sensitized in disaster management by introducing it in school curriculum. This was yet to be done.

- Comprehensive annual training program to impart training to officials and sections of society in the UT of Andaman and Nicobar Island was not prepared by the Directorate of Disaster Management (DDM). Only a training program was prepared which was yet to be approved by the UT Administration. Consequently, no training was conducted by DDM (July 2012).

- Training schedule was prepared by Odisha State Disaster Management Authority (OSDMA) to train the officials involved in disaster management in a phased manner. No such training was organised at the state level for learning the emergency skills. However, on four occasions during 2007-12, resource persons from the OSDMA were deputed to various District Emergency Operation Centres for imparting training on request.

During 2008-09, in 111 Multipurpose Cyclone Shelters of six coastal districts, five types of training were given to local people (orientation training: 4440, search and rescue: 2775, first aid: 2775, operation and maintenance of equipment: 222). However, no such training were imparted thereafter (June 2012). We further noted that other lead agencies like Home Guards, National Cadet Corps (NCC), National Services Scheme (NSS), Nehru Yuva Kendra Sangathan (NYKS), and revenue personnel were not imparted any such training at the state or district level. Medical personnel were not trained in hospital preparedness for emergencies or in mass causality incident management.

- In Odisha, only five mock drills were conducted during 2007-12 at four locations by Odisha Disaster Rapid Action Force personnel as a preparatory measure, and one joint exercise/mock drill was organised on train accidents. However, in these mock drills there was no involvement of agencies such as medical department, home guards, fire services, etc.

- In Tamil Nadu, the Fire and Rescue Services Department conducted mock drills at the district level for fire prevention and mock drills for rescuing flood affected victims. However, mock drills and community awareness for other disasters like earth quake especially in the state capital which was in seismic Zone-III were neither contemplated nor carried out.

- In Uttarakhand, two training programmes on primary health for Haridwar and Rudraprayag districts were organised in 2007-08 and 2009-10 in which 196 trainees participated. It was also noticed that no master trainers were trained to impart training to the staff at the district, block and village levels engaged in the prevention and mitigation of disaster management. Medical personnel were also not trained in hospital preparedness for emergencies or mass causality incident management.

Recommendations:

- ***The academic and training programmes of NIDM need to be evaluated for providing an assurance that stated objectives and value for money had been achieved.***
- ***The implementation of IDRN needs to be firmed up and the inventory data of resources needs to be updated.***
- ***Expeditious steps are required to fill the critical vacant posts in NIDM so that adequate training programmes are conducted.***

PART - II

Chapter – IX:

Disaster Specific Observations

9.1 Earthquakes

India is divided into five seismic zones according to the maximum intensity of expected earthquake. Zone-V is the most active and comprises the whole of Northeast India, the northern portion of Bihar, western Uttar Pradesh hills, Himachal Pradesh and Andaman & Nicobar Islands. India's high earthquake risk and vulnerability is evident from the fact that about 59 per cent of land area could face moderate to severe earthquakes. During the period 1990 to 2006, more than 23,000 lives were lost due to six major earthquakes in India, which also caused enormous damage to property and public infrastructure.

9.1.1 Institutional framework for earthquake management

Ministry of Earth Sciences (MoES) (India Meteorological Department (IMD)) is the nodal ministry for the management and mitigation of earthquakes in the country. IMD is the nodal agency responsible for monitoring seismic activity in and around the country, on round the clock basis and is involved in various seismological related activities. It maintains the National Seismological Network (NSN) consisting of 55 observatories which include 17-station Real Time Seismic Monitoring Network (RTSMN).

9.1.2 Earthquake Management Plan

In terms of National Disaster Management Guidelines on Management of Earthquakes issued in April 2007, MoES was to prepare the Earthquake Management Plan covering all aspects including earthquake preparedness, mitigation, public awareness, capacity building, training, education, research and development, documentation, earthquake response, rehabilitation and recovery. We noted that MoES did not prepare any disaster management plan for earthquakes.

MoES stated that it was involved in core operational activities of the specific hazard related services. It also added that MoES was not responsible directly for any other component of disaster management activities. The reply was not in consonance with the laid down provisions.

9.1.3 Optimum Seismological Network Program

A project on "Optimum Seismological Network Program" was sanctioned in May 2009 by the IMD at an estimated cost of ₹ 48 crore, which was reduced to ₹ 25.17 crore. The project implementation was proposed to be carried out in two phases spread over a period of three years from 2009-10 to 2011-12. The objective of the project was to strengthen and modernize the National Seismological Network for improving the detection and location capability for earthquakes of magnitude greater than or equal to 3.0, occurring anywhere in the mainland of the country. We noted that the project was still in the preliminary stages of implementation even after expiry of three years.

MoES stated (September 2012) that the original plan of establishing optimum

seismological network had to be revisited in view of according higher prioritization to other concurrent networks to optimize resources and communication needs.

9.1.4 Non-conducting of Seismic hazard and risk microzonation study

MOES/IMD had set up the Earthquake Risk Evaluation Centre at Delhi, in February 2004. During 2007-12, IMD proposed to carry out three projects viz.

I. seismic microzonation of Mumbai, Guwahati, Ahmedabad and Dehradun on 1:10000 scale;

II. creation of national database for seismic hazard and regional risk appraisal; and

III. impact assessment of utilization of database in planning and mitigation.

In order to improve the resource allocation for remedial upgradation and information alongwith education of the public, land use planning for policy makers, designers and disaster managers, an allocation of ₹ 298.38 crore was made for these projects.

IMD stated (July 2012) that the proposed activities were not carried out by it as the standard guidelines for microzonation work in the country, were prepared and released by MoES only in October 2011. MoES stated (September 2012) that the microzonation of Guwahati, Bangalore, Ahmedabad, Dehradun and Delhi was completed.

The reply was silent on seismic microzonation of Mumbai city, and the other two projects, namely, creation of national database for seismic hazard and regional risk appraisal and impact assessment of utilization of database in planning and mitigation by various stakeholders.

9.1.5 Non-Archival digitization of the Seismic analogue charts

IMD initiated a project titled "Archival digitization of seismic analogue chart" in May 2008 at an estimated cost of ₹ 13.50 crore for two years.

We noted that the duration of the project was extended from time to time and finally till June 2012. Society for Automation and Technology Advancement (SATA) completed scanning of 100000 seismic analogue charts and vector digitization of 5000 events contained in seismograms by March 2012 and submitted them to IMD for quality checks.

However, IMD could check quality of only 50 *per cent* deliverable like seismic analog charts and vector digitalisation of events, etc., as of March 2012. IMD stated in August 2012 that the main reason for delay in start of the project was late supply of equipment. Thus, the objective of the project was not achieved despite incurring expenditure of ₹ 7.54 crore as of June 2012.

MoES stated (September 2012) that digitizing analogue charts was a highly time consuming effort and the archival of past seismic analogue charts would be pursued till the successful digitization of the hard copy charts takes place. We noted that no time frame for the exercise was proposed in the reply.

9.1.6 Efforts of NDMA

As part of the programme on Vulnerability Analysis and Risk Assessment with respect to various natural hazards, NDMA had undertaken the task of preparing the upgraded hazard maps and atlas of Indian land mass. NDMA awarded the work of these maps to Building Materials & Technology Promotion Council in June 2011.

NDMA has also taken up National Earthquake Risk Mitigation Project. This project was still in preparatory phase after a lapse of five years of its conceptualization.

These are discussed in detail under Chapter-IV, para 4.3.1, 4.3.1.1 and 4.3.3.1 of this report.

9.1.7 Disaster preparedness in the states:

9.1.7.1 Andaman & Nicobar Islands

The Port Blair Municipal Council (PBMC) building bye-laws which were formulated in 1999 have incorporated provisions for safety standards for earthquakes and special hazards. In July 2003, the PBMC also reviewed these building bye-laws for suitable techno-legal regime for safer construction in disaster prone areas. However, the amended byelaws were yet to be approved and notified by the UT administration even after nine years of its preparation.

Union Territory Disaster Management Executive Committee decided (December 2009) that 25 buildings in various Islands would be retrofitted to use them in any crisis situations. Subsequently another 289 buildings were identified for retrofitting in June 2011. However, no work in this regard was taken up.

9.1.7.2 Andhra Pradesh

Under Greater Hyderabad Municipal Corporation's jurisdiction, 144 buildings had been identified in dilapidated condition out of which only five were demolished. Notices were issued to the remaining 139 buildings during 2004-12 wherein 53 buildings were in most dangerous condition and unsafe for living. However, no action was taken as of June 2012.

9.1.7.3 Odisha

OSDMA had issued necessary instructions in August 2007 for taking measures on making urban areas disaster resilient. However, the same was not followed up. In the selected district, no amendment was made in their building regulations.

9.1.7.4 West Bengal

State Disaster Management Plan made an attempt to identify blocks vulnerable to each type of disaster in terms of High (H), Medium (M) and Low (L). This exercise was, however, partial. For instance, two districts (Burdwan and Birbhum) fall in seismic zone III (moderate intensity zone) while Darjeeling falls in Zone-IV, which was a severe intensity zone. However, in these cases vulnerability of blocks to earthquakes was not assessed.

In Darjeeling district, retrofitting was done in two buildings as these were the only identified ones. We further noted that Singhamari Syndicate office building and the bus stand premises were also declared

as unsafe in November 2011 by Darjeeling Municipality but these were in use as of June 2012.

The 'Kolkata Municipal Corporation' had identified 2900 old and dilapidated vulnerable buildings. Buildings were not identified for retrofitting in Suri Municipality (Birbhum). Records of Urban Local Bodies did not indicate that urban planning had factored in avoidance of concentration of economic assets at one place.

9.1.7.5 Uttarakhand

The State Government in May 2005 established Hazard Safety Cell to ensure compliance of building byelaws and safe construction practices and provide technical support to the State Government in carrying out retrofitting of lifeline buildings like hospitals, fire station, etc. The cell had so far identified 7374[1] buildings in three cities out of which 1109[2] buildings were found to be vulnerable to moderate earthquake. These buildings were required to be retrofitted, but no measures had been taken. The Department of Disaster Management stated that the members of the safety cell were not taking interest in their work and thus, no remedial measures were taken yet.

We further noted that 0.10 to 94 *per cent* of houses in 13 districts were constructed of stone walls. Out of these, eight districts[3] had, on an average, 85 *per cent* stone walled structures categorized as Very High Damage Risk in the event of an earthquake.

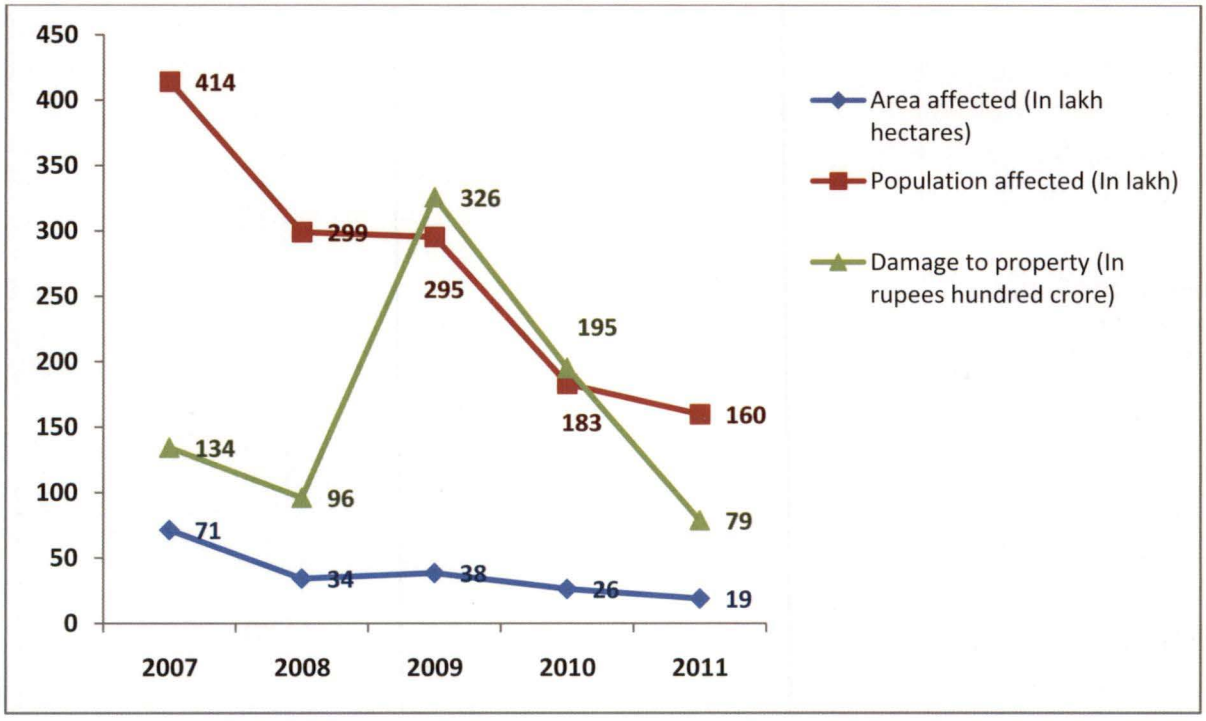
[1] Mussoori-3344, Nainital-2865 and Bageshwar-1165
[2] Mussoori-615, Nainital-401 and Bageshwar-93
[3] Uttarkashi, Chamoli, Rudraprayag, Tehri Garhwal, Pauri Garhwal, Pithoragarh, Bageshwar and Almora

9.2 Floods

Flood is one of the natural calamities that the country faces almost every year in varying degree of magnitude in some areas or the other. Various natural and human factors are responsible for increase in flood damages. The total flood-affected area in the country[4] is 456.40 lakh hectares. An average[5] of 72.25 lakh hectare of land is affected annually by floods of which 37.89 lakh hectare is the cropped area.

The damages due to floods during the last five years are shown in Chart 9.1:

Chart 9.1 --: Damage due to floods in India



Source: Central Water Commission data given by Ministry of Water Resources

[4] Working Group on flood management for the Eleventh Five-Year Plan
[5] Average of data from the years 1953 to 2011

9.2.1 Institutional framework for flood control

The primary responsibility for flood control lies with the states. The action on enactment of suitable legislation for Flood Plain Zoning Bill was yet to be taken by all the states except Manipur.

The Ministry of Water Resources (MoWR) was responsible for laying down policy guidelines and programmes for the development and regulation of the country's water resources. Central Water Commission (CWC) under MoWR had the responsibility of initiating, coordinating and furthering the schemes for the control, conservation and utilization of water resources in the states.

9.2.1.1 Action plan for management of floods

According to the guidelines for management of floods issued by NDMA in January 2008, MoWR was to prepare a detailed Action Plan for management of floods. The Ministry stated (June 2012) that the activities and their timeliness mentioned in the said guidelines were yet to be finally decided in consultation with State Governments and other concerned agencies.

Thus, in the last four years, MoWR had not formulated actionable plan for management of floods as per NDMA guidelines. This had impeded the proposed process for mitigation of floods in the country.

9.2.1.2 Crisis Management Plan

The Crisis Management Plan (CMP) of 2009 identified CWC as the Authority responsible for sending first information relating to flood forecasts. MoWR prepared its Ministry level CMP in March 2011 to handle crisis related to flood forecasting and dam failures. According to CMP, each state was required to establish a Dam Safety Organization (DSO) to address the safety issues of large dams in the states. However, only 14 states had prepared DSO (July 2012).

Similarly, the CWC issued (May 2006) guidelines for development and implementation of Emergency Action Plan (EAP) for large dams in the states.

We noted that only eight states had prepared EAP for 192 (4.06 *per cent*) large dams against 4728 large dams in 29 states as of September 2011. Thus, non-preparation of EAPs by the Project Authorities in respect of 96 *per cent* of large dams renders huge area and property left vulnerable to cascading affects of dam failure.

9.2.2 Contamination of water bodies

In CMPs review meeting held by Cabinet Secretariat in August 2009, MoWR was asked to consider the crisis on account of contamination of water in reservoirs. However, MoWR had not included this aspect in the CMP (July 2012).

Further, in the CMPs review meeting of March 2012, MoWR stated that it did not have the requisite infrastructure or the expertise to monitor the very large number of water bodies in the country. We noted that no headway had been made to mitigate this important environmental hazard.

9.2.3 Flood forecasting

The work of flood forecasting and warning in the country was entrusted with CWC. CWC collects hydro-meteorological data from its sites round the year. The activity of flood forecasting comprised level forecasting and inflow forecasting. The forecasts were issued once the water level in a river touched pre-defined warning level.

9.2.3.1 Absence of proper mechanism for monitoring

There were 4728 reservoirs and barrages in the country as of September 2011. CWC provided inflow forecasts to only 28 reservoirs and barrages. Thus, a large number of reservoirs and barrages were not monitored at all for their water levels.

Indian Institute of Public Administration (IIPA) conducted an evaluation study on Plan schemes for flood control. The report submitted by IIPA to MoWR in November 2009 highlighted various deficiencies. This included (i) non functional telemetry stations, (ii) temporary gauge sites during the flood period, (iii) flood forecasting stations not having dedicated communication facilities, etc. We noted that these shortcomings had not been rectified by MoWR till July 2012.

CWC (July 2012) stated that necessary directions had been issued to address these issues.

9.2.3.2 Modernization of flood forecasting

Expansion and modernisation of flood forecasting and warning system was taken up in successive five year plans by CWC. During Ninth, Tenth and Eleventh Plan periods, 55, 168 and 222 stations respectively were modernized with telemetry[6]. During Eleventh Plan, 222 telemetry stations were to be installed but only 204 telemetry/flood forecasting stations had been installed till March 2012.

We further noted that identification and marking of area on maps was to be done by states. However, as per Flood Forecast Monitoring Directorate, not much work was done in this regard.

9.2.4 Flood Management Programme (FMP)

A Task Force was set up in 2004 by the Government of India for flood management and erosion control. It recommended MoWR schemes related to flood management and anti erosion in respect of Ganga and Brahmaputra basin states for the Tenth Plan and Eleventh Plan periods. The estimated cost of these schemes was ₹ 4,982.10 crore. The works of immediate nature were taken up during Tenth Plan period.

MoWR implemented a state sector scheme, namely Flood Management Programme (FMP) in November 2007 to provide financial assistance to the State Governments for undertaking flood management works in critical areas during the Eleventh Plan period. Under FMP,

[6] Automatic data acquisition and real time data transmission system

Central assistance was provided to all the flood affected states in the country to undertake critical flood control and river management works. The works included river management, flood control, anti-erosion, drainage development, anti-sea erosion, flood proofing works besides flood prone area development programme in critical region.

During Eleventh plan, 420 works at an estimated cost as ₹ 9435.45 crore were approved with central share of ₹ 7739.69 crore under FMP. Out of these, 252 works were completed during Eleventh plan. Central assistance of ₹ 3566.00 crore (including ₹ 89 crore for the spill over works of Tenth plan) was released against the allocation of ₹ 8000.00 crore by Planning Commission up to 31 March 2012.

We noted that till March 2007, against the total flood prone area of 456.50 lakh hectares, 182.20 lakh hectares only had been provided reasonable protection against floods in the country. With the introduction of FMP, another 21.80 lakh hectares was to be protected against floods but new area of only 2.59 lakh hectares had been protected up to March 2011. Thus, a large area of the country was still vulnerable to floods and resultant damage to life and property every year.

9.2.5 Disaster preparedness in the States/UT

9.2.5.1 Andaman & Nicobar Islands

In May 2006, CWC formulated the guidelines for development and implementation of Emergency Action Plan (EAP) for Dams. We noted that EAP on dam failures had not yet been prepared as of July 2012 by the UT Government in compliance with the guidelines.

9.2.5.2 Odisha

We noted that adequate food grain reserves were not maintained. Relief rice (10 days) for the flood of September 2011 was supplied by Odisha State Civil Supply Corporation to 19 flood affected districts only in March 2012. Similar delay was noticed in the case of Balasore district.

Further, in Balasore-Sadar block, 462.08 MT of rice received in March 2012 was retained with storage agents. Thus, the supply did not reach the end users in time. This indicated misuse of relief funds.

Food grain received in March 2012 at Balasore Sadar block for distribution as relief material for Flood 2011

Preparedness for cyclones and floods in Odisha:

- Out of 205 large dams in Odisha, there was no emergency plan for the large dams except for Balimela and Jalaput dams, for which EAPs were under preparation (June 2012).
- State Crisis Management Committee for dam safety under chairmanship of Chief Secretary, had not been formed as per the Crisis Management Plan of MoWR.
- We test checked DDMA, Balasore regarding availability of boats for flood rescue operations for the year 2009-10

to 2011-12. We noted that 14 to 17 power boats had been stationed in various vulnerable places of the district. Out of these, six boats in 2009-10, four in 2010-11 and three in 2011-12 were not in running condition. No steps had been taken to replace/repair the damaged boats to make these functional.

9.2.5.3 Tamil Nadu

There were floods due to cyclone and heavy rainfall during Northeast monsoon 2010 in the test checked districts. In the pre-monsoon meetings, Public Works Department was directed by the District Collector to be prepared with sandbags to strengthen embankments. However, permanent restoration measures to prevent recurrent damage to crop, livelihood, property and infrastructure were not discussed and thus, vulnerabilities to flood had not been identified.

9.2.5.4 West Bengal

Emergency Action Plan of dam failure in respect of large dams in the State was not prepared.

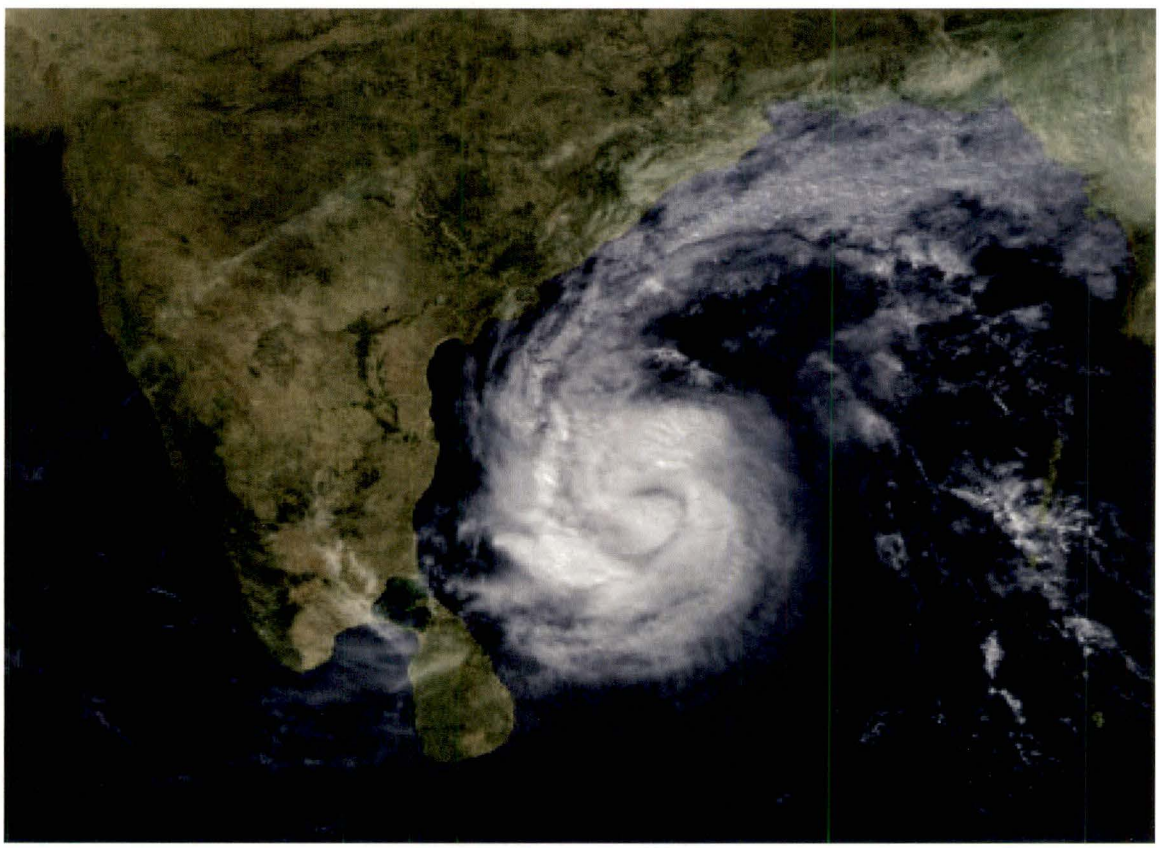
Seventeen projects with a total capital outlay of ₹ 1822.08 crore were sanctioned in 2008-09 to 2010-11 under Flood Management Programme Out of 17 projects, 13 projects had achieved 100 *per cent* progress. One project on Saraswati river achieved 50 *per cent* progress. The project on Kaliaghai-Kapaleswari-Baghai basin in Paschim Medinipur achieved only 12 *per cent* progress and the project on embankment of Sundarban achieved insignificant progress due to land acquisition problem.

The department attributed (August 2012) the delay to delayed acquisition of land for major projects, less working period in riverine projects, procedural delay in release of central funds, non availability of funds at the appropriate time and changes in design parameters at execution stage.

9.3 Cyclones and Tsunami

India has a coastline of about 7516 km which is exposed to nearly 10 *per cent* of the world's tropical cyclones. About 71 *per cent* of this area is in 10 states[7] and the Islands of Andaman, Nicobar and Lakshadweep are prone to cyclones. Coastal areas are also places that experience tsunami[8].

The tsunami of 26th December 2004 caused extensive damage to life and property in Tamil Nadu, Kerala, Andhra Pradesh, UTs of Puducherry and Andaman & Nicobar Islands. A population of 26.63 lakh in 1396 villages in five states and UTs was affected by this disaster. 9395 people lost their lives and 3964 people were reported missing and feared dead. Most of the missing persons were from Andaman & Nicobar Islands.



Tropical Cyclone along Indian Coast

[7] Gujarat, Maharashtra, Goa, Karnataka, Kerala, Tamil Nadu, Puducherry, Andhra Pradesh, Odisha and West Bengal.

[8] Tsunami is a series of large waves generated by sudden displacement of sea water caused by earthquake. Tsunamis have great erosion potential and dissipating its energy through the destruction of houses and coastal structure.

9.3.1 Institutional framework

The Ministry of Earth Sciences (MoES) was the nodal Ministry responsible for the management and mitigation of disasters of cyclone and tsunami. Its sub-ordinate office, India Meteorological Department (IMD) was responsible for the issue of warnings and advisories to national and international disaster management agencies, and for monitoring and prediction of cyclone disturbances over the North Indian Ocean.

Indian Tsunami Early Warning Centre was established at Indian National Centre for Ocean Information Services (INCOIS), Hyderabad, an autonomous body of MoES. This centre was responsible for continuous monitoring, detection of tsunamis and issue of advisories to the coastal regions.

Besides these, other institutions viz. National Centre for Medium Range Weather Forecasting and Indian Institute of Tropical Meteorology and Institutions under the Department of Ocean Development i.e. INCOIS, and Integrated Coastal and Marine Area Management, etc,. also provided valuable inputs for cyclone forecasting and monitoring. These institutions were under Earth System Science Organization (ESO), managed by ESO Council.

Role of Ministry of Earth Sciences

As per the NDMA guidelines, MoES was the nodal Ministry responsible for overall management of tsunami and cyclones. However MoES stated that it was not responsible directly for any other component of disaster management activities except for monitoring and detection of cyclones and earthquakes along with forecasting of cyclones. The reply may be viewed in the context of NDMA guidelines for cyclones which clearly define the action points for MoES. Further, MoES is the nodal Ministry for management of cyclones and tsunami.

9.3.1.1 Early warning systems & mechanisms

The following mechanisms to predict the calamities were in place:

(i) IMD's Area Cyclone Warning Centers (ACWCS) at Chennai, Mumbai and Kolkata and Cyclone Warning Centre at Bhubaneswar, Visakhapatnam and Ahmedabad were responsible for originating and disseminating the cyclone warnings at regional level. Cyclone Warning Division at New Delhi had similar responsibility at the national and international levels.

IMD had installed specially designed receivers within the vulnerable coastal areas for transmission of warning using broadcast capacity of INSAT satellite. This was a direct broadcast service of cyclone warning in the regional language meant for the area affected or likely to be affected by the cyclone. There were 352 Cyclone Warning Dissemination System (CWDS) stations along the Indian coast, of which 100 digital CWDS were located along the Andhra Pradesh coast.

(ii) Indian Tsunami Early Warning Centre was involved in continuous monitoring of tsunamis and issuing advisories to the coastal region. Upon generating

of requisite information, IMD disseminated the same to MHA control room, NDMA operation room and other designated government authorities both at the Centre and State level.

9.3.2 Vulnerability analysis and risk assessment

MoES was identified as the nodal Ministry for mitigation efforts towards disasters relating to cyclone and tsunami. As per actionable points of NDMA guidelines on cyclone, MoES was to evaluate the vulnerability of cyclones and its changing profile from time to time.

However, MoES informed (August 2012) that the responsibility of the Ministry is only to provide timely warning on tsunami and cyclones and associated storm surges to various stakeholders for taking action to minimize the risk and damage to loss of life.

MoES further stated (September 2012) that the vulnerability assessment schemes were to be taken up by the states under guidance of NDMA.

Thus, no specific programs related to the assessment of risk, hazard, vulnerability, damage and loss were initiated by the nodal Ministry as required under the national guidelines.

9.3.3 Delay in commencement of project

MoES sanctioned (March 2011) a project on "Multi-Hazard Vulnerability Mapping for the Indian Coast" to INCOIS at a total cost of ₹ 48 crore with a scheduled date of completion by March 2013. The aim of the project was to prepare and deliver vulnerability maps for the identified vulnerable areas of 5000 sq km in coastal states of the country. In March 2011, MOES released ₹ 7 crore to INCOIS, Hyderabad for execution of the project. We noted that INCOIS had not initiated the project as of June 2012. MoES stated (July 2012) that the project involved a lot of manpower with extensive field work for which an Expression of Interest had been issued to identify the firms and for finalization of Request for Proposal (RFP). An expenditure of ₹ 1.56 lakh was incurred under the project. We however noted that the MOES did not follow up the matter with INCOIS to expedite the project.

MoES stated (September 2012) that it had taken up, in pilot mode, the 3-D GIS digital data during the Eleventh plan under Tsunami Warning and Dissemination Initiative at INCOIS, Hyderabad and the project would be continued during Twelfth Plan.

The reply was not tenable as the Ministry released ₹ 7.00 crore in March 2011 but the nodal institute i.e. INCOIS, Hyderabad could spend only ₹ 1.56 lakh till July 2012 and the project activities were not initiated. The non-commencement of the project had delayed the development of vulnerability maps.

9.3.4 Non-preparation of disaster management plans

9.3.4.1 Action plan for management of tsunami and cyclone

NDMA guidelines required MoES to prepare a detailed action plan for

management of tsunami and cyclones with specific tasks, activity targets and time-frames. This would also be a part of the national disaster management plan. However, MoES did not prepare any disaster management and action plan for tsunami and cyclone management. MoES stated that only a user manual based on its Standard Operating Procedure (SOP) had been prepared by the Indian Tsunami Early Warning Centre at INCOIS, Hyderabad. Thus, the guidelines of NDMA had not been complied with.

9.3.4.2 Non-preparation of the National Mitigation Plan

MoES was the nodal Ministry for mitigation efforts in respect of disasters related to 'Earthquake', 'Tsunami' and 'Cyclone'. We noted that the MoES did not prepare the mitigation plans as of September 2012 due to lack of coordination between IMD and the MoES.

MoES stated (September 2012) that they had expressed their inability/difficulties to NDMA in 2010 for taking up these responsibilities as MoES institutions had no experience of coordinating and implementing the associated components of the disaster management cycle.

9.3.5 Upgradation of weather forecasting in the country

As per the National Policy of Disaster Management, forecasting climate change is the most important element of disaster management.

To modernize and upgrade the existing system of weather forecasting MoES submitted a proposal for implementation of the project in three phases. The Cabinet Committee on Economic Affairs, in December 2007, approved the proposal for phase-I at a total estimated cost of ₹ 920 crore with the project duration of 24 months from December 2007.

9.3.5.1 Budget estimate and actual expenditure

We found that out of the sanctioned amount of ₹ 920.00 crore during 2007-2012, IMD was able to spend only ₹ 438.63 crore (47.68 *per cent*) till March 2012. Slippage of over three years indicated slow pace of scheme implementation.

9.3.5.2 Shortfall in the achievement of the targets

MoES constituted a committee to specify the optimum requirement for observation, forecasting, aviation, agro meteorology and human resource in the field of meteorology to provide weather service of world standard. The committee recommended the optimum requirements for the modernization of IMD; however there was a shortfall in the achievements of the targets fixed even for phase-I. Details are in **Annex-9.1.**

Out of 17 projects undertaken in the modernisation scheme, five projects costing ₹ 84.15 crore were yet to be initiated. Another five projects costing ₹ 256.85 crore were under implementation. Only seven projects, costing ₹ 186.90 crore were completed.

MoES accepted (September 2012) the delays and lapses in modernization plan of IMD. It attributed the delay to (i) obtaining clearance for land in different states (ii) delays in finalization of tenders and award of contracts, and, (iii) delay in obtaining

security clearance from Ministry of Defence for commissioning coastal Doppler Weather Radars at Kochi, Goa, Karaikal and Paradeep etc.

9.3.5.3 Delay in implementation of phase-I

The nine project management councils formed to monitor the project never met during the project. Due to the lack of monitoring, the phase-I of modernisation project which was scheduled to be completed by December 2009 could not be concluded till July 2012.

The delay was also attributable to IMD's inability to adhere to the time schedule and failure in timely processing of tender, issue of purchase orders, and selection of site for installation of equipment etc.

MoES accepted (September 2012) the fact and stated that the administrative and technical supervisory/financial scrutiny systems would be revamped in future to ensure the improved implementation of standardized preparation of tender documents and RFPs for various procurements.

9.3.5.4 Non-implementation of the programmes/projects

IMD proposed a scheme on District Meteorological Information Centres (DMIC) throughout the country and an allocation of ₹ 204 crore was made in the Eleventh Plan for the purpose. The DMICs were envisaged to provide meteorological information at district levels. However, IMD stated (August 2012) that no work was taken up for setting up of the DMICs during Eleventh plan period.

9.3.5.5 Non-procurement of UAV and aircraft

IMD being the nodal agency in the country for cyclone forecasting sought to enhance the scientific understanding in three identified areas viz. cyclonic storms, fog and thunderstorms as major sources of hazards. Based on this, MoES sanctioned (March 2010) a Forecast Demonstration Project for severe thunder storms over east and north-east India, fog forecasting system and in tropical cyclones over the Bay of Bengal at an estimated cost of ₹ 49 crore.

The project to be implemented by IMD was scheduled to be completed in two years i.e. by March 2012. The project was to include procurement of Unmanned Aerial Vehicle (UAV) and hiring of probing aircraft.

We noticed that there was no progress after October 2010 despite incurring an expenditure of ₹ 1.32 crore on machinery and equipment till 2011-12. Thus, IMD/MoES failed to complete the project in a timely fashion.

MoES stated (September 2012) that the project was not successful due to delay in administrative approval.

9.3.5.6 Multi-Hazard Early Warning Support Interfaces for Emergency Response Planning

MoES sanctioned (May 2008) a project on 'Development of Multi-Hazard Early Warning Support Interfaces in support of Emergency Response Planning' to INCOIS at a total cost of ₹ 20 crore. This was meant to develop capacity for disaster risk reduction through monitoring and

forewarning system, training and dissemination of information. The project was scheduled to be completed by the end of Eleventh Plan i.e. 2007-12.

MoES released ₹ 3.82 crore to INCOIS for implementation of the project during 2008-10. We found that the centre failed to initiate the project as no expenditure was incurred on the project up to March 2011.

MoES stated (September 2012) that the delay was due to delay in commissioning of the real time data acquisition.

9.3.5.7 DTH-based Disaster Warning Dissemination System (DWDS)

As mentioned in para 9.3.1.1, IMD had three Area Cyclone Warning Centres (ACWC) and three Cyclone Warning Centres for providing cyclone warning services to the maritime states[9].

IMD decided (2009) to replace all ACWDSs receivers by the new DTH-based DWDS receivers. A total of 500 such systems were to be installed all over the country. In March 2011, an MOU was signed by IMD, ISRO and Doordarshan for replacement of the existing CWDS system with the proposed DTH–based DWDS.

We noted that IMD was to provide the final list of 350 sites under phase-I containing coordinators identified for each of the sites to ISRO by September 2010. However, IMD was able to provide the list of 358 stations only by March 2011. BEL and ISRO were able to supply only 59 numbers of Receive Only Terminals (ROT) as of July 2012 for DWDS stations in Tamil Nadu and Puducherry which were yet to be installed. Thus, the ambitious scheme of upgradation could not be implemented effectively.

9.3.6 Disaster preparedness in the States/UT:

9.3.6.1 Andaman & Nicobar Islands

The State Control Room was established in the Directorate of Disaster Management. It was manned by 12 temporary labourers in the absence of regular staff.

In the aftermath of tsunami, the UT Administration installed seven tsunami sirens. Status of sirens at inhabited islands was as under:

Name of district	Inhabited islands	Inhabited Islands with Tsunami siren	No. of siren installed
South Andaman	10	1	4
Nicobar	13	3	3
North & Middle Andaman	14	0	0

In February 2009, the UT administration purchased 24 additional tsunami sirens at a cost of ₹ 6.79 lakh to be installed in South Andaman district. The same were yet to be installed.

Thus, only 4 of 37 inhabited islands had tsunami sirens.

[9] West Bengal, Odisha, Andhra Pradesh, Tamil Nadu, Puducherry, Kerala, Karnataka, Maharashtra, Goa and Gujarat

Tsunami siren at Kamorta

The UT administration, in December 2011, assessed that in order to install the tsunami sirens in every single inhabited island of ANI, 146 tsunami sirens were required which were not procured (April 2012).

Relief materials

The leftover relief materials donated by various organizations for tsunami rehabilitation from 2005 onwards were lying in the central godown. The UT administration did not formulate any plan to utilize the leftover relief materials and the disaster preparedness materials. In November 2009, it was decided that these may be distributed to all the tehsils of ANI for storing and meeting future contingencies. We noted that some of the materials were lifted by the different districts during 2011 and were kept at the identified relief godowns in the three districts. However, a substantial portion was still lying in the central godown. Meanwhile, Directorate of Disaster Management paid rent of ₹ 18.21 lakh to Port Management Board as godown rent and area rent for the storage space used by them at central godown.

Central godown, Haddo

In **Nicobar** district, a godown constructed to store disaster preparedness material along with relief material was handed over to Civil Supplies Department in January 2012.

Inspection of relief godowns were not carried out during the period 2007-08 to 2011-12. In the absence of this, no information was available on the condition of relief material stored there and their usefulness.

9.3.6.2 Gujarat

NDMA was implementing the National Cyclone Risk Mitigation Project (NCRMP) with a view to enable states to mitigate the effects of cyclone. The project proposed to create/repair physical infrastructure that could potentially reduce the effect of any cyclone. Gujarat State Disaster Management Authority (GSDMA) conducted a vulnerability study of the coastal areas and identified vulnerable villages which required cyclone shelters. GSDMA (December 2008) requested district collectors of 12 districts to identify suitable lands for construction

of cyclone shelters. GSDMA identified 175 shelters to be built in 12 selected districts. The construction work on any of the land identified/allotted had not yet started. Delay in construction of cyclone shelters affected the preparedness of the state for mitigating the effects of cyclone.

9.3.6.3 Odisha

We noted the following deficiencies:

- Construction of building was completed at Paradeep but the radar was not installed after procurement for want of clearance from Ministry of Defence (May 2012). Three other Doppler Weather Radar Stations were not set up (June 2012).
- Risk Management Plan having early warning indicators had not been prepared.
- Out of 220 Automated Weather Communication Systems (AWCs) planned to be set up with assistance from ISRO, only 37 were set up (June 2012). Out of these, seven AWCs were not functioning properly and at two AWCs (Koraput and Malkangiri) necessary equipment was not installed.
- The rain gauge at the Balasore Sadar Block was positioned un-evenly on roof top supported by some bricks without any permanent structure. The two inner rain water collecting jars were in damaged condition with small holes due to rusting of the pot. Daily recording of the rainfall was taken from this damaged and unevenly positioned rain gauge.
- 15 VHF sets placed at the District Emergency Operation Centre and blocks were not working.
- HAM radio station in Bhadrak district was not in running condition (June 2012).
- Test check in six cases revealed that time taken by the State authority in communicating alert message to District Authority was 60 to 90 minutes during 2007-12. Dissemination of message by district authority to all concerned took another 60 to 330 minutes.

9.3.6.4 Tamil Nadu

While the state gets copious rainfall during the North-East monsoon, the coastal districts are highly vulnerable to cyclonic storms. We test checked the District Disaster Management Plans (DDMPs) relating to cyclone preparedness and found that:

- The DDMPs of test checked districts were not yet approved.
- Provision of High Power coastal radio stations, VHF network etc., had not been discussed in the plans.
- The life line infrastructure had not been listed.
- All weather link roads to be laid were not identified.
- The areas where saline embankments were to be constructed to prevent ingress of saline water associated with cyclonic storm surge were not identified.

There are 124 cyclone shelters in the state, 114 cyclone shelters located in the state were repaired and reconstructed. In addition approval of construction of 121 multipurpose evacuation shelters at a cost of ₹ 262.86 crore was given in December 2011. The construction of cyclone shelters was in progress.

9.3.6.5 Andhra Pradesh

(i) Two shore stations were established at Balusutippa and Antharvedi in East Godavari district to disseminate cyclone and weather forecast. These became non-functional due to breakdown of the communication system after the effect of Jal Cyclone in November 2010. No funds were provided for its restoration and these remained dysfunctional till July 2012.

Early warning systems (wireless networks) were procured at a cost of ₹ 8.25 lakh by the Project Officer, UNDP, East Godavari district and installed in December 2008 in East Godavari district. These became unusable due to lack of maintenance and were not in working condition from October 2009 i.e. within one year of their procurement. No steps were taken by the district to get the systems repaired.

(ii) For East Godavari district, cyclones and floods were identified as the most common disasters occurring every year.

We found that out of 168 cyclone shelters constructed between 1985 and 2001 in 13 vulnerable mandals of the district, 99 shelters were not in usable condition. No shelters were constructed in another 10 mandals identified as likely to be affected being adjacent to the cyclone prone mandals.

In 22 test checked shelters, we noted that the accommodation was not sufficient. They were lacking basic amenities and required major repairs. Two shelters were located in low lying areas, which can even be submerged during floods. We also noted that eight shelters were unauthorisedly occupied and used for the purposes other than what they were meant for.

Pedabapanapally shelter in low lying area

All the 12 rescue boats available in the district required repairs and were not in usable condition. Due to lack of sufficient equipment like rescue boats, life saving appliances, fishermen safety kits etc., the evacuation of victims and their belongings to safer places during disasters would be difficult.

9.3.6.6 West Bengal

The State Government constructed flood, cyclone and multi-purpose shelters and identified schools and government buildings as shelters.

Flood shelter at Dainhat, Katwa-II, Burdwan lying incomplete due to lack of funds

During 2007-12, the department released ₹ 7.17 crore for construction of 73 shelters and 132 relief godowns. Out of this, two test checked districts, Birbhum and Burdwan received ₹ 96.65 lakh for construction of nine flood shelters and six relief godowns. We noted that as of July 2012, construction of three shelters and five godowns of Birbhum district were completed at a cost of ₹ 43.65 lakh while three shelters in Burdwan and one in Birbhum were incomplete due to lack of funds. One shelter each in Burdwan and Birbhum was not taken up as the funds were returned citing cost escalation (Burdwan)/funds remained unutilized (Birbhum). Thus, department's failure to release requisite funds in time and apathy of the executing agencies to execute the work had resulting in four flood shelters being incomplete while two flood shelters were not constructed.

9.4 Droughts

Drought suggests a situation of water shortage for human, cattle and agriculture consumption resulting in economic losses primarily in the agriculture sector. The need is not just to provide immediate relief but also undertake long term mitigation measures for drought. It requires a more comprehensive approach to drought management which encompasses early warning, monitoring, relief and mitigation.

9.4.1 Institutional framework for drought control

As per NDMA guidelines on Drought Management (September 2010), Ministry of Agriculture was the nodal Ministry for coordinating the response to challenges of drought. The Department of Agriculture & Cooperation (DAC) in the Ministry of Agriculture was entrusted with coordination of relief measures necessitated by drought, hailstorm and pest attacks. The Drought Management Division of the DAC was the focal point for coordinating and monitoring response for drought management. It provided logistic support on requisition of the State Governments and was also responsible for drought preparedness and response.

9.4.2 Action on NDMA guidelines

NDMA issued National Disaster Management Guidelines for management of drought in September 2010. The guidelines envisaged the following role and responsibilities of DAC:

- Setting up of India Drought Management Centre (IDMC) as an autonomous body under DAC.
- Developing specific guidelines for the use of Information and Communication Technology for online interaction and availability of real-time drought related information.
- Formulation of cloud seeding policy.
- Establishing a dedicated faculty in selected ATIs and organizations exclusively for research and training in drought management by instituting chair positions.

DAC stated in November 2012 that a system for online interaction and availability of real time drought related information would be developed. It further added that other activities were also under consideration by the department. The fact remained that these activities were yet to be undertaken.

9.4.3 Contingency crop plan

Ministry of Agriculture with the help of Indian Council of Agricultural Research (ICAR), State Agriculture Departments and agriculture universities had to prepare the 'Contingency Crop Plan' and disseminate it among farmers with the help of support agencies. Central Research Institute for Dryland Agriculture under ICAR was entrusted with the task of preparing district wise contingency plans. DAC stated (October 2012) that the contingency plans for only 353 districts spread across 19 states had been prepared

and the work was in progress in remaining states.

9.4.4 National Disaster Response Fund funding

9.4.4.1 Delay in providing immediate relief

As explained in Para 5.2.2, the procedure followed for consideration of financial assistance from the National Disaster Response Force for **drought, hailstorm and pest attacks** was same as for other disasters, except that for these, Ministry of Agriculture processes the request instead of MHA.

Response time is the crucial factor in providing immediate relief to the affected people. We noted that the lengthy procedure for processing the State Memorandum was taking enormous time keeping in view the severity of disasters and affected people.

There were 15 cases of drought and hailstorm reported during the year 2009-10. In nine cases, time taken for release of assistance ranged between two to nine months. Similarly, during the year 2010-11 and 2011-12, eight cases were reported and in four cases time taken for release of assistance ranged between two to ten months.

The Ministry stated (November 2012) that declaration/notification of drought was the prerogative of State Government and many a time, drought assessment required a longer time frame. After careful assessment of the situation, State Government declared drought in affected districts/talukas and submitted relief memorandum at that stage seeking additional financial assistance.

Audit noted that for ensuring timely assistance for relief and suffering of the victims of the disasters, time interval of occurrence of disaster and reporting to Centre by State needed to be minimized and fund under State Disaster Response Fund should be readily available.

9.4.5 State Disaster Response Fund utilisation by the states

9.4.5.1 West Bengal

State Disaster Response Fund guidelines stipulate that funds should be used for meeting expenditure for providing immediate relief to disaster victims. However, in the case of West Bengal we noted that an amount of ₹ 46 crore was released (March 2011) from State Disaster Response Fund to 13 districts for creation of spot sources of drinking water as a part of drought management. This was in contravention of State Disaster Response Fund norms.

9.4.5.2 Andhra Pradesh

In the case of drought, input subsidy was to be distributed before the next cropping season to keep farmers in a position to have adequate funds for sowing the next crop. We noted that although 14 Mandals in East Godavari district were declared as drought affected in November 2011, no funds were provided by State Government till March 2012. Further, although ₹ 11 crore was provided in April 2012, no disbursements were made to the affected farmers (July 2012) defeating the very purpose of providing State Disaster Response Fund.

Undue delay in release of input subsidy served only as a handout, without providing rehabilitation of agricultural activities.

9.4.6 National Agricultural Drought Assessment and Monitoring System (NADAMS)

NADAMS was initiated by National Remote Sensing Agency, Department of Space, with the support of IMD and various state departments of agriculture, towards the end of 1986. All the activities of NADAMS project starting from procurement of satellite data till dissemination of information to user community were currently being carried out under Disaster Management Support Programme of ISRO.

At a later stage, Agricultural Division, National Remote Sensing Centre submitted a project proposal under in-house project mode funded under DMS programme of ISRO in 2010-11. The objective of the project was the assessment of agricultural drought conditions in terms of prevalence, intensity and persistence at district or sub district level in 13 states[10] during kharif season every year.

As per the proposal of NRSC, monthly drought reports were the deliverables from NADAMS project. The drought reports were to be used by the Ministry of Agriculture, Government of India; State Departments of Agriculture, Revenue and Relief, Scientific Organisations and Training Institutes. While sending the drought report every month, users was requested for feedback on the report.

We noted that during 2010-11 and 2011-12, NRSC had received feedback from a few[11] state governments and departments. Most of the states had not sent their feedback. Further the feedback was not received on monthly basis.

As per the project proposal, the Head of the Agriculture Division was to review the project activities every fortnight during the execution period, June-December, to ensure smooth implementation of all the activities. However, no review report was found on record.

The efficacy of NADAMS was to be assessed on the feedback and review of project activities. Due to non-receipt of feedback on the monthly drought reports and non-conduct of review of the project activities, the effectiveness of the project could not be ascertained.

[10] Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Jharkhand, Karnataka, Maharashtra, Madhya Pradesh, Orissa, Rajasthan, Tamil Nadu and Uttar Pradesh.

[11] Ministry of Agriculture, IMD, Pune, State Governments of Jharkhand, Tamil Nadu, Haryana and Karnataka State Disaster Monitoring Centre, Karnataka

9.5 Forest Fire

The most common hazard in forests is fire which is the major cause of their degradation. They pose a threat not only to the forest wealth but also to the entire regime of fauna and flora seriously disturbing the bio-diversity and the ecology and environment of a region. These fires are sometimes caused by inhabitants intentionally, to collect fodder for cattle but mostly fires are caused unintentionally.

The year wise details of cases of forest fire for the period 2007-08 to 2011-12 (during the fire season from 1 November to 30 June) are shown as under:

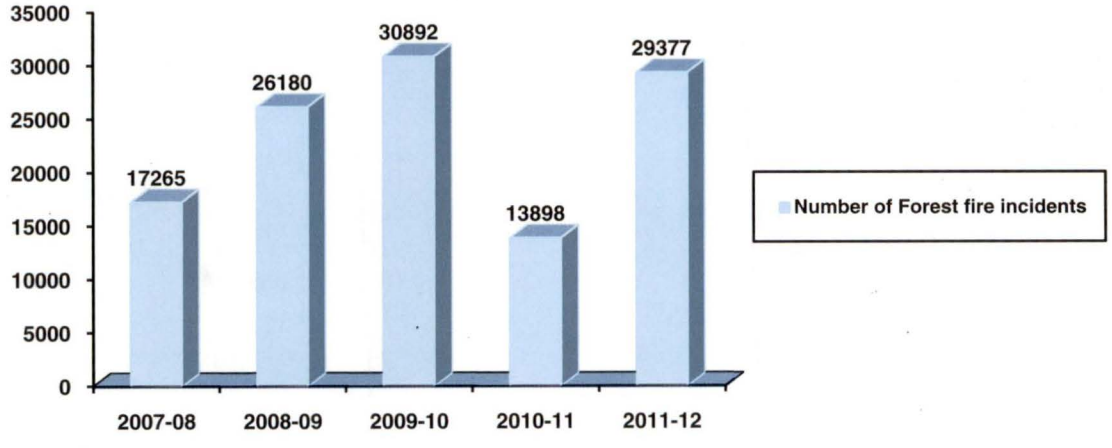


Chart 9.2: Incidents of forest fires in India

9.5.1 Institutional framework

Ministry of Environment and Forests (MoEF) was the nodal Ministry for forest fires. The role of the Ministry in respect of the forest fire disaster management were:

(i) to obtain Annual Work Programmes from the states which included the fire components and ensure that sanction is accorded to them well before the fire season;

(ii) to facilitate preparation of Crisis Management Plan of each State;

(iii) to evaluate and give feedback on forest fire management in the States.

In the Contingency Plan for Forest Fires prepared by MoEF, a four tier Crisis Management Group had been envisaged for coordinating the efforts and to align the duties and functions of the various levels of government machinery as depicted below:

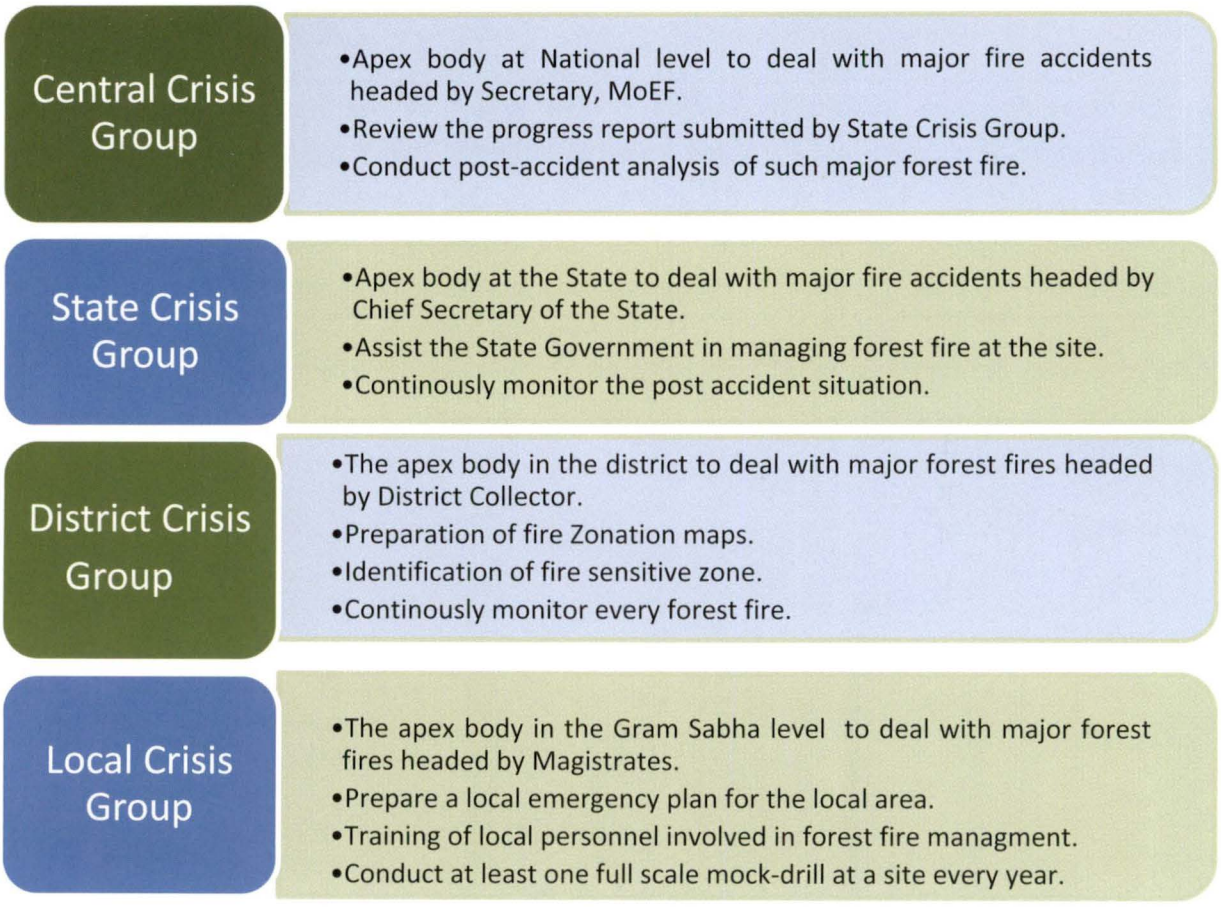


Chart 9.3: Multi level set up to deal with forest fires

9.5.2 Contingency Plan and State Forest Fire CMP

As per the Crisis Management Plan (CMP) of the Cabinet, MoEF was required to prepare contingency plan for dealing with forest fires. MoEF also had to issue detailed guidelines to the State Governments for the preparation of local contingency plans.

In January, 2010 (i.e. after a delay of about three years of formulation of CMP), MoEF requested the states for formulation of State Forest Fire Crisis Management Plan (SCMP)[12] and circulated format for the same.

Every state was to submit (a) the Forest Fire Plan which would include Emergency Fire Fighting Methodology latest by October of each year, and, (b) Forest Fire evaluation details latest by May of each year.

State crisis management plans are vital documents required for preparedness for forest fires. However, only five states viz. Chhattisgarh, Uttar Pradesh, Haryana, Bihar and Tripura and UT of Andaman & Nicobar had submitted the SCMP as of October 2012. Even these were pending with MoEF for approval.

[12] State Forest Fire Crisis Management Plan includes State Contingency Plan.

MoEF stated (October 2012) that it was actively pursuing with the various State Forest Departments regarding preparation of the SCMPs.

9.5.3 Forest fire early detection and monitoring mechanism

The Forest Survey of India (FSI) under MoEF had developed an indigenous methodology to detect forest fires from the given fire spots. The objectives of the project were to find and report forest fires at the nascent stage and to provide quick and reliable information to State Forest Departments (SFDs).

The forest fire early detection and monitoring mechanism had helped state forest agencies in obtaining forest fire information. It is being sent on a real time basis through SMS alerts and emails. The data is also provided to MoEF and is readily available on the official website of FSI[13].

There had been a marked improvement in timely dissemination of information to SFDs due to technological advancements. As a result, the time gap in providing such information to SFDs, which was around 24-36 hours prior to year 2011, had been reduced to two to three hours.

We noted that the data on the website of FSI provided only the location and time of forest fire but information about the magnitude of forest fire and loss due to fire was not available.

The utilization of this data by states and UTs could not be ascertained as majority of states and UTs had not prepared their SCMPs.

MoEF stated (October 2012) that attempts would be made to collect the data to the extent that it helps in evaluating the efficacy of the Fire Protection Plan of the states at the national level.

In our opinion, mere availability of data would not lead to better management of forest fires. It should form basis of national and State level planning. MoEF should utilize the same by analyzing it for future forest fire preparedness.

9.5.4 Central Crisis Group

MoEF had established a Central Crisis Group (CCG) in 2006, for management of forest fires at the national level, comprising Deputy Inspector General of Forests and Assistant Inspector General of Forests of Forest Protection Division. However, it was not headed by Secretary, MoEF and did not include members from other Ministries as prescribed in the Crisis Management Plan of the Ministry. Thus, MoEF did not follow the norms for setting up of CCG.

CCG was entrusted with the task of continuously monitoring the post-accident situations and to suggest measures for prevention of recurrence of forest fire accidents. We noticed that CCG was not playing its role effectively.

MoEF stated (October 2012) that collection of data as per the Crisis Management Plan would be done as a part of Crisis Management on an ongoing basis. Post fire analysis of the efforts of the State Government would be carried out at the Ministry and suitable initiatives would be taken.

[13] www.fsi.nic.in

9.5.5 Assessment of Intensification of Forest Management Scheme (IFMS):

MoEF provided funds for forest fire control and management mainly through Intensification of Forest Management Scheme (IFMS)[14]. During 2007 to 2012, MoEF had released an amount of ₹ 146 crore to various states and UTs under forest fires component of IFMS, against which the states had spent ₹ 92.40 crore during 2007-2011[15].

9.5.5.1 Release of funds and targets for states

We found that MoEF did not ascertain the gaps between existing infrastructure and ideal requirement of State Governments for which these funds were released. MoEF replied that the same had been sought from State Governments.

Moreover, MoEF merely fixed the targets on the basis of feedback received from the states and UTs Governments. Ministry did not prepare any list of forests prone to fire for prioritising funds to those areas.

MoEF stated (October 2012) that Fire Vulnerability Map of the forests of the country was being prepared by Forest Survey of India.

9.5.5.2 MoU under IFMS

As per operational guidelines of IFMS, a Memorandum of Understanding (MoU) was required to be signed by each implementing state and UT. We noted that only 17 states and UTs signed MoUs (October 2012).

We also noted that MoEF continued to release funds to the states and UTs which had not signed the required MoU. MoEF stated (October 2012) that the matter would be followed up with the remaining states/UTs which had not signed the MoU and the task would be completed in a time bound manner.

9.5.5.3 Monitoring of the scheme

MoEF was to arrange for periodic monitoring and evaluation of the scheme. However, no such monitoring and evaluation was done. MoEF stated that site visits and reviews had been done by officers of the Ministry from time to time. However, no reports of such evaluation were made available to audit.

Further, a Review and Monitoring Committee under the chairmanship of Principal Chief Conservator of Forests of State was to be constituted for half yearly review of the scheme. We noted that MoEF was not even aware of constitution of such committees indicating the absence monitoring mechanism at the Ministry's level.

MoEF stated (October 2012) that it had sent (in July 2012) directions to the states to conduct monitoring of sanctioned work programs under IFMS. Monitoring report had been received only from Haryana (October 2012).

[14] Funds for fire protection works are also released under (i) National Afforestation Programme (NAP) of National Afforestation and Eco-Development Board (NAEB) (ii) by 13th Finance Commission (major funding) and (iii) Integrated Development of Wildlife Habitat by Wildlife Division of MoEF as a part of their schemes.

[15] As per MoEF, the expenditure figures from States for the period 2011-12 are under compilation.

9.5.6 Preparedness for forest fires in Andhra Pradesh

The Crisis Management Plan (CMP) for forest fire of the state was submitted by the State Government to MoEF for approval only in June 2012.

In 12 districts of the state, 7357 forest fires occurred between 2009 and 2012. However, no forest fire evaluation details were submitted to Government of India during the period by the State Government.

The Central and State funds under the Intensification of Forest Management (IFM) scheme were not fully utilized during 2007-12. The utilization of the Central and State funds under the IFM scheme ranged between 47 and 89 *per cent* during 2007-11. The funds provided in 2011-12 remained unutilised.

9.6 Chemical disaster

Rapid industrialization in the country has increased the chemical hazard risk and vulnerability to the industry and the environment. The frequency and severity of chemical disasters have also increased over the last few years due to rapid development of chemical and petrochemical industries and increase in the size of plants, storage and carriers, specifically in densely populated areas. Common causes for chemical accidents are deficiencies in safety management systems and human errors. The nature of chemical agents and their concentration during exposure ultimately determines the level of toxicity and its damaging effects on living.

9.6.1. Institutional Framework

The Ministry of Environment and Forests (MoEF) is the nodal Ministry for chemical disaster as per Crisis Management Plan (CMP), 2007 of GoI. The Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996 envisage constitution of four tier Crisis Management System as depicted in the following figure:

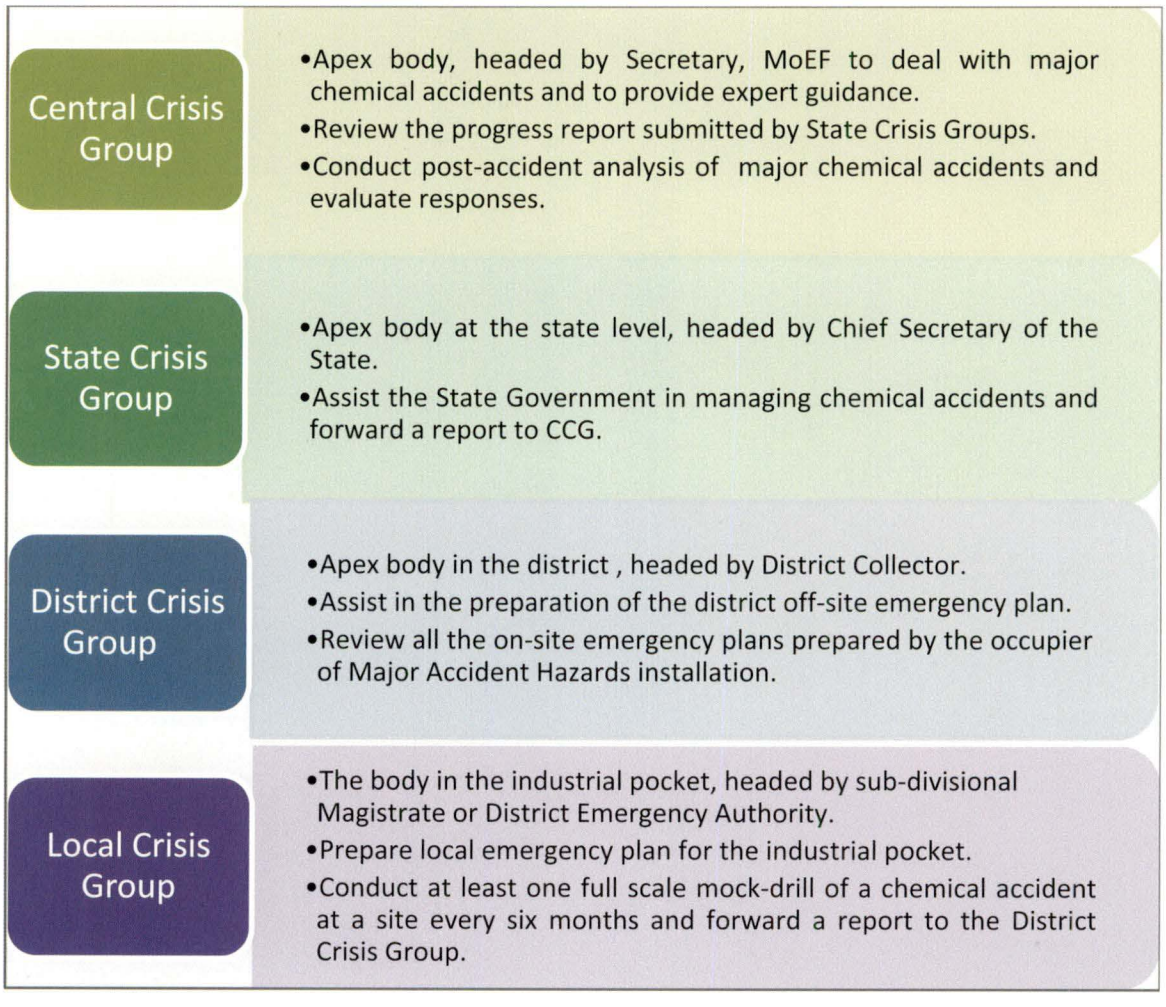


Chart No. 9.4: Multi level set up to deal with chemical disasters

9.6.2. Rules framed by the Ministry and their compliance

MoEF had notified two sets of rules namely:

(i) the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 and the amendment (MSIHC Rules), and

(ii) the Chemical Accidents (Emergency Planning, Preparedness and Response) Rules 1996 [CA (EPPR) Rules].

The MSIHC rules prescribed preparation of on-site emergency plan by the occupier and off-site emergency plan by the District Authority.

9.6.3. Compliance of MSIHC Rules:

9.6.3.1 Off-site emergency plan

The effects of a major accident in an industrial set up are not always restricted to the boundaries of the industrial installations. They may spill over to the community and the environment in the vicinity. It is the duty of the District Collector (or District Emergency Authority designated by the State Government) to prepare and keep up-to-date an adequate off-site emergency plan containing particulars specified and detailing how emergencies relating to a possible major accident on that site would be dealt with.

As of October 2012, there were 1889 Major Accident Hazardous (MAH) units located in 298 districts in the country. Off-site emergency plans were available for 189 districts of 1477 MAH units. The off-site emergency plans for another 50 districts of 315 MAH units were under preparation. Thus, 59 districts of 97 MAH units in the country did not have off-site emergency plans to deal with major accidents on their sites.

9.6.3.2 Rehearsal of the off-site emergency plan

The concerned authorities had to ensure that a rehearsal of the off-site emergency plan is conducted at least once in a calendar year.

MoEF reported (October 2012) that it had provided financial assistance to 45 districts for conducting rehearsal of the off-site emergency plans as a part of the plan preparation. However, MoEF did not provide any details of rehearsal of the off-site emergency plans actually conducted by these 45 districts.

9.6.3.3 On-site emergency Plan

The occupier of MAH units was to prepare and keep up-to-date, an on-site emergency plan containing details specified and detailing how major accidents would be dealt with on the site on which the industrial activity is carried on.

There were 1889 MAH units located in 298 districts in the country. Out of these, 1838 had prepared on-site emergency plans. Thus, the remaining 51 MAH units were still not prepared to deal with major accidents on their sites.

9.6.3.4 Mock drill of the on-site emergency plan

The occupier had to ensure that a mock drill of the on-site emergency plan was conducted every six months and a detailed report of such mock drill be made immediately available to the concerned authority.

MoEF did not provide the details about number of mock drills and stated that it would be available with the concerned State Labour Departments.

MoEF further stated (October 2012) that it receives this information from the concerned Chief Inspector of Factories as a part of its Annual Report.

9.6.3.5 Chemical Accident Information and Reporting System (CAIRS)

MoEF sanctioned (January 2006) a project of National Informatics Centre Services Inc. for development of an Online Web Based-CAIRS. The total cost of the project was ₹ 12.32 lakh. As per the recommendation of Central Crisis Group, in May 2009, MoEF requested all the Chief Inspector of Factories and the Labour Secretaries of the states and UTs to furnish the information pertaining to the chemical accidents that occurred in their States.

We noted that there were only 12 incidents reported since 2009. The authorities were however, not reporting all the chemical accidents regularly as even chemical accidents reported in the National Chemical Disaster Database published by MOEF, were not reported in CAIRS. Thus, CAIRS was yet to generate adequate response either due to lack of awareness or due to operational issues of website.

MoEF stated (October 2012) that there were operational difficulties in uploading of information in the CAIRS and they had taken up this matter with NIC.

9.6.4. Compliance of EPPR Rules:

9.6.4.1 Meetings of Central Crisis Group

The Central Crisis Group (CCG) was last constituted in August 2004. CCG has to meet once in every six months to monitor and discuss the major chemical accidents occurring in the country.

We noted that since 2007 the CCG had met only seven times and the time lag between the two meetings ranged as high as 21 months. It was evident that MoEF was not carrying out proper supervision and guidance for preparing and managing of chemical accidents in the country.

9.6.4.2 Progress reports submitted by the State Crisis Groups

The CCG had to review the progress reports submitted by the State Crisis Groups (SCG). However, we noticed that such progress reports were not being received from the SCGs by MoEF leaving them unaware of the status.

9.6.4.3 Red Book

MoEF was to publish a list (Red Book) of Members of the Central, State and District Crisis Group in the country. The Co-ordination Committee of MoEF, in 1998, decided that there was a need to review, update and print the Red book annually.

The latest available version was of 2010. Thus, Red Book was not being regularly updated by MoEF. As a result, the latest contact details of all the authorities and experts concerned with the handling of chemical accidents were not readily available to those who may need it. The

work of updation and printing of Red Book was awarded by the MoEF only in January 2012.

9.6.5. National Action Plan on Chemical (Industrial) Disaster Management

NDMA Disaster Management Guidelines on Chemical Disasters mandated MoEF with preparation of National Action Plan on Chemical (Industrial) Disaster Management. MoEF entrusted (June 2009) the task of preparation of Plan to Disaster Management Institute (DMI), Bhopal. The project including finalization of the draft report was to be completed in eighteen months i.e. by December 2010. We noted that there was a delay of more than 18 months. There was a further delay in evaluating and approval of the draft report by MoEF. Thus, the National Plan meant to minimize the occurrence of chemical and industrial disasters was yet to be put in place.

9.6.6. Emergency Response Centres

MoEF approved (July 1992) a scheme for setting up of Emergency Response Centres (ERC) in the country. The ERCs primarily dealt with chemical emergencies in a defined area and were round the clock facilies, with system for quick retrieval of information on hazards.

The ERCs were set up on mutual cost sharing basis between Central Government, State Government and the local Industries.

We noted that only eight ERCs in four states were funded by the Ministry. Thus, the spread of ERCs in the country was not uniform and ERCs were not established in most of the states/UTs even though there were considerable numbers of MAH units, as depicted in Table 9.1:

Table 9.1: Details of MAH units in states and ERCs funded by MoEF

Sl. No.	State	Total No. of MAH Units*	Number of ERCs funded by MoEF
1.	Gujarat	428	Nil
2.	Maharashtra	327	1
3.	Andhra Pradesh	144	5
4.	Uttar Pradesh	118	Nil
5.	Tamil Nadu	118	Nil
6.	Rajasthan	107	Nil
7.	West Bengal	85	Nil
8.	Karnataka	78	Nil
9.	MP	71	1
10.	Punjab	56	Nil
11.	Haryana	52	Nil
12.	Orissa	39	Nil
13.	Kerala	38	1
14.	Uttaranchal	30	Nil

***Source "National Profile of Major Accident Hazard Installations" published by MoEF in March 2011**

Thus, an effective system for chemicals crisis management was not available in the majority of states/UTs.

MoEF stated that as per the scheme, the commitment and share of State Government was required for establishment of ERCs. Therefore, it had fixed no targets for the same.

MoEF needs to follow up the matter with the State Governments to ensure setting up of ERCs at least in these states where MAH units were in abundance.

9.6.7. Disaster preparedness in the states:

9.6.7.1 Andhra Pradesh

We noted that:

- The Major Accident Hazardous units carried out independent safety audit of the industrial activities and forwarded the reports to the Director of Factories, Hyderabad. However, out of 343 safety audit reports due for the period from 2007 to 2012, just 211 reports were received.
- Though State Crisis Group (SCG) was constituted in the State in February 1998, yet no SCG meetings were conducted during the period 2007-2012. SCG had neither reviewed district off-site emergency plans nor forwarded any reports relating to off-site emergency plans of the districts to Central Crisis Group (CCG) during 2007-2012. Thus, the SCG was largely ineffective.
- District Crisis Groups (DCG) meetings were conducted, once in year, in only 5 out of 23 districts in the State during 2007-2012. No progress reports were submitted by the DCGs to the SCG during 2007-2012.
- Off-site emergency plans were prepared only for 11 out of 23 districts during 1995 to 2011. These off-site plans were not updated since 2007, although new MAH units were added in many of the districts.

9.6.7.2 Rajasthan

- ❖ In Jalore and Barmer districts, we noted that legal instrument for management of hazardous waste was not established and off site emergency plan was not prepared.
- ❖ No meetings were held by the DCG and LCG in the test checked districts.

9.7 Biological Disasters

Biological disasters are scenarios involving disease, disability or death on a large scale among humans. Such disasters may be natural in the form of epidemics or pandemics of existing, emerging or re-emerging diseases and pestilences. Biological disasters of natural origin are largely the result of the entry of a virulent organism into a congregation of susceptible people living in a manner suited to the spread of the infection.

9.7.1 Institutional Arrangement:

Ministry of Health and Family Welfare (MoH&FW) was the nodal Ministry for coordinating the response to challenges of biological disasters. MoH&FW was vested with the responsibility of:

- framing the national health sector guidelines,
- providing guidance and technical support for capacity development in surveillance,
- early detection of any outbreak,
- supporting the states during outbreaks in terms of outbreak investigations,
- deployment of Rapid Response Teams (RRTs),
- manpower and logistic support for case management, etc.

The apex decision-making body was the Crisis Management Group headed by the Secretary, which was advised by the Technical Advisory Committee headed by Director General Health Services (DGHS).

9.7.1.1 EMR Division

The Emergency Medical Relief (EMR) Division of the Directorate General of Health Services was the focal point for coordination and monitoring response for biological disasters of national and international concern. During 2007-12, EMR division had dealt with avian influenza, pandemic influenza and Cremean Congo Hemorrhagic fever.

The core function for preparedness for biological disasters was surveillance which was undertaken through Integrated Disease Surveillance Project (IDSP).

This project was run by National Centre for Disease Control (NCDC). IDSP was responsible for surveillance, detecting early warning signs and informing the government.

9.7.1.2 National Centre for Disease Control (NCDC)

NCDC was the nodal agency for implementing the International Health Regulations 2005[16] and for investigating disease outbreaks.

The functions of the NCDC broadly covered three areas viz. trained health manpower development, outbreak investigations, specialized services and operational and applied research. The NCDC provided teaching/training, research and laboratory support as well.

[16] IHR (2005) is to prevent, protect against, control and provide a public health response to the international spread of disease.

9.7.2 Legal framework

9.7.2.1 Epidemic Act

Health is a State subject and the primary responsibility of dealing with biological disasters rested with the State Governments.

The Epidemic Diseases Act, 1897 provided the states the authority to designate any of its officers or agencies to take measures for the prevention and control of epidemics. NDMA in its guidelines had observed that the Act did not provide any power to the Centre to intervene in the cases of biological emergencies. Further, the Act also did not take care of the prevailing and foreseeable public health needs including emergencies such as bioterrorism attacks and use of biological weapons by an adversary, cross-border issues and international spread of diseases.

In 2008, NDMA pointed out the need for amending the Epidemic Diseases Act 1897, with a more contemporary Act suggesting a time frame of three years for enactment of such legislation. We noted that even the draft bill was not finalised.

The Ministry stated (July 2012) that a draft Public Health (Prevention, Control and Management of Epidemics, Bio-terrorism and Disasters) bill was under consideration.

9.7.2.2 National Code for bio-security and bio-safety

NDMA guidelines (2008) suggested preparation and promulgation of a national code of practice for bio-security and bio-safety. This code would have provided the basis of accreditation of laboratories with respect to the handling of microbial material at the national level. Audit noticed that such a code had not been prepared by the nodal Ministry (October 2012).

The Ministry stated (November 2012) that there were existing guidelines for bio-security and bio-safety which were being followed by National Accreditation Board for testing and calibration Laboratories (NABL). Laboratories in the country were receiving accreditation from NABL on the existing guidelines.

We noted that NABL was accrediting laboratories in the country even without the formulation of national guidelines by NDMA which had highlighted the need for national code of practice for bio-security and bio-safety. Such a code was yet to be promulgated in the country.

9.7.3 Disease surveillance and early warning systems

NCDC performed the task of investigating disease outbreaks through its Integrated Disease Surveillance Project (IDSP). This project was launched with World Bank assistance in November 2004. The objective of the project was to strengthen the disease surveillance in the country by establishing a decentralized state based surveillance system for epidemic prone diseases to detect the early warning signals.

The project duration was extended for two years up to March 2012[17], with domestic

[17] From April 2012 the IDSP is proposed to be funded under NRHM in the 12th Plan

funding in 26 states and UTs and with World Bank support in nine states.

Under IDSP, a Central Surveillance Unit (CSU) at Delhi, State Surveillance Units (SSU) in each state and District Surveillance Units (DSU) aim all districts in the country were established to keep a track of disease outbreak.

9.7.3.1 Non Reporting to CSU

Central Surveillance Unit (CSU) received disease outbreak reports from the states and UTs on weekly basis. We noted that states and Union Territories did not send report on outbreaks to CSU every week.

Reporting from five states and union territories was below 50 *per cent* during the year 2012. Further, reporting from another seven states and union territories was between 50 and 79 *per cent* during 2012. Seven districts in the country had never reported data for IDSP till July 2012. Further, 22 *per cent* of the reporting units did not report data during 2012.

In the absence of regular reporting, IDSP would not work effectively. NCDC (September 2012) accepted the facts and stated that CSU was following up with states to obtain reports every week to ensure that every disease outbreak was reported.

EMR division also stated (October 2012) that notifications of epidemics was the prerogative of State Governments and information on epidemics declared by the State Governments was not available with them. This was indicative of gaps in coordination between Central and State units, which could effect the response to epidemics.

9.7.3.2 Strengthening of laboratories

In February 2009, fifty district laboratories were identified for strengthening with a view to obtain accurate lab based surveillance data. However, task of strengthening 15 out of 50 labs was incomplete (September 2012).

Lab Facilities in India

Laboratories were graded by Bio Safety Levels[18] (BSL) Bio-safety laboratories were required for the prompt diagnosis of the agents for effective management of biological disasters. Prior to the appearance of avian influenza, the health sector had only one BSL-3 laboratory at National Institute of Virology (NIV), Pune but subsequently six more BSL-3 labs were established. However, no BSL-4 lab was functional in India. BSL-4 lab at NIV, Pune was ready but not yet functional. NCDC informed that setting up of BSL-4 labs was not included in its upgradation proposal.

9.7.3.3 Manpower management

766 posts of technical personnel were sanctioned in SSU and DSU. Of these, only 420 posts were filled up till October 2012. NCDC (November 2012) stated that there was overall low availability of technical manpower and efforts were being made to increase manpower availability by starting new courses at National Centre for Disease Control, Public Health Foundation of India, etc.

[18] A method for rating laboratory safety. Laboratories are designated BSL 1, 2, 3, or 4 based on the practices, safety equipment, and standards they employ to protect their workers from infection by the agents they handle.

9.7.3.4 Telecommunication network for IDSP

To enable instant transfer of data, in 2005, ISRO was given the task of establishing satellite network for IDSP through EDUSAT. It was decided to set up a country wide network connecting all district headquarters, major medical colleges and the CSU. ISRO earmarked eight megahertz bandwidth under IDSP for establishing satellite network. Funds amounting to ₹ 12.93 crore were released to ISRO in September 2005 and January 2006 for installing VSAT system at 400 sites in the country.

We noted that:

No agreement or MoU was entered into with ISRO. There was no binding provision for implementation of the project with in a fixed time frame. Despite making available the entire funds to ISRO for installation at 400 sites, 33 sites were incomplete due to non availability of space and required infrastructure and short shipment by the suppliers.

In September 2010, the VSAT network stopped functioning due to technical problems. ISRO stated that IDSP network would be restored with the launch of GSAT-12 in July 2011. However, we noted that the services had not been restored to IDSP even after launch of GSAT-12.

NCDC stated (September 2012) that ISRO had allotted the bandwidth in February 2012 and awarded the contract to migrate the sites to new satellite GSAT-12. It further added that only when the satellite connectivity is available, remaining sites would be installed and network would be functional again.

Thus, the network for IDSP was not functional despite incurring an expenditure of ₹ 12.93 crore (September 2012).

9.7.3.5 Call Centre for IDSP

IDSP established a toll-free call centre in February 2008 as one of the tools to receive alerts and information regarding outbreaks of epidemic prone diseases.

We noted that the centre was non functional since April 2012, which coincided with switchover from World Bank funding to domestic funding.

The web-site of NCDC was still displaying the call centre toll free number but the call centre was not in operation.

Surveillance at entry points in the country:

The country had 25 airports, 12 ports and seven international land borders which catered to international traffic. Increase in the volume of traffic led to an emergence and re-emergence of a number of deadly diseases of global concern like SARS, swine flu, avian influenza and Ebola virus etc.

Surveillance at these entry points against dangerous global pathogens, capable of being brought in India by international passengers, is low in the country.

The Ministry stated in October 2012 that there is a need to establish health units at 23 entry points. Similarly health units at 21 entry points need to be strengthened. A proposal in this regard is underway for the Twelfth Plan period.

9.7.4 Upgradation of NCDC

In August 2005, it was decided to transform National Civil Defence College as an apex organization with the mandate of effective and exhaustive disease

surveillance and control activities. The Cabinet Committee on Economic Affairs approved the proposal for upgradation of NCDC in December 2010 at a cost of ₹ 382.41 crore. The project was to be completed by March 2013.

We found that the agreement for civil works was signed in September 2011. The layout plan for the NCDC was yet to be approved by Delhi Urban Arts Commission and Delhi Fire Services. Commencement of the project was delayed due to non obtaining of the timely approval of lay out plan. Further, out of the 103 newly sanctioned posts for 2011-12, only 13 Group B posts were filled and no Group A post was filled. Thus, proposed upgradation for effective surveillance was delayed.

9.7.5 A case study on Pandemic influenza 2009:

Pandemic Influenza (H1N1 flu) 2009

Influenza virus can infect both human beings and animals notably pigs, birds, horses etc. Three types of influenza viruses are known, namely A, B and C. Humans can be affected by all the three influenza viruses. Influenza A virus causes infection in humans all round the year and is responsible for most of the seasonal epidemics and pandemics. Influenza B causes sporadic and less severe outbreaks whereas the type C causes mild respiratory illness.

Influenza A [H1N1] is a subtype of Influenza A virus, which was first reported in Mexico in March, 2009 and then spread to other countries. In India the pandemic began with an imported case from U.S.A in May 2009. This was declared as a public health emergency of international concern in 2009 by WHO. In India, 31 states/ UTs were affected by this disease since 2009.

The Central Teams visited 22 states for assessing the preparedness for containment of Influenza-A H1N1 in September 2009. The Central Teams reported deficiencies in facilities for treatment of the disease such as inadequate ventilators, shortage of medicines and fumigation equipment etc.

The preparedness for containing the influenza was found deficient for such a pandemic situation.

Lessons learnt: Since 2009, every year a number of H1N1 infection cases have been reported from different parts of the country – repeatedly from Maharashtra, Assam and West Bengal etc. These repeated occurrences point towards a failure in institutional mechanism to prevent repeated outbreak of a particular contamination.

45 diagnostic laboratories (26 in government sector and 19 in private sector) were up-scaled to test Pandemic Influenza A H1N1 virus by March 2010. However, a comprehensive assessment of lab requirement in the country was yet to be made.

9.8 Radiological and Nuclear Emergencies

Radiation and radioactive substances have many beneficial applications, ranging from power generation to use in medicine, industry and agriculture. At the same time, the risks of radiation that may arise from these applications to the people working in these fields, the general public and the environment are enormous. These risks, therefore, need to be assessed and controlled effectively. Regulating safety is a national responsibility.

We have discussed the results of our audit on emergency preparedness for nuclear and radiation facilities in the country in Chapters-VI and VII of CAG's Performance Audit Report (Report No. - 9 of 2012-13 for the period ended March 2012) on Activities of Atomic Energy Regulatory Board (Department of Atomic Energy). A gist of these audit findings on emergency preparedness for nuclear and radiation facilities are discussed hereunder.

9.8.1 Institutional framework

Department of Atomic Energy (DAE) was the nodal agency for responding to any nuclear or radiological emergency. Atomic Energy Regulatory Board (AERB) was set up in 1983 to lay down safety standards and to assist DAE in framing rules and regulations for regulatory and safety functions.However, MHA is the nodal ministry to coordinate with various response agencies in the event of any nuclear or radiological disaster in the public domain.

9.8.2 Absence of coordinated implementation mechanism

NDMA brought out the National Guidelines for management of nuclear and radiological emergencies in February 2009. Various issues were identified by NDMA like sensitisation of people to remove the fear, adequacy of resources in the event of off-site emergency, strengthening regulatory and security aspects in industry and hospitals using radioactive sources etc.

We noted that although these gaps were identified in 2009 by issuing the guidelines and recommendations, no authority had taken the responsibility of acting on them.

9.8.3 Database relating to radiation facilities

Prior to the establishment of AERB, radiation facilities were under the regulatory control of BARC. AERB did not obtain sufficient data relating to radiation facilities operating in the country when the regulatory work was assigned to it.

AERB did not have an effective system in place to ensure continuous collection and updating of its inventory of all radiation sources.

9.8.4 Non monitoring of disposal of radioactive material

AERB issued consents for disposal of decayed radioactive materials from medical, industrial and research institutes for safe disposal to the original supplier or

to one of the approved radioactive waste disposal facilities[19] in India.

We noted that although several consents had been given so far, there was no proper mechanism to verify whether the sources had actually been disposed of in accordance with the safeguards prescribed in the consent letter. Records for all the sources disposed of, so far, at their facilities were being maintained by the National Waste Management Agency.

9.8.5 Orphan sources

International Atomic Energy Agency (IAEA) Safety Glossary defines an 'orphan source' as a radioactive source which was not under regulatory control.

We noted that there was no effective mechanism in place to prevent radioactive sources from getting out of regulatory control. The regulatory response mechanism to trace and discover lost and/or orphan radioactive sources in the country was also not effective. AERB should strengthen its current approach to deal with the issue of orphan sources by adopting the best practices laid down by the IAEA.

9.8.6 Emergency preparedness for nuclear and radiation facilities:

We reviewed the regulatory effectiveness of systems and procedures relating to emergency preparedness, both on-site and off-site and the general adequacy of emergency preparedness and coordination between various authorities.

9.8.6.1 On-site emergency preparedness

On-site emergency preparedness plans were put in place by the plant managements of Nuclear Power Plants (NPPs) and nuclear fuel cycle facilities. These emergency preparedness plans were tested by actual periodic exercises prescribed, based on the types of emergencies, by the plant managements of NPPs. Plant Emergency Exercises (PEE) were conducted once in a quarter, while Site Emergency Exercises (SEE) were conducted once a year. AERB only reviewed the report of these exercises conducted by the plant managements and did not directly associate itself in these exercises, even as observers.

As the nuclear safety regulator, AERB should associate itself as an observer in these exercises on selection basis to exercise adequate regulatory supervision in these exercises.

9.8.6.2 Off-site emergency preparedness

For the purpose of planning an off-site emergency, an emergency-planning zone was specified, up to a 16 km radius from the plant. The Emergency Response Manual of AERB specified the criteria to determine an off-site emergency. The protective measures in the public domain were also specified in the Manual.

Review in audit of off-site emergency preparedness in the country revealed the following:

- In the case of NPPs, the Off-site Emergency Exercise (OSEE) was

[19] National Waste Management Agency, BARC

conducted once in two years, in coordination with District Authorities and the public. We observed that there was no significant deviation in the conduct of OSEE and AERB was associated with these exercises as an observer.

- In all, 26 such emergency exercises were conducted during the period 2005-2011 in various NPPs. AERB submitted observer's reports to the plant authorities and the CMG for taking necessary action to rectify or revise the offsite emergency plans.

AERB stated (February 2012) that presently, it was not mandated to take follow-up action with the district and state authorities on deficiencies in emergency preparedness pointed out by it. However, it was considering asking the plant managements to obtain and submit information on the status of corrective measures taken, subsequent to the OSEEs by the local authorities.

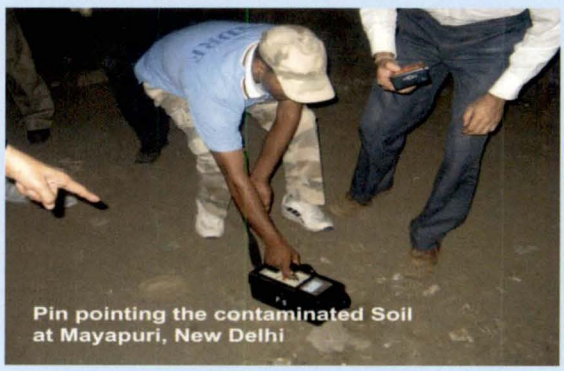
The reply confirmed the weakness in the regulatory regime since the AERB had no authority to enforce rules in the instances of malpractices and departures from the approved plans.

9.8.6.3 Emergency plans for radiation facilities

We noted that codes for emergency preparedness plans for NPPs and nuclear fuel cycle facilities of Department of Atomic Energy had been framed and issued. However, no specific codes on emergency preparedness plans for other types of radiation facilities such as industrial radiography, radiotherapy and gamma chambers, etc. had been brought out even though the hazard potential of these were rated as high.

9.8.7 Case Study: Radiation incident in Mayapuri, New Delhi

The University of Delhi procured radiation equipment containing a gamma cell in 1970, which was operated till 1985. AERB stated (June 2010) that this unused equipment containing the gamma cell was sold to a local scrap dealer in a public auction. Thereafter, the equipment was dismantled and the source assembly was handled by persons with bare hands. This resulted in serious radiation injuries to these persons, including the death of a person. These casualties occurred due to unsafe and unauthorized disposal of radiation equipment at Mayapuri, New Delhi in April 2010. It is apparent that the accident was the result of ignorance about practices for safe disposal of radioactive waste.

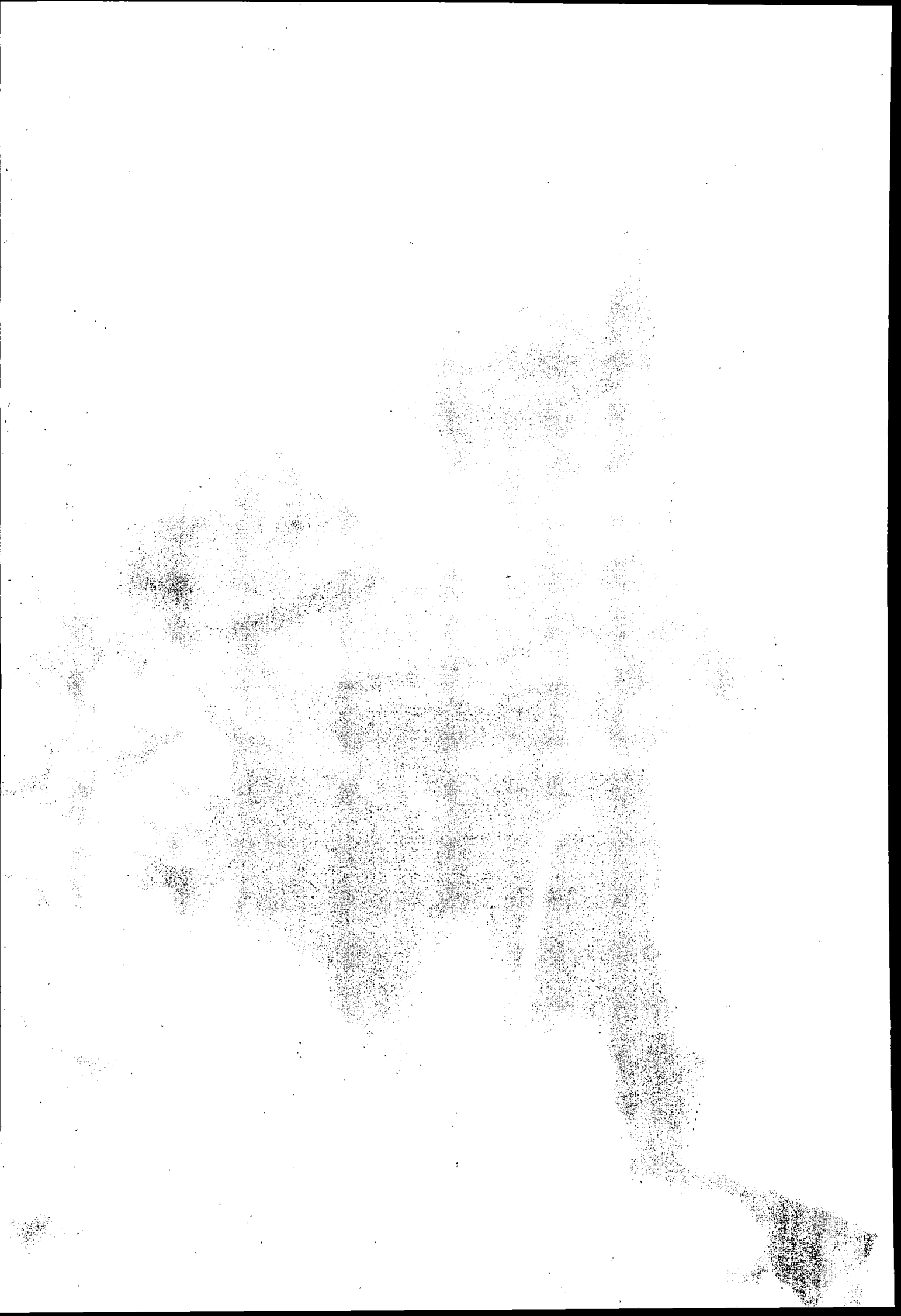


Pin pointing the contaminated Soil at Mayapuri, New Delhi

AERB further stated (February 2012) that the incident occurred primarily due to violations by University of Delhi of the clear and unambiguous requirements specified in the applicable rules, about safe disposal practices of radioactive wastes.

Recommendations:

- MoES should prepare the Earthquake Management Plan in consonance with National Guidelines issued in this regard. Communication between MoES and MHA needs to improve as MoES seem to be unaware of its responsibilities as spelt out in the NDMA guidelines.
- NDMA should complete its project on 'Vulnerability Assessment and Risk Analysis' with respect to various natural hazards.
- Ministry of Water Resources should ensure preparation of EAPs of the states covering all the major dams.
- There is a need to ensure timely completion of various projects undertaken by MoES for modernization of IMD.
- DAC should ensure that the activities envisaged in the National Guidelines on drought management are completed expeditiously to provide impetus for disaster preparedness for mitigation of droughts.
- Submission of monthly drought reports should be ensured by all the stakeholders so that the project activities of NADAMS may be reviewed periodically.
- Forest fire monitoring data could be utilized in preparation of the Contingency Plan for forest fires.
- An effective system for chemical crisis management at the state level and to provide a link between the accident sites and expert group is required to be devised.
- CAIRS need to update information of chemical accidents expeditiously.
- The Central Crisis Group needs to play its role in monitoring the post-accident situation and suggesting measures for prevention and recurrence of forest fires.
- The deficiencies reported in IDSP need to be rectified. Surveillance at the entry points and laboratory infrastructure in the country need to be strengthened.



PART - III

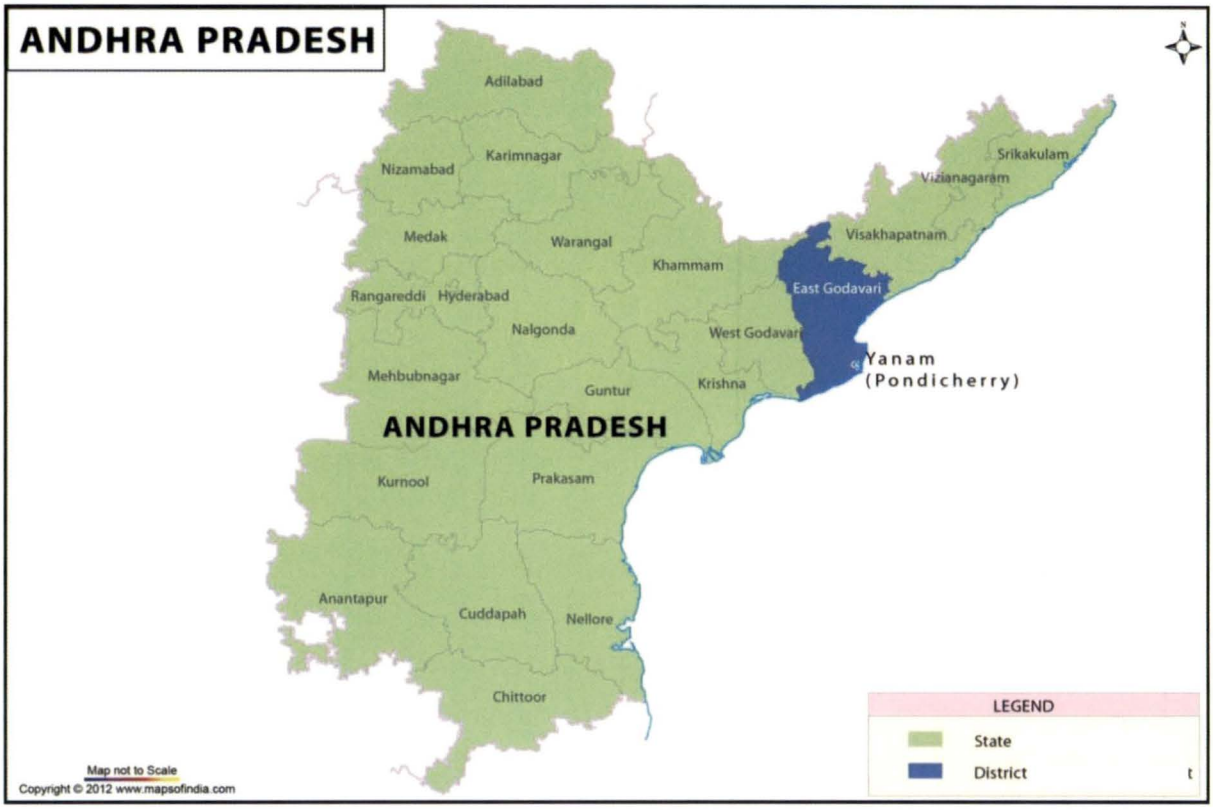
Chapter – X:

State/UT Specific Findings

State: Andhra Pradesh

1 Background

Andhra Pradesh with a 1030 km long coastline covers 274,000 sq km on the east coast of India and is the country's fifth largest state, accounting for 8.4 *per cent* of its total area. The state is vulnerable to major natural disasters like cyclones, floods and earthquakes, as well as to industrial and chemical hazards.



Map 10.1: Andhra Pradesh

1.1 Vulnerability Profile of the state: The major vulnerabilities to disasters in the state are categorized below:

Cyclones and Floods: About 44 *per cent* of its total territory is vulnerable to tropical storms and related hazards. The coastal region suffers repeated cyclones and floods.

Earthquakes: 34 *per cent* of the state falls in zone III[1]. Major urban centers of the state with mushrooming apartments and commercial complexes are Hyderabad (zone II), Visakhapatnam (zone II) and Vijayawada (zone III). Other important towns which fall in zone III are Tirupati, Nellore and Cuddapah.

[1] Source: Categorised as per Seismic Zone map of India given in the earthquake resistant design code of India [IS 1893 (Part 1) 2002]

Droughts: Eight districts in the state (out of total 23) are particularly vulnerable to drought viz., Anantapur, Chittoor, YSR (Kadapa) and Kurnool in Rayalaseema region; Rangareddy, Mahabubnagar and Nalgonda in Telangana region; and Prakasam in coastal areas.

The details of major disasters in the state in the last decade are given in **Annex-10.1**.

2 Institutional Arrangements in the state

The State Disaster Management Authority (SDMA) was constituted in the state in November 2007. The District Disaster Management Authorities (DDMAs) headed by the District Collector were also constituted in November 2007.

In Andhra Pradesh, Commissioner for Disaster Management and Ex-Officio Principal Secretary provides guidance and coordinates with other line departments for disaster preparedness work in accordance with the guidelines laid down by NDMA. The department is also responsible for preventive, relief and rehabilitation activities in the state. It is the nodal agency in planning and coordinating with other departments in prevention and relief measures for disaster management.

East Godavari district was selected in the state to assess district level preparedness.

3 Observations on Disaster Preparedness

a. Though the state level and district level authorities were established in 2007, we noticed gaps in their functioning. There were only three meetings of SDMA, SEC and DDMA's in selected districts during the five years covered in audit.

b. The state level plan was at the draft stage.

c. We noticed irregularities in the management of State Disaster Response Fund. These included diversion of funds (₹ 3.29 crore), non remittance of fund (₹ 46.49 lakh), non reconciliation and non submission of utilisation certificates (₹ 4024.38 crore). (Para nos. 5.1.3, 5.1.4 and 5.1.5)

d. No mapping of roads in vulnerable areas in the test checked district was done by the Roads and Building Department. Consequently, no measures were taken to identify vulnerable roads and alternative routes in the test checked district.

e. The Master Plan of Kakinada town prepared in 1977 was required to be revised every 20 years. However, no revision had taken-place so far.

f. In Hyderabad, 144 buildings were identified as dilapidated, of which only 5 were demolished. (Para no. 9.1.7.2)

g. We found that out of 168 cyclone shelters constructed, 99 shelters were not in usable condition. (Para no. 9.3.6.5)

h. Out of the 343 safety audit reports of Major Accident Hazard units for chemical safety due in the last five years, only 211 reports were received. Off-site emergency plans were prepared for only 11 out of the 23 districts. These off-site plans were also not updated since 2007. (Para no. 9.6.7.1)

i. Fund utilisation ranged between 47 and 89 *per cent* during 2007-11 under 'Intensification of Forest Management'. The funds provided in 2011-12 were not at all utilized by the state. (Para no. 9.5.6)

j. In drought affected areas substantial delays in providing funds were noticed during 2011-12. (Para no. 9.4.5.2)

k. Funds amounting to ₹ 6 crore received from the Government of India towards capacity building were not utilised. We noted that mock drills for chemical safety for off-site emergency plans were conducted only in two districts. (Para no. 8.3.1)

On a positive note:

- Individual action plans of the line departments were in place. The action plans were reviewed and updated regularly.
- The line departments at the district levels had formed their teams for relief operations.
- For recurring disasters in the state, the vulnerability profile was adequate.
- Periodical returns on physical and financial performance of various departments had been furnished by the District Authorities to the Commissioner for Disaster Management.

State: Gujarat

1 Background

Gujarat is vulnerable to all major natural hazards (drought, flood, cyclone, earthquake, tsunami, etc.). Vulnerability to disasters/emergencies of chemical, radiological and nuclear origin also exist.

Map 10.2: Gujarat

1.1 Vulnerability Profile of the state: The major disaster vulnerabilities in the state were categorized as under:

Earthquakes: In the seismic zoning map of India, earthquake hazard levels in Gujarat varied from moderate to high i.e. zone III to V. The cities of Ahmedabad, Bharuch, Rajkot and Bhavnagar fell in severe intensity zone, while Bhuj and Jamnagar fell in very severe intensity zone.

Tsunami: Gujarat was prone to tsunami risk due to its long coastline and probability of occurrence of near and offshore submarine earthquakes in Arabian Sea. Tsunami prone areas in the state included coastal villages of Kutch, Jamnagar, Rajkot, Porbandar, Bhavnagar, Anand, Ahmedabad, Bharuch, Surat, Navsari and Valsad districts.

Droughts: Substantial portion of the state was arid and semi-arid. Large parts of North Gujarat and Saurashtra had no sources of alternate irrigation. Drought vulnerability was also

increasing due to over exploitation of ground water. Falling water tables had put added stress on crops and water supplies.

Floods: Large areas of Gujarat were prone to flood and river erosion.

Chemical disasters: There was constant threat of chemical disasters as 35 *per cent* of the total Major Accident Hazard units of the country were located mostly at Vapi, Hazira, Ankleshwar, Dahej, etc.

The details of major disasters occurred during the last decade are given in **Annex 10.2.**

2 Institutional Arrangements in the state

Gujarat State Disaster Management Authority (GSDMA) was constituted in February 2001. It is the apex body for disaster management in Gujarat. The Authority is responsible for disaster preparedness, mitigation and assessment work for all types of disasters, natural or man-made. However, post disaster management rested with the State Commissioner of Relief.

Gujarat was the first state in India to have enacted an Act to provide a legal and regulatory framework for disaster management. GSDMA formulated a 'Disaster Management Policy' in September 2002. The 'Gujarat State Disaster Management Act' came into force in May 2003. As per the State Act, the District Collector was notified as the Authority for planning, coordinating and implementing the Disaster Management activities at the district level. District Collectors were also designated as Joint Chief Executive Officers of GSDMA. They were vested with emergency powers to undertake all the activities pertaining to DM including monitoring and implementation of policy and plans.

Bharuch, Jamnagar and Kutch districts were selected in Gujarat to assess district level preparedness.

3 Observations on Disaster Preparedness

a. We noted that only two meetings of SDMA were held in August 2007 and August 2010 during the last five years. The State Act came into force two years before the National Act; hence, it is not in conformity with it. No amendments were carried out to ensure compliance with the provisions of the National Act.

b. The state formulated a draft State Disaster Management Plan, which was approved only in July 2012.

c. Emergency operation groups to address the immediate impact of the incident were not created. Five Regional Emergency Response Centres (ERCs) were conceptualised at different location; however the construction for all ERCs buildings were incomplete except at Rajkot. We also noted that rescue equipment for ERCs

amounting to ₹ 97.70 crore were procured in 2008 and 2009 without completion of buildings.

d. We noticed irregularities in the management of State Disaster Response Fund. These included inadmissible expenditure (₹ 236.95 crore), non investment of the unspent funds resulting in loss of interest amounting to ₹ 189.86 crore and delay of two to eight months in actual remittance of central share. (Para nos. 5.1.2, 5.1.3 and 5.1.5)

e. Under NCRMP, GSDMA identified 175 shelters to be built in 12 selected districts. The construction work had not yet started. (Para no. 9.3.6.2)

f. In the three selected districts, we noticed that there were 57 men-in-position against the sanctioned strength of 112 personnel in the Fire and Emergency Services wing of the Municipality. (Para no. 7.4.4)

On a positive note:

- GSDMA formulated 'Disaster Management Policy' for Gujarat in September 2002 which was in force.
- Early warning systems and mechanisms were in place. The types of disasters, their frequency and intensities have been comprehensively identified. This was part of the Hazard Risk and Vulnerability Atlas (HRVA) of the state up to taluka level.
- During 2007-12, Gujarat Institute of Disaster Management conducted 152 training programmes covering 3808 participants.
- During last three years, mock-drills were carried out in 278 districts, 637 talukas, 2372 villages and 381 municipalities.

State: Maharashtra

1 Background

Maharashtra has a coast line of 720 Km with 35 creeks. The state has to guard against coastal security threats, cyclones, floods and other related disasters.

Due to floods and torrential rain 1100 people died in Maharashtra during July and August 2005. Again in 2006 the state witnessed floods during monsoon in which more than 400 people died.

Map 10.3: Maharashtra

1.1 Vulnerability Profile of the state: The major vulnerabilities to disasters in the state were categorized as under:

Earthquakes: Most of Maharashtra is covered by the Deccan traps, which is a sequence of basalt flows[2] formed about 65 million years ago. Maharashtra and the adjoining regions are prone to earthquakes of moderate magnitude. Koyna region experienced the maximum number of tremors in Maharashtra. Excluding the Koyna region, and other regions of Killari, Khardi (Bhatsa) and Medhi (Surya), the districts of Beed, Raigad, Thane and Nanded periodically witnessed intermittent subterranean acoustic emissions.

[2] A flood basalt or trap basalt is the result of a giant volcanic eruption or series of eruptions that coats large stretches of land or the ocean floor with basalt lava.

Cyclones: The coastal areas were prone to cyclones risks and the state has a coastal belt of over 720 km between Gujarat and Goa. Thus the Konkan region including Mumbai is prone to cyclones. There are 386 marine fishing villages/hamlets with 17,918 boats, engaged in fishing in this coastal belt. In the Arabian Sea, during the period 1890-1995, 207 depressions/cyclonic storm/severe cyclonic storms were recorded of which 19 affected the Maharashtra-Goa coast. Mumbai being a coastal city faced many threats of cyclones in the recent past. It had faced peripheral cyclonic impact in 1982, 1988 and October 1996 and had been hit by cyclone on two occasions (1948 and June, 1996).

Floods: All districts of the state are flood prone. Ahmednagar, Beed, Solapur, Latur, Osmanabad, Jalna, Aurangabad, Buldhana are moderately flood prone. There were about 300 rivers having an aggregate length of about 19200 km with an almost equal aggregate length of very small rivers and defined nallas. Among them, Godavari, Wainganga, Krishna, Bhima, Tapti, Narmada are the major rivers/ tributaries. In Konkan, there were 22 main west flowing rivers which joined the Arabian Sea.

Tsunami: Mumbai had not experienced a major tsunami in recorded history. There is no historical data or scientific study indicating significant tsunami risk to Maharashtra. The tsunami event of 1945 which happened as a result of the great Makran earthquake could therefore be taken as the reference level for tsunami management planning. A two meter tsunami wave, if occurring during high tide, can result in very high waves due to the strong tidal action in Arabian Sea.

2 Institutional Arrangements in the state

SDMA was constituted in the state in May 2006. The State Government constituted DDMAs for 33 districts of the state in June 2006. Greater Mumbai Disaster Management Authority (GMDMA) for Mumbai City and Mumbai Suburbs was however, constituted only in January 2011.

The Revenue and Forest Department through its Relief and Rehabilitation (R & R) Division is responsible for overseeing the implementation of disaster management programme in the state. The line departments such as Public Health, Environment, Home, Agriculture department were designated as nodal departments for different types of disasters at the state level, which coordinated with the R & R Division for effective implementation of disaster management. R & R Division issued instructions to District Collectors through Divisional Commissioners, who were responsible for implementation of disaster management in the district. District Collector issued instructions to Tehsildars and other heads of line departments at taluka level for disaster management.

Sindhudurg district was selected by us for this audit. On 21 June 2012 there was a fire in the State Secretariat building at Mumbai while our audit was underway. As a result, the State Government could not provide many details relating to disaster preparedness. Our report therefore, does not contain information regarding the working of the SDMA. We focused on the District Authority of Sindhudurg and GMDMA to assess the district level preparedness.

3 Observations on Disaster Preparedness

a. The State Government had prepared its Disaster Management Plan in 1998. However, the SDMP and DDMP of Sindhudurg district did not ensure incorporation of generic categorisation of disasters (L0, L1, L2 and L3 with increasing severity) nor specific plans by various departments to handle different disasters.

b. We noticed irregularities in the management of State Disaster Response Fund. These included inadmissible expenditure (₹ 3.26 crore) and under utilisation of fund (₹ 20.29 crore). Sindhudurg district could utilise only ₹ 0.24 lakh out of ₹ 64.75 lakh for mitigation activities. The district had also not utilised the allotted funds under DRM and DRR activities. (Para no. 5.1.3)

c. We noted that the Development Control Regulations, 1991 for Mumbai city was based on the erstwhile National Building Code. These were not updated on the lines of the National Building Code, 2005 to provide safeguards against natural hazards.

d. In Sindhudurg district, Geographic Information System based emergency planning and response system did not exist and the Collectorate did not have a satellite phone. Lifeline structures, cyclone shelters, multipurpose evacuation centres, etc., were not identified to cope with emergency situations.

e. There was no plan in the district to address the post disaster disease surveillance, networking with hospitals. (Para no. 7.5.7.1)

f. The State Government under Modernisation of Police Force Programme of 2005-07, 2007-08 and 2008-09 sanctioned procurement of Total Containment Vehicle (₹ 6.24 crore), Robot (₹ 2.14 crore) and Bomb Suits (₹ 6.22 crore) to increase the operational efficiency of Bomb Detection and Disposal Squad in Mumbai. The equipment were however, not procured (August 2012).

g. We noted that three mock drills were held in 2007-08, one in 2008-09 and no mock drill was conducted thereafter. No reports in this regard were sent to the State Government.

On a positive note:

- In May 2012, the Chief Minister chaired two meetings to review Mumbai city and Suburbs and district level Pre-monsoon preparedness meeting. These meetings were organized to coordinate the work of the state and Central organisations for monsoon preparedness.
- In Sindhudurg district Standard Operating Procedures (SOPs) were prepared for dealing with different disasters which contained action to be taken starting from receipt of early forecasts and warnings.

State: Odisha

1 Background

Odisha a state on the eastern coast of India, in view of its geographical characteristics, encountered flood, cyclone, drought, etc., almost every year. The state was struck by a super cyclone in October 1999 in which over 8000 human lives were lost. Recurring floods cause a lot of damage to the state.

Map 10.4: Odisha

1.1 Vulnerability Profile of the state: The major vulnerabilities to disasters in the state are categorized as under:

Tsunami: The Sumatra fault zone and tectonic plate setting along the Andaman & Nicobar Islands and Burma Micro plate boundaries in the eastern part of the Bay of Bengal pose potential threats of tsunami for the coast of the state. According to assessments, 266 villages of different districts were vulnerable to tsunami.

Floods: The 482 km long coastline exposed the state to flood, cyclones and storm surges. Heavy rainfall during monsoon caused floods in the rivers. Rivers of the state and their many tributaries and branches posed serious flooding risks.

Earthquakes: A large portion of the state comes under earthquake risk zone-II. The Mahanadi and Brahmani graven, Mahanadi delta and parts of Balasore and Mayurbhanj district come under earthquake risk zone-III. 43 urban centers with a population of nearly 27 lakh fall under earthquake risk zone-III.

Major natural disasters that affected the state during 2007-12 are given in **Annex 10.3**.

2 Institutional Arrangements in the state

After the super cyclone of 1999, the State Government set up (December 1999) Odisha State Disaster Management Authority (OSDMA) as an autonomous body headed by Chief Secretary. After DM Act, SDMA was established in October 2010 with the Chief Minister as the Chairperson and DDMAs were established in November 2010 with the responsibility of prevention, mitigation and management of disasters. SEC was constituted in December 2010 to assist SDMA.

The office of the Special Relief Commissioner (SRC), Odisha under the Revenue and Disaster Management Department (RDMD), acted as the Secretariat of SDMA. The Special Relief Commissioner took decisions at the time of natural calamities.

Baleshwar, Bhadrak and Dhenkanal districts were selected in the state to assess district level preparedness.

3 Observations on Disaster Preparedness

a. SDMA, constituted in 2010, had not met since its inception. Further, SRC did not take any initiative to convene the meeting of SDMA.

b. SDMP was not prepared even after lapse of more than six years of the DM Act. NDMA had also released ₹ 10.63 lakh to the state in January 2010 for this purpose. Despite the availability of sufficient funds, the state could not formulate its DMP as yet.

c. State Disaster Management Policy formulated in March 2005 did not include man-made disasters. The Policy also lacked the following aspects of (i) adoption of safe construction practices, (ii) retrofitting of life line buildings, (iii) owner driven reconstruction practices, and, (iv) provision to generate temporary lively hood option for the affected community.

d. The State Crisis Management Committee for dam safety under chairmanship of Chief Secretary had not been formed in the state.

e. We noticed irregularities in the management of State Disaster Response Fund. These included inadmissible expenditure (₹ 53.83 crore), non investment of the unspent funds resulting in loss of interest amounting to ₹ 25.16 crore during the year 2008-09

to 2011-12 and non-submission of utilisation certificates for ₹ 526.42 crore by the agencies, departments, OSDMA etc. for the period ranging from one to five years (March 2012). (Para nos. 5.1.2, 5.1.3 and 5.1.5)

f. SEOC and DEOCs were established but these had not been provided with exclusive manpower for their smooth operation.

g. Risk Management Plan having early warning indicators had not been prepared by the state. Out of 220 Automated Weather Communication Systems (AWCS) planned, only 37 AWCS were set up. Of these, seven AWCS were not functioning properly.

h. 15 Very High Frequency (VHF) sets placed at the District Emergency Operations Centre and blocks were not working.

i. Government of India released grant of ₹ 66.91 lakh in March 2011 for strengthening of State Emergency Operation Centre and District Emergency Operations Centre. We noted that ₹ 43 lakh had been utilized for providing the required equipment and human resource support for state and district EOCs. Another ₹ 10 lakh had been provisioned for Video Conferencing facility. Stand-by SEOC could not be set up due to administrative delays.

j. Odisha Disaster Rapid Action Force was not a composite unit including police, engineering and medical staff. It consisted only of personnel from the State Armed Force.

k. We noted that adequate food grain reserves were not maintained and relief rice (meant for 10 days relief to BPL families) for the flood of September 2011 was supplied by Odisha State Civil Supply Corporation to flood affected districts only in March 2012. (Para no. 9.2.5.2)

l. Rescue items at 114 cyclone centres were either non functional or passed their useful life. This included life buoys, the life jackets and fibre ropes which were not replaced till June 2012. Two satellite phones supplied to Jagatsinghpur and Cuttack districts remained out of order.

m. We noted that adequate steps were not taken to amend the building bye-laws and regulation as a step to make urban areas disaster resilient. In the selected districts, no amendment had been made in their building regulations. (Para no. 9.1.7.3)

n. The training on search and rescue was given to only 153 fire-service and police personnel during the period 2008-12 at the state level and 2775 local people at 111 Multipurpose Cyclone Shelter level during 2008-09. The other lead agencies like Home Guards, Medical, NCC, NSS, NYKS, and revenue personnel were not given any such training at the state or district level. During the year 2007-12, only five mock drills were conducted at four locations by the ODRAF personnel as a preparatory measure. (Para no. 8.3.2)

o. No periodic joint inspections were conducted to monitor the conditions of equipment supplied to the cyclone shelters, flood shelters and DEOCs and availability of operators or trained personnel.

p. The state had not prescribed Standard Operating Procedure with defined roles and responsibilities of each nodal agency to deal with particular disaster.

On a positive note:

- After super cyclone of 1999, a number of measures were taken for strengthening the institutional framework considering lessons learnt from previous experiences.
- Disaster Management Information System was available with the management to analyze the risks. The state had established its own MIS for analyzing intensity of rainfall and areas of risk from the information received through the districts from 177 rain gauges stationed at different locations.
- 35 cyclone warning dissemination systems were installed in the coastal districts, 37 Automated Weather Systems for predicting weather related calamities, and 177 rain gauges stationed at different locations for predicting intensity of rainfall were installed.

State: Rajasthan

1. Background

Rajasthan faced severe water scarcity, had poor rainfall, and was classified as an arid and semi-arid region. Geographically, deserts in the state constituted a large share of landmass. With 10.4 *per cent* of the country's area and 5.5 *per cent* of its population, Rajasthan had only about one *per cent* of the country's water resources. On the basis of climatic conditions and agricultural practices, Rajasthan was divided into 10 agro-climatic zones ranging from arid western to flood prone eastern.

Map 10.5: Rajasthan

1.1 Vulnerability Profile of the state: The major disaster vulnerabilities in the state were categorized as under:

Droughts: Low rainfall coupled with erratic behaviour of the monsoon in the state made Rajasthan most vulnerable to drought. Drought invariably had a direct and significant impact on food production and the overall economy of the state.

Floods: The state was generally deficit in rainfall, yet it also experienced flood in many areas during monsoon period due to its erratic behavior. The flash flood in Jaipur, Loonkransar and many other places caused heavy damage.

Earthquakes: Earthquake hazard in the state was moderate. The state fell under earthquake zone II (Low damage risk zone), III (Moderate damage risk zone) and IV (High damage risk zone). Some areas of districts of Jalore, Sirohi, Barmer and Alwar districts fall in zone IV whereas many parts of Bikaner, Jaisalmer, Barmer, Jodhpur, Pali, Sirohi, Dungarpur, Alwar and Banswara fall in zone III. The remaining districts come under zone II. Earthquakes of magnitudes ranging from 5 to 7 occurred within the state and close to its boundary in the past.

The details of major disasters or emergencies in the last decade are at **Annex-10.4**.

2 Institutional Arrangements in the state

State Disaster Management Authority was established in September 2007. DDMAs in all the districts of the state were established in September 2007. State Executive Committee was constituted in the state in October, 2007.

The Commissioner of Revenue Administration, Disaster Management and Mitigation (State Relief Commissioner) is responsible for preventive, relief and rehabilitation activities in the state. He acts as the nodal agency in planning and coordinating with other departments for disaster prevention and relief measures.

Barmer and Jalore districts were selected in the state to assess district level preparedness. Both these districts fall under Multi Hazardous Zones and are vulnerable to drought, flood and earthquake.

3 Observations on Disaster Preparedness

a. The State Government had not provided separate staff and office building to SDMA to carry out its functions efficiently. The work of the authority was being executed through the staff of Disaster Management and Relief Department (DMRD) in the DMRD premises.

b. Advisory Committee for SDMA was not constituted. SDMP had not been finalized and State Policy for Disaster Management was also at draft stage.

c. The test checked DDMAs did not have their own establishment. The work of the authority was executed through the staff provided by the respective Collectors.

d. District Advisory Committees had not been constituted till May 2012. District Disaster Management Plans for test checked districts were not approved.

e. We noticed that state had not invested unspent State Disaster Response funds which resulted in potential loss of interest of ₹ 65.21 crore during 2008-10. (Para no. 5.1.2)

f. We noted that the state EOCs are not working properly. EOC in Barmer district was operated by the staff of education department in the conference hall of the Collectorate premises. Similarly, the EOC in Jalore district was operated by the Collectorate staff in Collectorate premises.

g. There was an approved budget of ₹ 65.47 lakh for the UNDP-DRR project. Out of this only ₹ 26.18 lakh was released in July 2010 and only ₹ 0.17 lakh was utilised by the state.

h. We noted that various activities for institutional strengthening, capacity building and mainstreaming for development were not executed in the state for reduction of Disaster Risk.

i. We noted that the communication and medical equipment purchased from CRF were not installed.

j. In September 2009, 17 High Band Frequency (HBF) wireless sets of 20 watt and 7 sets of 2 watt were supplied to Superintendent of Police (SP), Barmer for easy and early communications in case of any disaster. Of these, 14 wireless sets of 20 watt and three 2 watt sets were lying uninstalled (May 2012). The SP stated in May 2012 that uninstalled wireless sets were lying in sub store, Barmer and process of their distribution would be started soon. Similarly, in April and May 2009, 18 HBF wireless sets of 20 watt and 7 sets of 2 watt were supplied to SP, Jalore. Of these 17 sets of 20 watt and 2 sets of 2 watt were lying uninstalled as of May 2012.

k. No formal training programmes had been organised for the training of teachers in the state on school safety and disaster management. Central assistance released for capacity building for State Disaster Response Force was mis-classified to avoid lapse of funds during 2010-12. (Para no. 8.3.1)

l. We noted that at DMRD, Barmer and Jalore, there were no annual progress reports/ periodical returns in respect of prevention, preparedness and mitigation of disasters activities executed in the district.

On a positive note:

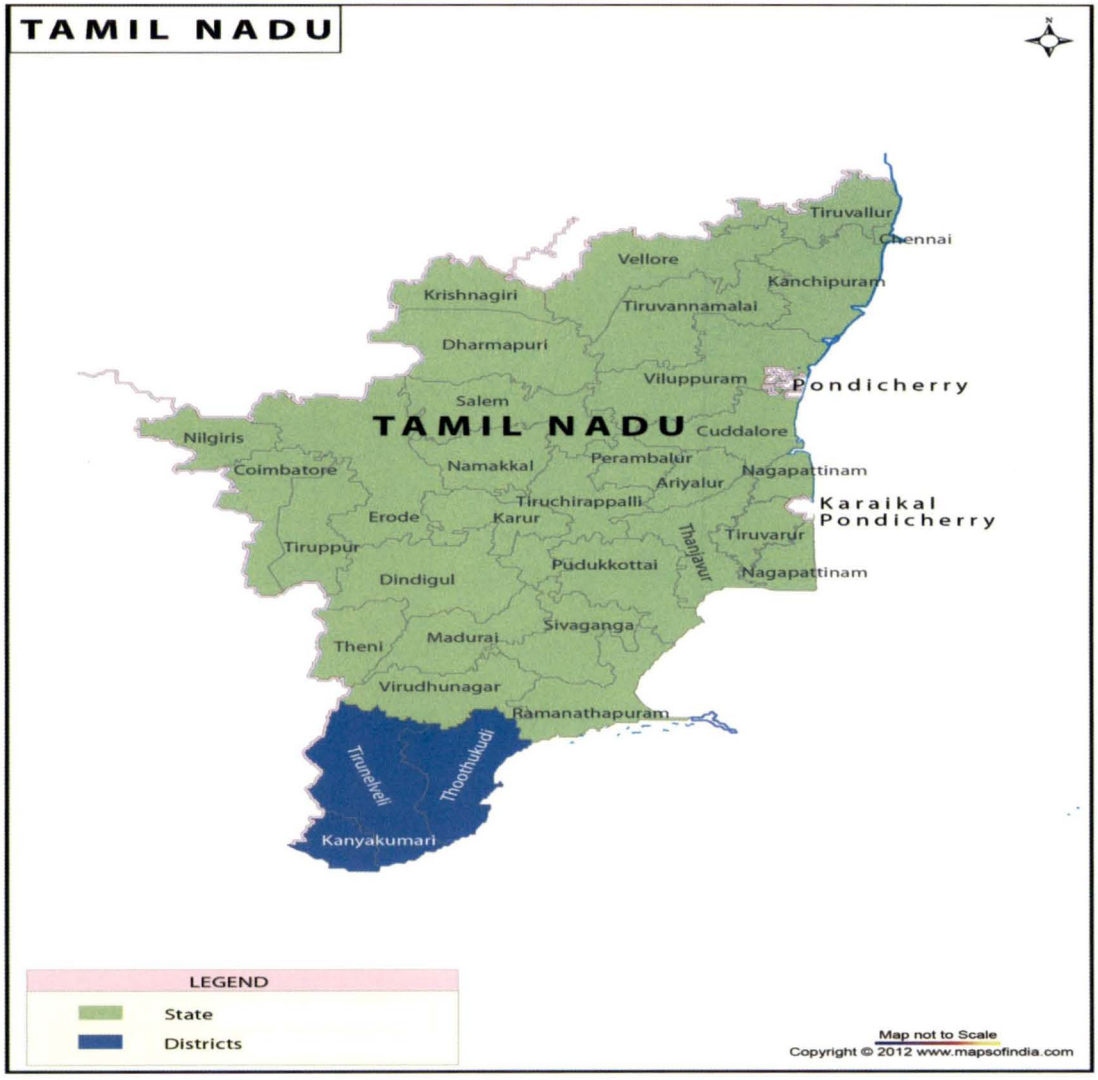
- Hand books were prepared at district/divisional level giving information about early warning systems, area prone to flood/cyclone and relief centers.
- Necessary arrangements were made in advance for power supply restoration during disaster.
- Availability of drinking water and maintaining hygiene and sanitation was ensured by the Public Health Engineering Department of the districts.

State: Tamil Nadu

1 Background

Tamil Nadu has a long coastline of about 1076 km. Moderate to severe cyclones hit its coast during the north east monsoon period. A number of river basins are prone to floods during the monsoon. The state's hill districts (Nilgiris and Dindigul) are prone to landslides. High density of population in the coastal belt, dependence of a large proportion on primary sectors and environmental issues in the coastal areas and river deltas make the state a high disaster risk state.

Cyclone Nisha in November 2008, a major landslide in November 2009 and Cyclone Thane in December 2011 were the major disasters that occurred in the state in the recent time.



Map 10.6: Tamil Nadu

1.1 Vulnerability Profile of the state: The major disaster vulnerabilities in the state are categorized as under:

Earthquakes: Though not as seismically active as states in the northern and western parts of the country, small to moderate earthquakes occurred in Tamil Nadu. The State Capital, Chennai falls in seismic zone III.

Cyclones: The state was frequently subjected to devastation by natural calamities due to cyclonic storms and flooding due to its location in a highly vulnerable part of Peninsular India. During 1900-2009, 50 cyclonic storms of which 26 were very severe ones crossed the coast of Tamil Nadu. There are 13 districts situated in eastern coastal stretch of the state and there are 25 blocks situated at the coastal line. On an average, the state faces one or two severe cyclones in the Northeast monsoon period. Even during the non cyclonic phase, the state received copious rainfall as a result of formation of low pressure and depressions in the Bay of Bengal. The low pressure and depressions so formed, lasts for at least three to four days bringing intense rains causing large scale flooding and inundation in the vulnerable areas.

Tsunami: The state is also prone to tsunami and in 2004 tsunami affected the coastal areas of the state. The impact was severe as more than 10000 people died in the affected states with 7996 deaths in Tamil Nadu.

Droughts: There was severe drought in 2002-03 and in 2003-04 affecting most of the districts of the state.

Landslides: During North East monsoon 2009, the state received heavy rainfall and as a result, there were 899 landslides in Nilgiris district. During North east monsoon 2010, there was very heavy rainfall which led to heavy loss of life and property.

The details of major disasters or emergencies during last decade are in **Annex-10.5**.

2. Institutional Arrangements in the state

SDMA was constituted in September 2008 and DDMAs were established in January 2012. The Commissioner of Revenue Administration, Disaster Management and Mitigation Department who was also the State Relief Commissioner was responsible for preventive, relief and rehabilitation activities in the state. He acted as the nodal agency in planning and coordinating with other departments to take measures for relief, rescue and restoration before, after and during the period of disasters. The District Collector acted as the nodal agency at the district level.

Thoothukudi, Tirunelveli and Kanyakumari districts were selected in the state to assess district level preparedness.

3 Observations on Disaster Preparedness

a. SDMA was constituted in September 2008 but it did not meet even once. SEC was constituted in January 2009 but it met only once in June 2009 and no meetings were

conducted during the years 2010-11 and 2011-12. DDMAs were constituted in January 2012, after a delay of six years but did not meet even once.

b. Neither SDMP nor State Disaster Management Rules were prepared. The State Government also did not ensure preparation of disaster management plans by different departments of the states in accordance with the guidelines issued by NDMA.

c. We noticed that in Tirunelveli district, interest earning of ₹ 22.85 lakh on unspent balance of relief for natural calamities during June 2008 to December 2011 was not remitted back into government account.

d. No dedicated man power was sanctioned for EOCs at the selected districts. Communication from the district EOC to the state EOC was not possible through VHF communication and the only all weather reliable communication available was the micro wave communication of the police. A police man with VHF set was posted in the test checked districts only during October to December every year to receive phone calls.

e. Tuticorin district with a coastal length of 163.5 km and about 21 fishing villages did not have a patrolling boat. There was no early warning system in any of the coastal villages.

f. Approval for construction of 121 multipurpose evacuation shelters at a cost of ₹ 262.86 crore was given in December 2011. The construction of cyclone shelters was in progress as of September 2012. (Para no. 9.3.6.4)

g. The State Government had not provided the state and District Disaster Management Authorities with adequate staff. The Disaster Management Cells in the test checked districts were manned by only one assistant each.

h. Funds of ₹ 5 crore released to DM cell for capacity development meant for the year 2010-11 were neither utilised nor surrendered. Mock drills and community awareness for earth quake were not contemplated. (Para no. 8.3.2)

On a positive note:

- 264 senior level officers of various departments of the State Government were imparted training at NIDM.
- As a part of public education and community awareness and in order to sensitize the people, puppet shows and street plays on disaster management were conducted in the state.
- Arrangements were made to keep adequate stock of relief material in the selected districts of Kanyakumari, Tuticorin and Tirunelveli. Directions to inspect dams, embankments, and other structural measures before monsoon were issued for flood preparedness.

State: Uttarakhand

1 Background

Uttarakhand due to its complex terrain and ongoing tectonic activities is highly prone to hazards like earthquakes, landslides, cloud bursts, and flash floods. The state also experienced a large number of forest fires and road accidents every year.

Map 10.7: Uttarakhand

1.1 Vulnerability Profile of the state: The major disaster vulnerabilities in the state were categorized as under:

- **Earthquakes:** Earthquakes were the most devastating disaster in the mountains. Out of the 13 districts in the state, four districts fell completely and five partially in Zone V of the Earthquake Risk Map of India. The remaining parts of the state fell in Zone IV. However, no major earthquake after Chamoli (1999) was experienced in Uttarakhand. In the last five years (2007 onwards), Uttarakhand also experienced a series of landslides and cloud bursts.
- In the last five years, there was a loss of 653 human lives due to various disasters. Twenty seven *per cent* of these casualties were due to landslides, 21 *per cent* from hailstorm, storm and epidemics, 28 *per cent* from excessive rain, 18 *per cent* from earthquake and cloudburst, two *per cent* from avalanche and four *per cent* were from fire accidents.

The details of major disasters or emergencies during last five years are in **Annex-10.6**.

2 Institutional Arrangements in the state

As envisaged in the DM Act, the State Disaster Management Authority (SDMA) headed by Chief Minister and eight other members, was constituted (October 2007). State Executive Committee (SEC) was formed in January 2008. The District Disaster Management Authorities were also set up in all the districts.

The Department of Disaster Management is the nodal department in the state, responsible for coordinating and implementing all disaster management related affairs. The department also had an autonomous institution namely Disaster Mitigation and Management Centre (DMMC) for undertaking disaster related studies and for providing technical support to the department. DMMC was also responsible for managing the State Emergency Operations Centre (SEOC), throughout the year.

Nainital district was selected in the state to assess district level preparedness.

3 Observations on Disaster Preparedness

a. In the state, the frequency and intensity of various disasters had not been identified.

b. SDMA, although constituted in October 2007, had not formulated any rules, regulations, policies and guidelines. SEC was formed in January 2008 but never met since its creation. DDMA was constituted in Nainital in December 2007. Since inception, DDMA met only twice (April and May 2011). Thus, the state authorities were virtually non functional.

c. The State Disaster Management Plan was under preparation and actionable programmes were not prepared for various disasters.

d. We noticed irregularities in the management of State Disaster Response Fund. These included non investment of funds which resulted in potential loss of interest of ₹ 9.96 crore during 2007-2012. There were delays ranging from 80 days to 184 days in the release of the central share during 2007-11 and no funds were released in 2011-12 as the State Government did not submit utilisation certificates and Annual Report of Natural calamity. (Para nos. 5.1.2 and 5.1.5)

e. No plan was prepared in the state for early warning. The communication system was inadequate. This resulted in delayed information to vulnerable population. (Para no. 6.3.3)

f. Hazard Safety Cell of the State Government had so far identified 7374 buildings in three cities out of which 1109 buildings were found to be vulnerable to moderate earthquake. These buildings needed to be retrofitted, but no such measures were taken. (Para no. 9.1.7.5)

g. Geological Survey of India in June 2008 identified only 101 villages as vulnerable out of 233 disaster affected villages. No measures were taken by the State Government for their rehabilitation, despite a lapse of four years after their identification.

h. The State Government did not sanction any post for the State Disaster Management Authority which affected the establishment of the Management Information System. In DEOC (District Emergency Operation Centre) at district level, there was an acute shortage of manpower. In 13 districts, only 66 posts (56 *per cent*) were filled against sanctioned manpower of 117 (9 posts each in 13 districts).

i. It was also noticed that no master trainers were trained to impart training to the staff at the district, block and village level engaged in the prevention and mitigation of disaster management. Medical personnel were also not trained in hospital preparedness for emergencies or mass casualty incident management. (Para no. 7.5.7.2)

On a positive note:

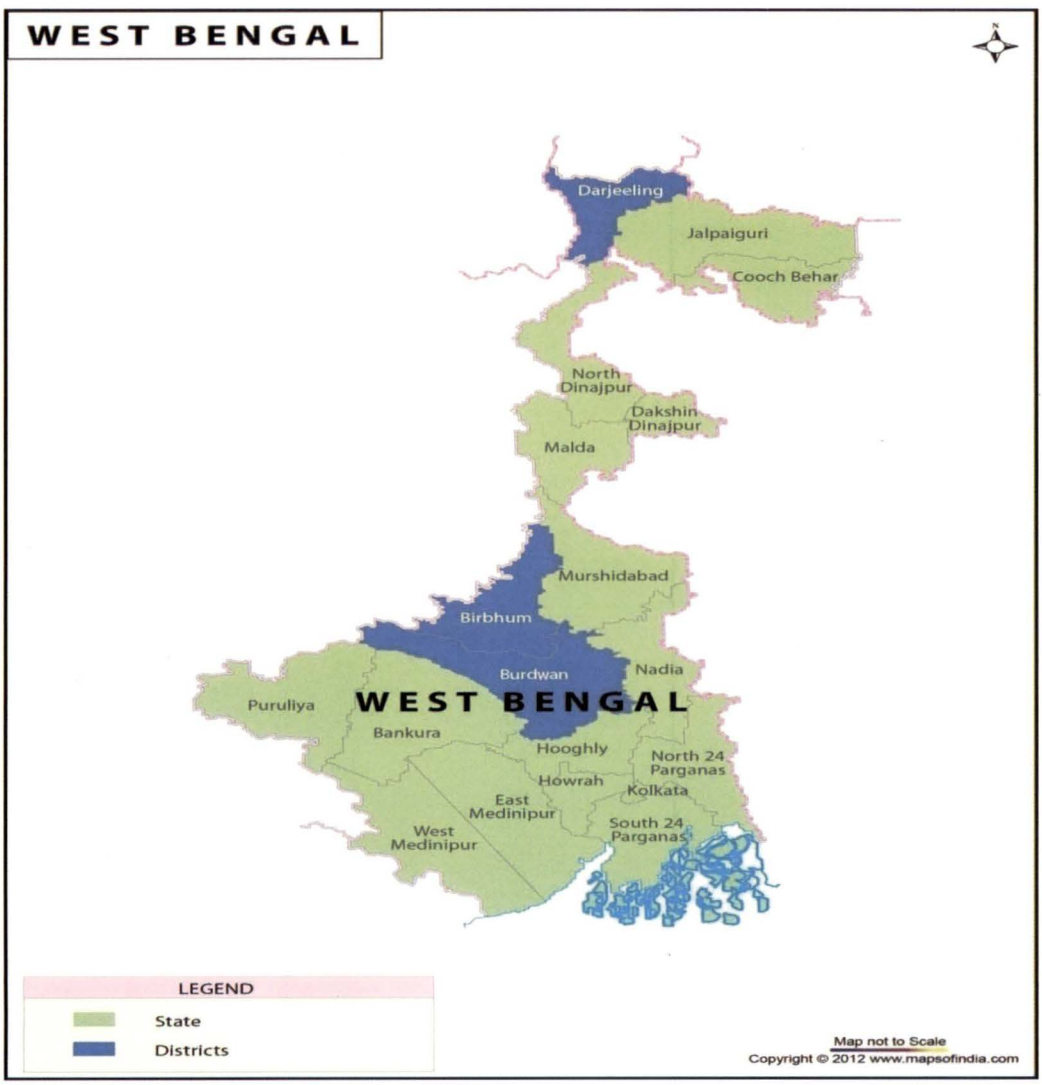
- Emergency Operations Centers were established at both state (July 2006) and district level (November 2009).
- Communication equipment such as satellite phones, police wireless, SMS network and video conferencing were established for disseminating post disaster information. Media was being regularly updated on disaster event and alerts through SMSs and study materials.
- For earthquake and landslide, GIS officials (project staff) at the state level were conducting detailed vulnerability assessment of eight major cities. GIS was in place for disaster management purposes and for developmental planning.
- Disaster management department trained 71474 government officials and non government officials through 546 different training programmes/workshops.

State: West Bengal

1 Background

West Bengal, a part of the Bengal Delta, has a history of floods. This was because the landmass of the state was formed by the Ganga-Padma system of rivers through the delta building process of which flood is an adjunct being the main carrier of sediment. At present 42.30 *per cent* of total area of the state is susceptible to flood, spread over 110 blocks in 18 districts. The widest area affected by flood, as recorded in 1978, is about 30,607 sq km. About 23,970 sq km of area was devastated by flood in 2000.

In the state, all the districts are disaster prone. Disaster Management Report (2007-11) indicated that the state suffered a loss of ₹ 435.49 crore (in 598 blocks of 18 districts) and 164 lakh people were affected during the period.



Map 10.8: West Bengal

1.1 Vulnerability Profile of the state: The major disaster vulnerabilities in the state were categorized as under:

Earthquakes: In the seismic hazard zonation map, regions were divided in the seismic zones II–V. The lowest perceived hazard, zone II, was in the south-western part of West Bengal (Purulia), while the districts of Kolkata, Murshidabad, Birbhum, Burdwan, Hooghly, Howrah, Nadia, Bankura, Purba and Paschim Medinipur came under zone III. Zone IV covered the north and southeast of Kolkata, Darjeeling, North and South Dinajpur, parts of Jalpaiguri and Coochbehar, North and South 24-Parganas and Malda. Zone V was delineated on the eastern parts of Jalpaiguri and Coochbehar.

Landslides: The landslide hazard is prevalent mostly in the hilly terrains of Darjeeling district. Urbanization, especially in the hilly terrain, involving construction activities often trigger landslides.

Floods: Approximately 55.8 *per cent* of the state is susceptible to floods. The main rainfall season in the state is from June to September, i.e., the monsoon rain. Seventy five *per cent* of the total rainfall in a year takes place due to the south-western monsoonal wind-flow. According to the Irrigation Department, 37.6 lakh hectares of West Bengal (42.4 *per cent* of the geographical area and 69 *per cent* of its net cropped area) was flood prone. Floods are caused by Himalayan Rivers, Ganga-Padma-Bhagirathi river system, Western rivers and tidal rivers. Under the influence of these river systems, 15 districts were prone to floods with the risk ranging from medium to very high.

Droughts: The districts of Bankura, Purulia, Birbhum and parts of Paschim Medinipur are affected by drought at regular intervals, mainly due to deficient rainfall and adverse soil conditions.

Cyclones: Coastal areas of the state are prone to cyclone. Susceptible districts are Purba Medinipur, 24 Parganas-South, 24 Parganas-North, Howrah and Hooghly.

Details of disasters hit West Bengal in last decade are given in **Annex-10.7**.

2 Institutional Arrangements in the state

SDMA and DDMAs in all the districts were notified by the State Government in August 2007. The Disaster Management Department (DMD) was headed by the Secretary and was assisted by a group of officers and employees working at the Secretariat, directorate, districts, sub-divisions and block levels. DMD was to co-ordinate with various departments responsible for different aspects of prevention, preparedness and mitigation of disasters.

Darjeeling, Burdwan and Birbhum districts were selected in the state to assess district level preparedness.

3 Observations on Disaster Preparedness

a. Draft SDMP was prepared in 2008-09 and updated in 2009-10 but was not approved by SDMA. The state had not framed rules to guide the implementation of DM Act. Out of ₹ 10.63 lakh released by NDMA only ₹ 4.55 lakh (43 *per cent*) was utilised for preparation of SDMP for 2009-10 and 2011-12. DDMP were prepared during 2007-12 in the test checked districts but these plans were not approved by SDMA.

b. SDMA met only once in September 2008 since its constitution. State Advisory Committee was constituted in April 2010 but it never met (September 2012).

c. Three platoons of State Armed Police (SAP) were trained in disaster management and were stationed at Asansol, Barrackpur and Raiganj. Fourth platoon was proposed for disaster prone districts of North Bengal. This had not been achieved so far (September 2012).

d. Kolkata Police, between May 2009 and March 2010 proposed setting up of different special groups-Disaster Management Group, Kolkata Disaster Relief Force and Kolkata Police Rescue Force to mitigate the effect of disasters. However, these proposals were not approved by the State Government. Specialised groups in disaster management would have improved disaster preparedness of the force.

e. Civil Emergency Force under Civil Defence was constituted but adequate manpower and equipment were not provided. (Para no.7.4.1.2)

f. We noticed irregularities in the management of State Disaster Response Fund. This included non investment of unutilised balance by the state for which it had to bear interest burden of ₹ 187.80 crore up to 2011-12. Inadmissible expenditure of ₹ 47.70 crore was also incurred. (Para nos. 5.1.2 and 5.1.3)

g. SDMP made an attempt to identify blocks vulnerable to each type of disaster in terms of high, medium and low. However, vulnerability of blocks to earthquakes was not assessed. Further, the L0-L3 categorisation of disasters was also not done. (Para no. 9.1.7.4)

h. We noted that in Darjeeling district, Singhamari Syndicate office building and the bus stand premises were declared as unsafe in November 2011. Inspite of this, premises were used. (Para no. 9.1.7.4)

i. SDMP proposed an ambitious central communication network for disaster management connecting State Emergency Operation Centre to District Emergency Operation Centres and District Emergency Operation Centres to Block Emergency Operation Centres through VSAT etc. However, no action had been taken in this direction. (Para no. 6.3.1)

j. DEOCs were limited to control room operations during monsoons. No manpower was provided for EOC in Burdwan and Birbhum districts while four contingency workers had been employed in Darjeeling.

k. We noticed irregularities in the scheme "Revamping of Civil Defence" as the state had not provided its share for one component of the scheme, there was diversion of funds and incorrect submission of Utilisation Certificates. (Para no. 7.4.1.1)

l. The state did not conduct any assessment to measure the efficiency and effectiveness of disaster management tools and to improve the information system.

m. The state failed to release requisite funds in time and lackadaisical approach of the executing agencies to execute work had resulted in non-completion of four flood shelters and non-creation of two flood shelters. (Para no. 9.3.6.6)

n. No action was taken to include emergency casualty management in the medical curriculum. Emergency casualty management plans were not prepared and procedures for treatment of casualties by private hospitals during disasters were not laid down.

o. In Birbhum district, school safety training was not conducted, while in Darjeeling, funds for capacity building were mentioned but no training was conducted. We also noted that training was not conducted for vulnerable sections of society like patients, students, fishermen and farmers in any of the three test checked districts. (Para no. 8.3.2)

On a positive note:

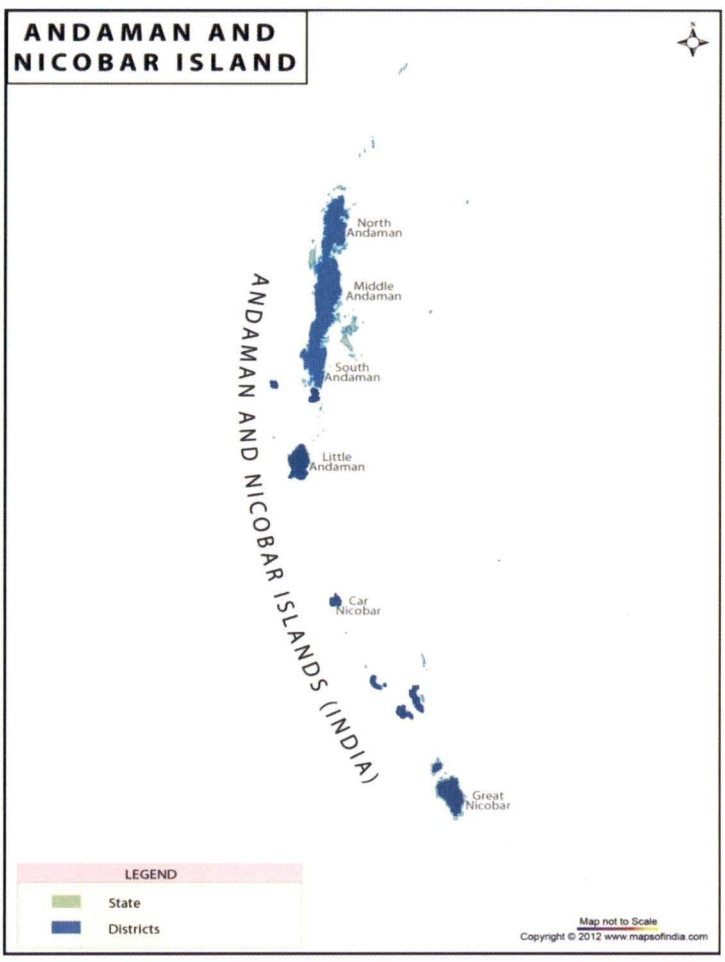
- The state published West Bengal Disaster Management Policy and Framework in December 2007.
- Cyclone warning dissemination sets were installed in vulnerable places along the coastline of the state.
- In Birbhum and Burdwan, 260 government officials and teachers were trained as targeted.
- In Darjeeling, Community Oriented Policing Service (COPS) trainings of 230 Civil Defence volunteers were conducted in two phases in February 2011 and March 2012. In Burdwan, mock drills / training on rescue and evacuation were conducted in all 31 blocks.

Union Territory: Andaman & Nicobar Islands

1. Background

The Union Territory of Andaman & Nicobar Islands (ANI) is situated in the Bay of Bengal, mid way between peninsular India and Myanmar. ANI is one of the multi hazard prone areas of India. The islands are in the Bay of Bengal, which is one of the five cyclone prone areas of the world.

On 26 December 2004, the coasts of ANI were devastated by a 10 m (33ft.) high tsunami following the Indian Ocean earthquake. More than 2,000 people were confirmed dead and a minimum of 40,000 people were rendered homeless. The worst affected in the Nicobar Islands were Katchal and Indira Point; the latter subsided 4.25 m and was partially submerged in the ocean. Teressa Island was said to have been split into two parts and Trinkat Island into three parts. Some estimates said that the islands were moved as much as 100 feet (30 m) by the earthquake and tilted.



Map 10.9: Andaman & Nicobar Islands

1.1 Vulnerability Profile of ANI: The major vulnerabilities to disasters in Andaman and Nicobar Islands are as under:

Cyclones and Tsunami: ANI is open from all the sides and is exposed to hydro-meteorological disasters like floods, cyclones, storm surges, cloud bursts and tornadoes. ANI also fall in cyclogenesis[3] zone and a significant number of cyclones striking the east coast of India and Bangladesh are generated every year from the Andaman Sea.

Earthquakes: ANI is also prone to various geological disaster risks. It is located in one of the most seismically active parts of the world. It runs parallel to the boundary separating the Australian and Eurasian plates in the Indian Ocean that are continuously jostling with each other. The Islands are susceptible to very high intensity of seismicity. As per the seismic zoning map of India, these Islands are classified in Seismic Zone-V.

No disasters occurred in the UT after the earthquake and tsunami of December 2004.

2. Institutional Arrangements in ANI

A Union Territory Disaster Management Cell was established in ANI which was re-designated as Union Territory Disaster Management Authority headed by the Chief Secretary and comprising 12 other members in July 2003. Subsequently, in August 2005, the Lt. Governor constituted island level, sub-divisional level and tehsil-level disaster management committees. According to the DM Act 2005, the Union Territory Disaster Management Authority (UTDMA) and the Union Territory Disaster Management Executive Committee (UTDMEC) were established in January 2008. In the three districts, viz. South Andaman, Nicobar and North and Middle Andaman the DDMAs were also setup in January 2008. Subsequently, in September 2008, the Administration established a Directorate of Disaster Management (DDM) as a nodal agency for implementation of Disaster Management Plan (DMP) and for disaster preparedness activities as well as inter-state and inter-district communication liaison.

All the three districts of South Andaman, North & Middle Andaman and Nicobar were covered in audit with emphasis on the district level preparedness at Car Nicobar and Nancowry Islands.

3. Observations on Disaster Preparedness

a. Union Territory Disaster Management Authority constituted in January 2008, met only once in April 2012. The UT Executive Committee constituted in January 2008 had also met only once on December 2009. UT and District Authority had not made authorization to Departments or authority concerned for procurement under emergency situations in terms of the provisions of DM Act.

b. UTDMP for ANI was finalized and approved only in April 2012. However, no separate district level Disaster Management Plans had been formulated. SOPs of line departments were not prepared for the North and Middle Andaman and South Andaman districts.

[3] Cyclogenesis is the development or strengthening of cyclonic circulation in the atmosphere.

c. No UT and district disaster response and mitigation fund had been constituted in ANI. However, we found that an amount of ₹ 11.86 lakh was utilized for expenditure on items not related to disaster preparedness under the head "Relief on account of Natural Calamities" at North and Middle Andaman district.

d. Identification of vulnerable areas of ANI had not been undertaken using GIS mapping. In all three districts of ANI, identification and mapping of most common disasters had not been made.

e. The state control room had been established in the DDM but no regular staff had been deputed. The Administration decided in December 2011 to install tsunami sirens in every single inhabited island of ANI. 146 Tsunami sirens need to be purchased but these sirens have not yet procured. (Para no. 9.3.6.1)

f. MHA directed (March 2011) the UT Administration of ANI to raise a State Disaster Response Force to deal with rescue and response situations in the event of disaster, by identifying and earmarking their battalions and companies to be trained as State Disaster Response Force. These companies were to be provided two categories of training-Training of Trainers (ToT), and company level training to the companies of State Disaster Response Force personnel. In December 2011, the Assistant Superintendent of Police, ANI proposed to train a company of Indian Reserved Battalion as State Disaster Response Force. Accordingly, ANI Administration requested NDMA to arrange for conducting the training of master trainers. However, no training was imparted to them so far. As such, in the absence of required training, State Disaster Response Force was yet to be established for ANI. The Department of Disaster Management stated (August 2012) that training of State Disaster Response Force was underway with the Police Department.

g. Mobile search and rescue teams consisting of police, fire service, medical department and Andaman Public Works Department were yet to be constituted.

h. We noted that evacuation routes[4] were constructed in only one out of thirteen inhabited islands of Nicobar district. No evacuation routes had been constructed in the other two districts, namely South Andaman and North and Middle Andaman.

i. Union Territory Disaster Management Executive Committee decided in December 2009 that 25 buildings in various islands would be retrofitted to use them in any crisis situations. No work in this regard, though, was taken up as yet. (Para no. 9.1.7.1)

j. Inspection of relief godowns was not carried out during the period 2007-08 to 2011-12. No information was available on the condition of relief material stored there. (Para no. 9.3.6.1)

[4] Evacuation Routes to be installed and displayed along the sea shores

k. During 2007-08 to 2011-12 only three doctors were trained in Management of Mass Casualty. No training programmes for paramedics, capacity building and trauma at UT or district level were conducted. (Para no. 7.5.7.2)

l. MHA sanctioned ₹ 5.00 lakh to the Administration in March 2006 for project preparation activity relating to NCRMP. No project proposals were submitted by ANI.

m. Emergency Action Plans (EAP) on dam's failures was not prepared. (Para no. 9.2.5.1)

n. In Nicobar district, three EOCs were equipped only with STD and FAX facilities. EOC at Car Nicobar was not operational. Even the electrical connection to this EOC had not been provided till date.

o. Order for 13 satellite phones costing ₹ 15.80 lakh was placed in October 2011. Although, DDM had paid royalty, licence fee and spectrum charges to DoT, the satellite phones were yet to be supplied. ISRO installed a V-SAT system (DMS Node) under DMS Programme at Port Blair in 2006. We noted that the system was not functional for several years. (Para no. 6.3.2)

p. The School Safety Disaster Management Plan was approved in June 2011. Funds were awaited from NDMA.

q. The proposal for requisite manpower which was assessed to be 67 for the districts was still pending with MHA since November 2010.

r. A comprehensive annual training program to impart training to the officials and sections of society at the UT, District Division and Block level was not prepared by the Directorate. DDM had not prescribed any returns on physical and financial performance from the District Authorities. (Para no. 8.3.2)

On a positive note:

- Classification of disasters from L0 to L3 had been made in August 2005 and competent authorities to declare and deal with different level of disasters were identified.
- Tsunami affected area was mapped in South Andaman district.
- For last mile connectivity and control of the operations, the Administration linked up villages with Community based Disaster Management Plans through each district under a portable platform.
- The Disaster Management Cell in the Police Department imparts trainings on "Collapsed Structures Search and Rescue" and "Medical First Responder" to the officials of various departments, students and different NGOs.
- Mock drills were done at UT level and it was also conducted in Nicobar district and South Andaman district.

Chapter – XI:
Conclusions

Disasters lead to disruption of normal life. They can also result in significant loss of infrastructure, population and government facilities. There is a distinct increase in the frequency of disasters in the country and their impact in terms of casualties and damage. Besides natural disasters, the potential of manmade disasters is increasing manifold with increased urbanisation and development. The importance of disaster preparedness, more specifically, disaster mitigation and prevention efforts cannot be overstated in such a scenario.

On the basis of this Performance Audit, we have the assurance that there was an increased awareness about disaster preparedness and the need for disaster risk reduction in the country. National level legislation had established a multi level institutional set up. Funding arrangements for response related work was clearly laid down and nodal agencies and departments identified for handling specific disasters. Significant progress had been made at the state level on early warning and communication systems.

NDMA is chaired by the Prime Minister of India and has an overarching presence in the field of Disaster Management. The National Act and the policy have been formulated. The responsibility for preparing the National Plan vests with National Disaster Management Authority. However, the National Plan for Disaster Management was yet to be finalised even after six years of the Act coming into force. The national guidelines developed by NDMA were not adopted and applied by the nodal agencies and state governments. As the Apex body, NDMA did not take effective measures to ensure the application of its Guidelines.

NDMA's project management capacity was deficient. As a result, none of its mitigation and vulnerability mapping projects was completed. Its internal systems also needed strengthening as the business rules were yet to be finalised and manpower issues were to be resolved. The important aspect of mainstreaming disaster preparedness with the flagship social sector schemes was yet to be taken up by NDMA.

Certain issues relating to funding arrangements needed to be streamlined by MHA. Delays in remittance of funds from State Disaster Response Fund to districts, delays in submission of Utilisation Certificates by states and grant of National Disaster Response Fund for work other than response, were a few causes of concern. In our opinion, the establishment of specific Disaster Mitigation funds at the national, state and district levels, as envisaged in the DM Act, would be a significant step towards achieving the goal of disaster mitigation.

Response to a specific disaster is perhaps the best test of the level of disaster preparedness. We looked into the disaster response efforts to ascertain their effectiveness. The reaction of the National Disaster Response Force was an essential element of our tests. We noted that it was not yet established as a well equipped, well trained specialised force. Further, we noted that the deficiencies in this regard were not recognised and remedied especially in

terms of deployment of suitable manpower, equipment and training. The Force Standard Operating Procedure are yet to be finalised and communicated to the states. Diversion of this Force for non-disaster events needs to be checked. The Force did not have sufficient manpower and no single chain of command had been established.

We noted that IMD, ISRO and other agencies had established early warning systems for tsunami, cyclones, etc. However, we found that due to lack of monitoring and timely inputs from all participants, most projects regarding the dissemination of data to stakeholders were still incomplete. In many cases, the equipment procured for these projects were lying uninstalled.

We noted deficiencies in preparedness for manmade disasters. The nodal ministries had established structures but their functioning needed to be strengthened at the ground level. The Ministry of Earth Sciences seems to be unaware of its role in disaster management. Comprehensive documentation and reporting of nuclear and radiological disasters, forest fires and chemical disasters was badly needed. Legislation needs to be updated for biological disasters. To ensure effective control over these disasters, vigilance at the entry points to the country needed to be further strengthened and laboratory facilities also needed urgent upgradation.

To consolidate the efforts already made for disaster preparedness, it is essential that the NDMA effectively discharges its statutory responsibilities and the roles and responsibilities of other entities are clearly demarcated, documented, disseminated and monitored.

(Roy Mathrani)
Director General of Audit
Central Expenditure

New Delhi
Dated: 15 March 2013

Countersigned

(Vinod Rai)
Comptroller and Auditor General of India

New Delhi
Dated: 15 March 2013

Annexures

Annex- 2.1
Meetings of state level Institutions (Para 2.5.4.3)

Name of the state	Institutions	Date of constitution	No. of meetings held during last five years
Andaman and Nicobar Islands	Union Territory Disaster Management Authority	09.01.2008	One
	Union Territory Disaster Management Executive Committee	09.01.2008	Six
	UT Advisory Committee	Not constituted	
Andhra Pradesh	SDMA	14-11-2007	Two
	SEC	14-11-2007	One
	State Advisory Committee (SAC)	Not constituted	
Gujarat	SDMA	1.09.2003	Two
	SEC, SAC	No provision for constitution of these in Gujarat State Disaster Management Act, 2003	
Maharashtra	SDMA	24.05.2006	Eight
	SEC	24.05.2006	11
	SAC	No reply received due to fire at Secretariat	
Odisha	SDMA	20.10.2010	Nil
	SEC	06.12.2010	Three
	SAC	Not constituted	
Rajasthan	SDMA	6.09.2007	10
	SEC	15.10.2007	13
	SAC	Not constituted	
Tamil Nadu	SDMA	September 2008	Never met
	SEC	January 2009	One
	SAC	Not constituted	
Uttarakhand	SDMA	10.10.2007	Never met
	SEC	18.01.2008	Nil
	SAC	11.02.2008	One
West Bengal	SDMA	1.08.2007	One
	SEC	1.08.2007	97
	SAC	6.04.2010	Nil

Annex- 4.1
Vacancies in NDMA (Para 4.6.1)

Position as on	Sanctioned Strength	Men-in position	Vacant posts	Percentage of vacant posts
31.3.2008	124	49	75	60
31.3.2009	124	68	56	45
31.3.2010	124	76	48	39
31.3.2011	123	71	52	42
31.3.2012	123	83	40	33

Annex- 6.1
Database on different scales collected, stored and accessible to users (Para 6.1.1.1)

Sl. No.	Category/scale of the database to be collected	Database actually collected	Database stored	Database put for use for access to authorized users
1	National GIS database on 1:50,000 scale (planned for 320 million hectares)	224 Million (70 *per cent*)	224 Million (70 *per cent*)	NDEM computer infrastructure for serving is yet to be positioned for operational dissemination, thus not accessible to users.
2	GIS database on 1:10,000 scale (for 169 multi hazard prone districts)	No complete district. (However, data for entire Indian coast is collected.)	No	NDEM computer infrastructure for serving is yet to be positioned for operational dissemination, thus not accessible to users.
3	GIS database on 1:2,000 scale (for six mega cities - Hyderabad, Bangalore, Kolkata, Chennai, Ahmadabad and Mumbai)	Available for Hyderabad, Bangalore and Kolkata only.	No	NDEM computer infrastructure for serving is yet to be positioned for operational dissemination, thus not accessible to users.

Annex- 6.2

Reasons for non operationalisation of VPN nodes (Para 6.1.4)

VPN node site	Reason why they are non-operational
IMD Delhi (semi- operational)	The video conferencing system was in bad shape. Indent for repair was being processed. Currently only audio conferencing was possible.
Prime Minister's Office	So far appointment for re-orientation to GSAT-12 could not be obtained due to security reasons and grant of permission to enter the campus. The same was awaited.
Prime Minister's Residence	
Shimla, Himachal Pradesh	The antenna fell down from the terrace and became non-functional. Repair actions were initiated.
Mumbai, Maharashtra	The equipment were burnt during the recent fire at Mantralaya. Assessment was being done on the available equipment.

Annex- 8.1

Scheme of financial assistance to the Administrative Training Institutes (Para 8.1.3.2)

Year	Total no. of ATIs targeted	No. of ATIs which achieved target	No. of ATIs which have not achieved target	Percentage of short fall	Area of concern
2007-08	29	7	22	75.86	10 ATIs did not conduct any program
2008-09	29	9	20	68.97	3 ATIs did not conduct any program
2009-10	29	12	17	58.62	5 ATIs did not conduct any program
2010-11	29	16	13	44.83	2 ATIs did not conduct any program
2011-12	29	14	15	51.72	2 ATIs did not conduct any program

Annex- 8.2
Vacancies in NIDM (Para 8.1.6.2)

Position as on	Sanctioned strength	Men-in position	Vacant posts	Area of concern
31.3.2008	46	42	4	2 post of faculty/ researcher remain vacant
31.3.2009	46	42	4	3 post of faculty/researcher remain vacant
31.3.2010	46	43	3	2 post of faculty/ researcher remain vacant
31.3.2011	57	43	14	4 post of faculty/ researcher remain vacant
31.3.2012	57	45	12	4 post of faculty/ researcher remain vacant

Annex- 9.1
Shortfall in the achievements of the targets fixed for phase-I (Para 9.3.5.2)

Proposed equipment	Optimum requirements of equipment	Equipment were to be procured in Phase- I	Installed
Automatic Rain-Gauges	3600	1350	708
Automatic Message Switching Systems	1150	550	550
Doppler Weather Radars	68	13	9
Wind Profilers	15	4*	Nil
Aeronautical Instrumentation sets	50	26*	Nil
RS/RW systems	44	25*	Nil
Pilot balloons	70	70	70
Lightening detection nodes	10	10*	Nil

* Not procured as of date

Annex- 10.1

Details of recent disasters or emergencies in Andhra Pradesh

Sl No	Period of occurrence of Disaster	Disaster	No. of districts affected	Population affected (in lakh)	Human deaths in no.	No. of houses damaged	Crop area damaged (Hectares)
1	October 2001	Heavy Rains / Flash Floods	5	---	119	111340	---
2	December 2003	Cyclonic Storm / Flash Floods	6	42.68	44	17147	265741
3	September 2005	Heavy Rains / Flash Floods	10	350	107	118618	551966
4	August 2006	Cyclone Storm / Floods	10	13.84	165	276567	219897
5	September 2006	Heavy Rains	8	0.23	52	29837	219950
6	October & Nov. 2006	Ogni Cyclone	5	13.85	41	95218	384550
7	June 2007	Heavy Rains	16	8.35	50	195456	51587
8	September 2007	Heavy Rains/Floods	15	2.4	77	33241	62000
9	October 2007	-do-	6	0.94	9	9246	16405
10	October & Nov. 2007	-do-	4	27.32	36	611907	23000
11	Feb. 2008	-do-	11	0.13	4	122	292854
12.	March 2008	Unseasonal heavy rains and Floods	22	0.014	36	3556	227507
13	August 2008	Heavy Rains/ Floods	15	44.28	130	44364	196038
14	November 2008	Khaimuk Cyclone	9	1.0	0	1190	59287
15	November 2008	Nisha - Cyclone	5	1.0	9	8258	220000
16	September & October 2009	Floods due to unprecedented Rains	13	20.72	90	259095	226092
17	May 2010	Laila - Cyclone	14	17.80	22	14298	26685.83
18	June to Sept. 2010	Heavy Rains/ Floods	22	8.95	65	11022	277000
19	October & Nov. 2010	Heavy Rains/ Floods/ JAL Cyclone	13	16.98	63	20554	483000
20	December 2010	Heavy Rains/ Floods	15	8.16	21	3169	1208000
21	December 2011	Thane Cyclone	9	0	0	0	62883

(Source: Data furnished by Commissioner for Disaster Management)

Annex- 10.2

Details of recent disasters or emergencies in Gujarat

Period	Disaster	Remarks (No. of persons died, affected, loss of crops etc)
1999-2000	Drought	9449 villages in 155 taluks of 17 out of 25 districts with a population of 250 lakh were affected. The failure of fodder crop affected livestock population of 71.33 lakh. Banaskantha, Jamnagar, Kutch and Patan districts were severely affected. Food-grain production was lower by 29.45 *per cent* compared to that of last year.
January 2001	Earthquake	Kutch - Over 13000 people killed. A total of about 1.3 million houses, lifeline infrastructures were damaged to variable extent.
2001-2002	Drought	40 *per cent* damage of crops sown after the first rains due to delayed and scanty rains.
July 2005	Flood	About 125 people killed.
July-August 2006	Flood	Surat city and south and central Gujarat - Nearly 150 people had died in the floods while over 100 others had died in post-flood epidemic of leptospirosis. Direct and indirect monetary losses have been estimated at ₹ 16,000 crore.

(Source: State Disaster Management Plan of the Gujarat state)

Annex- 10.3

Details of recent disasters or emergencies in Odisha

Year	Disaster	Districts affected	Population affected (Flood and heavy rain)	Villages affected (Drought)
July 2007	Floods	12	13.32 lakh	-
August and September 2007	Floods	15	22.47 lakh	-
June and September 2008	Floods	21	47.18 lakh	-
2009	Flood & heavy rain drought / pest attack	17 18	6.61 lakh	5294
2010	Flood and heavy rain, drought, unseasonal cyclonic rain	06 17 24	0.89 lakh	10674 (12 lakh hectare)
2011	Flood and heavy rain	21	35.68 lakh	

(Source: Annual Reports on natural calamities of Special Relief Commissioner)

Annex- 10.4

Details of recent disasters or emergencies in Rajasthan

Period	Disaster	Remarks (No. of persons died, affected, loss of crops etc)
August 2006	Flood	Heavy rainfall resulting in flood in Barmer district. Malwa and Kawas villages submerged and 104 persons died.
13 May 2008	Serial bomb blasts	In Jaipur, 63 persons died, 78 persons injured and 105 persons sustained minor injuries.
30 September 2008	Stampede at Jodhpur	216 persons died, 9 seriously injured and 83 persons sustained minor injuries.
April 2009	Earthquake	It hit Jaisalmer district and surrounding areas, seven persons injured, 2 animal died. It damaged pucca houses-93 completely, 2157 seriously, 276 partially and kucha houses-3 completely, 196 seriously, 51 partially.
29 October 2009	IOC Depot Fire at Jaipur	11 officers and labourers died, 65 injured and estimated loss of national property was ₹ 650 crore.
December 2009	Collapse of Chambal Bridge at Kota	48 labourers died and 12 injured in the accident.

(Source: Admn. & Progress Report 2006, 2008-09, DMRD and Information provided by Collectorate)

Annex- 10.5

Details of recent disasters or emergencies in Tamil Nadu

Period	Nature of disaster	Remarks (No. of persons died, affected, loss of crops etc)
26.09.2001	Earthquake of magnitude 5.5 in the Richter scale off the coast of Puducherry	3 deaths and minor damage to property in Puducherry and coastal Tamil Nadu
26.12.2004	Sumatra-Andaman earthquake and Tsunami– a very great earthquake in the north Indian Ocean and the Bay Bengal	7996 persons died and 1.50 lakh people were rendered homeless. Livelihood of fishermen and others were destroyed. 4.90 lakh persons were evacuated in Tamil Nadu.
October-November 2005	Very active north east monsoon 2005 coupled with low pressure area and deep depression over Bay of Bengal. Intense torrential downpour of rain in in many districts of Tamil Nadu.	497 persons died, 1520 cattle lost their lives, 104843 huts fully damaged and 206340 huts partly damaged.
17.12.2007 - 21.12.2007	Heavy Rainfall during North east monsoon	71 human lives lost, 385 milch animals lost and 20216 huts were damaged.
March 2008	Unseasonal heavy rains	24 human lives lost. 804 animals lost. 5782 huts were damaged.
26 November 2008	Nisha Cyclone	245 human lives lost, 6601 milch animals were lost. 10.59 lakh huts were damaged. 5.85 lakh hectares of agricultural crop damaged. 543 public buildings were damaged.
7.11.2009	Landslide in the Nilgiris district	44 persons lost their lives. 3715 huts were damaged. 899 landslides occurred in the state highways.
October – December 2010	Heavy north east monsoon rains	203 human lives lost. 6256 cattles were lost. 13975 huts were fully damaged and 52812 huts were partially damaged.
12.08.2011	Earthquake of magnitude 3.5 in Ariyalur area in Tamil Nadu	One death and minor damage in the districts of Cuddalore, Perambalur, Tiruchirappalli and Villupuram.
30.12.2011	Thane Cyclone – Cuddalore and Villupuram districts severely affected.	56 lives lost, 401 cattle died, 577584 huts were damaged and 2.34 lakh hectares crops were damaged. 27 High Tension towers, 45460 electric poles and 4700 transformers were uprooted.

(Source: Annual Report on natural calamities of Revenue administration, Disaster management and mitigation department, Chennai)

Annex- 10.6

Details of recent disasters or emergencies in Uttarakhand

Period	Disaster or natural calamity during 2007-08 to 2011-12	Loss of life due to natural calamities during 2007-08 to 2011-12
2008	Land Slide (9[1]), Storm (1), Lightening (1), Glacier incident (2), Heavy rains (6) and Others[2]	***Total loss of lives: 653***
2009	Land Slide (12), Heavy rains (8), Glacier incident (1), Lightening (1), Cloud burst (1) and Others	Loss of life due to: Landslide: 175 Avalanche: 13 Fire accidents: 26
2010	Land Slide (1), Storm (3), Heavy rains (2), Lightening (1) and Others	Heavy rains: 186 Cloud burst/ earthquake: 118
2011	Land Slide (4), Heavy rains (2), Cloud burst (3), Flash flood(1) and Others	Others[3]: 135
2012 (up to March)	Land Slide (1) and Others	

(Source: Department of Disaster Management, Uttarakhand)

Annex- 10.7

Details of recent disasters or emergencies in West Bengal

Sl. No.	Period	Disaster/ Natural Calamity	Remarks (No. of persons died, affected, loss of crops etc)
1	June-Sept 2010	Severe drought	11 districts affected
2	April 2010	Tornado	Uttar Dinajpur district was affected, 43 human lives lost, Estimated value of damaged crops ₹ 2395.35 lakh Estimated value of loss to houses: ₹ 15089.58 lakh.
3	May 2009	'AILA' cyclone	11 districts affected, 197 people died and lakh of people rendered shelter less. 4.47 lakh hectares crop area affected and Livestock loss was estimated at 213665 nos. The number of fully and partly damaged houses (both kutcha and pucca) was 403275 and 555458 respectively.
4	June-Aug 2007	Landslide	Darjeeling district was affected, 12 human lives lost, life of 1.32 lakh persons affected
5	July-October	Flood	13 districts affected; 355 human lives lost; life of 118.22 lakh persons affected; 8.59 lakh hectare

[1] In bracket, no. of incidents are given
[2] Tree-fall, drowning, wall collapse, cylinder blast, debris-fall, high tension wire fall, stampede incidence etc.
[3] Other calamities are fire, avalanche, road accidents, hailstorm, and epidemics etc.

	2007		cropped area affected Total estimated damage to houses, crops and public property: ₹ 203.86 crore.
6	September –October 2006	Flood/cyclone	Monsoon rains and tropical cyclone-driven storms in the Bay of Bengal hit India and Bangladesh. West Bengal recorded 50 deaths, 300 were injured and 30,000 mud houses destroyed. Heavy rains left large parts of Kolkata city under water; subsequently 2000 people were evacuated from the city
7	June-Aug 2006	Flood	The regions of Birbhum, Burdwan and Murshidabad were affected mainly from continuous monsoonal downpour
8	October 2005	Flood	Heavy rains caused floods in many areas. About 3000 coastal villages were inundated.
9	July 2005	Flood/ Landslide	Heavy monsoon rains triggered flash floods and landslides
10	June-Oct 2004	Flood	Heavy monsoon rains affected several districts
11	June - Nov 2003	Flood	Monsoon rains caused floods affecting the regions of Darjeeling, Jalpaiguri, Malda and Murshidabad
12	November 2002	Cyclone	Caused 78 deaths along with the destruction of agricultural crops and property
13	June-August 2002	Flood	Flooding in Cooch Behar and Jalpaiguri in North Bengal due to monsoon rains. Flash floods swamped ten villages, causing four deaths and 11,000 cases displacement
14	July-Sept 2001	Flood	Kolkata was affected

(Source: Annual Administrative Report from 2007-08 to 2010-11 of State Disaster Management Department and State Disaster Management Plan)

Glossary

ACWCS	Area Cyclone Warning Centers
AERB	Atomic Energy Regulatory Board
ALTM-DC	Airborne Laser Terrain Mapping and Digital Camera
AMSS	Automatic Message Switching Systems
ARGs	Automatic Rain Gauges
ATIs	Administrative Training Institutes
ATLS	Advance Trauma Life Support: is a training course introduced by American Association of Surgeons which provides training in managing airway, breathing and circulation to save lives in emergency department trauma rooms.
AWCs	Automated Weather Communication Systems
BARC	Bhabha Atomic Research Centre
BEL	Bharat Electronics Limited
Biological disasters	Biological disasters are scenarios involving disease, disability or death on a large scale among humans, animals and plants due to toxins or disease caused by live organisms or their products.
BMTPC	Building Materials & Technology Promotion Council
BSL— Biosafety Level	A method for rating laboratory safety. Laboratories are designated BSL 1, 2, 3, or 4 based on the practices, safety equipment, and standards they employ to protect their workers from infection by the agents they handle.
CA EPPR	Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996
CAIRS	Chemical Accident Information & Reporting System
CAPF	Central Armed Police Forces
CBRN	Chemical, Biological, Radiological and Nuclear
CCG	Central Crisis Group
CD	Civil Defence
Cloud burst	A cloudburst is an extreme amount of precipitation, sometimes with hail and thunder which normally last for few minutes but is capable of creating flood like condition.
CDC	Consultancy Development Centre
CMG	Crisis Management Group
CRF	Calamity Relief Fund
CSU	Central Surveillance Unit
CWC	Central Water Commission
CWDS	Cyclone Warning Dissemination System
CWG	Commonwealth Games-2010
DAC	Department of Agriculture and Cooperation
DAE	Department of atomic Energy
DDM	Directorate of Disaster Management
DDMA	District Disaster Management Authority

DDMP	District Disaster Management Plan
DEOC	District Emergency Operations Centre
DFPR	Delegation of Financial Power Rules
DGCD	Director General Civil Defence
DHS	Directorate of Health Services
DM	Disaster Management
DMCs	Disaster Management Centers
DMIC	District Meteorological Information Centres
DMMC	Disaster Mitigation and Management Centre
DMRD	Disaster Management & Relief Department
DMS	Disaster Management Support Programme: aims to provide timely support and services from aero-space systems, both imaging and communications, towards efficient management of natural disasters
DoS	Department of Space
DPR	Detailed Project Report
DRMP	Disaster Risk Mitigation Programme
DSC	Decision Support Centre
DTH	Direct -to- Home
DWDS	Disaster Warning Dissemination System
DWR	Doppler Weather Radar is a type of radar used to locate meteorology, calculate its motion, and estimate its type
EAPs	Emergency Action Plans
EMR	Emergency Medical Response
Epidemics	The outbreak of a disease affecting or tending to affect a disproportionately large number of individuals within a population, community, or region at the same time.
EPPR Rules	Emergency Planning, Preparedness and Response Rules, 1996
ERC	Emergency Response Centre
ESF	Emergency Support Function
FDP	Forecast Demonstration Project
FMP	Flood Management Programme
FSI	Forest Survey of India
Geotechnical Investigations	This is to assist the design engineers and town planners to understand the general site conditions on the basis of the site classification leading to building of safe and economical habitats.
GDMO	General Duty Medical Officer
GIS	Geographic Information System
GMDMA	Greater Mumbai Disaster Management Authority
GoI	Government of India
GSDMA	Gujarat State Disaster Management Authority
GSI	Geological Survey of India
HLC	High Level Committee

HPC	High Power Committee
IAEA	International Atomic Energy Agency
ICS	Incident Command System
IDRN	India Disaster Resource Network
IDSP	Integrated Disease Surveillance Project
IFMS	Intensification of Forest Management Scheme
IGNOU	Indira Gandhi National Open University
IISc	India Institute of Science
IMCT	Inter Ministerial Central Team
IMD	Indian Meteorological Department
IMG	Inter Ministerial Group
INCOIS	Indian National Centre for Ocean Information Services
INTOSAI	International Organisation of Supreme Audit Institutions
ISRO	Indian Space Research Organisation
IT	Information Technology
Lifeline buildings	Important Government building and public buildings like hospitals etc
LMC	Lower Medical Category
MAH unit	Major Accident Hazardous unit
Man made disasters	These are consequence of technological or human hazards. These include fire, nuclear, radiological, biological and chemical disasters.
MHA	Ministry of Home Affairs
MHD	Multi Hazard Districts
MoEF	Ministry of Environment & Forests
MoH&FW	Ministry of Health and Family Welfare
MoWR	Ministry of Water Resources
Mock disaster drill	A mock disaster drill is set up to train people in proper action in case of a real disaster. A scenario is set up and different agencies involved do what they would do in case of a real disaster.
MRDS	Mobile Radiation Detection System: was to have a mobile monitoring van equipped with radiation detection system and protective gear to carry out the assessment of the radiological impact.
MSIHC Rules	Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989
Natural disaster	A disaster when a natural hazard affects humans and the built environment. These include earthquake, drought, flood, cyclone, tsunami, etc.
NBCC	National Building Construction Corporation
NCCD	National Calamity Contingent Duty
NCCF	National Calamity Contingency Fund
NCMC	National Crisis Management Committee
NCRMP	National Cyclone Risk Mitigation Project
NDCN	National Disaster Communication Network
NDEM	National Database for Emergency Management
NDMA	National Disaster Management Authority

NDMF	National Disaster Mitigation Fund
NDMIS	National Disaster Management Informatics System
NDRF	National Disaster Response Force
NDRR	National Disaster Response Reserve
NEC	National Executive Committee
NECP	National Emergency Communication Plan
NERMP	National Earthquake Risk Mitigation Project
NFRMP	National Flood Risk Mitigation Project
NFSC	National Fire Service College
NIC	National Informatics Centre
NIDM	National Institute of Disaster Management
NIDR	National Institute of Disaster Response
NIV	National Institute of Virology
NLRMP	National Landslide Risk Mitigation Project
NPCBAERM	National Programme for Capacity Building of Architects in Earthquake Risk Management: The project was to ensure seismically safer habitats by training of practicing Architects
NPCBEERM	National Programme for Capacity Building of Engineers in Earthquake Risk Management: The project was to ensure seismically safe construction by training of the civil and structural practicing Engineers
NPDM	National Policy on Disaster Management
NPPs	Nuclear Power Plants
NRIs	National Resource Institutes
NRSA	National Remote Sensing Agency
NRSC	National Remote Sensing Centre
NSN	National Seismological Network
NSSP	National School Safety Programme
NWP	Numerical Weather Prediction
ODRAF	Odisha Disaster Rapid Action Force
OSDMA	Odisha State Disaster Management Authority
Pandemic	A pandemic is an epidemic of infectious disease that has spread through human populations across a large region
PEE	Plant Emergency Exercises
PERT	Post Emergency Response Team
PMC	Project Management Council
PMO	Prime Minister Office
PSHA	Probabilistic Seismic Hazard Analysis
RDMD	Revenue and Disaster Management Department
ROT	Receive Only Terminals
RRC	Regional Response Centre
RSOs	Regional Security Officer
RTSMN	Real Time Seismic Monitoring Network

Retrofitting of buildings	Making changes to the systems inside the building or the structure itself at some point after its initial construction and occupation
SAC	Space Applications Centre
SATA	Society for Automation and Technology Advancement
SCG	State Crisis Group
SCMP	State Forest Fire Crisis Management Plan
SDMA	State Disaster Management Authority
SDMF	State Disaster Mitigation Fund
SDMP	State Disaster Management Plans
SDRF	State Disaster Response Force
SEC	State Executive Committee
SEE	site emergency exercises
SEOC	State Emergency Operation Centre
SEOG	State Emergency Operation Group
SERC	Structural Engineering Research Centre
SFC	Standing Finance Committee
SFDs	State Forest Departments
SoI	Survey of India
SOP	Standard Operating Procedure
SRC	Specification Review Committee
SRC	Special Relief Commissioner
Surveillance	Continuous observation, measurement, and evaluation of the progress of a process or phenomenon with the view to taking corrective measures.
ToR	Terms of Reference
ToT	Training of Trainers
UAV	Unmanned Arial Vehicle
UNDP	United Nations Development Programme
UTDMA	Union Territory Disaster Management Authority
UTDMEC	Union Territory Disaster Management Executive Committee
VA&RA	Vulnerability Analysis and Risk Assessment
VHF	Very High Frequency
VPN	Virtual Private Network
VSAT	Very Small Aperture Terminal