

Disaster Preparedness for Natural Hazards Current Status in India

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International Centre for Integrated Mountain Development

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Disaster Preparedness for Natural Hazards: Current Status in India



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A consultancy report by
Chandrani Bandyopadhyay

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Foreword

Inhabitants in the Himalayan region are exposed to many natural hazards. The mountain ranges are young with an unstable geology, steep slopes, and a climate that is difficult to predict. As a result, the region is highly susceptible to natural hazards such as floods and flash floods, landslides, and earthquakes. In populated areas, these can lead to disaster. Vulnerable groups – the poor, women, and children – are often hit hardest.

Since its establishment in 1983, ICIMOD has dedicated much of its work to examining ways to reduce the risk of disasters from natural hazards, thereby working towards the decreased physical vulnerability of people in the Hindu Kush-Himalayas. This work has encompassed training courses, hazard mapping, landslide mitigation and control, mountain risk engineering, watershed management, vulnerability assessment, and much more. ICIMOD has also fostered regional and transboundary dialogue for improved management of both the resources provided and the risks threatened by the big rivers in the Himalayan region; sharing of hydro-meteorological data and information among the countries in the region is of particular importance for mitigating the risk of riverine and flash floods in the major river basins.

This publication is one of a series produced under the project ‘Living with risk – sharing knowledge on disaster preparedness in the Himalayan region’, implemented by ICIMOD during a 15-month period in 2006 and 2007. The project was funded by the European Commission through their Humanitarian Aid department (DG ECHO) as part of the Disaster Preparedness ECHO programme (DIPECHO) in South Asia, and by ICIMOD. Through this project, ICIMOD has endeavoured to encourage knowledge sharing and to strengthen capacity among key practitioners in the field of disaster preparedness and management. This has been done through training courses, workshops, knowledge compilation and dissemination, and the establishment of a website (www.disasterpreparedness.icimod.org).

The publications resulting from this project include baseline assessments of the disaster preparedness status in the four target countries (Bangladesh, India, Nepal, and Pakistan); case studies and a framework on local knowledge for disaster preparedness; and gender and vulnerability aspects in disaster risk reduction. The publications, training sessions, and workshops were undertaken in the context of the ‘Hyogo Framework for Action 2005-2015’ which recommends that regional organisations should promote sharing of information; undertake and publish baseline assessments of disaster risk reduction status; and undertake research, training, education, and capacity building in the field of disaster risk reduction.

The long-term mission to bring the Himalayan region to an acceptable level of disaster risk has only just begun. The countries in the region are among the most disaster prone in the world in terms of number and severity of disasters, casualties, and impact on national economies. Only by strong commitment, hard work, and joint efforts can this situation be improved. It is ICIMOD's hope that our collective endeavours will help improve disaster risk reduction in the mountain region we are committed to serve.

Dr. Andreas Schild
Director General
ICIMOD

This report is one of four status reports on disaster preparedness planning covering four countries; viz., Bangladesh, India, Nepal, and Pakistan. The purpose of these reports is to provide an opportunity for the reader to get a quick overview of the current status on disaster preparedness documents in place and the institutions governing the implementation of these documents in the respective countries.

The reports are based on consultancies undertaken as part of the project 'Living with risk – sharing knowledge on disaster preparedness in the Himalayan region', implemented by ICIMOD, and funded by the European Commission through its Humanitarian Aid Department (DG ECHO) as part of the Disaster Preparedness ECHO Programme (DIPECHO) in South Asia, and by ICIMOD. The project takes off from the Hyogo Framework for Action 2005-2015 (HFA) which provides guidance on the roles regional organisations, such as ICIMOD, can play in long-term work towards reducing the risks of disaster. One recommendation by HFA is to undertake and publish baseline assessments of the status of disaster risk reduction.

As part of this project, a 'regional workshop on disaster preparedness plans' was held in Kathmandu in August 2006. The main objective of this workshop was to discuss the status of disaster preparedness as reflected in policies, strategies, plans, and other relevant documents available, or being developed, in the four countries. Particular interest was given to identifying gaps and shortcomings in the functioning and implementation of these guiding documents. First drafts of these country status reports were prepared for the workshop and formed the basis for the discussion and gap analysis. The reports have since been updated, improved, and extended. The outcome of the workshop was summarised in 15 concluding points, highlighting the status of disaster preparedness (DP), in particular, and disaster management (DM), in general, in the region. These 15 concluding points follow below.

The complete compilation of all documents at all governance levels, covering all types of disaster and providing full descriptions of all implementing institutions is an immense task, and it is beyond the scope of this project. ICIMOD has a mandate to focus primarily on mountain hazards, and therefore the scope of the consultancy has been to cover earthquakes, landslides, and floods, including flash floods (see Annex 1 for Terms of Reference). Furthermore, the study focused on documents and institutions governing disaster preparedness planning at the central, national level, with more limited coverage given to district and community levels. Hence, the reports are not

exhaustive in terms of covering all natural hazards. Nevertheless, the documents and institutions governing disaster preparedness at the national level do, in many cases, take a multi-hazard approach. In conclusion, the present document will give the reader a good, albeit quick, overview of the status of disaster preparedness planning for natural hazards. As such, it is the hope of ICIMOD that it will prove helpful as a source of information and thereby support the joint efforts undertaken by many government and non-government organisations towards a Himalayan region that is better prepared to mitigate the impacts of disasters.

Dr. Mats G. Eriksson
Water, Hazards and
Environmental Management
ICIMOD

Conclusions from the Regional Workshop on Disaster Preparedness Plans for Natural Hazards (Kathmandu, 7-9 August 2006)

General Observations

1. Disaster preparedness (DP) has to be approached **holistically** because it is difficult to isolate preparedness from other components of disaster management (DM) such as reduction, response, and recovery.
2. A **paradigm shift** in DM from a relief-driven approach to a more preparedness-driven approach is occurring.
3. **Local communities** should be at the centre of DM plans. They are the first victims of natural hazards and the first respondents.

Development and Vulnerable Groups

4. DM should be integrated into **national development plans** for improved sustainable livelihoods and poverty reduction.
5. A **multi-hazard approach** is crucial as most communities are exposed to hazards that have interacting and cascading effects.
6. **Vulnerable groups** and marginalised people are insufficiently addressed in DM plans.

Institutions and Policies

7. The **political will** to direct sufficient resources is essential for the efficient implementation of existing DM plans.
8. Planning for DM is an iterative **process** that should be based on the efficient use of already existing resources.
9. **Roles and responsibilities** for DM of all stakeholders at the national, regional, and local levels need to be clarified. DM should be a priority on the national political agenda.

Knowledge and capacities

10. **Local knowledge** should be respected and combined with other knowledge to improve the design and implementation of DM activities.
11. **Learning** from past disaster events through research and documentation is important in order to anticipate and respond to future disasters more effectively than is currently the case.
12. **Education and training** in DM is necessary for awareness and capacity building of all stakeholders.

Communication and Cooperation

13. **Insufficient coordination** prevails among key actor in the field of DM.
14. Functional and **efficient communication** among key actors at local, national, and international levels needs to be improved.
15. **Data and information sharing** at a regional transboundary level needs to be strengthened and requires appropriate capacity and technology.

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This report has been written at a time when the entire nation is moving on a fast track towards a resilient India. The author thanks all those people who have made this possible through their vision, commitment, and dedication.

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Last, but not the least, many thanks to my family, especially Bhasker and Kuhu, for being there, no matter what!

Chandrani Bandyopadhyay

Executive Summary

The introduction to India, its historical experience of natural disasters, and ancient records that contain measures to address them or be prepared for them familiarise us with the environment of disaster preparedness in India and the efforts made to improve them and institutionalise them that make up the rest of the text.

This is followed by a section placing India globally in terms of vulnerability to recurrent and concomitant disasters, particularly floods, landslides, and earthquakes. Reasons for this lie in its situation in South Asia, openness to the sea along a lengthy coastline, the vastness and diversity of its subcontinental terrain, its many mighty rivers, and the rugged geomorphology of the Himalayas. Human-induced reasons are also taken into account, not least the changing demography of a growing population and the reactions to recurrent disasters that lead to activities on yet more vulnerable or degraded land, which in turn leave people and assets vulnerable to yet more disasters.

The report continues by describing the disaster management structure that was built up following Indian Independence in 1947, and which is the basic structure upon which changes and revisions are taking place currently. A comprehensive description is given of the federal structure and the avenues through which power is devolved to the states, with the central government in a supportive, enabling role by providing financial and physical resources, warning, transport, inter-state movement, and emergency food supplies.

Nationally the Home Ministry carries out this work through a Central Relief Commissioner who receives information through the Meteorological Department's early warning and forecasting systems and the Central Water Commission. There is also a Crisis Management Group to coordinate the activities of central ministries and review the contingency plans of the state governments. Overarching this are three committees at cabinet level: The National Crisis Management Committee (NCMC) headed by the Cabinet Secretary and two other Cabinet Committees, one on Natural Calamities and the other on Security.

At state level, the Relief Commissioners look after relief and rehabilitation for disasters and are under the Chief Secretary, and at the district level natural disasters are the responsibility of the District Collectors or Magistrates. Funds, namely, Calamity Relief Funds, are allocated, and these come in varying proportions from the national and state levels.

This structure has been institutionalised since 1947, and it is on the base established by this structure that the new paradigm perspective is taking place and institutional changes introduced.

Following the International Decade for Natural Disaster Reduction (IDNDR), the concern shifted from relief to prevention, especially considering the loss of development gains that each ensuing disaster brings. The text describes in good detail the initiatives from 1994 in the form of the establishment of a Central Sector Scheme on Disaster Management and the series of Finance Commissions and National Plans that have emphasised the integration of preparedness and disaster management at all levels of planning in India. Instrumental, however, in tabling the idea of a disaster management plan at overall national level as a promoting template was the High Powered Committee (HPC) on Disaster Management. It prepared a report in 2001 that contained wide-ranging recommendations for a system of disaster management throughout the country at various levels, backed by a National Disaster Response Plan (NDRP). The acceptance of this report by the Government of India put the wheels in motion to integrate disaster preparedness planning into the plans and activities of all states and districts through to villages in India. The HPC also formulated a model district disaster management plan that set down stipulations for background analysis and procedures.

On the ground, since 2002, the shift in paradigm is being institutionalised through a National Disaster Management Framework and later, in 2005, added impetus was given to this with a legal framework; viz., The National Disaster Management Act. Following the act it became mandatory to establish a National Disaster Management Authority (NDMA) under the chairmanship of the Prime Minister with a National Executive Committee to assist it. Through its auspices a National Plan for Disaster Management was to be prepared to lay down national policy. A National Institute of Disaster Management (NIDM) was then established to train; and also to carry out research and support policy formulation as well as give support to other institutions in the field throughout the country.

The Act promotes the establishment of disaster management authorities through to the state and district levels and down to the village committees. The structure at state and district levels follows the national-level structure. In terms of fund allocation and authority and responsibility for preparedness planning and mitigation measures, the procedures are quite comprehensive.

Supporting initiatives have been the government's introduction of an Incident Command System, for which training was undertaken in the USA by selected personnel, and emergency support functions. Plans, checklists, and standard operating procedures (SOPs) have all been prepared by the National Disaster Management Authority.

The paper describes the formulation of plans at different levels of governance. A district plan template was prepared by the NIDM in 2005 and planning is being promoted right through to the community level.

It is clear from the narrative that efforts are on to merge all the components of disaster preparedness and risk reduction into a comprehensive whole. Arrangements include not only the huge administrative machinery of the Government of India, but also the private sector and non-government actors. This all depicts a very busy and active

burst of planning as India moves towards the paradigm of preparedness and poises to institutionalise this paradigm, fixing it, as it were, in the national psyche.

Such ambitious plans and activities suffer also from weaknesses, and these generally fall between the process and the actual practice. For instance, although the government accepted the National Disaster Response Plan and certain concepts have been implemented, the entire plan has not. The Act of 2005 provides for a national plan for managing disasters, but there are no clear guidelines. At other levels, although state to district and community planning for disaster management has been introduced conceptually and responsible parties identified, different states are at different stages in the exercise. Until recently there was no real institutional back-up. The Act of 2005 rectifies that to a certain extent. Previously the coordination and control structure in disaster preparedness was poorly defined and, unless an officer had a great deal of personal commitment, preparedness planning suffered. Capacity-building is of course the key, and 10 states have already trained district-level officers.

As far as communicating and sharing knowledge is concerned, a National Communication Plan has been drawn up that envisages a dedicated communication system using the latest technologies. Communications have been strengthened by using the police network (POLNET) and a nation-wide electronic inventory, the India Disaster Resource Network (IDRN), which has information about equipment, human resources, and critical supplies from district level onwards. Additionally GIS is being used to provide maps that will be useful for identifying hazards and an on-line India Disaster Knowledge Network (IDKN) is being established.

Regionally, a SAARC Disaster Management Centre (SDMC) was established in New Delhi in 2006, and there is also a Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) that is considering making disaster management one of its key areas of cooperation.

Recommendations focus on concerted promotion of disaster preparedness nationwide; a closer look at urban areas and their needs; thorough integration of plan implementation, both vertically and horizontally; building on the NDRP rather than framing a completely new national plan; holding regular drills; completing plans within a specified time frame; and that states ensure that their District Disaster Management Authorities are now fully notified and established.

In conclusion, the status appears to be that India has accepted that pre-disaster planning and preparedness is essential, and a hive of activity ensued after IDNDR. Many initiatives took place concomitantly, and because of this it is often difficult to determine what initiative is driving what. However, it is clear that each of these initiatives has given impetus to others and the clock will not be turned back in relation to preparedness planning. Although the driving force is the government, the government has made efforts to include all sectors into what is a comprehensive vision of a nation that is as prepared to the greatest possible extent for whatever natural disaster comes next.

Acronyms and Abbreviations

BIMSTEC	Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation
BMTPC	Building Materials and Technology Promotion Council
CMG	Crisis Management Group
CRF	Calamity Relief Fund
DDM	Department of Disaster Management
DDMP	District Disaster Management Plan
DDMA	District Disaster Management Authority
DMAP	Disaster Management Action Plan
EM-DAT	emergency disasters' database
EOC	Emergency Operations' Centre
ESF	emergency support functions
GDP	gross domestic product
GIS	geographic information system
HPC	High-powered Committee on Disaster Management
ICS	Incident Command System
IDNDR	International Decade for Natural Disaster Reduction
IDKN	India Disaster Knowledge Network
IDRN	India Disaster Resource Network
IFRC	International Federation of the Red Cross and Red Crescent
IMD	Indian Meteorological Department
NCDM	National Centre for Disaster Management
NCCM	National Crisis Management Committee
NDMA	National Disaster Management Authority
NDMF	National Disaster Management Framework
NDRF	National Disaster Response Force
NDRP	National Disaster Response Plan
NEC	National Executive Committee
NGO	non-government organisation
NIDM	National Institute for Disaster Management
NPDM	National Policy on Disaster Management
OFDA/CRED	Office of the US Foreign Disaster Assistance/ Centre for Research on the Epidemiology of Disasters
POLNET	police network
SAARC	South Asian Association for Regional Cooperation
SDMA	State Disaster Management Authority
SDMC	SAARC Disaster Management Centre
SOP	standard operating procedure
UNDP	United Nations Development Programme
UT	Union Territory

Some Key Terms

Capacity – A combination of all the strengths and resources available within a community, society, or organisation that can reduce the level of risk, or the effects of a disaster.

Disaster – A serious disruption of the functioning of a community or a society causing widespread human, material, economic, or environmental losses which exceed the ability of the affected community or society to cope using its own resources.

Disaster risk reduction (disaster reduction) – The conceptual framework of elements considered with the possibilities to minimise vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, within the broad context of sustainable development.

Hazard – A potentially damaging physical event, phenomenon or human activity that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation.

Mitigation – Structural and non-structural measures undertaken to limit the adverse impact of natural hazards, environmental degradation and technological hazards.

Preparedness – Activities and measures taken in advance to ensure effective response to the impact of hazards, including the issuance of timely and effective early warnings and the temporary evacuation of people and property from threatened locations.

Resilience/resilient – The capacity of a system, community or society potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure. It is determined by the degree to which the social system is capable of organising itself to increase its capacity for learning from past disasters for better future protection and to improve risk reduction measures.

Risk – The probability of harmful consequences, or expected losses (deaths, injuries, property, livelihoods, economic activity disrupted or environmental damaged) resulting from interactions between natural or human-induced hazards and vulnerable conditions. Conventionally risk is expressed by the notation $\text{Risk} = \text{Hazards} \times \text{Vulnerability}$. Some disciplines also include the concept of exposure to refer particularly to the physical aspects of vulnerability. A disaster is a function of the risk process. It results from the combination of hazards, conditions of vulnerability and insufficient capacity or measures to reduce the potential negative consequences of risk.

Risk assessment or analysis – A methodology to determine the nature and extent of risk by analysing potential hazards and evaluating existing conditions of vulnerability that could pose a potential threat or harm to people, property, livelihoods and the environment on which they depend.

Vulnerability – The conditions determined by physical, social, economic, and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards.

Adapted from UN/ISDR (2004)



Chapter 1

Introduction

In recent years, despite the age we live in being one of technological innovation, the increased frequency, intensity, magnitude, and impact of natural disasters have claimed thousands of lives and caused immense material losses throughout the world. In recent decades this has been attributed to an increase in population worldwide and subsequent developments like urbanisation, use of vulnerable regions or degraded land, and alterations in the environment. In the second half of the twentieth century about 250 'great natural catastrophes' claimed the lives of about 1.4 million people, most of whom succumbed to windstorms or floods. The 1990s alone had four times more disasters than in the 1950s and a 15-fold increase in economic losses during the same period (Munich Re Group 2000).

Most of the world's worst disasters occur between the Tropics of Cancer and Capricorn, Asia being the most affected continent with 39% of the total disasters reported from 1992-2001, accounting for 74.5% of the total casualties (IFRC 2002).

Whereas hazard events cannot be prevented from occurring, devastation and loss can be prevented to a great extent. Impacts of natural disasters can be reduced through pre-disaster activities for mitigating risks; and such activities are among the most crucial aspects of disaster risk reduction to consider in forming a coordinated strategy or plan. Natural hazard mitigation is an important policy issue because 'monetary losses from natural disasters are reaching catastrophic proportions' and are expected to increase. Mitigation is arguably the most critical activity of the four phases of disaster management: mitigation, preparedness, response, and recovery (Godschalk et al. 1999). This is particularly relevant in the case of recurrent natural hazards, such as cyclones and floods, in vulnerable locations where action to reduce damage can be more effective than relief and recovery.

The terrain

The state of India covers an area of 3.3 million sq. km., extending from the Himalayas in the north to the tropical rain forests in the south. It lies entirely in the northern hemisphere, the mainland extending between latitudes 8°4' and 37°6' north and longitudes 68°7' and 97°25' east. Surrounded by the Bay of Bengal in the east, Arabian Sea to the west, and the Indian Ocean to the south, the total length of the

coastline of the mainland, Lakshadweep Islands, and the Andaman and Nicobar Islands is 7,516.6 km. The Himalayas form a natural barrier for the peninsula from mainland Asia. Extending 2,500 km over northern India, the three parallel ranges, the Himadri, Himachal, and Shivaliks, have deep canyons gorged by rivers flowing into the Gangetic Plain. The topography varies from high mountains in the north, to flat rolling plains and the Deccan Plateau in the south.

The climate varies from tropical monsoon in the south to temperate in the north. The climate is broadly classified as tropical monsoon and the monsoons have two seasonal wind directions - the northeast monsoon and the southwest monsoon. The northeast monsoon, commonly known as winter monsoon, blows from Central Asia to the Indian Ocean, whereas the southwest monsoon blows from the Indian Ocean, the Arabian Sea, and the Bay of Bengal. The southwest monsoon brings most of the rainfall.

There are four groups of rivers; namely, Himalayan, Deccan, coastal rivers, and rivers of the inland drainage basin. The Himalayan rivers are fed by melting snow and glaciers and flow throughout the year. During the monsoon months, the Himalayas receive very heavy rainfall and rivers swell, causing frequent floods. The Deccan rivers are rainfed and fluctuate much in discharge. The coastal streams, especially on the west coast, are short in length and have limited catchments. The streams of the inland drainage basin of western Rajasthan are few.

Demography

The population of India was more than 1,027 million according to the 2001 population census; hence India's population rose by 21.34 % from 1991 to 2001. The sex ratio (i.e., number of females per thousand males) was 933, rising from 927 in 1991. The total literacy rate is 65.38%. Although India covers only 2.4% of the world's land area, it supports over 15% of the global population, exceeded only by China. Two-thirds of the population work in agriculture and related sectors, accounting for around 22% of its gross domestic product (GDP).

For administrative purposes, India is divided into 29 states and six union territories (UT). States are administered by elected state governments whereas union territories are administered by the President through an appointed administrator. Each state is divided into districts, sub-divisions or tehsils and blocks, and gram panchayats (village administration). There are 604 districts in India administered by state and/or UT governments.

Past perspectives on disasters

Indian history cites many instances of coping with natural and human-made disasters, from invasions and wars to droughts, floods, famines, earthquakes, and cyclones. The location of the sub-continent with its unique geoclimatic features, together with a dense population, makes for an interesting mix of vulnerability and resilience. Through the centuries, people have had to cope with frequent hazards through distinctive settlement patterns, livelihood preferences, sociocultural practices, and traditions.

In addition to religious literature promoting the need for harmony between humans and their environment, scholastic and scientific literature in ancient India dealt with aspects of disaster preparedness and mitigation. One example is the philosopher-astronomer-mathematician Varahamihira (505-587 AD) who wrote about earthquakes, their causes, and predictability in the *Brihad Samhita*. In it he discusses signs of earthquakes and correlates them with cosmic and planetary influences, underground water and undersea activities, unusual cloud formations, and abnormal behaviour of animals. These became part of folklore and form the basis of coping mechanisms extant at community level today. The *Atharva Veda* discusses drought mitigation strategies (Biswas 2000) and the *Arthashastra*, a treatise on public administration by Chanakya (4th century BC), has a section on famine relief and mitigation measures.

Chapter 2

Natural Hazards in India

The Himalayas are the world's youngest fold mountains, are tectonically active, and sustain the largest global, non-polar glacial deposits. The Indo-Ganga-Brahmaputra basin, stretching parallel to the Himalayan arc, carries water and silt from wide catchments through the longest alluvial plain in the world. About 58% of the Indian landmass is prone to earthquakes and landslides of different magnitudes and about 12% of its geographical area (about 40 million hectares) is subject to riverine and flash floods of which about eight million hectares are susceptible to annual flooding. Thirty-five major urban centres with populations of more than half a million each are located in high risk, seismic zones where earthquakes of magnitude of six or above on the Richter scale are distinct possibilities. Parts of the northeast receive the highest rainfall in the world whereas parts of the northwest have the scantiest, just as some areas of the trans-Himalayas are among the coldest inhabited areas and part of the Thar Desert is among the warmest. This wide variation in rainfall and climate make many regions of India susceptible to hazards such as droughts, floods, hailstorms, cloudbursts, avalanches, and heat and cold waves that claim lives, livelihood, and property (Dhar Chakrabarti 2006).

States along the Bay of Bengal and the Arabian Sea are affected by about 80 per cent of all cyclones (and accompanying floods and storm surges) generated in the region. Despite many irrigation projects, 68 per cent of the arable land is drought-prone, half of it critically so with annual precipitations of less than 750 mm and consequently immense social (primarily health) and financial implications because of its impacts on agriculture and food production, diminishing access to safe water supplies, and negation of development achievements.

In addition to highly visible disasters are the 'normal' disasters such as road accidents, infant and maternal mortality, water and air pollution, overexploitation of groundwater and arsenic poisoning, and the disaster of poverty that leads to malnutrition; none of these causing huge losses of life or considerable stress to the administrative and socioeconomic coping mechanisms, but which, nevertheless, as with natural disasters, affect the poor and marginalised severely and disproportionately. As disasters force the poor on to marginal lands and into increased penury, a vicious cycle ensues that requires an institutional mechanism to respond to not only one calamity, but a cumulative product of past circumstances and events as well. Attempts at hazard zoning have been made as a response to the increase in disasters in recent years.

The ferocity and impact of natural disasters in recent years has exceeded even the worst history. Disasters occurred in areas that had not been previously seen to be vulnerable to that particular disaster, or struck a traditionally vulnerable area with more intensity. In 2001 as a whole, India suffered 73.1% of all disaster-related deaths in Asia (IFRC 2002). Because of its sub-continental proportions and multiplicity of hazards faced, while one part of the country faces droughts, concomitantly another can be suffering from floods. Hence, vulnerability is of great concern. Some disaster events, for example, occur regularly: floods in the Ganga-Brahmaputra river systems occur every year, resulting in immense economic losses. There is an immediate need to put in place a mitigation or risk reduction system evolved from traditional coping mechanisms. Repetitive disasters should be considered within development planning itself, and their preparedness and mitigation implications should be taken into account in policy design.

Repeated disasters lead to substantial losses of hard-earned development gains as well as diverting development funds towards disaster relief. According to World Bank estimates, direct losses of public and private infrastructure in India have amounted to approximately \$30 billion over the past 35 years (World Bank 2003). Since less than 25% of the events registered actually provide loss estimates, the official figures probably understate their true economic impact. According to the same study, 2.25% of the GDP and 12.15% of the national revenue were lost because of natural disasters from 1996-2001. This has serious implications for overall macroeconomic management and development planning. Table 1 gives an idea of the cost of disasters from 1996 to 2001.

Table 1: Disaster history by major hazards in India, 1996-2001

Hazard	No of events reported	No of deaths reported ('000)	People affected ('000)	Losses reported (\$ million)	No of reports of loss submitted	% reported	Average loss per report (\$ million)
Windstorms	15	14.6	25,213.7	5,619	15	100	374.6
Floods	29	8.9	150,980.3	2,928	18	62	162.7
Earthquakes	3	20.1	16,367.0	4,707	6	200	784.5
Drought	4	-	90,000.0	588	-	-	-
Other	24	5.9	356.9	-	3	13	-
Total	75		282,917.9	13,842	-	56	329.6
Source: World Bank (2003)							

Floods

Flood disasters affect the largest number of people globally, accounting for 63% of the total number affected by disasters from 1992-2001. In the decade from 1992-2001, hydrometeorological disasters accounted for 64% of the decade's estimated damage from reported disasters (IFRC 2002). In India, between 1996-2001, floods accounted for 38.7% of all disaster events and 53.4% of the people were affected by floods.

The Indian weather is greatly influenced by the monsoon system. The country receives three quarters of its annual precipitation during the summer monsoon months between June to September. In terms of spatial variations, the areas carrying heavy riverine discharge are those that receive heavy precipitation during monsoons, thereby compounding the problem. The entire Indo-Gangetic plain and the northeastern states receive an annual precipitation of over 1,000 mm; in the lower Gangetic Plains, it is between 1,500-2,500 mm, while in upper Assam the annual average precipitation is over 2,500 mm. The Lower Gangetic Plain and Assam Valley are therefore heavy rainfall areas and most flood-prone.

The southwest monsoon during the months from June to October brings the maximum rainfall. Consequently the rivers are in spate and carry heavy discharge during this period, often resulting in floods, especially in the lower reaches. Flooding is aggravated by sediment deposition in the river channels, drainage congestion, and synchronisation of river floods with ocean tides along the coastal plains.

On average, the nation loses about Rs 100 million due to floods annually: the amount spent on relief and reconstruction results in a phenomenal loss of resources every year. Table 2 lists the principal flood-prone states, the damage figures from 1953 to 2004 are given in Table 3 and Box 1 gives a summary of flood facts for India.

Table 2: Principal flood-prone states in India		
State	Flood-prone area as % of total area of the state	Flood-prone area of the state as % of the total flood-prone area of the country
Uttar Pradesh	32.61	19.4
Bihar	55.22	13.0
Assam	50.14	9.8
West Bengal	37.42	8.1
Orissa	10.34	4.0
Other States	6.92	45.7
Total	12.17	100.0

Table 3: Flood damage in India, 1953-2004

Sector	Annual average	Maximum (year)
Area affected (million ha)	7.63	17.50 (1978)
Crop area affected (million ha)	3.56	10.15 (1988)
Population affected (million)	32.92	70.45 (1978)
Human lives lost (No.)	1,590	11,316 (1977)
Cattle lost (No.)	94,485	618,248 (1979)
Houses damaged (No.)	1,234,616	3,507,542 (1978)
Total damage (Rs million)	18,052 (400 million US\$)	88,645 (2000)
Source: Central Water Commission		

Box 1: Flood facts – India

- According to EM-DAT (International Disaster database, OFDA/CRED) for 2004, India ranked fourth among the top 10, considering the number of casualties.
- In 2005, it ranked second among the top ten in the incidence of natural hazards.
- In the top 10 by number of affected, India ranks third after China and Bangladesh.
- Scrutiny of all natural disasters in India from 1900 – 2005 revealed the country suffered 160 floods, 21 droughts, and 24 earthquakes. The 160 floods killed 50,964, left 9,034,230 homeless, and 675,252,850 affected.
- In 2004, the number of human lives lost due to floods was 1,275, in 1998 floods killed 2,889 people.
- The infrastructure loss in 2004 was estimated at Rs 1,896 crore while the area affected was 8,031 million hectares.

Source: Times of India, Mumbai, July 24, 2005

Flash floods in India

Flash floods are common in arid and semi-arid areas where rainfall occurs in short, intense storms. Mountain areas prone to thunderstorms, coupled with steep terrain and thin soils, result in high runoff within a short period of time and are very prone to flash floods. Increasing population, changing lifestyles, and rapid urbanisation in mountain areas mean human settlement and intervention in more hazardous areas. Along with flash floods, related hazards, including landslides and debris flows, are becoming more frequent and severe (Gruntfest and Hammer 2001). Table 4 lists the major flood disasters from 1953 to 2002.

Table 4: List of major flood disasters in India, 1953-2002

Year	Population affected (million)	Area affected (million ha)	Crop area damaged (million ha)	Human lives lost (No)	Cost of total damage (Rs million)
1953	24.28	2.29	0.93	37	524
1954	12.92	7.49	2.61	279	573
1955	25.27	9.44	5.31	865	1027
1956	14.57	9.24	1.11	462	535
1957	6.76	4.86	0.45	352	234
1958	10.98	6.26	1.40	389	440
1959	14.52	5.77	1.54	619	862
1960	8.35	7.53	2.27	510	632
1961	9.26	6.56	1.97	1374	313
1962	15.46	6.12	3.39	348	950
1963	10.93	3.49	2.05	432	366
1964	13.78	4.90	2.49	690	666
1965	3.61	1.46	0.27	79	72
1966	14.4	4.74	2.16	180	884
1967	20.46	7.12	3.27	355	1555
1968	21.17	7.15	2.62	3497	2111
1969	33.22	6.20	2.91	1408	4044
1970	31.83	8.46	4.91	1076	2878
1971	59.74	13.25	6.24	994	6324
1972	26.69	4.10	2.45	544	1583
1973	64.08	11.79	3.73	1349	5690
1974	29.45	6.70	3.33	387	5689
1975	31.36	6.10	3.85	686	4717
1976	50.46	11.91	6.04	1373	8887
1977	49.43	11.46	6.84	11316	12019
1978	70.45	17.50	9.96	3396	14548
1979	19.52	3.99	2.17	3637	6142
1980	54.12	11.46	5.55	1913	8402
1981	32.49	6.12	3.27	1376	11965
1982	56.01	8.87	5.00	1573	16449
1983	61.03	9.02	3.29	2378	24916
1984	54.55	10.71	5.19	1661	19056
1985	59.59	8.38	4.65	1804	40593
1986	55.50	8.81	4.58	1200	37485
1987	48.34	8.89	4.94	1835	25697
1988	59.55	16.29	10.15	4252	46303
1989	34.15	8.06	3.01	1718	24053
1990	40.26	9.30	3.18	1855	13646
1991	33.89	6.36	2.69	1187	14883
1992	19.26	2.65	1.75	1533	33446
1993	30.41	11.44	3.21	2864	32824
1994	27.55	4.81	3.96	2078	17946
1995	35.93	5.25	3.25	1814	37023
1996	44.73	8.05	3.83	1803	21625
1997	29.67	4.57	2.26	1402	28311
1998	68.72	9.13	5.87	2758	58459
1999	25.66	3.98	1.76	576	21064
2000	40.07	4.94	2.88	2345	16602
2001	22.44	3.01	1.91	811	26247
2002	22.41	2.87	1.27	640	14888
Avg	32.98	7.38	3.47	1560	13523

Source: Prasad 2005

Landslides

Landslides are a major hydro-geological hazard with regular occurrence in almost all hill regions such as the Himalayas, north-eastern hill ranges, Western Ghats, Nilgiris in the south, Eastern Ghats, and the Vindhyas in central parts. Heavy and prolonged rainfall due to tropical disturbances or convective storms is a common trigger for landslides. Little or no advance warning often hinders timely action. Table 5 gives information about the major landslide occurrences, their locations, dates, and impacts.

Table 5: Major landslides

Event	Location	Dates & time	Impact
Amboori Landslide	08°30'33"N and 77°11'15"E	20:30 and 20:45 hrs on 9 November 2001	38 lives lost, houses buried.
Malpa Rock Avalanche	30°01'55"N, 80°45'07"E Malpa Village in Kumaun Himalayas, on the right bank of the Kali River	00:25 hrs on 18 August 1998	210 killed including 60 pilgrims to Mt Kailash. Sudden detachment of rock mass with velocity as high as 30m/s. Village entirely destroyed by debris as high as 15m in some locations.
Marappalam Landslide	11°20'00"N and 78°49'00"E State Highway No 8, Mettupalayam-Ooty stretch	1200 and 1300 hours 11 Nov 1993	11 people killed, highway destroyed, railroad damaged, buried two buses with passengers, damaged buildings.
Nashri Landslide	33°06'15" N and 75°15'47"E, National Highway 1A, from Jammu to Srinagar	First occurred in 1913, 20 times in 85 years	Blockage and disruption of national highway, primary connection to Srinagar.
Kaliasur Landslide	30°14'30" N, 78°55'50" E on the Hardwar-Badrinath Road	Repetitive occurrence 1920, 1952, 1963, 1964, 1965, 1969, 1970, 1971, 1972, 1985.	19 September 1969 most devastating slide- 300 m stretch of road dislocated vertically and laterally, severe damage to road structure.
Khuni Nallah Blockslide cum Rockfall	35°17'35" N and 75°07'48", National Highway 1A, from Jammu to Srinagar between Ramban and Banihal	Almost annual feature	Steep gradient induces slides and rockfalls leading to destruction of vital bridges, communication network, and so on.
Snowdon Landslide	31°06'00" N and 77°12'00"E in Shimla, Himachal Pradesh	February 1971	Destruction of a six-storey medical college under construction
Great Alaknanda Tragedy	30°N to 30°47'00"N and 79°E to 79°47'00"E Along River Alaknanda and tributaries including Patalganga	1800 hrs on 20 July 1970	381 lives lost. Intense rainfall and cloudburst upstream resulted in breaching of the landslide dam and devastation downstream. Breaching of Rishiganga landslide dam, spate of landslides, damaged bridges, reactivation of old landslides, road subsidence, severe toe erosion, 9.1 million cu.m of silt and rock brought into Alaknanda.
Gangtok Siliguri Road	27°16'44"N and 88°35'30"E, National Highway 31A to Gangtok.	Several times since 1959. 1966 and 1972 were major occurrences	Floods of 1959 aggravated the slide. Massive road damage in July 1966 with destruction of protective measures. Intense rainfall and seismicity triggering factors
Sher-ka-Danda Landslide	29°24'00" N and 79°30'00"E at Nainital, Uttarakhand.	1867 and 1880	Permanently filled a portion of Naini Lake.

Source: BMTPC and CDMM 2003

Earthquakes

Earthquakes strike without warning and cause widespread damage to various structures and systems. These can neither be predicted nor prevented in terms of their magnitude, place, and time of occurrence. Globally, between 1950- 1999, earthquakes constituted 29% of great natural catastrophes, with 47% of the fatalities, 35% of economic losses and 18% of insured losses (Munich Re Group 2002). The Himalayas are the most active seismic zone in the Indian subcontinent and have suffered over 650 recorded earthquakes of a magnitude of 5 and above in two centuries. Table 6 gives an account of earthquakes in the region from 1897 to 1993.

Table 6: Region-wise earthquake occurrence, 1897-1993

Seismic region	States	No of earthquakes of magnitude				Return period
		5.0-5.9	6.0- 6.9	7.0-7.9	8.0 +	
Kashmir & W Himalayas	J&K, HP, sub-mountainous Punjab	25	7	2	1	2.5-3 years
Central Himalayas	Uttaranchal, UP	68	28	4	1	1 year
North-east India	All NE states	200	128	15	4	< 4 months
Indo-Gangetic basin & Rajasthan	Rajasthan, Plains of Punjab, Haryana, UP and West Bengal	14	6	-	-	5 years
Cambay & Rann of Kutch	Gujarat	4	4	1	1	20 years
Peninsular India	Southern states including Lakshdweep	31	10	-	-	2.5 - 3 years
Andaman & Nicobar Is	A&N islands	80	68	1	1	<8 months
Source: NCDM 2001						

Based on the probable intensities and return periods, a seismic map of the country has been standardised in which the regions have been integrated into four seismic zones of various intensities. Zone 5 has been historically vulnerable to severe seismic activity of MSK IX and above. The high damage risk zone includes large areas of the Himalayan arc and its foothill regions. The state-wise zones are given in Table 7 and major earthquakes in Table 8.

Disasters like floods, landslides, and earthquakes are regular features, causing huge losses of life, property, and livelihoods. It is estimated that disasters result in annual average losses amounting to about 2.25% of the GDP (World Bank 2003). Preparedness measures involving all stakeholders are essential and must be integrated into national and subnational plans and implemented by raising public awareness.

Table 7: Classification of states according to seismic zones

Seismic zone	Risk zone	Intensity		States
		MSK	Richter	
V	Very High Damage Risk Zone	IX	8+	Entire North East and parts of J&K, Himachal, Uttaranchal, Gujarat, Bihar and Andaman & Nicobar
IV	High Damage Risk Zone	VIII	7 – 7.9	Parts of J&K, HP, Punjab, Haryana, Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, West Bengal, Gujarat and Maharastra
III	Moderate Damage Risk Zone	VII	5 – 6.9	Parts of Punjab, Haryana, Uttar Pradesh, Bihar, Jharkhand, West Bengal, Orissa, Madhya Pradesh, Chhatisgarh, Rajasthan, Gujarat and Maharastra, Andhra, Tamil Nadu, Karnataka, Kerala and Lakshdweep
II	Low Damage Risk Zone	VI	- 4.9	Parts of Rajasthan, MP, Chhatisgarh, Jharkhand, Orissa, Maharastra, AP, TN, Karnataka and Kerala

Table 8: Major earthquakes in India

Year	Location	Magnitude (Richter)
1803	Kumaon Region	7.7
1819	Kutch	8.0
1869	Cachar, Assam	7.5
1885	Sopore, J&K	7.0
1897	Shillong	8.7
1905	Kangra, Himachal Pradesh	8.0
1906	Himachal Pradesh	7.0
1918	Assam	7.6
1930	Dhubri, Assam	7.1
1934	Bihar-Nepal	8.3
1947	Dibrugarh, Assam	7.8
1950	Arunachal Pradesh-China border	8.5
1952	Pongdo & Tango, North East India	7.5
1956	Anjar, Gujarat	7.0
1963	Badagaum (Koyna)	5.3
1966	Nepal-India Border	6.1
1967	Koyna	6.5
1988	Manipur-Burma	6.6
1988	Bihar – Nepal border	6.4
1991	Uttarkashi, Uttar Pradesh	6.6
1993	Latur, Maharashtra	6.3
1997	Jabalpur, Madhya Pradesh	6.0
1999	Chamoli, Uttar Pradesh	6.8
2001	Bhuj, Gujarat	6.9
2005	Jammu & Kashmir	7.6

Source: NCDM 2001; Singh et al. 2000

Chapter 3

National Disaster Preparedness

Background

The current disaster management system in India has its roots in drought response and famine management in the late eighteenth century. The earliest initiatives in developing an institutional mechanism for disaster management began in 1883 with the First Famine Code formulated by a Famine Commission. After 1947, the initial focus was on food scarcity and famine so a Scarcity Relief Division within the Ministry of Agriculture was put in charge of drought and scarcity management and gradually given the responsibility for managing all natural disasters when it was upgraded to a Natural Disaster Management Division (NDMD) within the Ministry of Agriculture. It was perceived subsequently that each disaster created complex emergencies that called for a holistic approach to effective management. As a result, the responsibility for disaster management, excluding drought, was shifted to the Ministry of Home Affairs in June 2002.

The increasing frequency and magnitude of disasters notwithstanding, the management process has always been traditional and disasters looked upon as aberrations or interruptions in normal day-to-day functioning of society, to be responded to primarily with relief. The cultural ethos of the most vulnerable people, facing frequent disasters with little resilience and a poor quality of life, was one of fatalism and acceptance of loss as the wrath of nature. A similar attitude prevailed within the administrative machinery too, with a focus only on post-disaster relief and rehabilitation. The prevalent nomenclature of the nodal officials and departments dealing with disaster management; viz., relief commissioners and departments of relief, indicate the significance of relief in the administrative system. Even now, the fund earmarked for disaster management is called the Calamity Relief Fund (CRF).

Current disaster management structure

In the federal structure of the Indian administration, disaster management is the responsibility of the states, with the national government playing a supportive role. The basic responsibility for undertaking rescue, relief, and rehabilitation measures in

the event of natural disasters is that of the state governments concerned, particularly the district administration. The role of the central government is supportive, in terms of supplementing physical and financial resources and complementary measures in sectors such as warning, transport, and inter-state movement of staple foods.

National level

After 1947, the country has had a fairly well-structured institutional system that has been required to respond to all crises and disasters. At the national level, the Ministry of Home Affairs is the focal agency for managing disasters generally. Disasters that require special technical responses are to be dealt with by the relevant department or ministry.

Within the Ministry of Home Affairs, the Central Relief Commissioner is responsible for coordinating relief operations during natural disasters. The Central Relief Commissioner receives early warnings and forecasts from the Indian Meteorological Department (IMD) and Central Water Commission on a continuing basis. Other ministries, departments, and organisations, with primary and secondary functions for disaster management, constitute a Crisis Management Group (CMG). A nodal officer, nominated from each ministry or department, is responsible for preparing a sectoral action plan or emergency support function plan for disaster management. The CMG's functions are to review the contingency plans, devise measures for dealing with natural disasters, and coordinate the activities of the central ministries and state governments in relation to disaster preparedness and relief. In the event of a disaster, the CMG should meet frequently to review the relief operations and extend all possible assistance to the states affected. Table 9 lists the nodal ministries managing different types of disaster, and Figure 1 illustrates the disaster management set-up at national level.

Table 9: Nodal ministries managing different types of disaster

Type of disaster/ crisis	Nodal ministry
Natural and man-made disasters	Ministry of Home Affairs
Drought	Ministry of Agriculture
Air Accidents	Ministry of Civil Aviation
Railway Accidents	Ministry of Railways
Chemical Disasters	Ministry of Environment
Biological Disasters	Ministry of Health
Nuclear accidents inside or outside the country which pose a threat to the people of India	Department of Atomic Energy
Source: NCDM 2001	

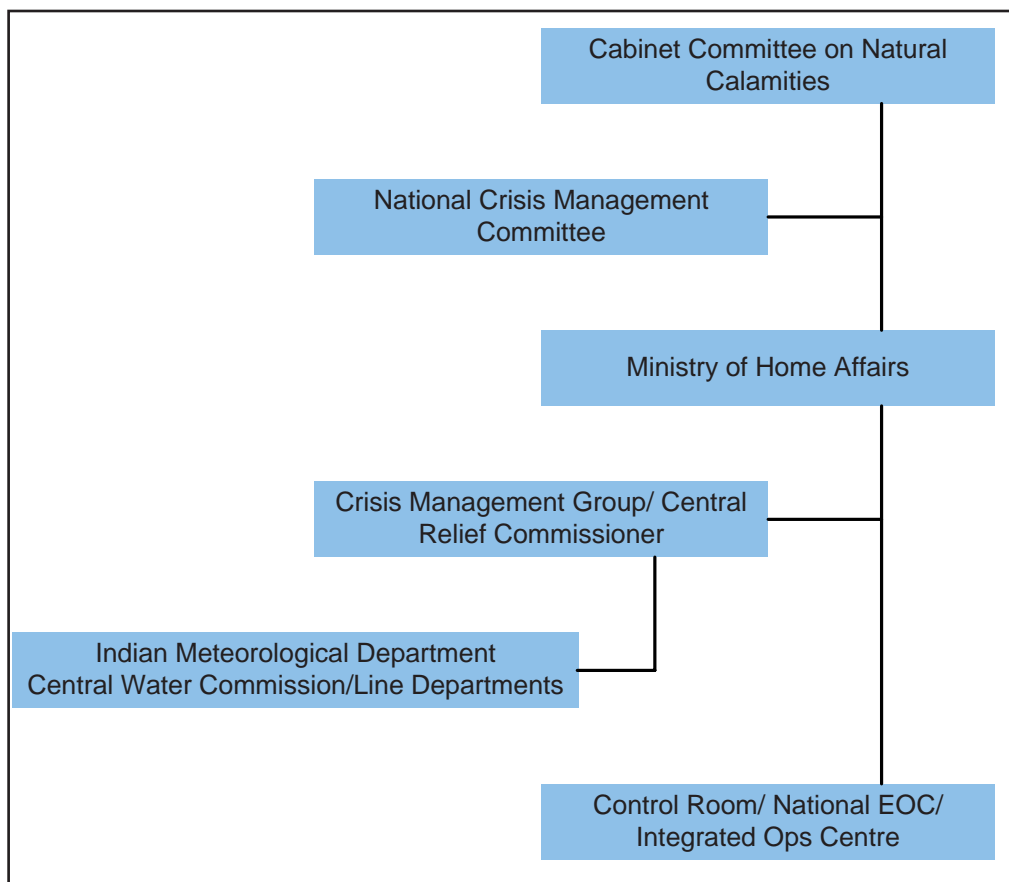


Figure 1: Disaster management set-up at national level

At a higher government level, there is a National Crisis Management Committee (NCMC) headed by the Cabinet Secretary. Membership is composed of secretaries from all relevant ministries and departments. The NCMC gives directions to the CMG as and when necessary. The NCMC can give directions to any ministry, department, or organisation to carry out specific actions in a crisis situation.

At the apex level, there are two cabinet committees; viz., the Cabinet Committee on Natural Calamities (originally the Cabinet Committee on Drought Management) and the Cabinet Committee on Security. The principal issues relating to natural disasters, primarily those pertaining to institutional and legislative measures needed to promote an effective strategy for natural disaster management, are placed before the Cabinet Committee on Natural Calamities.

State and district levels

A similar structure to the one at national level exists at state level. Relief commissioners are in charge of relief and rehabilitation measures in the wake of natural disasters in

their respective states. The Chief Secretary is in overall charge of relief operations in the state. The relief commissioner and the additional relief commissioners function under his or her direction and control. In many states, the secretary of the revenue department is also in charge of relief. The response at state level is governed by annual contingency plans. The Contingency Action Plan identifies the initiatives to be taken by various central ministries and public departments in the wake of natural calamities. It sets down the procedures and determines the focal points in the administrative machinery to facilitate relief and rescue operations, especially in perennially flood-prone states. Prepared with a response and relief-oriented approach, these plans have limited scope for mitigation and preparedness activities. Relief codes or manuals in different states determine the amount of and procedure for relief distribution.

The District Magistrate or Collector is responsible for overall management of disasters in his or her particular district. All disaster management activities are undertaken by the state and district administration and are put into operation on the basis of provisions laid down in state disaster management manuals. In the event of a disaster, a district collector has the authority to mobilise the response machinery immediately and enjoys absolute financial autonomy to withdraw money under the provisions of the general financial rules or treasury code. The district collector has the authority also to request the armed forces for assistance if circumstances demand. Thus the nodal authority to respond to a disaster rests with the district collector of the affected district. Other bodies, such as the armed forces and non-government organisations, complement the efforts of the state government. The armed forces can mobilise and coordinate rescue and relief in the shortest possible time and non-government organisations are useful for communicating with the community.

Schemes for financing relief expenditure in the wake of natural calamities are governed by a Finance Commission appointed by the Government of India every five years. Under the existing scheme, each state has a fund called the Calamity Relief Fund (CRF), administered by a state-level committee, and headed by the Chief Secretary of each state. The size of fund is determined by taking into consideration the expenditure normally incurred by relief and rehabilitation over the previous ten years. In case the funds in the CRF are not sufficient to meet the specific requirements, state governments can seek assistance from the National Calamity Contingency Fund (NCCF) – a fund established at national level. This is still the overall organisation but, since 2000, attempts at changes in institutional approach began.

The new paradigm and institutional changes

The prevailing approach to disaster management focused on post-disaster response and relief began to give way to a more holistic prevention-based approach during the International Decade for Natural Disaster Reduction (IDNDR) 1990-2000. India took

note of IDNDR objectives and introduced measures to reduce loss of life and property. The experience of disasters over the years augmented by the deliberations of the global community on disaster risk reduction brought attention to the need for prevention, preparedness, and mitigation aspects of disaster management.

With the progress of IDNDR, concern for a comprehensive approach to disaster management in India gained ground, focusing on the huge development losses from each disaster, which the country could ill afford. This concern was buttressed by a series of disasters that struck the country during IDNDR (see Tables, 4, 5, and 8). Together with the Asian Tsunami of 2004 these had a profound effect on the national psyche and focused the thinking towards the two-way link between disasters and development.

Early initiatives

Central Sector Scheme on Disaster Management – One of the earliest institutional initiatives in terms of a changing approach was the Central Sector Scheme on Disaster Management, implemented from 1993-94, and focused on disaster preparedness with an emphasis on mitigation and preparedness measures and improving the national capacity to reduce the adverse impacts of natural disasters. The principal activities undertaken involved hazard mapping and vulnerability assessment (e.g., preparation of the Vulnerability Atlas of India); human resource development (establishment of a National Centre for Disaster Management (NCDM) in New Delhi and disaster management cells with dedicated faculties in all the administrative training institutes in the states); upgrading the early warning system and strengthening the seismological instrumentation network; awareness generation; and other related activities.

Committees and commissions: recommendations and directions

High-powered Committee on Disaster Management – A High Powered Committee (HPC) on disaster management was established in August 1999 to recommend an institutional system for managing disasters. The committee studied the disaster management system globally and had a series of consultations with all stakeholders. Recommendations were made in 2001 which focused on the need for a holistic effort considering all disasters within a coordinated system of governance. It is this recommendation from the HPC that possibly provided the impetus for the Act of 2005 and gradual establishment of national-level authorities and committees. HPC also provided a model district plan. The HPC also focused on instilling a culture of prevention into the national psyche.

Finance Commission – The Finance Commission is a constitutional body set up every five years to deliberate and recommend measures for devolution of funds, revenues,

and taxes between the central and state governments. Past Finance Commissions had addressed issues and concerns of calamity relief, leading to the establishment of mechanisms like the Calamity Relief Fund and National Fund for Calamity Relief over the years. The Eleventh Finance Commission (2000 – 2005) stressed proactive, pre-disaster preparedness planning rather than a mere relief funding mechanism. The Twelfth Finance Commission continued in a similar vein, emphasising the necessity for integrating disaster preparedness and mitigation provisions into state plans, rather than as part of calamity relief. This commission also emphasised hazard mapping and a transparent relief distribution process and provided states with a total allocation of Rs 21,333.33 crore (\$US 4,848.5 million) for calamity relief and Rs 500 crore (\$US 1,136,364 approx) for the National Calamity Contingency Fund (NCCF) to be replenished by special duties and surcharges.

Planning Commission – The Planning Commission of India incorporated a separate chapter on ‘Disaster Management – The Development Perspective’ in the 10th Five Year Plan (2002-2007), with the objective of informing, guiding, and providing specific strategies for all state governments on disaster management. The Tenth Five Year Plan emphasised that development cannot be sustainable without mitigation being built into the development process. It provided for preparation of a plan for disaster mitigation for all states and mandated that each development initiative in a hazard-prone area should have disaster prevention or mitigation as a term of reference. This helped bring about a shift in approach from national development to ‘safe national development’ and laid down broad parameters and strategies for information dissemination and research initiatives, capacity building, training and education, community-level initiatives, and institutional arrangements. The Eleventh Five Year Plan reiterated the aim of safe development with integration of mitigation measures into development initiatives.

A chain of disasters brought a shift from a relief-based to a proactive preparedness and mitigation-based approach. It was realised that the apparent loss of human life and assets masked insurmountable losses in livelihood, social capital, and economic development. The cost of rehabilitation and reconstruction of a shattered infrastructure and economy can be enormous and carry over for years.

The paradigm shift in public policy from a disaster-specific to a comprehensive and holistic approach in a multisectoral and multidisciplinary format gained momentum. This approach proceeded from the conviction that development cannot be sustainable unless disaster mitigation is built into the development process and investments in mitigation are more cost-effective than expenditure on relief and rehabilitation.

National disaster management framework

The shifting paradigm is currently being institutionalised through a National Disaster Management Framework (NDMF) which highlights the ‘interdependence of economy, environment, and development and links the issues of poverty alleviation, capacity building, and community empowerment as well as other structural and non-structural issues of prevention and preparedness, response and recovery for effective disaster risk mitigation and management” (Dhar Chakrabarti 2006). The underlying premise behind this framework is that, whereas hazards are inevitable, they need not become disasters every time.

The National Disaster Management Framework proposes initiatives pertaining to institutional mechanisms, disaster prevention strategy, early warning systems, disaster mitigation, preparedness, response, and human resource development. The NDMF is given in Figure 2.

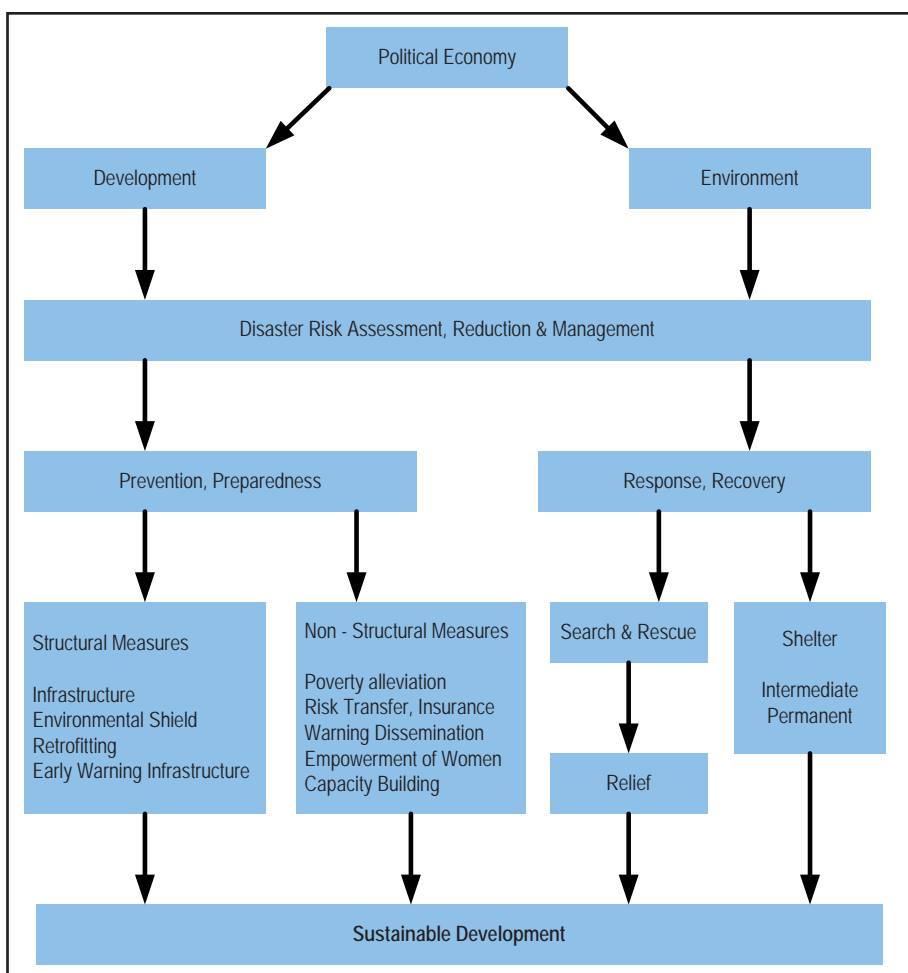


Figure 2: National disaster management framework

Although the response, relief, and rehabilitation mechanisms for disasters have been well-established since Independence, the new framework gives priority to the pre-disaster aspects of mitigation, prevention, and preparedness. Establishment of legal back-up for activities undertaken in the name of disaster management is one of the first steps in an efficient institutional framework. The framework is being put into operation through a techno-legal framework and preparedness, mitigation, and risk reduction initiatives. The National Disaster Management Act of 2005 enacted recently provides for an elaborate system for managing disasters.

National Disaster Management Act 2005

The National Disaster Management Act, 2005, which came into the statutes on 26th December, 2005, provided a legal and institutional framework for “the effective management of disasters and for matters connected therewith or incidental thereto.” The Act provided for an institutional mechanism at the national, state, and local levels for comprehensive disaster management. It also provided for establishment of the following institutions and mechanisms to deal with disaster management.

National Disaster Management Authority (NDMA) – The NDMA is entrusted with formulating policies, plans, and guidelines to ensure timely and effective response to disasters. The Prime Minister is Chair of the NDMA, and it has seven members. It is expected to frame guidelines for provision of minimum standards of relief, special provisions to be extended to widows and orphans, and ex gratia assistance for restoration. The NDMA is authorised to constitute an expert committee of professionals in the field of disaster management with practical experience of disaster management at the national, state, and district levels to recommend measures for different aspects of disaster management.

National Executive Committee (NEC) – The Act provides for the constitution of this committee, under the chairmanship of the Home Secretary, to assist the NDMA in performance of its functions. The committee assists the NDMA and ensures compliance with and implementation of the directions of the government and NDMA. The NEC members include secretaries of the ministries or departments of agriculture, defence, drinking water supply, environment and forests, finance (expenditure), health, power, rural development, telecommunications, space, science and technology, urban development, and water resources as well as the Chief of the Integrated Defence Staff of the Chiefs of Staff Committee, ex officio. The NEC is empowered to constitute sub-committees and nominate experts to dispense with its functions.

The responsibility for preparing the National Plan for Disaster Management lies with the NEC with regard to national policy. This is to be done in consultation with state governments and other expert bodies and organisations. The plan is to be approved by the NDMA and should include disaster prevention and mitigation measures to be taken

at national level, measures for integration of such measures into development plans, preparedness and capacity-building measures for effective response to disasters, and the roles and responsibilities of ministries and departments in delivering these activities. The NEC recently began preparing the National Plan.

National Policy on Disaster Management (NPDM) – This policy was prepared by the NDMA and is currently being considered by the government. The draft policy envisions a safer and disaster-resilient India than heretofore through development of a holistic, multisectoral, multi-stakeholder, and technology- driven approach which will ensure that hazards of nature and negligence of human beings do not endanger the lives and property of citizens; that economic growth and development take place without damaging natural and built-up environments; and that the interests of the poor, women, and other disadvantaged sections of society are protected from future natural or human-induced calamities. This is to be achieved through a culture of prevention, mitigation, and preparedness to pre-empt disasters to the greatest extent possible and to generate prompt and efficient responses to disasters. The entire process will focus on the community and will be given momentum through the collective efforts of all government agencies, non-government organisations (NGOs), and the private sector.

The objectives of the National Policy on Disaster Management are given in Box 2.

Box 2: Objectives of the national policy on disaster management

- To promote a culture of prevention and preparedness by focusing on disaster risk reduction as an overriding priority at all levels
- To encourage mitigation measures based on state-of-the-art technology and environmental sustainability
- To mainstream disaster management concerns into the development planning process
- To put in place a streamlined institutional techno-legal framework in order to create and preserve the integrity of an enabling regulatory environment and a compliance regime
- To develop contemporary forecasting and early warning systems backed by responsive and fail-safe communications and information technology (IT)
- To promote a productive partnership with the corporate sector and media to create awareness and contribute to capacity development
- To ensure efficient response and relief with a caring approach towards the needs of the vulnerable sections of the society
- To undertake reconstruction as an opportunity to build disaster-resilient structures and habitat
- To undertake recovery to bring back the community to a better level than in the pre-disaster stage

National Institute of Disaster Management (NIDM) – The NIDM was founded from its predecessor the National Centre for Disaster Management (NCDM) with the aim of creating an institute of excellence in disaster management studies in India. As per the provisions of the Act, the NIDM is required to design, develop, and implement training programmes; undertake research; formulate and implement a comprehensive human resource development plan; provide assistance in national policy formulation; assist other research and training institutes, state governments, and other organisations in discharging their responsibilities effectively; develop educational materials for dissemination; and promote awareness among stakeholders in addition to any other function as assigned by the Central Government. The NIDM is also required to network with various research and training institutions to share knowledge and resources.

National Disaster Response Force – The National Disaster Response Force (NDRF) was established by upgrading and converting eight standard battalions of the central paramilitary forces as a specialist force to respond to disaster situations. These battalions consist of two battalions each from the Border Security Force (BSF), Indo-Tibetan Border Police (ITBP), Central Industrial Security Force (CISF), and Central Reserve Police Force (CRPF). Based on the vulnerability profile of different regions, these battalions are to be stationed in nine different locations to be deployed instantly in the event of any serious disaster situation. The NDRF is expected to be fully operational by the end of 2007. Four battalions will be trained specifically to respond to human-induced disasters. Units of this force will work under the general superintendence, direction, and control of the NDMA. They will liaise closely with the state governments and be available to them proactively.

State Disaster Response Forces (SDRF) – The states have been advised to set up their own specialist response forces. The existing resources of the state armed police, fire, and rescue services, home guards, civil defence, and others will be the sources from which the SDRFs are constituted to generate specialist response. They will also include women members to look after the needs of women and children. NDRF battalions and their training institutions will assist the states and UTs in this effort.

State Disaster Management Authorities (SDMAs) – The Act provides for establishment of state disaster management authorities under the chairpersonship of each Chief Minister. They will lay down disaster management plans and policies for the state; coordinate implementation; provide guidelines; recommend provision of funds for mitigation and preparedness; and review measures taken for preparedness, mitigation, and disaster risk reduction. Twenty-three states have already notified their SDMAs.

State Executive Committee (SEC) – The state governments are empowered to constitute a State Executive Committee under the chairpersonship of the Chief Secretary and four secretaries from relevant departments. These committees are responsible

for implementing the national and state plans and for acting as the coordinating and monitoring body for management of disasters in the state. They will prepare state disaster management plans as per the guidelines of the national authority after consultation with local authorities, departments, and people's representatives as each committee deems fit.

District Disaster Management Authorities (DDMAs) – Every state will constitute a District Disaster Management Authority under the co-chairpersonship of the District Magistrate and the President of the Zilla Parishad (district council), providing for integration of the executive and legislative focal points at the district level. The District Disaster Management Plan is to be prepared by the District Authority. The process of notifying these district authorities is currently under way in most states. Figure 3 gives the institutional framework for disaster management in India.

Disaster mitigation initiatives

The Departments of Relief are being restructured to incorporate mitigation and preparedness within their responsibilities and are being renamed Departments of

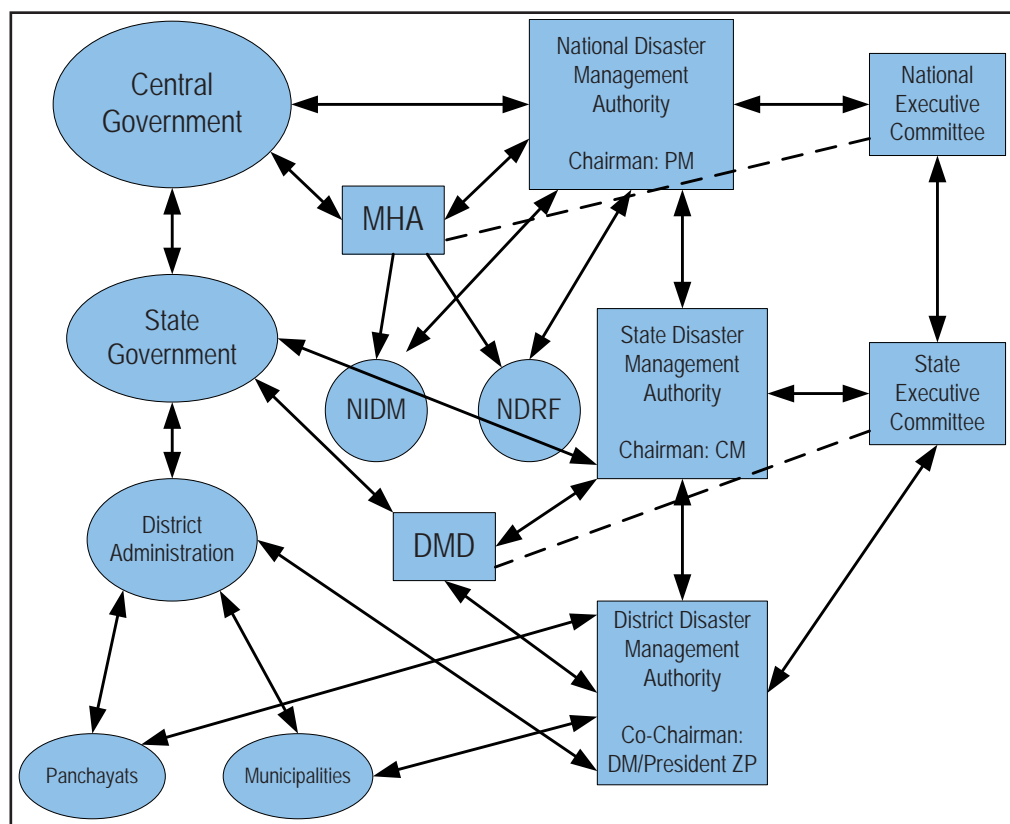


Figure 3: Institutional framework for disaster management in India

(Source: Dhar Chakrabarti 2006)

Disaster Management (DDMs). The objective of renaming the departments was to institutionalise risk management into the system. In eleven states, the offices of the relief commissioners have already been converted and put into operation as the 'Office of Secretary, Disaster Management and Relief'. Relief codes and manuals at the state level which provided the basis for disaster management are being reframed to incorporate all components of the disaster management cycle.

Techno-legal regime for mitigation – An expert committee was constituted to formulate model building bye-laws, town and country planning legislation, and zoning and building regulations for incorporating disaster-resistant features. This committee finalised the model building bye-laws for town and country planning legislation, land-use zonation, and development control legislation. The municipalities and city development authorities all over the country have been advised to make necessary changes in their respective bye-laws and regulations in accordance with the model laws.

The Bureau of Indian Standards has issued new building codes for construction of buildings in different seismic zones in the country. The National Building Code has also been revised, taking into consideration the natural hazards and risks of various regions.

Earthquake and cyclone mitigation – Two national programmes for capacity building in earthquake risk management to impart training to 10,000 engineers and 10,000 architects on safe architectural and construction practices are being implemented.

A National Earthquake Mitigation Project has been developed for detailed evaluation and retrofitting of buildings and training of masons in earthquake-resistant construction as well as providing assistance to states to put in place appropriate techno-legal regimes. A pilot project for detailed evaluation and retrofitting of five, key public buildings has been undertaken in Delhi. Retrofitting construction plans for two buildings are ready and construction is expected to begin in June 2007. The Accelerated Urban Earthquake Vulnerability Reduction Programme is being undertaken in 38 cities with populations of over 500,000 in seismic zones III, IV, and V. The programme incorporates orientation for senior officials and representatives of the local planning and development bodies and sensitises them about earthquake preparedness and mitigation measures, training for engineers and architects, education programmes for schools and colleges, and awareness programmes at the community level.

A National Core Group on Cyclone Monitoring and Mitigation comprised of experts in the field has been assigned the responsibility of looking at warning protocols for cyclones, upgrading technology, coordinating mechanisms between central and state governments, early warning and dissemination mechanisms, and cyclone mitigation measures.

Disaster risk management programme (DRMP) – A community-based disaster risk management programme is being implemented with UNDP assistance in 169 out of 604 districts in 17 multi-hazard prone states. In this programme, the states are being helped to draw up local-level disaster management plans, set up multi-hazard resistant emergency operation centres (EOCs), form village-level volunteer teams, and undertake training and capacity-building, mock drills, and so on. This programme has been introduced in all flood-prone states that are emphasising preparation of disaster management plans at the state, district, block, and village levels.

Civil defence and fire services – The Civil Defence is being revamped and strengthened to supplement local efforts for disaster response and relief. As an important part of the disaster management structure, it is envisaged that Civil Defence and Fire Services will contribute to community preparedness and public awareness at the grass-root level. Under the aegis of the SDMAs and DDMAs, the Civil Defence and Home Guards will be key responders. Similarly, the Fire Services are being modernised to convert them into multi-hazard response units.

Emergency medical preparedness – Medical preparedness is the most basic and crucial component of any disaster management plan. The NDMA, in close coordination with the Ministry of Health and Family Welfare, states, and premier medical research institutes has constituted a task force to formulate guidelines to improve capacities in emergency medical response and mass casualty management. Medical emergency plans for disasters for hospitals will include developing and training medical teams and paramedics, capacity building, trauma and psycho-social care, mass casualty management, and triage. The triage and casualty-handling capacity of all hospitals at the time of disasters will be worked out and recorded through a consultative process by all the states and union territories in the pre-disaster phase. Integration of private medical facilities with government ones will be ensured through legal and procedural support. These plans will also address post-disaster, disease surveillance systems, networking with hospitals, referral institutions, and accessing services and facilities such as availability of ambulances and blood banks.

Mobile hospitals – Equipped with state-of-the-art medical and emergency facilities, these units will be located in different parts of the country. During normal periods, they will be attached to different hospitals in the country to provide medical assistance. Hospital preparedness for mass emergencies is being incorporated into medical curricula, and in-service training for medical response professionals is being conducted.

Incident Command System (ICS) – The current command structure in the administrative hierarchy for managing disasters in India is traditional. The Government of India has

taken measures to strengthen and professionalise the same by drawing upon the principles of the ICS with suitable adaptations. Developed by the United States Forest Department (USFD), initially for managing forest fires, the ICS system has proved to be effective in providing an effective and systematic response to disasters. The ICS is essentially a system for organising emergency functions in a standardised manner while responding to any disaster. It will provide for specialist incident management teams with an incident commander and officers trained in different aspects of incident management, logistics, operations, planning, safety, and media management.

The government aims to put in place such teams in each district by imparting training in different facets of incident management to district-level functionaries. The emphasis will be on use of state-of-the-art technologies and equipment and on contemporary systems of planning and execution with connectivity to the joint operations' room at all levels. The initial ICS trainers received training in the United States, and they are training other officers of the central and state governments in different modules of ICS. A pilot study is currently being undertaken by NIDM to make the module suitable for the Indian system.

Flood preparedness and response – Floods continue to be a menace, mainly due to the huge amount of sediment carried downstream by the Himalayan rivers. Embankments also have problems of drainage congestion and waterlogging during heavy rainfall. Flood preparedness in India, introduced in 1950, has concentrated primarily on flood protection measures such as embankments, dams, barrages, and forecasting and early warning. The state governments have been assisted in introducing mitigation programmes such as construction of raised platforms. One hundred and seventy-two flood forecasting stations are in place along the major river basins and are operated by the Central Water Commission for monitoring and warning purposes.

Hazard mapping and early warning systems – The entire country has been mapped for four major hazards on a scale of 1: 2.5 million by the Vulnerability Atlas of India (BMTPC 1997). Subsequently, state-level vulnerability maps were published for the same hazards on the same scale along with district-wise risk assessment of housing types. A Peer Group for Updating and Revision of the Vulnerability Atlas of India has completed revision of the maps and submitted its report to the Ministry of Housing and Urban Poverty Alleviation, Government of India.

The available early warning and monitoring systems that are especially geared towards cyclone, drought, and floods are being upgraded and made more efficient. A network of advanced Doppler radars has been installed along the coasts for tracking cyclones. Added coverage of the west coast is under construction. Medium-range weather forecasting for droughts has been useful for early warning also. The Government of India has approved an advanced Tsunami Warning System under the Ministry of Earth

Sciences. The National Early Warning System for Tsunamis is to become operational by September 2007 after necessary testing and simulation. A National Centre for Tsunami and Storm Surges is being set up at the Indian National Centre for Ocean Information Services (INCOIS) in Hyderabad. An Interim Tsunami Warning Centre became operational at INCOIS in July 2005. Two coastal radars have been installed on the mainland for this purpose.

Human resource development and capacity building – Human resource development is a key aspect in establishing a disaster-resilient community, as it aims to institutionalise capacity-building processes. By and large, the education and training system had ignored disaster mitigation and risk reduction until recently. The capacity-building process is being introduced at both the primary school level and in updating the curricula of specialised courses such as engineering, architecture, and medicine. Efforts are being made to improve the capacities of education and training institutions to impart training in new concepts and practices to the workforce.

At the school level, disaster management has been included in the curricula for middle and secondary education. Disaster management has also been included in the post-induction and in-service training of civil and police officers. Course curricula have been developed for engineering, architecture, medical, and nursing courses also.

Earthquake-engineering education has been included in the curricula of the engineering colleges at the undergraduate level as a major step towards disseminating disaster education. As a public awareness initiative, a compilation of information, education, and communication (IEC) material on various aspects of disaster risk mitigation has been distributed to all states for translation into local languages and subsequent dissemination among communities. Awareness programmes about earthquakes, floods, and cyclones are being broadcast by All India Radio, Doordarshan, and print media, and sensitisation programmes are being held for school and college students at the national, state, and district levels. A programme to train and certify 50,000 rural masons in multi-hazard resistant construction is also being implemented.

Multi-stakeholder participation – The Act of 2005 provides for participation of all stake-holders in the disaster preparedness process. The Act mandates the State and District Disaster Management Authorities to involve civil society members from the community such as teachers, writers, and so forth. Contributions of other stakeholders from the Civil Defence, National Cadet Corps, and local NGOs will also be solicited to empower the communities and generate awareness. NGOs will be encouraged to identify their areas of interest and expertise.

The corporate sector has made commendable efforts in disaster relief and mitigation. The efforts range from preparation of ‘on-site’ and ‘off-site’ plans, relief distribution, heli-

ambulances, and fire and environmental protection. The NDMA has set up a national task force for the corporate sector to formalise its role in the disaster management process.

Chapter 4

National-level Disaster Management Planning

Preparedness planning: rationale and characteristics

Disaster Preparedness minimises the adverse effects of a hazard through effective precautionary actions, rehabilitation, and recovery to ensure timely, appropriate, and effective organisation and delivery of relief and assistance following a disaster (NCDM 2001). It involves activities designed to minimise loss of life and damage, organising temporary removal of people and assets from a threatened location, facilitation of timely and effective rescue, and relief and rehabilitation (Singh et al. 2000). Preparedness relates to the accepted risk facing an area or population due to a disaster and relates to activities aimed at an organised response. Preparedness plans are thus action plans for short-term response and can be divided into passive and active categories. The more traditional activities include preparing disaster manuals, stockpiling relief goods, and generating lists of resources and personnel. These are passive. Active measures include development of comprehensive response plans, monitoring of threatening hazards (such as cyclone tracking or stream-flow monitoring), training of emergency personnel, and development of tools and methods of emergency response. Plans should have the following common features: clarity of aim, realism, level, flexibility, coordination, clear responsibilities and duties, ease of use, clear plan components, and viability (Carter 1991).

Disaster management planning in India

Disaster management in India is a state subject, but the national government has a supportive role. Since Independence in 1947, disasters have been handled by the states affected through allocations of the Calamity Relief Fund (CRF). This fund, allocated to each state on the basis of recommendations from the Finance Commission, receives 75% of its allocation of funds from the national government and the balance is contributed by the state concerned. The CRF is used by state governments on the basis of their respective relief codes. Individual states, especially those facing annual floods, have prepared their own contingency plans and relief codes for coordinating their responses according to the specific needs of each state.

Disaster management planning at the national level was first recommended by the High Powered Committee (HPC) on Disaster Management in 2001. The HPC was established to prepare disaster management plans at the national, state, and district levels in view of the increasing frequency and intensity of natural disasters and the need to strengthen the organisational structure. Subsequently, its mandate was augmented to include human-induced disasters in order to develop a more comprehensive disaster management system. The HPC took an overview of recent disasters (natural as well as human-induced) and identified common response and preparedness mechanisms. The approach of the HPC was holistic, in line with the Yokohama Strategy (1994), focusing on planning for prevention, reduction, mitigation, preparedness, and response to reduce loss of life and property.

The HPC recommendations put planning as an important component of all preparedness measures. They suggest that the most important component of preparedness is planning for all contingencies. The plans have to be linked with different support departments, linking district plans to state plans, and state plans to national plans, i.e., horizontal and vertical integration.

HPC prepared a report with wide-ranging recommendations for institutionalising a system of disaster management in the country at various levels, as also a National Disaster Response Plan (NDRP) (Annex 2). The vision of the HPC was not to prepare a plan for a complete overhaul of the system but to build on the existing structure and practices and streamline the bottlenecks caused by the large number of disasters occurring in different parts of India.

National Disaster Response Plan (NDRP)

The HPC prepared a National Disaster Response Plan in 2001-02 (Annex 2) to provide uniformity in response mechanisms, including scale of assistance, in various parts of the country. Preparedness and mitigation plans were to be formulated by the states in the specific contexts of their vulnerabilities.

The NDRP was the outcome of extensive deliberations and consultations with all relevant ministries and departments of the national government. It took into account the work and learning from the various systems of response that have been implemented all over the world. The NDRP has a multi-hazard approach and incorporates a culture of quick response, incorporating concepts such as the 'trigger mechanism' to identify the sequence of events after a disaster and of four levels of response; namely, L0 (preparedness activities); L1 (an event that can be managed at district level); L2 (an event that requires assistance and active participation of state resources to manage the disaster); and L3 (a national-level disaster affecting two or more states). Although the union government plays a supportive role to state governments, it has to be

prepared for L3 level of disasters and maintain close monitoring of L2 as well as L1 disasters that affect different parts of the country. Therefore, the approach of the plan is to identify common elements of response and act as a base plan and framework around which the supporting agencies can draw up the details of their plans.

The approach of the NDRP is that a national response mechanism has to be prepared and any impending disaster has to be closely monitored in order to provide immediate assistance whenever required. The national response mechanism has to be predefined in terms of process, related handbooks, and checklists that are needed during a disaster. The document contains procedures and formats for activities to be carried out during an L3 disaster. In this document, the quick response mechanisms have been outlined along with checklists and handbooks that will be required for detailed enumeration of each task as follow-up action to the plan.

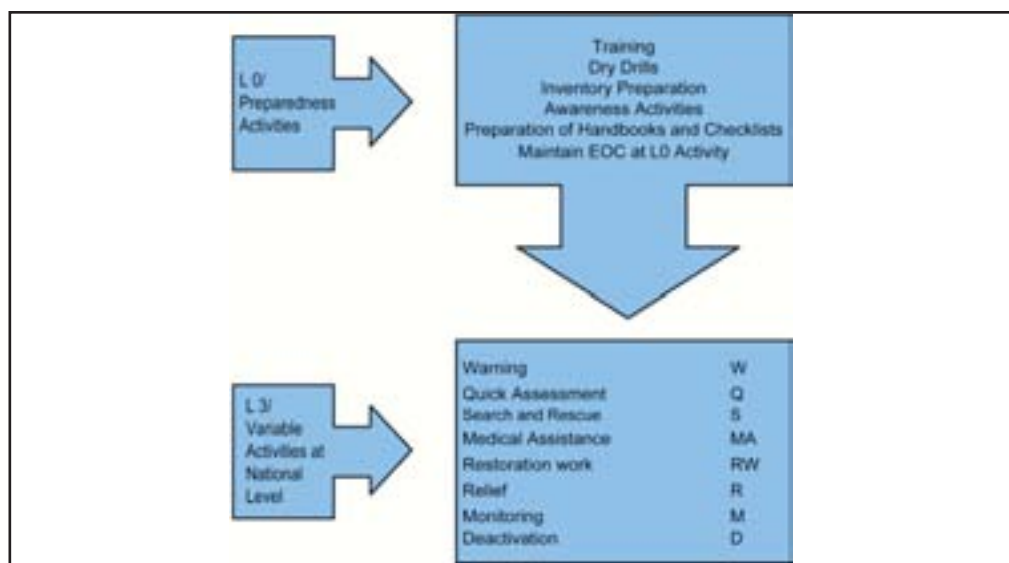
The NDRP primarily explains processes and mechanisms that are brought into action after the declaration of L3 in a disaster event. It also defines the approach of the HPC to holistic management of disasters and the role of the national government. The LO or preparedness measures to be taken before a disaster strikes have been listed along with those in the event of a disaster, from warning (W), quick assessment (Q), search and rescue (S), medical assistance (MA), and relief (R), to deactivation (D) at the end of the emergency. These activities have been marked for individual disasters also. Figure 4 broadly summarises the activities for response to disaster.

A crucial input required for disaster planning is time. The speed at which the government reacts to a disaster determines the impact and effectiveness of the intervention for the community affected. Accordingly, the working document to the response plan identifies the actions to be taken in the first 24 hours and those that need to be completed within 48 hours.

The National Disaster Response Plan contains step-wise progress of activities in the following phases of disaster.

- Pre-disaster warning
- Disasters where warnings can be given
- Disasters where effective warning cannot be given
- De-warning or scaling down of the alert
- National-level meetings for coordination
- Quick response

The document also provides a list of handbooks, checklists, and minimum standards to be maintained that will be required by the personnel responding to disasters.



SUBGROUP I - Water and climate-related hazards

Disasters	L0	Concept of operations during L3							
		W	Q	S	MA	RW	R	M	D
Floods and Drainage Management	•	•	•	•	•	•	•	•	•
Cyclones Tornadoes Hurricanes	•	•	•	•	•	•	•	•	•
Hailstorms Cloudbursts Snow Avalanches Heat & Cold Waves Thunder & Lightening	•	•	•	•	•	•	•	•	•
Sea Erosion	•			•	•		•	•	
Droughts	•	•	•		•	•		•	

SUBGROUP II – Geologically-related hazards

Disaster	L0	Concept of operations during L3							
		W	Q	S	MA	RW	R	M	D
Earthquakes	•		•	•	•	•	•	•	•
Landslides Mudflows	•	•	•	•	•	•	•	•	•
Soil Erosion	•		•				•	•	
Dam Bursts & Dam Failures	•		•	•	•	•	•	•	•
Mine Fires	•		•	•	•	•	•	•	•

- Extensive efforts will be required Efforts will not be required / minimal efforts will be required

W = warning; Q = quick assessment; S = search and rescue; MA = medical assistance; RW = restoration work; R = relief; M = monitoring; D = deactivation

Source: Department of Agriculture & Cooperation 2001, p. 17

Figure 4: Specific response actions for L3 disasters at national level

Major components of the NDRP

Emergency support functions (ESFs) – The National Disaster Response Plan provides for primary and secondary agencies and emergency support functions to deal with the response activities. There are 14 ESFs identified in the plan, and these, along with the primary national agency responsible for carrying them out, are given in Table 10.

In addition to the ESFs and the primary and secondary agencies, the following provisions were made in the plan for providing efficient response. Major planning interventions were the following.

Quick response teams – These are to be established in the preparedness phase and be capable of leaving for the site within six hours of the event after the declaration of L3 – they include the following categories.

Assessment teams to assess the damage and prioritise response activities for deploying the right kind and quantity of human resources and materials in the area affected. The teams may comprise of four groups of officers – joint secretaries, area officers, technical officers, and medical officers.

Table 10: Emergency support functions

ESF No	Function	Primary national agency
ESF 1	Communication	Ministry of Communication
ESF 2	Public Health & Sanitation	Ministry of Health & Family Welfare
ESF 3	Power	Ministry of Power
ESF 4	Transport	Ministry of Surface Transport/ Ministry of Railways
ESF 5	Search & Rescue	Ministry of Defence
ESF 6	Donation Management	Ministry of Disaster Management/ Ministry of Home Affairs
ESF 7	Public Works & Engineering	Ministry of Urban Affairs & Poverty Alleviation
ESF 8	Information & Planning	Ministry of Information Technology
ESF 9	Relief Supply Management	Ministry of Planning & Programme Implementation
ESF 10	Food	Ministry of Food & Civil Supplies
ESF 11	Drinking Water & Water Supply	Ministry of Water Resources
ESF 12	Shelter	Ministry of Urban Affairs & Poverty Alleviation
ESF 13	Media	Ministry of Information & Broadcasting
ESF 14	Help lines	Ministry of Disaster Management/ Ministry of Home Affairs

Medical response teams consisting of

- medical first (aid) response and
- disaster mortuary assessment team.

Search and rescue and other teams

- Urban search and rescue
- Collapsed structure search and rescue
- Specialised sniffer dog teams

Emergency operations' centre (EOC) – In a disaster situation, the variables of intensity, population affected, and severity of damage need to be quickly assessed based on which government agencies can allocate and deploy relief. EOCs are nodal centres (see Figure 5) that are activated during disasters to organise coordinated response in terms of effective management of resources, disaster supplies, and relief management by providing a chain of command and direction. In the case of an L3 disaster, EOCs in the nation, state, and districts affected have to be activated. The national EOC will provide centralised direction for emergency operations, communications, and warning and evacuation; mobilise additional resources; coordinate support and aid; issue emergency information and instructions specific to national-level organisations; consolidate; and analyse and disseminate damage assessment data and situation reports. The EOCs have to be equipped with state-of-the-art communication technology

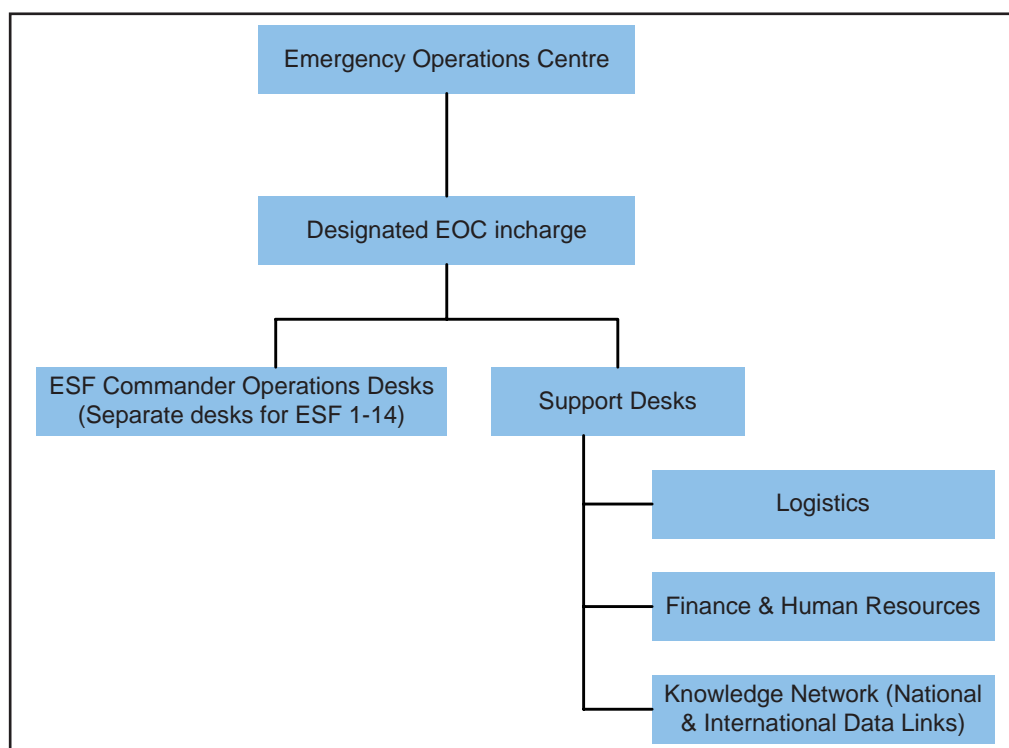


Figure 5: National emergency operations' centres

and GIS systems for quick and effective decision-making. The structure in which EOCs are housed should also be as disaster-resistant as possible.

Incident Command System (ICS) – As already discussed, the NDRP proposed an adaptation of the ICS of the USA for the Indian system of disaster response as a model tool for command, coordination, and use of resources at the site of the incident. The system can be applied to a wide variety of disaster situations. The organisation of the ICS is built around five major management activities; viz., command, operations, planning, logistics, and finance/ administration (see Figure 6).

Special emphasis areas – The national plan identifies the following areas for special emphasis as LO or preparedness activities in addition to the response initiatives.

- Building bye-laws for each disaster
- Minimum standards and layouts for EOC and relief camps and standard operating procedures (SOPs) for the same

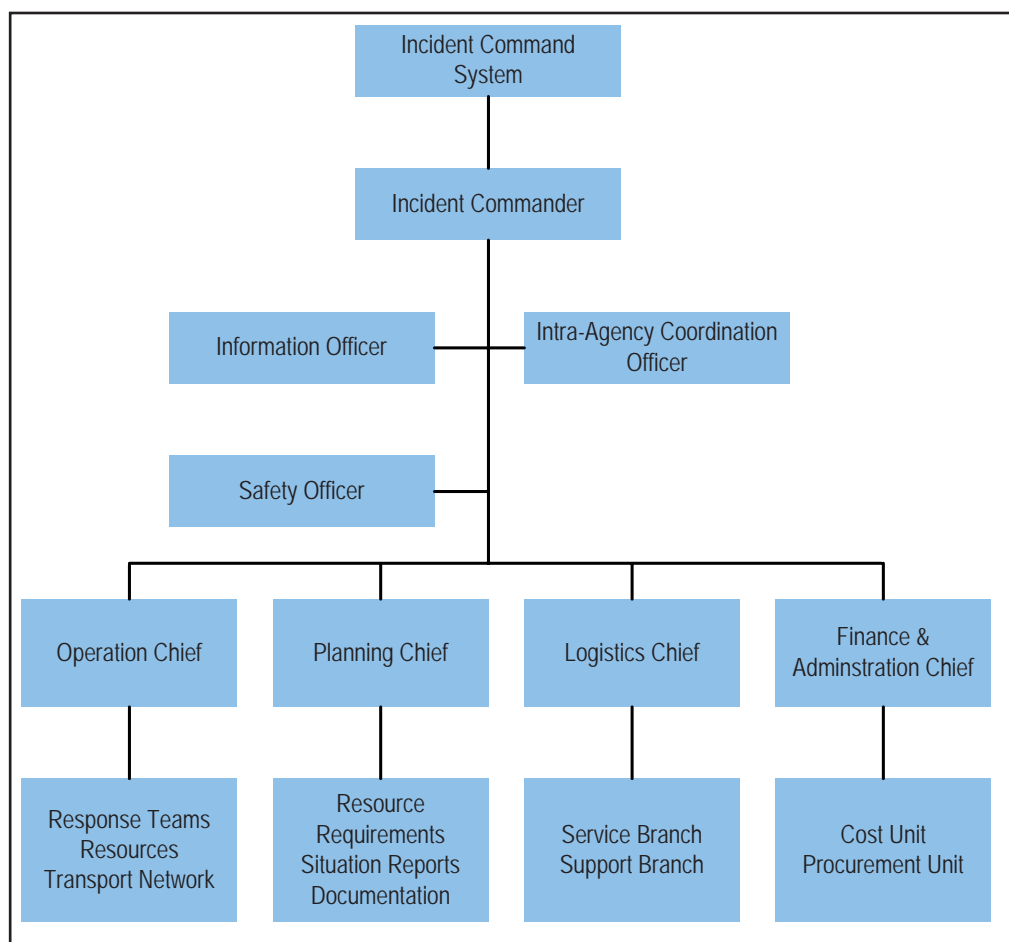


Figure 6: Incident command system

- Insurance policies for disasters
- Facilities in disaster situations for women and children and the physically challenged
- Provision of maps and integration of GIS in the response plan

National Disaster Response Plan: implementation process

The HPC recommendations and NDRP were accepted by the Government of India on submission in October 2001. The National Framework prepared subsequently in 2004 and currently being implemented draws heavily on the HPC recommendations and NDRP. The Incident Command System and Emergency Operations' Centres have already been institutionalised in the disaster management system of the country. The recently set up National Disaster Management Authority (NDMA) has been mandated to prepare the guidelines for plans, checklists, and operating procedures for various organisations. The Disaster Management Act of 2005 also provides for emergency support plans to be drawn up by relevant departments and agencies and for designating resources in advance. 'Quick Response Teams' have been established at national level. The training and equipping are underway for 96 specialist search and rescue teams, each team consisting of 45 personnel such as doctors, paramedics, structural engineers, and others. These teams will be located at various centres around the country and will have the latest equipment as well as dog squads for locating survivors in the debris. Apart from specialist search and rescue units, it has been decided that personnel from the central police organisations should also be given training in search and rescue so that they can be requisitioned to the sites of incidents without loss of time. Pending arrival of the specialist teams, the battalions located near the site of an incident will be deployed immediately. For this purpose, a curriculum has been drawn up and integrated into the training curricula of these organisations. The Incident Command System is being put into operation by training trainers who will then train the designated incident commanders. Most importantly, legal back-up in the form of the National Act and institutional mechanisms like the Disaster Management Authorities at the national, state and district levels have been important steps in improving national preparedness.

National Disaster Management Plan: recent developments

The Disaster Management Act of 2005 provides for the preparation of a plan for the whole country called the National Plan. The National Executive Committee is mandated to prepare this plan giving due consideration to the national policy and in consultation with the state governments and expert bodies or organisations approved by the national

authority. As per the provisions of the act, the plan should include the following.

- Measures to be taken for the prevention of disasters or mitigation of their effects
- Measures to be taken for the integration of mitigation measures in the development plans
- Measures to be taken for preparedness and capacity building to respond effectively to any threatening disaster situations or disaster
- Roles and responsibilities of different ministries or departments of the Government of India with respect to the earlier functions

The act provides for annual revision of the plan by the authority as well as financial provisions to be provided by the Government of India for implementation. The relevant ministries and departments of the government are to draw up their own plans keeping the National Plan in mind.

It can be concluded that the planning process in India is still in a preparatory phase. While the National Disaster Response Plan was accepted by the government in October 2001, the National Act of 2005 provides for preparation of a plan by the National Executive Committee (NEC) to be approved by the National Authority (NDMA). As of now, the authority has submitted a National Policy on Disaster Management to the Government of India, and it is being considered. It can be surmised that the National Plan will be prepared on the lines of the approved National Policy.



Chapter 5

State and Local-level Disaster Management Planning

In the federal structure of administration in India, disaster management is a state responsibility. Thus, action from the states is crucial for planning and implementation. Moreover, in a country of subcontinental proportions, a unified national-level disaster management plan may not be able to address complex issues at local level. State and local-level plans are thus more viable because they can focus on specific hazards and vulnerabilities of the state.

State-level disaster management plans

After Independence in 1947, India had developed a system of relief administration based on the relief codes or manuals and contingency action plans prepared by each state, focusing on disasters such as floods and droughts that occur frequently. The contingency action plans prepared by each state according to its perception of hazards generally dealt with pre-disaster (primarily pre-monsoon) inspection and maintenance of irrigation canals, embankments, check dams, collection and analysis of local and upstream weather data, information on release of water from dams, and liaison with relevant departments. However, over the years, because disasters became increasingly complex, these measures were found to be inadequate and rather ad hoc.

High-powered Committee (HPC): guiding principles of state plans

Comprehensive state disaster management planning was discussed by the HPC in its consultations with state relief commissioners – the nodal officers for disaster management. Though it was initially suggested that HPC prepare a model state plan for all states to emulate, it was felt that it would not be feasible to develop a single plan that all states could follow, given the variation in contextual attributes of the different states. Hence, a set of guiding principles for preparation of ‘State Disaster Management Plans’ was formulated: these guiding principles were meant to facilitate consistency.

The basis of the guiding principles is that planning for disaster management has to be done in advance for action to be effective. The whole process of preparation of disaster management plans introduced by the HPC emphasises taking timely preventative measures by incorporating them into the development planning system. This promises to generate a nation-building exercise that will involve the poorest of the poor in their own development. As management of disasters is concerned with saving human lives, zero-error management is required, and for this planning in advance is imperative. Actions during a disaster can be anticipated to the greatest extent possible and guidance can be given in advance to facilitate this process in the most efficient manner when the need arises. The need to plan during the actual disaster phase should be as little as is possible given the circumstances. Box 3 presents some guiding principles for state disaster management plans.

Box 3. Salient features of guiding principles for state DM plan

- The plan will be structured along the L0 (preparedness) to L1 (district-level intervention required), L2 (state-level intervention required) and L3 (national-level calamity) activities. While the state intervenes only if the disaster has reached L2 level, it needs to be active and alert for other levels of disaster as well. For L1 level, it needs to monitor activities carried out by the districts, while for L3 level, it has to coordinate with the Central Government for response.
- Guiding principles advocate marking responsibilities to organisations, departments, and individuals in their primary or secondary roles.
- Immediate response actions (first 24 and 48 hours), resource mobilisation, donation management, impact assessment, and information dissemination will be identified.
- The recovery and rehabilitation section focuses on essential aspects of shelter, livelihood, and infrastructure and how they could be mainstreamed into normal development activities.
- A database will be prepared that enlists the vulnerability of the state to different types of disasters with due recognition accorded to promotion of indigenous knowledge.
- An annual summary of resources including events, personnel, and materials will be given.

Disaster Management Act 2005: provisions for state plans

Subsequent to notification of the Disaster Management Act of 2005, all the states are mandated to develop comprehensive disaster management plans at the state, district, block, and local levels. The National Disaster Management Authority (NDMA) established under the Act is mandated to formulate the guidelines to be followed by the State Disaster Management Authorities in drawing up the State Plan. The State Disaster Management Plan is to be prepared by the State Executive Committee with regard to the guidelines laid down by the national authorities and in consultation with

local authorities, district administration, and people's representatives. The state plans will have to be approved by the State Disaster Management Authority. The Act directs that state plans should include the following.

- Vulnerability of different parts of the state to different hazards
- Measures to be adopted for prevention and mitigation of disasters
- Manner in which mitigation measures will be integrated with development plans and projects
- Capacity-building and preparedness measures to be taken
- Roles and responsibilities of each department of the government of the state in relation to the above measures
- Roles and responsibilities of each department of the state government in responding to any threatening disaster situation or disaster

The act also directs the state governments to make appropriate provisions for financing the measures identified in the plan and for annual reviews and revision exercises.

Existing state disaster management plans

Although state disaster management plans under the provisions of the Disaster Management Act of 2005 are yet to be prepared, some Indian states have been proactive in preparing such plans on the basis of HPC guidelines or even before. Maharashtra was the first to draw up state (Annex 3) and district-level disaster management plans in the aftermath of the Latur Earthquake in 1993. The planning exercise was carried out in 1994-95, with assistance from the World Bank and the UNDP. Maharashtra, is located in the western part of the country and is vulnerable to floods, droughts, landslides, earthquakes, cyclones, and human-induced disasters. One of the poorest states in India, Orissa, is one of the most prone to hazards also. The 1999 super cyclone was a benchmark in disaster management efforts as there was a paradigm shift in the way the people's perspectives, policies, and actions on managing disasters changed. Orissa was the second state to draw up a plan for disaster management. Brief descriptions of these two plans follow (Box 4).

District disaster management plans

As most of the action takes place in the districts, preparation of comprehensive disaster management plans at the district level is given top priority. Pre-disaster planning is critical for ensuring an efficient response at the time of a disaster. A well-planned and well-rehearsed response system can deal with the exigencies of calamities and also establish a resilient coping mechanism. Optimal use of scarce resources for rescue, relief, and rehabilitation during and after crises is possible only through detailed planning and preparation. The district magistrates or district collectors are the nodal officers for emergency response in the event of disasters at district level. Preparation of District Disaster Management Plans (DDMPs) is necessary in order to provide a

Box 4: Briefs on the State Disaster Management Plans of Maharashtra and Orissa

Maharashtra (Annex 3)

Prepared in three phases with the assistance of the World Bank and UNDP, the first phase concentrated on preparing a document for Risk Analysis and Vulnerability Assessment, by a State Action Plan with District Disaster Management Plans for six districts initially and a Mitigation Strategy for the state. The state plan was developed as an integrated plan encompassing all disasters in a multi-hazard response approach. A common planning and operational framework was proposed for all disasters to ensure systematic assessment, communication, and management of risk (appropriate to the disaster), and identification of response.

Departments and agencies of the Government of Maharashtra and other non-governmental agencies were expected to participate in disaster management. The plan provides for institutional arrangements, roles, and responsibilities of the various agencies, their interlinkages in disaster management, and the scope of their activities. It focuses on the role of various government departments and agencies like the Emergency Operations' Centre in case of disasters. This plan concentrates primarily on a response strategy.

The institutional arrangements in the DMAP provide for bringing all agencies and departments with disaster-specific functions under a single umbrella of control and direction. The plan strengthens administrative arrangements, with the Chief Secretary as the team leader supported by the Relief Commissioner with branch arrangements at the Emergency Operations Centre at the Mantralaya (State Secretariat). The Emergency Operations' Centre (EOC) was proposed as the hub during a disaster. The primary function of an EOC is to implement the DMAP which includes coordination, policy-making, operations management, data collection, record keeping, public information, and resource management.

It estimates emergency needs and identifies the resources to meet these needs. It also involves preparation of well-designed plans to structure post-disaster response and familiarise stakeholders, particularly communities, through training and simulation exercises.

Orissa

Orissa's plan was the first attempt to bring out a common plan for 19 categories of possible disaster identified by the HPC. It has a 'multi-hazard approach' and incorporates actions that promote a 'culture of preparedness.' The State Disaster Management Plan only highlights the activities of state government agencies and departments of Prevention, Response and Recovery for L1 and L2 disasters and the activities during L0.

The State Emergency Response Plan, a constituent of the comprehensive disaster management plan, sets out the roles and responsibilities of the agencies involved in emergency response and coordination arrangements. Under response arrangements, incident control is vested in control agencies that are primarily responsible for responding to specific emergencies. Support agencies provide services, personnel, or material to support or assist control agencies or persons affected. Response agencies can perform the role of either control or support agencies depending upon the particular emergency.

Emergency response plans also provide for the operation of state, district, block, or municipal emergency response coordination centres where response coordinators and liaison officers from control and support agencies will be located to receive, collate, and disseminate information and coordinate the provision of resources. The concepts of NDRP like EOC, incident command, disaster level, and emergency support functions (ESF) have been incorporated into the state's disaster management concept.

framework for disaster managers and district administrations to prepare for and ultimately respond to disaster events. Each DDMP's preparations should be made on the basis of vulnerability of the district to various disasters and the resources available. Moreover, in preparing plans for the districts, the structure should facilitate quick retrieval of relevant information on which the authority or individual has to act.

District plans should be multi-hazard response plans that assist and equip district administrations to organise their emergency preparedness, response, and mitigation functions in a timely and efficient manner within each district and extend the necessary support to the state and central governments. Each district plan focuses on operations and defines the types of responder agencies within the district and from within and outside the government.

The DDMP establishes a structure for a systematic, coordinated, and effective response at the district level. Components of a district plan are given below.

- Defines a system of coordination at the district level
- Identifies all the responder agencies at the district level and assigns functional responsibilities to each of them
- Establishes a central facility in the district that enables all the responder agencies to interact and coordinate their efforts
- Suggests hazard-specific preparedness, response, and mitigation measures
- Plans resource requirements and coordinates with the state government to requisition additional resources
- Provides an inventory of resources, key facilities, and addresses for deployment and assistance for preparedness and mitigation

High-powered Committee (HPC): guidelines for district plans 2002

The High Powered Committee (HPC) prepared a model District Disaster Management Plan with the following responsibilities.

- Assigning responsibility to organisations and individuals to carry out specific actions for projected items (This includes defining lines of authority and organisational relationships. It also includes activities such as identification of personnel, equipment, facilities, supplies, and other resources.)
- Identifying and recording basic information about the district; viz., topography, communication links, and so forth
- Establishing procedures and organisational arrangements for hazard identification and vulnerability analysis at district level
- Identifying mitigation measures for long-term management of risk to reduce the adverse fall-out of disaster events on physical and social infrastructures
- Identifying functions that might be required during the response phase to protect lives and assets in the community

- Arranging to organise short-term and long-term recovery and rehabilitation of communities affected
- Establishing an interface with the media, NGOs, relief and donor agencies, and other stakeholders

The HPC emphasised the need for a district plan structured in a way that facilitates easy and rapid retrieval of relevant information on which the authority or individual may have to act.

District disaster management plan: NIDM template 2005

The National Institute of Disaster Management (NIDM) has prepared an indicative template for preparation of DDMPs (Annex 4). The template is only indicative of the components of a comprehensive district disaster management plan and needs supplementing with district-specific issues; in other words it is an indicative outline of a DDMP that can be adapted in the context of a particular district. Significant guidelines for preparing a DDMP are given in Box 5.

Box 5: Significant guidelines for preparing a DDMP

Identify the objectives, context, and the institutional mechanism or individual responsible for preparing, implementing, and revising the plan.

- Introduce the district in terms of its physical, socioeconomic, and critical infrastructure.
- Carry out a comprehensive hazard, risk, and vulnerability analysis of the district and risk assessment of specific hazards.
- Identify the structure of a disaster management mechanism available at the district level in terms of the presence of disaster management committees, incident command system, emergency operations' centres, and a coordination mechanism with line departments.
- Prepare a mitigation strategy for specific hazards and sectors, both structural and non-structural, including an implementation strategy.
- Carry out preparedness and response planning, including identification of response functions, assignment of specific tasks to individual response agencies, identification of equipment, supplies, and personnel required by the response agencies for performing the assigned tasks. (A response plan outlines the strategy and resources needed for search, rescue, and evacuation.)
- Identify recovery and rehabilitation interventions for the communities affected in terms of livelihood and vital support systems.
- Establish standard operating procedures (SOPs), clearly underlining the roles and responsibilities of various organisations and individual officials during various stages of the disaster management cycle.
- Integrate long-term mitigation measures into development activities in the district during normal times and into financial allocations.
- Establish procedures for monitoring, evaluation, and revision of the plan.

Disaster Management Act 2005: provisions for district plans

The Disaster Management Act 2005 provides for preparation of a Disaster Management Plan for every district. To be prepared by the District Disaster Management Authority, in consultation with district-level departments and organisations in line with the national and state plans, the district plan will include the following.

- The areas in the district vulnerable to different forms of disasters
- Measures to be taken for the prevention and mitigation of disaster by the government department at district level and the local authorities in the district
- The capacity-building and preparedness measures required at the district level and the local authorities in the district to respond to any threatening disaster situation or disaster
- The response plans and procedures in the event of a disaster, providing for:
 - allocation of responsibilities to the government departments at district level and the local authorities in the district;
 - prompt response to disaster and relief thereof;
 - procurement of essential resources;
 - establishment of communication links; and
 - dissemination of information to the public.

The act provides for annual review and revision of the plans. Copies of the plan have to be provided to all departments of the government at district level and to the State Disaster Management Authority which forwards it to the State Government. The District Disaster Management Authority has to review the plans periodically and issue appropriate instructions to the relevant departments for implementation. The act directs every office of the Government of India and state governments at district level and the local authorities to prepare a disaster management plan under the supervision of the district authority outlining the following mechanisms.

- Provisions for prevention and mitigation as provided for in the district plan and as assigned to the department or agency concerned
- Provisions for capacity-building and preparedness as described in the district plan
- Response plans and procedures in the event of any disaster threatening or occurring

In addition to plan preparation, each department or the agency is also expected to coordinate implementation procedures with those of other organisations at the district level such as the local administration, communities, and other stakeholders.

Existing district disaster management plans

As with the state plans, some districts had been proactive in preparing plans according to HPC Guidelines and the NIDM template before the act came into existence. Disaster management plans for all districts of Maharashtra were in existence even before the HPC was constituted. Plans have been prepared by Latur in Maharashtra, Kullu in Himachal Pradesh, Maharajganj in Uttar Pradesh (Annex 5), Darjeeling in West Bengal, and Coochbehar, West Bengal. The plans by and large deal with preparedness measures, institutional frameworks, and response centres and actions to be taken by the stakeholders involved. Some of them are disaster-specific and others analyse the district's vulnerabilities and focus on involving the communities. Box 6 contains a brief description of these plans.

Community-based disaster management plans

Community participation has been recognised as a necessary element in preparation for disaster occurrence, particularly for small- and medium-scale disasters. The experiences and practices of community-based disaster mitigation programmes show the positive impact of a participatory approach. The local community is the main focus of risk reduction programmes as it is the community that is adversely affected and the first responder to the event. Traditional coping practices and survival mechanisms come into use long before outside help reaches a site.

Transforming communities at risk into communities that have disaster resilience is the by-word of community-based disaster preparedness and its major strength. The concept of community preparedness assigns significant roles to organisations and individuals living in the community with a stake in its economic sustainability. The formation of a community-based response organisation or community-based volunteer team is an important step in mobilising communities for sustainable disaster risk reduction. These community groups play a vital role in the risk reduction process.

Community-based preparedness planning is a crucial area in the national framework. By means of a 'disaster risk management programme', the community is trained to undertake risk mitigation and disaster preparedness in a participatory framework. Village disaster management plans include resource mapping, risk and vulnerability mapping, and shelter and evacuation mapping exercises along with identification of hazard-specific mitigation activities. Mock drills are held at regular intervals, especially before the season in which most disasters take place to validate the plan and archive a state of preparedness. These village-level plans are integrated horizontally with block and district level plans and vertically with the operational plans of various departments. Disaster management plans have been prepared for 8,643 villages,

Box 6: Brief description of district disaster management plans

Latur DDMP, Maharashtra

Prepared in the aftermath of a devastating earthquake in 1996-97, the Latur DDMP is a multi-response plan with an institutional framework for managing disasters. It is disaster-specific in terms of action to be taken by various agencies. It gives a comprehensive analysis of the district's vulnerability, contact details of the responders, and actions for community mobilisation.

Kullu DDMP, Himachal Pradesh

Prepared in 2001, this plan deals primarily with preparedness measures and the organisational structure for responding to disasters by establishing disaster management committees at district, sub-divisional, block, and tehsil and sub-tehsil levels. It identifies the vulnerability and capacity of the district in the context of hazards and describes the powers and functions of each member of the disaster management committees before, during, and after disasters. NGOs and Community-based Organisations and prominent members of the community are members of the disaster management committees.

Maharajganj DDMP, Uttar Pradesh (Annex 5)

Prepared in 2002-03, the DDMP focuses on operations and defines responder agencies within the district, and from within and outside the government. It has an administrative structure for systematic, coordinated, and effective response at the district level. The focus is on floods as this is the main hazard; and the plan contains a brief overview, hazard analysis of the district, important socioeconomic indicators, flood and earthquake risk analysis, and likely impact on the population. The organisational structure of the district identifies responsibilities for disaster management and prevention and mitigation strategies adopted to reduce the impact of disasters.

Darjeeling DDMP, West Bengal

Darjeeling district in the northern part of West Bengal, bordering Sikkim, is a mountain district vulnerable to landslides and floods. The DDMP, prepared in 2004, is geared towards landslide and flash flood management, especially during monsoons. The plan is comprehensive to the extent that each vulnerable village is identified and contact details at village-level. Quick Response Teams, NGOs, and evacuation shelters are listed in detail.

Coochbehar DDMP, West Bengal

This district is in the northern part of West Bengal bordering Bangladesh and is a highly flood-prone area. The plan contains a list of rescue centres, district control room operations, nodal personnel and contact details, vulnerable areas, a district communication network, and the role of various government departments and NGOs.

1,046 gram panchayats (cluster of villages, lowest strata of governance), 188 blocks, and 82 districts.

Planning for disasters in India is a dynamic work in process involving all levels of administration and all stakeholders. The overall aim is to integrate various planning levels to enable specific local-level issues to be addressed within the local context,

while the broad spectrum is addressed by state and national-level plans. The initiative to integrate long-term planning and preparedness for disaster mitigation into development planning has facilitated the introduction of safe national development, as emphasised by the Tenth Five Year Plan.

Chapter 6

Disaster Preparedness Plans – Strengths and Weaknesses

Although disaster preparedness planning began with relief-oriented manuals and annual contingency plans to respond to disasters, over the last decade India has followed a system of comprehensive and holistic disaster management planning, with emphasis on all stages of the disaster management cycle. With respect to preparedness, the national initiatives have focused on putting an efficient response mechanism in place; identifying a response force and response equipment; medical preparedness; improving the capabilities of responders; improving the early warning system; and providing an institutional mechanism for implementation. All initiatives have followed an all-hazard, multisectoral approach. One important aspect of disaster management planning in India is its bottom-up approach involving the communities. Although this process is still in the early stages and far from being complete, this approach aims to inculcate a culture of prevention nation wide. It is believed that this approach can empower communities by building resilience within them.

Planning initiatives in India currently suffer from weaknesses related to (a) the process and (b) the practice. Disaster management planning has been under consideration at various levels since 1994-95. Jolted by the Latur Earthquake in 1993, Maharashtra pioneered the planning exercise by preparing state and district-level plans. After facing devastating disasters, Orissa and Gujarat also followed suit. At the national level, a National Disaster Response Plan (NDRP) was accepted by the Government of India in 2001. The NDRP primarily deals with national-level ministries and departments focusing on effective warning, communication, and coordination. Although certain concepts identified in the plan were implemented, the entire plan has not been put into operation. In addition, the Disaster Management Act of 2005 provides for a National Plan for Disaster Management to be prepared by the National Executive Committee and approved by the National Disaster Management Authority. The Act also provides for the plan to be holistic, aimed towards prevention, mitigation, and capacity building for effective response, preparedness, and in line with national policy. Similar guidelines have been provided for state and district plans. As of now, the draft policy has been

formulated but the national plan is yet to be formulated. At the moment, therefore, the planning process is in need of clear policy guidelines. It is not clear what the status of the NDRP will be in terms of subsequent policies and plans.

At the state, district, and sub-district levels, a planning process was introduced throughout the country. However, in the absence of clear institutional arrangements, planning for disasters suffered from differential levels of planning between states and districts. It was invariably those states that faced devastating disasters which were the most proactive in preparing plans. It was thought that, despite the availability of guiding principles and templates and the primary responsibility for disaster management being vested in the states, lack of instruments such as legal back-up, institutional mechanisms, and regulations were primary reasons for the differential introduction of the planning process. Not all states were equally proactive with respect to disaster management. The act has provided for standardisation of institutional mechanisms in terms of mandatory disaster management authorities and executive bodies at the state and district levels responsible for planning and implementation of disaster management initiatives. Currently initiatives to establish authorities are still in process and planning will resume only after all the instruments are in place.

The practice or implementation of plans at the field level has suffered from the fact that institutional back-up to implementation, in the form of legislation, regulations, and rules, was not available until recently. The coordination and control structure in disaster preparedness was not well defined and thus was heavily dependent on the personal commitment and concern of nodal officers. Lack of an organisation dedicated to disaster management at the district, state, or national level diluted the responsibility for implementation. This was especially true at the district level where disaster management, planning, and implementation had to be handled simultaneously with routine administrative duties by the district collector. Moreover, capacity building of personnel in disaster management planning is a crucial but long-term process. In 2006-06, NIDM had held training on district disaster management planning in 10 states for district-level officials. This training is being carried out in other states also, but it has not been possible to bring all the officials from the departments concerned together in a training programme. These programmes are held at the state headquarters; therefore bringing all the senior officials from all the districts together at the same time is not always possible. External factors such as elections and natural calamities also delay training of key personnel. Lack of skilled personnel for disaster management activities often compromises follow-up action such as updating information, monitoring of procedures and actions, rehearsals, and public awareness measures. Thus weaknesses in both the process and practice of planning have deterred the disaster management movement in the country. Although the Disaster Management Act of 2005 is a step in the right direction, putting its provisions and instruments into operation is a sine qua non for proper disaster preparedness and management. Only then can the country move towards disaster risk reduction in the communities.

Chapter 7

Communicating and Sharing Knowledge About Disaster Preparedness

Communication is the mainstay for managing emergencies. Communications can be of immense use in effective disaster management by being instrumental in promoting awareness and dissemination mechanisms during the preparedness stage and for emergency communication during times of disaster (Department of Agriculture and Cooperation 2001). Recent disasters have demonstrated the important role effective communication systems play.

Communicating and sharing knowledge at national level

Nationally the need for a state-of-the-art communication system for disaster management has been recognised. However, information coordination and management are major challenges in India due to the sub-continental proportions of the country and the diversity of languages and cultures. In order to address the challenges and use communication technology for rapid response for disaster preparedness and management, effective decision-making, and improving the skills of practitioners, the following initiatives are being taken within the national framework.

National emergency communication network

The communication network between the national and state EOCs has been the responsibility of the Department of Telecommunications. However, considering that communication becomes the first casualty in most rapid onset disasters, efforts are being made to put in place a multi-mode and multi-channel communication system. The police network (POLNET), formerly for police personnel only, has been made available for disaster management. The POLNET has been extended to the Emergency Operations' Centres (EOCs) and district incident commanders (district collectors) in addition to the available terrestrial links.

National emergency communication plan

A National Emergency Communication Plan was developed, and it identified an implementation process for a dedicated communication system for disaster management with built-in redundancies. The plan's objective is to set up a reliable information and communication network for emergencies employing both terrestrial and satellite-based communication technologies. This plan has been approved by the government.

The Indian Space Research Organisation (ISRO) has set up a communication hub on a V-Sat terminal with audio, video, and data communication facilities in New Delhi: it is connected to 25 client nodes in state EOCs and national nodes. Phase I of the National Disaster Management Communication Plan to provide satellite-based mobile voice, data, and video communications between national EOCs and state EOCs as well as mobile EOCs has been completed. Phase II for connecting national, state, and district EOCs with disaster sites is currently being implemented. The plan integrates the existing communication links with state-of-the-art dedicated emergency communication measures. A schematic diagram of the plan is given in Figure 7.

Indian disaster resource network

During disaster situations, an organised inventory of specialised equipment, supplies, and skilled personnel is essential for mobilising resources for immediate response. Lack of an updated inventory has, in the past, resulted in loss of precious time.

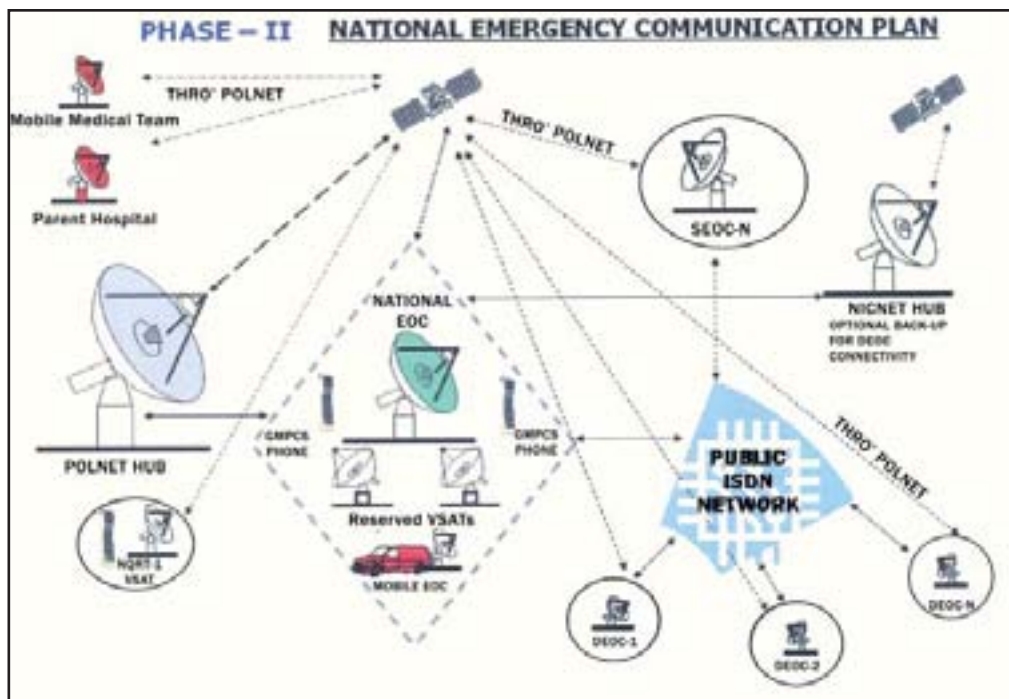


Figure 7: Schematic diagram of the national emergency communication plan

A nation-wide electronic inventory of essential and specialist resources for disaster response has been established called the Indian Disaster Resource Network (IDRN). The IDRN is a web-based centralised database that provides quick access to resources, hence minimising the time taken to respond to emergencies. The IDRN is an organised information system for collecting and transmitting information about specific equipment, human expertise, and critical supplies from district level onwards.

The IDRN lists the equipment and resources by type and by function as well as location. Being a live system the inventory is revised every quarter with entries made at the district and state level. The nodal authority in each district is responsible for collecting, compiling, and updating the data in the inventory in the central server with the help of the relevant district departments. Security features have been built in to prevent unauthorised entry into the web portal. The data of specified items in the inventory are collected from various departments at the sub-district (sub-division or block) level in paper format and entered at the district level through the IDRN portal.

The users and partners of IDRN are 602 district administrations of 35 states and union territories (UTs); 35 state and UT administrations; 5,000 member corporate bodies registered with the Confederation of Indian Industry; around 33,000 builders, contractors, and construction companies registered with the Builders' Association of India; Indian Railways; and public sector undertakings. Over 84,000 records from 564 districts have been entered, while data from the remaining districts are being collated.

GIS database and decision support system

The geographical information system (GIS) database is an effective decision support tool for emergency responders through which they can have access to information in terms of crucial parameters for areas affected by disaster. Efforts are being made to set up a mechanism for sharing thematic and spatial data through a designated electronic clearing house. The National Spatial Data Infrastructure (NSDI) was recently set up by the Survey of India (Department of Science and Technology) to collect, compile, analyse, and prepare value-added maps for use by various agencies in the field of disaster management; for management of natural resources; and for industrial applications. The NSDI will work towards interoperability of data and information-sharing protocols to facilitate effective policy analyses and informed decision-making for improving the effectiveness of disaster management (DM). It will then form a synergic linkage with the National Database for Emergency Management (NDEM) established by the Ministry of Home Affairs and designed to have spatial and non-spatial databases in a secure environment. It will be enlarged and fine-tuned to address the information needs for DM during both natural and technological disasters through the entire management cycle.

India disaster knowledge network

Knowledge of disasters transcends the rigid disciplines of prevalent knowledge and has to be considered within the entire gamut of knowledge available. The need for integrating disaster-related knowledge is recognised in various institutions across the country and symbiotic linkages are being put into operation through an on-line India Disaster Knowledge Network (IDKN) portal to provide a platform for practitioners and technical institutes to share tools, formats, guidelines, and other resource materials for various disasters. The IDKN will cover natural, manmade, and biological disasters and evolve as a network of networks tuned to the needs of disaster managers, decision makers, communities, and many others. The process of encouraging and forging symbiotic linkages is to be enhanced by forming horizontal and vertical linkages with premier international organisations. The focus will be on building partnerships to complement each other's efforts.

Communicating and sharing knowledge at regional level

Disasters of great proportion are rarely confined within national boundaries. Recent disasters bringing devastation in several South Asian countries have brought into focus, as never before, that nothing short of strong regional cooperation can reduce the risks of disaster in any meaningful manner in this part of the world. Mutual cooperation among countries with vulnerability to similar disasters can go a long way to reducing the risks from disasters.

The Department of Science and Technology and other scientific research institutions pursue international cooperation with many countries. Regional cooperation in promoting early warning systems for disasters is spearheaded by the Indian Meteorological Department (IMD) and Central Water Commission for Joint Flood Management. Institutional arrangements for sharing real-time data on water levels in transnational rivers and formation of oceanic depressions are already in place. After the tsunami in 2004, the Indian Ocean Rim Association for Regional Cooperation (IOR-ARC) has been instrumental in triggering a series of cooperative initiatives among member countries with the purpose of sharing meteorological and early warning information; however, addressing disaster management issues holistically had not been attempted until recently.

SAARC Disaster Management Centre, New Delhi

The South Asian Association for Regional Cooperation (SAARC) has taken the initiative of establishing a SAARC Disaster Management Centre (SDMC) in New Delhi. Inaugurated on 10th October, 2006, the SDMC is currently located within the National Institute of Disaster Management. It is to be developed as a dynamic centre for knowledge,

research, and training on disasters, actual or potential, natural or manmade, in any part of South Asia. It is envisioned that the SDMC will be a global centre of excellence in the field of disaster risk mitigation and management. The SDMC is expected to work with all the stakeholders in the member countries on disaster management by providing policy advice and facilitating capacity-building services such as strategic learning, research, training, system development, and promotion of expertise for effective disaster preparedness and mitigation.

The SAARC Disaster Management Centre is expected to collaborate with other SAARC Centres, particularly the SAARC Meteorological Research Centre, SAARC Coastal Zone Management Centre, and SAARC Forestry Centre to avoid duplication and achieve synergy in terms of programmes and activities.

Another regional networking association of South Asian countries called the Bay of Bengal Initiative for Multi-sectoral Technical and Economic Cooperation (BIMSTEC) is considering disaster management as one of the key areas of cooperation. Comprising of countries dependent on the Bay of Bengal for their trade; viz, Bangladesh, Bhutan, Nepal, India, Sri Lanka, Myanmar, and Thailand, BIMSTEC aims to provide a unique link between South Asia and South-east Asia based on mutual interests and common concerns among member countries and the complementarities of their economies.

International and multilateral agencies

Disaster preparedness in India has received assistance from various international and multilateral agencies. The disaster management planning process taken up by the state of Maharashtra in the aftermath of the Latur Earthquake was sponsored by the World Bank, and the Gujarat Reconstruction Programme received assistance from various agencies, one of them being the World Bank. The Disaster Risk Management Programme (DRM), currently being implemented in 169 multi-hazard prone districts, is a collaborative effort of the UNDP, USAID, and European Union. The ICS (Incident Command System) programme, through which trainers and incident commanders are being trained in the United States, is funded by the USAID.



Chapter 8

Conclusions and Recommendations

India is going through a phase of intensified preparedness for all disasters. Disaster management gained momentum from the International Decade for Natural Disaster Reduction (IDNDR) and the devastating impacts of severe events over the decades. It has come a long way towards establishing a robust system for disaster risk reduction.

The shift in paradigm brought about by IDNDR has affected a shift in attitude within the government. The initiatives undertaken in recent years are geared to address all major activities in the disaster management cycle. The aim of these initiatives is to usher in a culture of prevention across the spectrum of stakeholders in the short and long term. The shifting paradigm has ensured a focus on pre-disaster preparedness and mitigation activities. Long-term mitigation activities, such as techno-legal back-up and institutional mechanisms, disaster resistant construction, retrofitting, flood and cyclone shelters, mass awareness generation, human resource development, and capacity building, have been taken up with great enthusiasm and preparedness activities for better response have received due attention. Preparedness initiatives include the constitution of dedicated response forces, search and rescue teams in states, regional response systems, and incident command systems for better management. Inter-agency and inter-departmental coordination in the form of emergency support functions have been taken up by the government. However, the approach has been holistic, rather than compartmentalised into mitigation, preparedness, response, and rehabilitation. Efforts have been made to merge all the components of disaster risk reduction into a comprehensive whole. Moreover, with the state governments having the primary responsibility for managing disasters, the priority for action depends on individual states to a great extent. Long-term mitigation for building disaster resilient communities is reinforced by preparedness measures at various levels.

The status of disaster management plans in the country can be summarised in the following points.

- The exercise of disaster management planning has been introduced throughout the country, but some states have been more proactive than others. This has resulted in differential capacity development and progress among the states.

- In the federal structure of the Indian polity, disaster management is a state subject; and so each state acts according to its own priorities. This means some states, especially those that face devastating disasters, have taken more initiatives than others, so the entire country is not together in terms of disaster prevention and mitigation.
- In the absence of dedicated disaster management instruments, such as legal and institutional back-up, the process and implementation of plans have faced impediments. These have been addressed to some extent by the Disaster Management Act of 2005.
- In view of the differences in geography, hazard profiles, and socioeconomic characteristics across the country, community-based disaster management planning was introduced to build resilience.
- The Disaster Management Authority set up recently has started working towards forming a robust institutional mechanism for disaster management.

Disaster management planning in India is dynamic and is experiencing a rise in impetus at the moment. Although considerable initiatives have been taken, more effort is needed to take the entire country forward in mission-mode for disaster risk reduction. Although the new national legislation is expected to bring about a uniform and dedicated mechanism for managing disasters from the national to the sub-district level, the following recommendations are being given keeping the current status of disaster preparedness and management in mind.

- Disaster management requires proactive ‘pre-action’ by each state to prepare for various calamities, both regular and unexpected. The differential capacity of states needs to be standardised into time-bound actions.
- Plan preparation at each level should be completed within a specified time, following which a standardised evaluation by a designated authority comprising of senior administrators, disaster management practitioners, and sector specialists should take place.
- Periodic rehearsals are required to streamline emergency functions and coordination mechanisms. Rehearsals also reveal the weaknesses in planning during non-emergency situations, providing scope for improvement before a disaster strikes. It also gives the administration a fair idea of the capabilities of the administration and the resilience of the people.
 - Although sporadic, community-based rehearsals are being held at the community level, a nationwide exercise has not taken place yet under the Disaster Management Risk Programme. The HPC had recommended the last week of April to be earmarked as the ‘Plan Updating Week’ and the first week of May as the ‘Rehearsal Week’ every year. A nation-wide observation of these weeks would automatically increase awareness and motivate people to follow a culture of safe development, on the one hand, and facilitate revision of plans, on the other. Although accepted in principle, this practice has not been implemented on a country-wide basis yet.

- Due to the increased complexity of the impact of disasters in urban areas, metropolitan and mega-metropolitan areas and the localities within them merit a closer look in terms of disaster preparedness and planning. Disaster management plans should be developed for cities in vulnerable areas. Although separate city plans may have to be prepared for hazard-prone cities, indicative guidelines and coordination mechanisms need to be incorporated into the respective plans.
- Successful integration of higher and lower levels of governance determines the feasibility of a plan. A plan has to be integrated horizontally with the development plan of the area as well as vertically with the next level for it to be viable.
- The National Act has mandated the NDMA and the National Executive Committee to prepare and execute the National Disaster Response Plan. It remains to be seen whether a new plan will be prepared or whether the existing NDRP will be adapted by NDMA. The existence of a previous National Disaster Response Plan, accepted by the government, could lead to duplication if a new plan is prepared, it would be better to modify the current NDRP to the changing situation. At present it is not clear what the status of the present NDRP will be if an entirely new plan is prepared.
- The National Act also provides for state and district disaster management authorities, and these are still in the process of being notified in various states.

It is expected that the disaster management planning process in India will see many changes in the near future. The central theme is the belief that a community prepared and aware about disasters will be a resilient community, duly empowered by a newly-created disaster management (DM) structure, and working in cohesion across all sectors will help realise the national objective of communities resilient to disasters throughout India as a whole.



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Annex 1

Terms of Reference Preparation of a Status Report on Natural Disaster Preparedness Plans

Background

There is a growing concern within the international community to improve disaster management and preparedness. As a response, ICIMOD has initiated work on collating important information about disaster preparedness in the region through a project titled '***Living with Risks – Sharing Knowledge on Disaster Preparedness in the Himalayan Region***'. The specific objective of the project is to support key practitioners with current knowledge in the field of disaster preparedness, mainly floods, landslides and earthquakes; and build capacity in multi-hazard risk assessment, as well as provide a platform for interaction and exchange of experiences. The prime target countries for the project are Bangladesh, India, Nepal and Pakistan, and with the mountain areas in these countries being of particular interest.

The project is funded by the European Commission Humanitarian Aid Department (DG ECHO) and will be implemented between 1 April 2006 and 30 June 2007.

As part of the activities, the project will promote exchange of experiences, best practices and cross-learning between practitioners through the arrangement of two ***regional workshops*** and the establishment of a website as the basis for knowledge networking.

The first workshop is anticipated to take place in early August. The workshop will focus on disaster preparedness in general and ***plans*** for disaster preparedness in particular. In this case, Plans on a *national* level are of prime interest, but plans on *district* and *community* levels are also of great importance.

Objective of the task

The objective is to provide an account on state-of-the-art on disaster preparedness plans in each of the four target countries: Bangladesh, India, Nepal and Pakistan. There will be a document for each country, with the aim to provide as complete account of existing plans as possible. The account will form basis for a gap analysis during the forthcoming workshop regarding Natural Disaster Preparedness Plans (NDPP) in the four target countries.

Scope of work

The consultant shall prepare a status report on Natural Disaster Preparedness Plans (NDPP) in his/her country.

- A) This report shall list all relevant Preparedness Plans on a national level in relation to three main natural hazards:
- Floods (including flash floods)
 - Landslides (and related land mass movements)
 - Earthquakes

When applicable, a mountain focus shall be taken.

- B) In addition the report shall account for the existence of Preparedness Plans on a district (or similar) and community levels in relation to the three above-mentioned natural hazards. Examples of existing plans shall be attached.
- C) For the national, district, and community plans listed and described, an account of the history of the plans (how they were put into place), institutional ownership and their present functionality, shall be given. Hence, the work encompass a *quantitative* aspect, listing, and describing all relevant Natural Disaster Preparedness Plans, and a *qualitative* aspect, accounting for the functionality of the plans. With functionality means the success with which the plan has been implemented; is it in place and being used? If not, what are the shortcomings and gaps? Case studies may be enclosed from relevant institutions.
- D) The work can be based on individual expertise, or as collaborative work of a group or institution. The work will to a large extent be a desk study using modern communication facilities (internet, telephone, fax), but it *may involve visits to relevant governmental* or other institutions for the collection and assessment of NDPP. In general, the consultant shall try to be as thorough investigating, precise, and objective as possible in his/her study. In cases the consultant may provide his/her own personal analysis on adequacy of plan, impediments to implementation, among others.
- E) All NDPP accounted for and discussed in the report shall appear in the list of References. Relevant plans may also be attached as appendices to the report. In addition, as an appendix, a list of organisations working in Disaster Preparedness in the country shall be provided (it does not need to be exhaustive). From the list it should be clear if the organisation is a governmental, NGO, or other organisation and their role should be stated. Informal networks and/or institutions may also be mentioned.

Reporting

The consultant shall be prepared to present his/her report at the regional disaster preparedness workshop planned for in the end of August 2006.

ICIMOD contacts

For issues or enquiries in relation to the scope of work, please contact Dr. Mats Eriksson (meriksson@icimod.org) or Mr. Vijay Khadgi (vkhadgi@icimod.org) at Water, Hazards and Environmental Management, ICIMOD, tel. +977 1 55 25 313.

NATIONAL DISASTER RESPONSE PLAN

NATIONAL CENTRE FOR DISASTER MANAGEMENT

INDIAN INSTITUTE OF PUBLIC ADMINISTRATION

NATIONAL DISASTER RESPONSE PLAN

PREPARED BY
HIGH POWERED COMMITTEE
on
DISASTER MANAGEMENT



DEPARTMENT OF AGRICULTURE AND COOPERATION
MINISTRY OF AGRICULTURE
GOVERNMENT OF INDIA

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A number of Sub Groups and Sub Committees were set up and Research Studies commissioned by the HPC, and material from these has been heavily drawn upon towards preparation of the final HPC Report & NDRP. Views expressed in these reports do not necessarily represent the considered opinion of the HPC.

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ABBREVIATIONS

ACWCs	Area Cyclone Warning Centres
AIR	All India Radio
ATIs	Administrative Training Institutes
BMTPC	Building Material and Technology Promotion Council
BUCFAC	Building Code Formulators and Administrators Conference of India
CRC	Central Relief Commissioner
CMG	Crisis Management Group
CWC	Cyclone Warning Centres
EGM	Empowered Group of Ministers
EOC	Emergency Operations Centre
ESF	Emergency Support Functions
GIS	Geographic Information System
IMD	India Meteorological Department
ICS	Incident Command System
NATMO	National Atlas and Thematic Mapping Organisation
NCCM	National Centre for Calamity Management
NCDM	National Centre for Disaster Management
NCMC	National Crisis Management Committee
NRSA	National Remote Sensing Agency
PSUs	Public Sector Undertakings
RSMC	Regional Specialized Meteorological Centre
SOP	Standard Operating Procedures
SSH	Saffir-Simpson Hurricane Scale
SSTC	Saffir-Simpson Tropical Cyclone
WMO	World Meteorological Organization

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Introduction

VISION OF THE DOCUMENT

The need for an effective disaster management strategy to lessen disaster impact has increasingly been felt in many quarters. Strengthening of organizational structure of disaster management and reorienting existing organisational and administrative structures have been of prime concern. To achieve these objectives, a High Powered Committee (HPC) on Disaster Management was constituted with the approval of the Prime Minister under the Chairmanship of Shri J. C. Pant, former Secretary to the Government of India.

The original mandate of the HPC was confined to preparation of plans for natural disasters only. It was felt in deliberations of HPC that man-made disasters also be included in the holistic approach for preparation of plans, which was then approved by the Prime Minister.

The following document of the National Disaster Response Plan has been the outcome of extensive consultations and deliberations with all concerned ministries, and departments at the Centre. The HPC has also initiated the process of State and

The High Powered Committee on Disaster Management has taken into account the lessons and learning from past experiences and the work of many international organizations in the preparation of the National Disaster Response Plan. In essence, the work of the HPC has been twofold – bringing and assimilating knowledge and, understanding the commonalities of response actions by learning from past experience.

District plans in order to bring about cohesiveness and uniformity in the formulation of disaster plans in all states and districts all over the country.

It has also taken into account the work and learning of many international bodies, international agencies and Disaster Management Plans of many other countries. The work of the the HPC for the preparation of the National Response Plan has been two-fold:

- ♦ Bringing together a wide range of disaster related readings and processes from all over the world and trying to understand the various systems of response that have been implemented all over the world.
- ♦ Trying to understand the common element of response in order to bring out a well thought-out and planned Response Mechanism for our country. It has also taken into account the lessons learnt from past experiences.

However, this has been the first attempt to assimilate and bring out a common plan for the Centre for at least the thirty-one disasters identified by the High Powered Committee. It has a multihazard approach and incorporates the 'Culture of Quick Response'. The extensive consultations have led to the emergence of many new concepts for the execution of the plan: Trigger mechanisms that identify the sequence of events after a disaster and the L concept that identifies four levels of response, namely L0, L1, L2, L3 are just some of them. Although the Centre plays a supportive role to State governments, it has to be prepared for L3 level of disasters and maintain close monitoring of L2 as well as L1 disasters that affect different parts of the country. It is also required to keep itself updated on various disasters that have occurred all over the world. Therefore, the approach to the plan has been to identify all common elements of response. This acts as a base plan or a

generic/modular plan for all response activities. It provides a framework around which other agencies and departments can outline their own activities for disaster response.

This plan will then be supplemented with specific disaster plans to take into account the peculiar conditions that might arise due to the specific disaster. However, these specific plans will have to be dealt with, in detail, in order to provide and account for all disasters in India.

Preparation and planning well in advance have been reflected throughout the plan. The checklists and handbooks that will make this plan operational have also been identified. Planning and preparation have been given a lot of importance as it is better to be totally prepared rather than go unprepared and add to the chaos at a disaster site.

EVOLUTION OF THE DOCUMENT

Vulnerability of the Indian sub-continent towards disasters, both natural and man-made, is widely recognized. India is vulnerable to various natural disasters like floods, droughts, cyclones, earthquakes, landslides, avalanches, forest fires and the like. Losses caused by disasters continue to mount year after year. The need for an effective disaster management strategy to lessen disaster impact is increasingly being felt in many quarters and also for strengthening of organizational structure for disaster management. Alongwith, regular updating of Codes/Manual/Disaster Plans of the states on the basis of experience gained and technological developments should be done. To achieve these objectives, a High Powered Committee (HPC) on Disaster Management Plans was constituted with the approval of the Prime Minister under the chairmanship of Shri J. C. Pant, former Secretary to the Government of India.

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Strengthening of organizational structure of disaster management and reorienting existing organisational and administrative structures have been of prime concern. To achieve these objectives, a High Powered Committee (HPC) on Disaster Management was constituted with the approval of the Prime Minister under the Chairmanship of Shri J. C. Pant, former Secretary to the Government of India.

deliberations of HPC that man-made disasters might also be included for the holistic approach for preparation of plans, which was then approved by the Prime Minister.

The enhanced **Terms of Reference** of the HPC are as follows:

1. To review existing arrangements for preparedness and mitigation of natural and man-made disasters including industrial, nuclear, biological and chemical disasters,
2. Recommend measures for strengthening organizational structures, and
3. Recommend a comprehensive model plan for management of these disasters at the National, State and District levels.

There were some additional considerations by HPC like forecasting and warning systems, response mechanisms, development programmes, development of human resources, public awareness, proactive measures, information technology, networking/coordinating, periodic updating of building practices and codes, structural measures, state-of-the-art Control Rooms and other matters.

APPROACH OF THE HPC TOWARDS MANAGEMENT OF DISASTERS

The approach of the HPC is holistic, inline with the Yokohama strategy evolved during the International Decade of Natural Disaster Reduction (IDNDR), i.e. planning for prevention, reduction, mitigation and preparedness and thereafter response plan to reduce the loss of lives and property due to disasters.

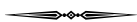
Efforts of HPC are not to develop a plan de novo, but to build on what exists at different levels and streamline such bottlenecks as may be existing considering the very large number of disasters that occur in different parts of India.

It was felt that the generic categorization of disasters would help in preparing disaster management plans. This generic categorization of disasters is in no way intended to disturb the handling of specific disasters by various departments and ministries at the Centre or the State level according to existing rules of business of the government. In fact, all conceivable disasters would fall in one or the other of the five sub-group categorizations as mentioned in the course of this report.

ROLE OF THE NATIONAL GOVERNMENT

- ◆ Monitoring and Support
- ◆ Knowledge Networking
- ◆ Documentation
- ◆ Financial Matters
- ◆ Evaluation
- ◆ Building up inventories
- ◆ Initiating Community Awareness programmes
- ◆ Training of community cadres for response and relief operations through a participatory approach
- ◆ Generating awareness through media and workshops for students

This document of the National Response plan only highlights the activities of 'immediate response' for an L3 disaster.



Methodology

The entire work of the High Powered Committee has been compiled into two main documents:

- I High Powered Committee Report
- II National Disaster Response Plan

KEY ISSUES

In order to prepare a comprehensive and cohesive response plan for the Centre, other important issues such as the disaster profile, Government policies and mitigation measures also have to be taken into account. These issues have been dealt with, in detail, in the Recommendations within HPC Report.

Disaster Profile of India

The unique geo-climatic and social condition of India makes this region particularly vulnerable to disasters. Disasters occur with unfailing regularity and despite better preparedness, the economic and social costs on account of these disasters are on the increase each year. This section of the HPC Report consists of:

The National Disaster Response Plan has evolved as a document that focuses only on Response actions and provides links to other documents necessary for the effective overall management of disasters. The nature and extremity of a disaster demand that a separate plan has to be focused only on the immediate quick response activities thereby initiating a culture of Quick Response.

- i) Past records
 - Frequency
 - Dates/Years
 - Extent of damage
- ii) Vulnerable areas of the country
 - Macro-zonation according to geological setting.
 - List of vulnerable states and districts according to specific disasters.
 - Percentage of vulnerability of the country in context to each disaster.
 - Risk assessment according to the socio/economic conditions of urban and rural areas (metros, cities, towns, etc.)

Detailed checklists/forms for release of equipment and manpower and handbooks for all personnel/ministries/agencies involved in the immediate response activities recommended in the plan are integral and imperative for the complete and comprehensive view of the NDRP (National Disaster Response Plan) document.

National Policy on Disaster Management Plan

This section enumerates the policies that have been developed for the management plan in view of the lessons learnt from previous disasters. This includes policies developed for mitigation and preparedness. Apart from the National Calamity Management Act, it makes a note of the policies suggested by the Tenth and the Eleventh Finance Commission.

Mitigation/ Developmental Activities

This section forms an important part of the entire plan as the effectiveness of the response activities primarily depend upon the preparedness achieved during non-disaster times. In the past, the approach towards coping with the effects of disaster has been post-disaster management mainly involving actions like evacuation, search and rescue, rehabilitation, etc. Quite often the occurrence of natural disasters used to be relegated to history till the next one occurred. IDNDR has effectively shifted the focus from rescue and relief towards preparedness and mitigation. The damage due to disasters can be minimised by the preparation of a

Preparedness plan. The L0 stage suggested in the High Powered Committee interim reports will be utilised for all preparedness plans and activities. Section 4 of the plan deals with all national level L0 activities.

HOW TO USE THE DOCUMENT

This section of the National Response Plan contains the activities and responsibilities of only the 'Immediate or Quick Response'. The document contains the procedures and formats for activities that need to be carried out during an L3 disaster. Recommended support documents specific to each disaster will provide a modular character to the document. Detailed checklists, forms for release of equipment, manpower and handbooks for all personnel/ministries/agencies involved in the immediate response activities recommended in the plan are integral and imperative for the complete and comprehensive view of the NRP (National Response Plan) document. These support documents will have to be specialised and therefore will be developed by the respective ministries/agencies.

ABOUT THE DOCUMENT

The response plan needs to outline responsibilities, response, activities and exact sequence of events to be followed after the declaration of an L3 disaster by supporting checklists of responsibilities and actions, other handbooks and formats for the complete execution of the plan. Most of the checklists and handbooks require detailed enlisting of specific tasks that will have to be detailed out by respective agencies and ministries depending upon the technical nature of the task. In this document the response mechanisms, especially quick response mechanisms, have been outlined along with a listing of checklists, and handbooks that will be required for the detailed enumeration of each task as follow-

up actions to this plan. This document broadly contains the following L3 Response Mechanisms:

- ◆ Point wise explanation of the mechanisms and responsibilities of each concerned department (along with related handbooks of responsibilities)

- ◆ Graphical/Chart representation of the mechanism

The following document only deals with the 'Response Plan'. The sections on profile, policies and mitigation activities for disaster management have been dealt with in brief in the High Powered Committee Report.



Approach

NATIONAL RESPONSE APPROACH

Most of the disaster situations are to be managed at the State and District levels. The Centre will play a supporting role and provide assistance when the consequences of a disaster exceed District and State capacities. The Centre will mobilise support in terms of various emergency teams, support personnel, specialized equipment and operating facilities depending on the scale of the disaster and the need of the State or District.

Although active assistance to an affected State/District will be provided only after the declaration of a national level disaster (L3), the National response mechanism has to be prepared and any impending State or District disaster has to be monitored in order to provide immediate assistance whenever required. For this purpose the National response mechanism has to be pre defined in terms of process, related handbooks, and checklists that will have to be used during a disaster.

Legal Framework

There is no enactment either of the Union or of any State Government to deal with the

Although the Centre plays a crucial role in managing disasters it only plays a supportive role to the State and District authorities. The Centre has to maintain and concentrate on monitoring, warning activities and step into action when a disaster situation exceeds the capacity of the State authorities. In order to formalize and give meaning to these procedures, new concepts of Trigger Mechanism, L concept, etc. have been developed as an integral part of the National Disaster Response Plan.

The concept of Trigger Mechanism has been incorporated by the HPC as an emergency quick response mechanism, which would spontaneously set the vehicle of management into motion on the road to disaster mitigation.

management of disasters of all types in a comprehensive manner. The Environment (Protection) Act, 1986 was passed for the 'protection and improvement of environment and the prevention of hazards to human beings, other living creatures, plants and property.' The Ministry of Environment and Forests prepared and published the Rules on 'Emergency Planning, Preparedness and Response for Chemical Accidents' in 1996 only. These rules pertain to toxic and hazardous chemicals, and provide a reference mechanism for the Central, State, District and Local levels.

The Public Liability Insurance Act, 1991 casts a responsibility on the owner of a unit producing hazardous substance, as defined in the Environment (Protection) Act, 1986, to provide immediate relief where death or injury to any person or damage to any property results from any accident to the extent indicated in the Schedule to the Act. The owner has been required to make one or more insurance policies so that the liability for providing relief is covered by a policy.

In absence of an enactment, the HPC has prepared a "National Calamity Management Act"; a draft of which has been circulated to all the States as well as all the concerned ministries of the Government of India for their comments. The Act aims at ensuring efficiency and effective management of natural and other calamities, for achieving greater coordination and responsiveness with respect to prevention and mitigation of disasters as also to provide better relief and rehabilitation of victims of disasters.

The proposed National Calamity Management Act envisages the formation of a National Centre for Calamity Management for the purpose of effective management of all disasters arising out of calamities.

A Committee to prepare a Model State

Disaster Management Act was constituted by the HPC. This Committee had the mandate to prepare the draft Act within two months' time, under the chairmanship of Shri P.K. Mehrotra, Director General, Madhya Pradesh Academy of Administration, Bhopal. The Committee perused disaster-related legislation in several countries such as the Robert T. Stafford Disaster Assistance and Emergency Relief Act of USA and decided to adopt relevant aspects suitable to Indian conditions. The Committee also decided to take into account available codes and relief manuals and the relevant Acts related to Disaster Management in India in preparing the Model Act. The Committee met on two more occasions and finalised the draft of the Model State Disaster Management Act. A copy of this draft Act was also circulated to the State Chief Secretaries and Relief Commissioners of all States and DGs of all State ATIs for their comments, suggestions and further follow-up actions. It was submitted as part of Interim Report I, was accepted by the Central Government, and circulated to all Chief Ministers.

Building Codes and Bye-Laws: Proper conceptualization, risk evaluation, designing, construction and maintenance of houses and buildings are all disaster reduction measures. Compliance to building guidelines and codes covering all aspects of disasters needs to be addressed by building codes and bye-laws and these need to be uniform as far as possible. The situation warrants a high degree of coordination between the organisations involved in the formulation of the building codes and for the same, setting up of "Disaster Hazard Mitigation Codes Coordinating Group" is required that would look into the existing gaps and fill them. It has been suggested that 'Building Code Formulators and Administrators Conference of India' (BUCFAC) be created to discuss common problems and concerns and provide feedback on code enforcement, implementation problems and gaps.

Building codes and standards need to be made a part of the building byelaws and regulations thereby forcing developers, engineers, architects and engineers to adhere to them.

CONCEPTS USED IN THE DOCUMENT

Trigger Mechanism

Trigger mechanism is a concept that has been developed in order to ensure the smooth flow of response activities after disaster.

The concept of Trigger Mechanism has been incorporated by the HPC as an emergency quick response mechanism, which would spontaneously set the vehicle of management into motion on the road to disaster mitigation process.

The Trigger Mechanism has been envisaged as a preparedness plan whereby the receipt of a signal of an impending disaster would simultaneously energise and activate the mechanism for response and mitigation without loss of crucial time. This would entail all the participating managers to know in advance the task assigned to them and the manner of response. Identification of available resources, including manpower, material, equipment and adequate delegation of financial and administrative powers are prerequisites to successful operation of the Trigger Mechanism.

The Trigger Mechanism is in essence, the Standard Operating Procedure (SOP) in which the implementation of efforts on ground is well laid down. Activities such as evacuation, search and rescue, temporary shelter, food, drinking water, clothing, health and sanitation, communications, accessibility and public information, that are important components of disaster management, would follow on the activation of the Trigger Mechanism. These activities are common to all types of disasters and require sub-division and preparation of sub-

action plans by each specified authority. Each sub-group has been requested to work out the trigger mechanism relevant to their group of disasters.

Trigger Mechanism requires the disaster managers to:

- ◆ Evolve an effective signal/warning mechanism.
- ◆ Identify activities and their levels.
- ◆ Identify sub-activities under each activity/level of activity.
- ◆ Specify authorities for each level of activity and sub-activity.
- ◆ Determine the response time for each activity.
- ◆ Work out individual plans of each specified authority to achieve activation as per the response time.
- ◆ Have Quick Response Teams for each specified authority.
- ◆ Have alternative plans and contingency measures
- ◆ Provide appropriate administrative and financial delegation to make the response mechanism functionally viable.
- ◆ Undergo preparedness drills.

To understand the concept of Trigger Mechanism and incorporate it in the plans to be prepared by each sub-group, a committee had been set up under the Chairmanship of Shri M.K. Shukla, Director General, Civil Defence, which included all five Convenors of Sub-Groups, experts from ATIs and NCDM and Member Secretary, HPC. The sub committee has given its recommendations on which further follow-up action will be required.

L Concept

The L concept has been developed to define the different levels of disaster in order to facilitate the assistance to States, and the Centre. It has four levels, which are as follows:

L0 level denotes normal times which

will be utilized for close monitoring, documentation and preparatory activities. Training of search and rescue teams, rehearsals, evaluation and inventory updations for response activities will be carried out during this period.

L1 level is denoted when the disaster can be managed at the District level where the State and the Centre need to be on guard in case assistance is required for disaster relief operations.

L2 Level disaster situations are those that require assistance and active participation of State resources for management of the disaster.

L3 level disaster situation arises in case of large scale disasters that have a noticeable impact on a number of districts or states and when the State and District authorities have been overwhelmed with the disaster and require assistance from the Centre for reinstating the State and District machinery as well as rescue and relief operations.

Declaration of L3

In many cases the scale and intensity of the disaster as determined by the technical agency are sufficient for the declaration of L3 disaster. The designated technical agency/authority (IMD, etc.) has to pre-determine the parameters of intensity of each disaster by virtue of which it would be declared as L3, triggering off all necessary and subsequent actions without prior meetings or notifications during the response phase of a disaster situation.

Officially, the declaration of L3 will be the responsibility of Central Relief Commissioner for natural disasters in consultation with the concerned ministries.

In spite of the declaration of L3, the activities to be carried out by the Centre are

largely dependent on the capacity of the State authorities to manage the disaster.

The parameters for each disaster are to be set by the designated authority (IMD, etc.). It has been recommended that the concerned authority should recommend a system for the declaration of L3 that includes scientific parameters and the time for the declaration of an L3 event.

Alerts (Pre-event)

In case of any impending disaster for a specific area, the District/State and the Center need to initiate action as soon as the designated authority issues a warning. In cases where disaster warning is possible, the District/State/Center can initiate pre-disaster preparedness activities immediately after the warning is issued. In most situations the role of the Center would be to monitor preparedness activities and send information to the concerned central departments. However, the estimated scale and extent of damage is the determining factor for a District, State or Center alert.

Planning Assumptions

In disaster situations, effective utilization of resources can be ensured if the conditions of the disaster are assessed and taken into consideration during the planning phase. Disasters cause loss of property, injury and disruption of normal life and have an impact on social and physical infrastructure.

The extent of casualties and damage will reflect factors such as the time of occurrence, severity of impact, weather conditions, population density, building constructions and possible triggering of secondary events such as fires and floods. When planning a response for disasters, these assumptions can benefit in planning effective response for crisis situation.

Primary and Secondary Agencies

The designated primary agency, acting as the

Central agency will be assisted by one or more support agencies (secondary agencies) and will be responsible for managing the activities of the ESF (Emergency Support Functions) and ensuring that the mission is accomplished. The primary and secondary agencies have the authority to execute response operations to directly support the State needs.

Emergency Support Functions

During the period immediately following a major disaster or emergency requiring central response, primary agencies when directed by NCCM will take actions to identify requirements and mobilise and deploy resources to the affected area to assist the State in its response actions under fourteen ESFs (Emergency Support Functions). Each ESF is headed by a primary agency, which has been selected based on its authorities, resources and capabilities to support the functional area.

The ESF will coordinate directly with their functional counterpart State agencies to provide the assistance required by the state.

Request for assistance will be channelled from the District level through the designated State agencies for action. Based on the state identified response requirements, appropriate central response assistance will be provided by an ESF to the State or at the State's request, directly to an affected area.

Situation Reports

A situation report provides an update of relief operation at regular intervals. These reports are crucial for planning out response actions to the affected areas. Situation reports are required to be issued at the Centre through the Nodal Ministry, Ministry of Agriculture – EOC/NDM Control Room, provides these reports as well to the state

through the concerned department. These reports are an important means of communication between the concerned officials at the State and the Centre. The intervals of the reports are determined according to situation needs and at the discretion of the CRC. The situation reports provide information on the following:

- ◆ Disaster status
 - Weather condition (which determine relief operation)
 - Name and number of affected districts
 - Affected area (population, no. of villages, no. of gram panchayats, blocks, urban local bodies)
- ◆ Casualties
 - Types of casualties according to the specific disaster
 - First Aid
 - Communication and infrastructure status (each ESF according to the checklist)
 - Operational status of airport, port, railways, national highways and state roads and other nodal points
- ◆ Status of flow of relief materials
 - Food and materials
 - Through air droppings
 - Through surface transport (ship, road)
 - Through rail
 - Medical and health
- ◆ Arrivals/Departure of teams
 - Central team
 - International team
 - Defence deployment
 - Central forces

Quick Response Teams

The quick response teams at the Centre should leave for the affected site within six

hours of the event after the declaration of L3. They have to be adequately briefed by their respective department heads and Central Relief Commissioner. The teams should be self-sufficient in terms of their own survival kit and for the disaster response work. These teams should be all-hazard teams that are prepared for all disasters. The teams can be divided into two broad categories:

- ◆ Assessment teams
- ◆ Medical Response teams

1. National Quick Assessment Teams

Assessment and prioritisation of response activities requires pre-conditioning and skills to manage disaster situations effectively. Therefore there is a need for specialised teams that can work during crisis situations. These teams will have to be trained to handle multiple hazards and specialised equipment. The three primary groups for quick assessment are:

Quick Damage Assessment teams, Medical Response teams and Search and Rescue teams

Quick Damage Assessment teams

- ◆ Consist of four groups – Joint Secretaries, Area Officers, Technical Officers, Medical Officers
 - a. Joint Secretaries from the concerned ministries - Assessment of situation
 - b. Area Officers of the State - To assess and then, if required, to assist/supplement local administration needs
 - c. Pool of Technical Officers
 - c.1. Disaster Assessment Team – Power
 - c.2. Disaster Assessment Team – Telecom
 - d. Disaster Medical Assessment Team

2. Quick Response Teams

Medical Response

- a. Medical first (aid) response
- b. Disaster Mortuary Assessment team

Search and Rescue and other teams

- a. Urban search and rescue
- b. Collapsed structure search and rescue
- c. Specialised sniffer dog teams

Quick Response for Rescue and Relief in Major Disasters

In situations such as the Orissa cyclone and Bhuj earthquake, the Central Government has to respond appropriately at the earliest. To meet situations like this, perhaps there may be a need to institutionalize a Standing Committee of a Group of Ministers, comprising Ministers from the Ministries of Defence, Health, Agriculture, Railways, Surface Transport, Power, etc., to be chaired by the Home Minister. This Group of Ministers would have the benefit of the presence of the Cabinet Secretary, the three Chiefs of Staff (Army, Air Force and Navy), Secretaries of concerned Departments and all DGs of Paramilitary forces.

Special Disaster Relief Unit may be located in the Home Ministry under the charge of a Secretary level officer who would be the Secretary to the Group of Ministers referred to above. The committee is of the view that all the Armed Forces should have a dedicated component of personnel and equipment at the battalion level for disaster management.

The five Army Commands may have fully equipped centres in the five command regions at appropriate locations, which may have heavy equipment necessary to carry out relief and rescue activities in the region at short notice, with trained personnel to operate them. The details of such a set-up would be worked out in due course for incorporation into the Disaster Management Plan in

consultation with the Ministry of Home Affairs and the Ministry of Defence. An appropriate organizational set-up at the state level to cope with incoming relief and rescue measures is an urgent necessity, so that in disaster situations of colossal magnitudes, no time is lost in directing incoming relief and rescue measures to the exact locations where they are required. This too would be worked out and incorporated in the Disaster Management Plan in due course.

Special Emphasis (Policies for the same to be covered in Section II)

- ◆ Building bye-laws for each disaster
- ◆ Minimum standards and layouts for EOC relief camps and SOPs for the same
- ◆ Insurance policies for disasters
- ◆ Facilities in disaster situations for women, children and physically challenged
- ◆ Provision of maps and integration of GIS in the response plan

Emergency Operations Centre

In a disaster situation, variable factors of intensity, affected population and severity of damage need to be quickly assessed based on which government agencies can allocate and deploy relief. Therefore, in the absence of normal circumstances, an Emergency Operation Centre becomes a nodal point for the overall coordination and control of relief work. In case of an L3 disaster EOCs at the Centre, State and District have to be activated. The primary function of these EOCs is to facilitate smooth inflow and outflow of relief and other disaster response related activities. These EOCs act as bridges between the Centre, State and District. The EOCs have to be equipped with state-of-the-art communication technology and a GIS enabled system for quick and effective decision making. The structure in which EOCs are housed should also be disaster-resistant as far as possible. The EOC

Incharge who has had substantial expertise in the area of disaster management and is familiar with the area of disaster should head the EOC. Since the EOC functions and activities require quick and spot decisions, the EOC equipment as well as manpower is required to be periodically evaluated and tested. Therefore the core nucleus of the EOC will remain functional throughout the year.

Incident Command System

The Incident Command System was first established in 1970 after a wild fire outbreak in Southern California. Since then it has been widely accepted and adapted in many other states of America and now in many other parts of the world too. The Incident Command System can also be effectively adapted to the Indian system of disaster response as it is a model tool for command, coordination and use of resources at the site of the incident. It is based on the management and direction tools that experts and managers are already aware of. The Incident Command System has considerable flexibility and can grow or shrink to meet different needs. This makes it a very cost-effective and efficient management system. The system can be applied to a wide variety of disaster situations. The organization of the Incident Command System is built around five major management activities. They are:

Command

- ◆ Sets objectives and priorities
- ◆ Has overall responsibility of the incident or event

Operations

- ◆ Conducts tactical operations to carry out the plan
- ◆ Develops tactical objectives
- ◆ Organization
- ◆ Directs all resources

In the absence of normal circumstances, an Emergency Operation Centre becomes a nodal point for the overall coordination and control of relief work. In case of an L3 disaster, EOCs at the Centre, State and District have to be activated. The primary function of these EOCs is to facilitate smooth inflow and outflow of relief and other disaster response related activities.

Planning

- ◆ Develops the action plan to accomplish the objectives
- ◆ Collects and evaluates information
- ◆ Maintains resource status

Logistics

- ◆ Provides support to meet incident needs
- ◆ Provides resources and all other services needed to support the incident

Finance/Administration

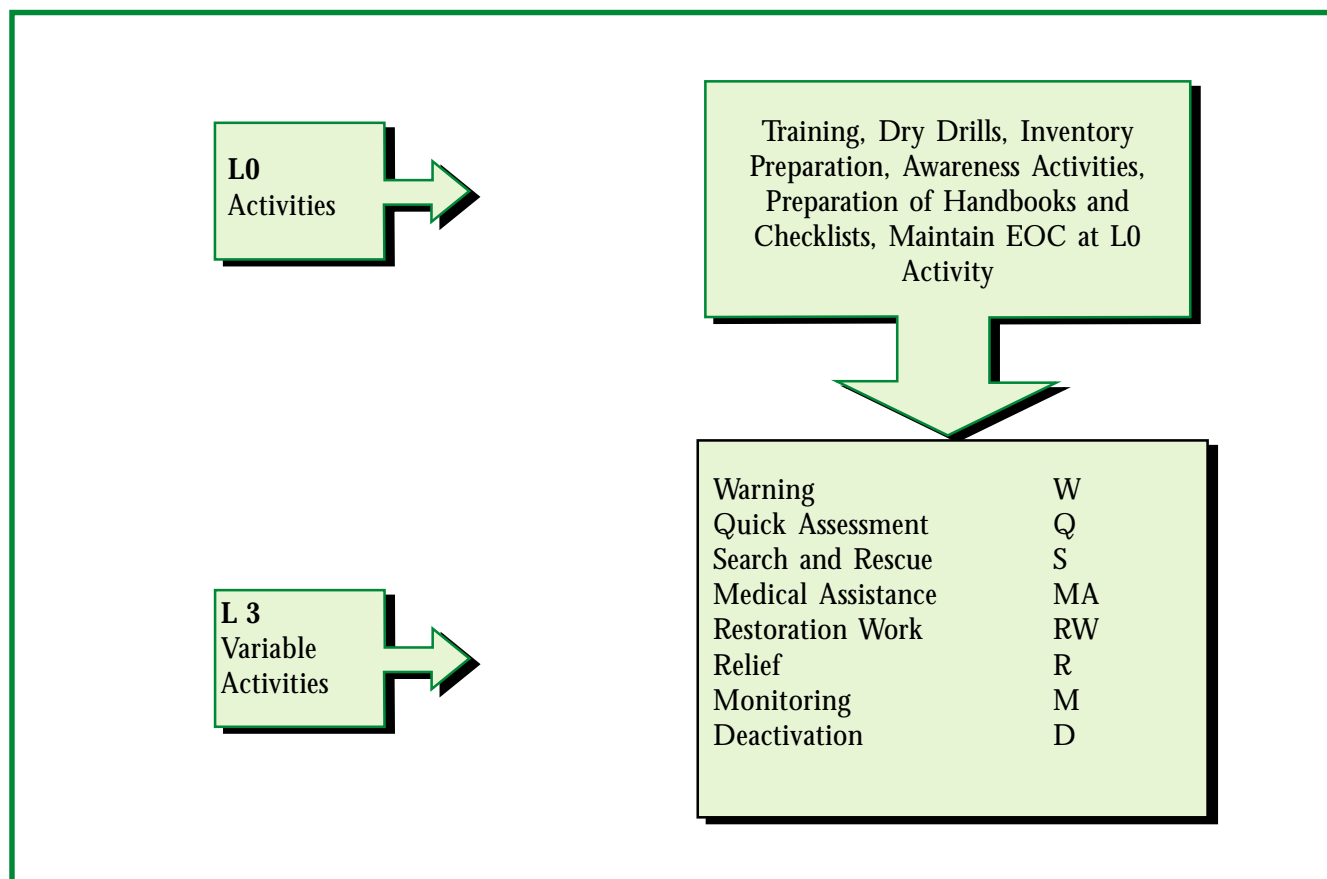
- ◆ Monitors costs related to incident

- ◆ Provides accounting
- ◆ Procurement Time
- ◆ Recording cost analyses

DISASTER SPECIFIC APPROACH TO RESPONSE ACTIONS

All activities at the level of the Ministry of Agriculture, the Crisis Management Group and other ministries under the head of Emergency Support Functions should address all aspects of the thirty one disasters identified by the HPC. The following chart broadly summarizes the activities for response actions to a disaster and the

ACTIVITIES FOR RESPONSE ACTIONS TO A DISASTER



LEGEND

- Activities to be Undertaken
 No activity

III. 2 SUBGROUP I - WATER AND CLIMATE RELATED HAZARDS

Disasters	L0	Concept of operation during L3							
		W	Q	S	MA	RW	R	M	D
Floods and Drainage Management	•	•	•	•	•	•	•	•	•
Cyclones Tornadoes Hurricanes	•	•	•	•	•	•	•	•	•
Hailstorm Cloud burst Snow Avalanches Heat & Cold Waves Thunder & Lightning	•	•	•	•	•	•	•	•	•
Sea Erosion	•			•	•		•	•	
Droughts	•	•	•		•	•		•	

III. 3 SUBGROUP II - GEOLOGICALLY RELATED HAZARDS

Disasters	L0	Concept of operation during L3							
		W	Q	S	MA	RW	R	M	D
Earthquakes	•		•	•	•	•	•	•	•
Landslides Mudflows	•		•	•	•	•	•	•	•
Soil Erosion	•		•				•	•	
Dam Bursts & Dam Failures	•		•	•	•	•	•	•	•
Mine Fires	•		•	•	•	•	•	•	•

III. 4 SUBGROUP III – CHEMICAL, INDUSTRIAL & NUCLEAR RELATED DISASTERS

Disasters	L0	Concept of operation during L3							
		W	Q	S	MA	RW	R	M	D
Chemical and Industrial Disasters	•		•	•	•	•	•	•	•
Nuclear Disasters	•		•	•	•	•	•	•	•

III. 5 SUBGROUP IV– ACCIDENT RELATED DISASTERS

Disasters	L0	Concept of operation during L3							
		W	Q	S	MA	RW	R	M	D
Road, Rail and other Transportation accidents including Waterways	•		•	•	•	•	•	•	•
Mine Flooding	•		•	•	•	•	•	•	•
Major Building Collapse	•		•	•	•	•	•	•	•
Serial Bomb Blasts	•		•	•	•	•	•	•	•
Festival related Disasters	•		•	•	•	•	•	•	•
Urban Fires	•		•	•	•	•	•	•	•
Mine Flooding	•		•	•	•	•	•	•	•
Oil Spill	•		•	•	•	•	•	•	•
Village Fires	•		•	•	•	•	•	•	•
Boat Capsizing	•		•	•	•	•	•	•	•
Forest Fires	•		•	•	•	•	•	•	•
Electrical Disasters & Fires	•		•	•	•	•	•	•	•

III. 6 SUBGROUP V – BIOLOGICALLY RELATED DISASTERS

Disasters	L0	Concept of operation during L3							
		W	Q	S	MA	RW	R	M	D
Biological Disasters	•	•	•		•		•	•	•
Epidemics	•	•	•		•		•	•	•
Food Poisoning	•	•	•		•		•	•	•
Cattle Epidemics/ Pest Attacks	•	•	•		•		•	•	•

subsequent charts mark out the activities for each disaster under each sub-group.

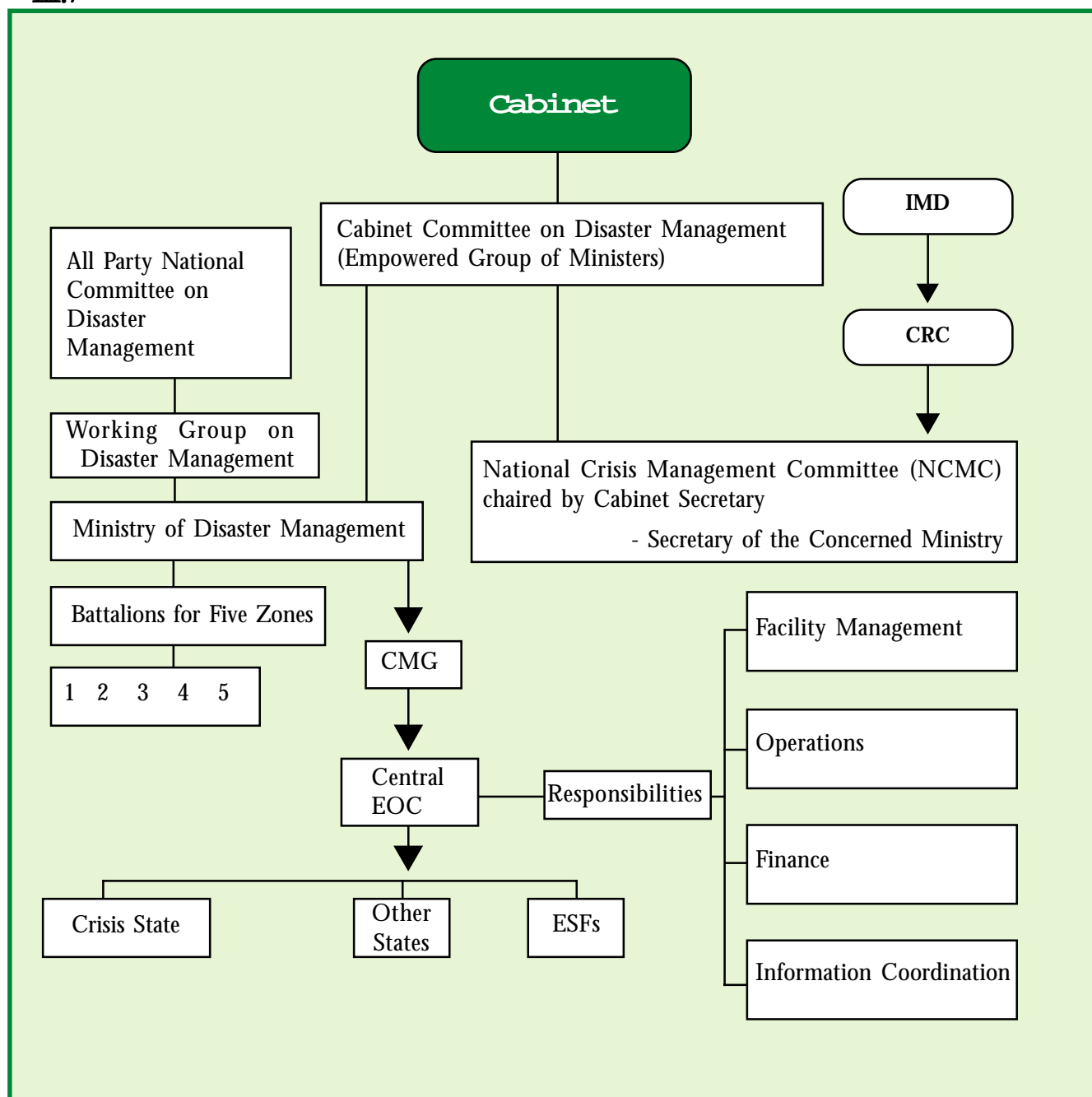
Concept of Operation for an L3 Disaster at the Centre

1. Flow Chart – Information

The effective management of an L3 disaster largely depends upon the

coordination and proper flow of information through specialised channels and networks. After the declaration of an L3 disaster, NCMC, in consultation with the technical support of IMD for natural disasters and respective nodal agencies for other disasters, becomes instrumental in mobilizing a nationwide support and network. The same has been shown in the chart below:

III.7



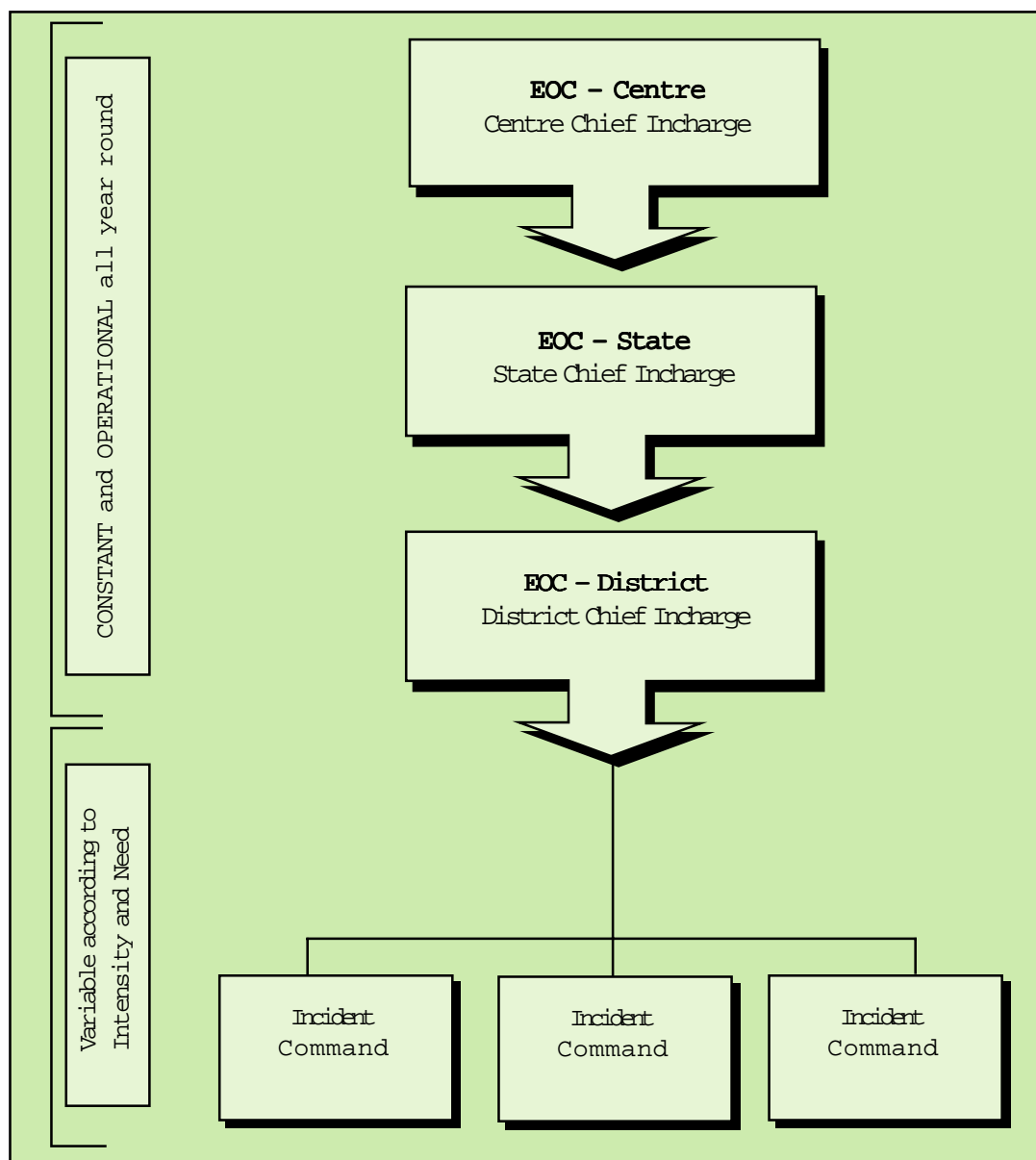
Flow Chart – Command of Coordination Activities for an L3 Disaster

The execution of response and relief activities should follow a systematic and well laid out action plan that ensures a bottom-up approach. The Incident Commanders take the most crucial and key decisions at the disaster, as they are aware of the ground realities. The District, State and subsequently the National EOC act as facilitators and overall agents of prioritising and mobilising resources from external

sources in order to meet the demands of each incident command. The incident commands are headed by officers/ personnel who are experienced and have the following broad qualifications

- ◆ Considerable experience in the field of disaster management especially in the specific disaster that has occurred.
- ◆ Have spent a few years in the field of disasters and are familiar with the physical as well as

III.8



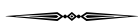
administrative set-up of the disaster affected area.

EMERGENCY INFORMATION DISKNET

The ESF (Emergency Support Function) on Information and Planning should maintain a database of all disaster related information in the form of a GIS enabled 'Disknet' that will allow easy access and retrieval of information during a disaster. The Disknet will be the hub /storage point for activities that should be carried out for response activities and at the same time continue to update itself during the L0 phase. It would enable and speed up the transfer of digital

information and prepare a mammoth knowledge base that can be tapped for assistance during a disaster. The database at the Centre can be linked with nodal knowledge institutions for various disasters. These institutions, in turn, can be linked to the State Level and subsequently the local level information institutions in order to form a well-networked countrywide database.

During the response phase of a disaster, all EOCs and each ESF can be directly linked to the disknet in order to access and know the status of relief and other requirements throughout the country.



Maps

VULNERABILITY MAPS

Natural and man-made hazards continue to occur in our life and if not properly managed hazards tend to become disasters. To avoid hazards turning into disasters and contain damages caused by them, a pre-disaster proactive approach consisting of prevention, reduction and mitigation is called for. After the occurrence of the disaster, a post-disaster reactive approach for relief and rehabilitation is required to be taken up speedily for reducing misery and suffering of the affected people.

Maps play a crucial role in identifying vulnerable and high-risk areas in the country. Specialised maps that can assist in the identification and planning of response activities have to be further developed. These maps, when integrated with a knowledge network with GIS (Geographic Information System) will become an important decision-making tool in the hands of disaster managers.

The planning and implementation of these works – prevention, reduction, mitigation, relief and rehabilitation require the following:

1. Precision Maps with
 - a. Spatial Data and
 - b. Non-Spatial Data
2. Identification of activities, agencies, resources and funds for carrying out the works
3. Implementation and Monitoring at all stages
(I0, I1, I2, I3)

The requirement of Topographical and Thematic Maps, Database – Spatial and Non-Spatial for various types of identified disasters have been described.

The following maps will be helpful during the response stage:

- ◆ Road maps of India along with metalled and unmetalled roads (Survey of India-Toposheets, respective ministry of each State, Ministry of Surface Transport)
- ◆ Railway map (Ministry of Railways) for location of Rescue and Relief trains
- ◆ Important Airports and Aerodromes in India (Ministry of Civil Aviation, Airport Authority of India, Ministry of Defence)
- ◆ Location of Public Sector Units (PSUs) (Ministry of Heavy Industries and Public Enterprises)
- ◆ Location of major hospitals and primary health centres
- ◆ Location of civil defence installations
- ◆ Location of the relief material storage site and the state EOC
- ◆ Advanced Information Technology installations

- ◆ Government sites that can be used as shelter points, relief camps and donation management activities

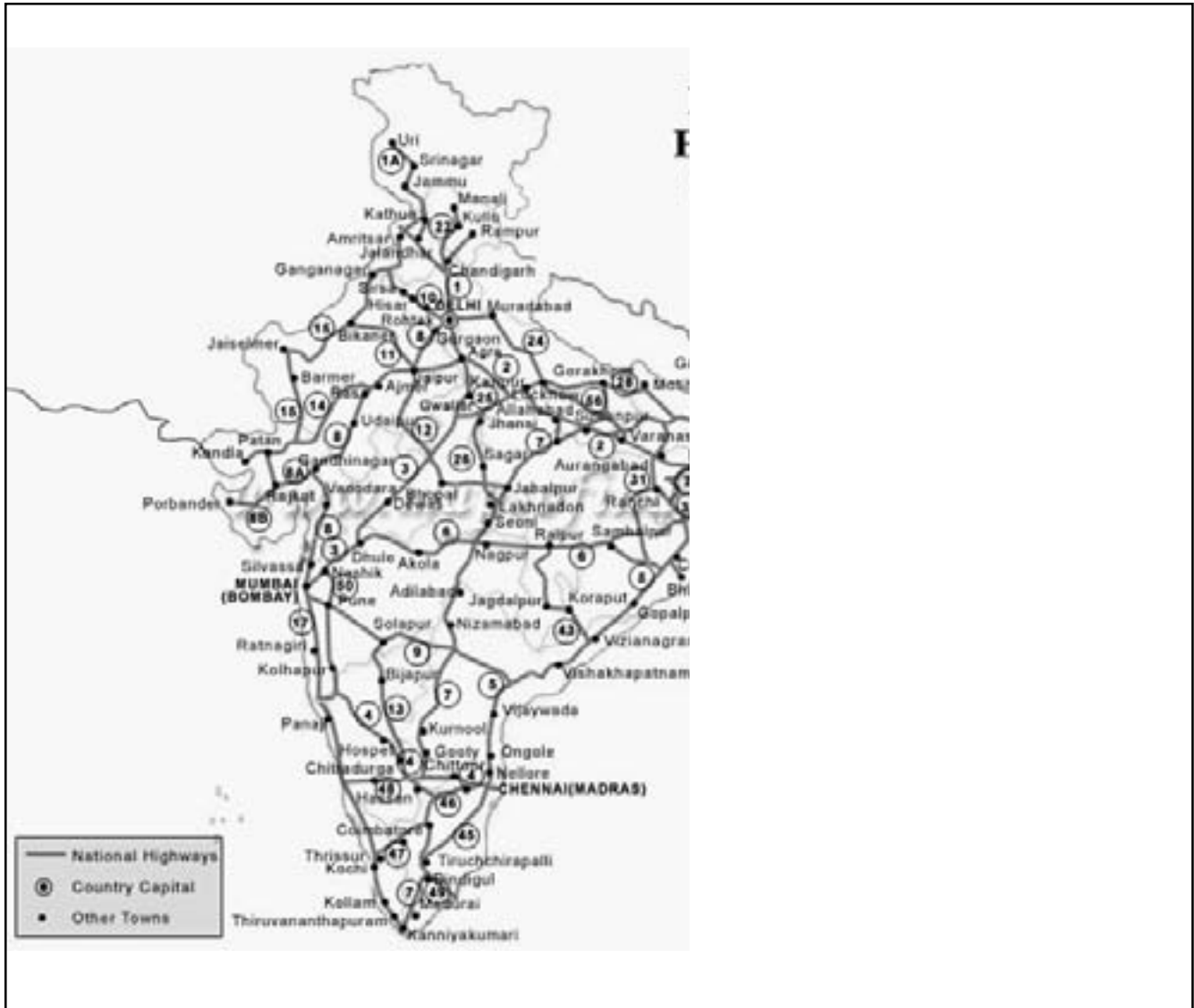
Apart from these maps, the vulnerability maps prepared by BMTPC and NATMO can provide basic maps identifying national highways and air and rail routes. These are essential to identifying key areas related to damage and the available facility for rescue and relief and accessibility during a disaster.

Currently, guidelines exist for the preparation and use of maps. All the existing maps and the new ones as recommended must be digitised so as to permit the use of GIS for planning, prevention, reduction, mitigation, relief and rehabilitation works, in addition to constant monitoring of all activities at various stages. The following maps given below can be primary base maps for disaster response. These maps can be further enriched with various theme-based layers, which can be dynamically viewed in a GIS environment.

- ◆ National Highways of India
- ◆ Railway Network of India
- ◆ Air Network of India
- ◆ Major and intermediate Ports in India
- ◆ Population Density Map of India

Base Map No.1. IV.1

This map contains country capital, other towns and national highways. This map could be added with the following theme-based layers:

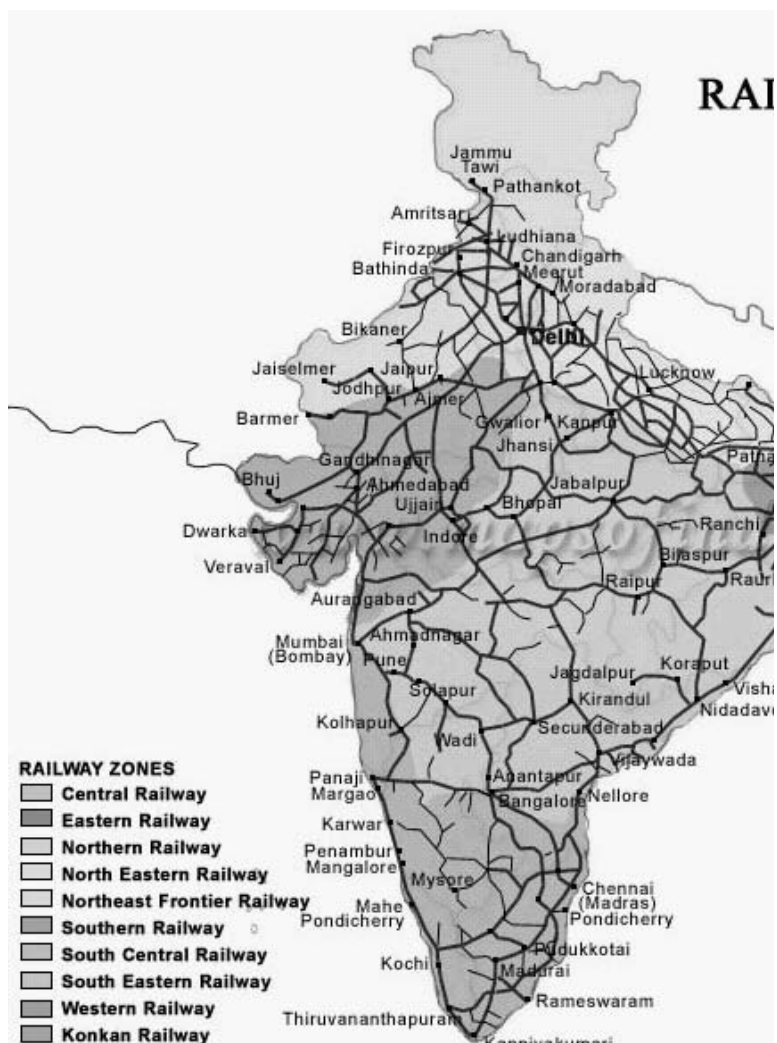


- ◆ Public sector units
- ◆ Large scale chemical factories (Ministry of Environment and Forests)
- ◆ National monuments
- ◆ Defence installations
- ◆ Locations of State bus terminals
- ◆ Inter-State road entry points
- ◆ Topologies/Hill roads
- ◆ State EOC location

* Some of the maps have been taken from the site www.mapsofindia.com. We thank them for their co-operation.

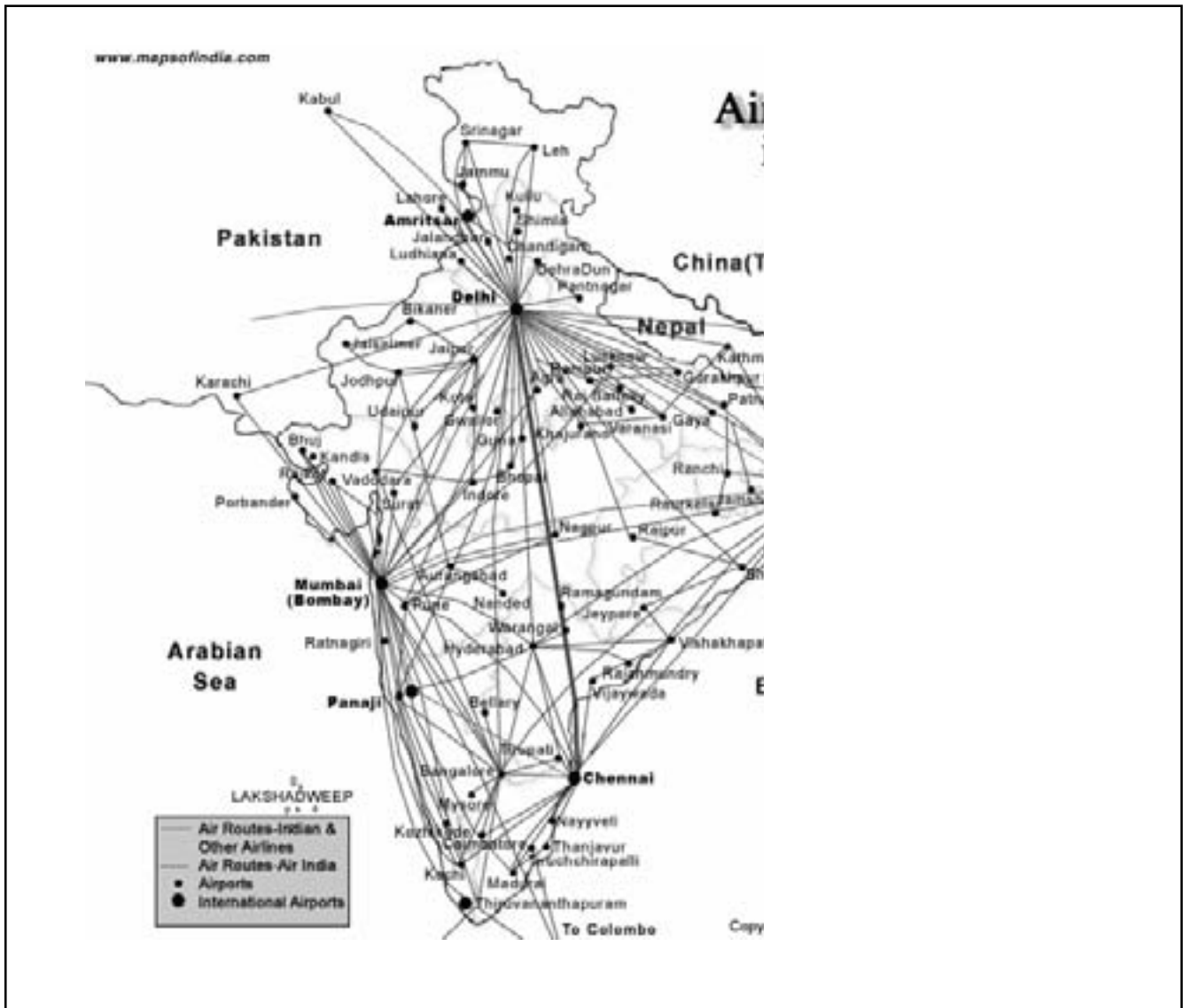
Base Map No. 2 IV.2

This map identifies all the zonal railway routes of India, the important railway stations and terminals. It can also identify the following:



- ◆ Location of relief trains
- ◆ Railway bridges and tunnels
- ◆ Location of Heavy Industries
- ◆ Train schedules and frequencies
- ◆ Major terminals
- ◆ Location of broad gauge and meter gauge tracks
- ◆ State EOC location

This map identifies air routes, airports and international airports in the country. It can also identify:



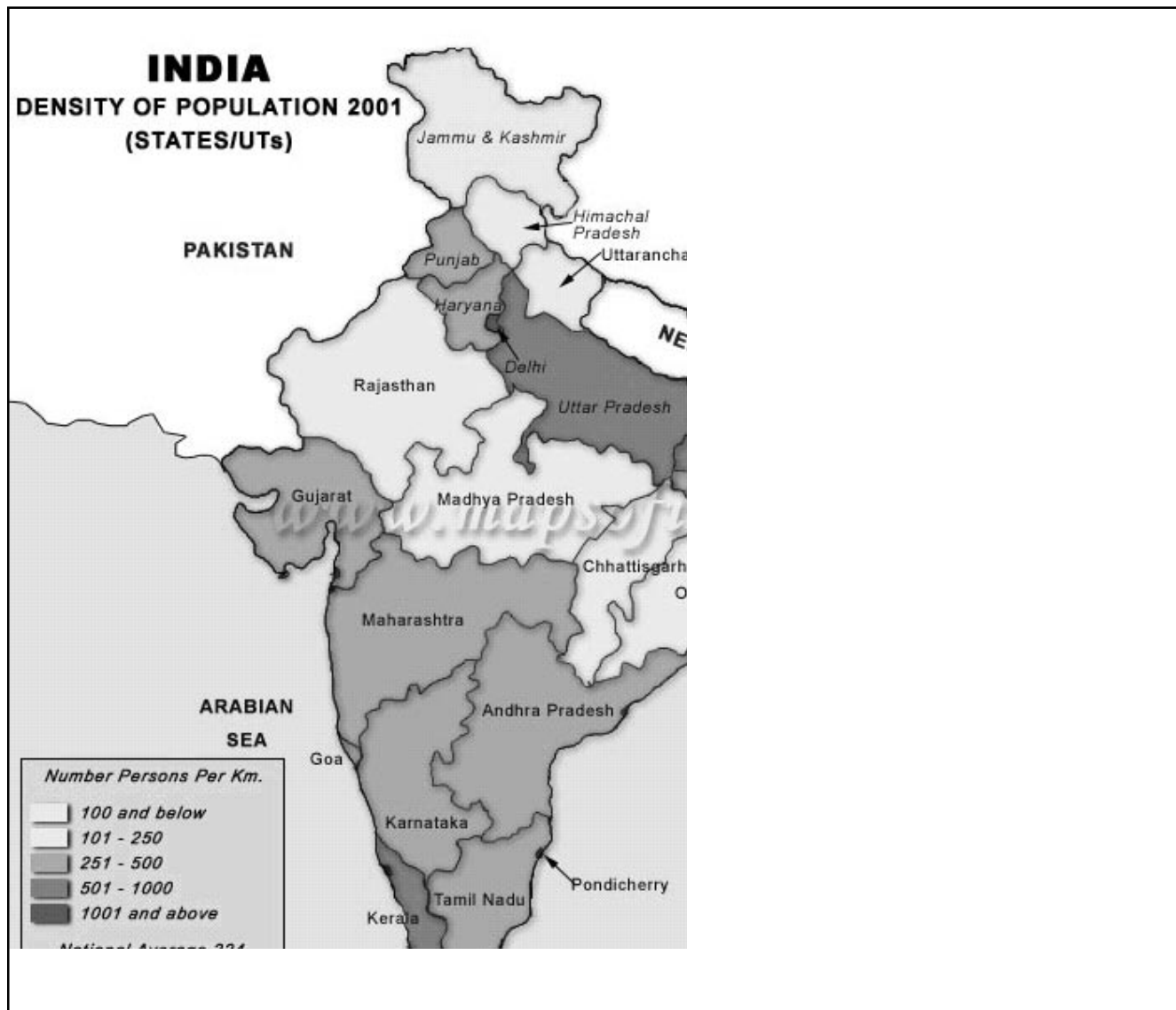
- ◆ Air force stations
- ◆ Helipads
- ◆ Defence installations
- ◆ Communication facilities (Air Traffic control rooms, etc.)
- ◆ Aircraft strengths and types
- ◆ Air control radius of each station/airport
- ◆ State EOC location

This map identifies the major seaports. It can also be used to show:



- ◆ Warehouses/Storage yards
- ◆ Dockyards and dock capacities
- ◆ Forecasting facilities
- ◆ Coastguard stations and navigation routes
- ◆ Tides
- ◆ Location of heavy industries in the vicinity of a coast
- ◆ Interlinking inland waterways
- ◆ State EOC location

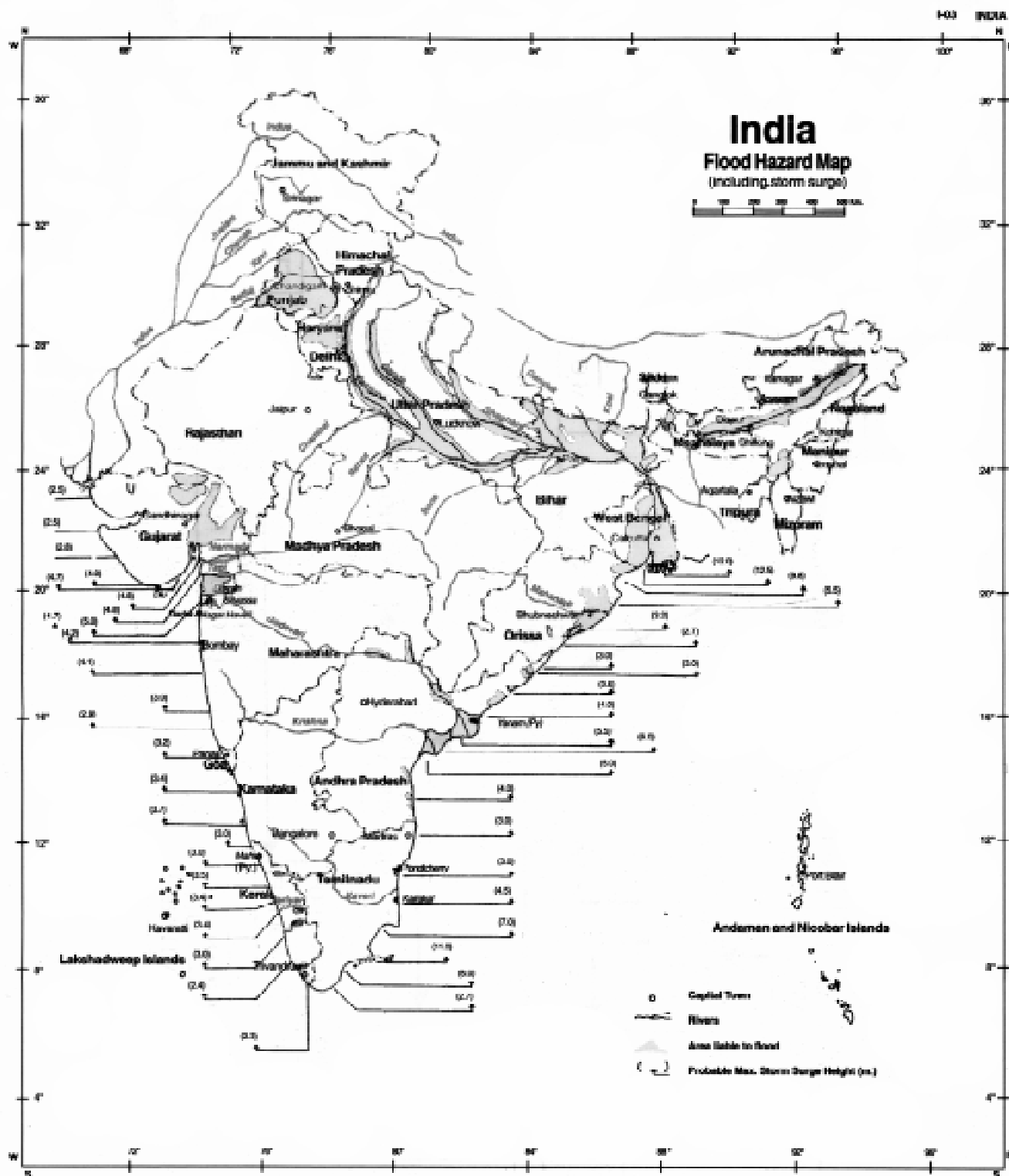
This map identifies population densities according to the 2001 census. It can also show:



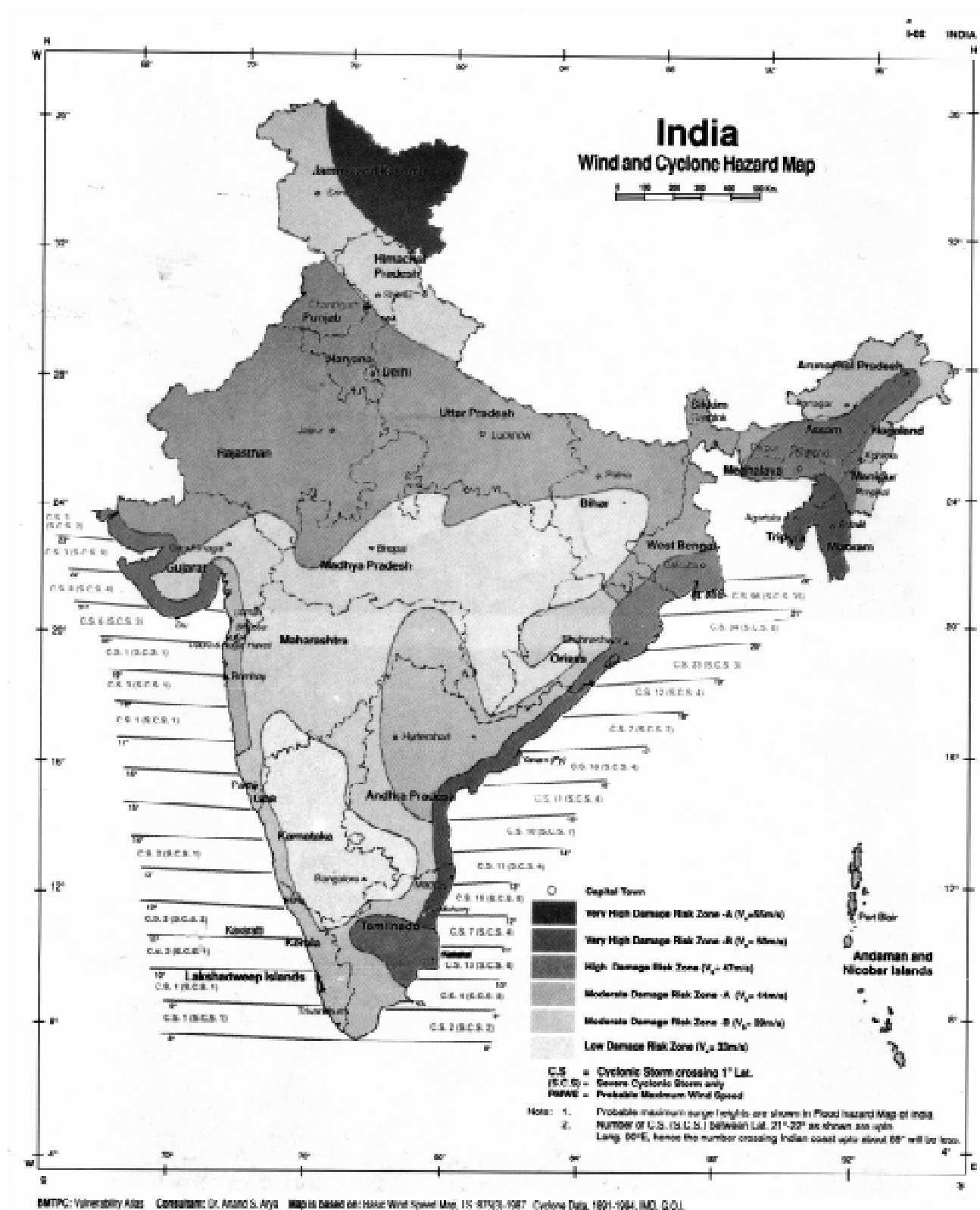
- ◆ Various languages
- ◆ Age-sex composition
- ◆ Socio-economic characteristics
- ◆ Rural-urban distribution
- ◆ State EOC location
- ◆ Education
- ◆ Percentage decadal growth
- ◆ Health Index

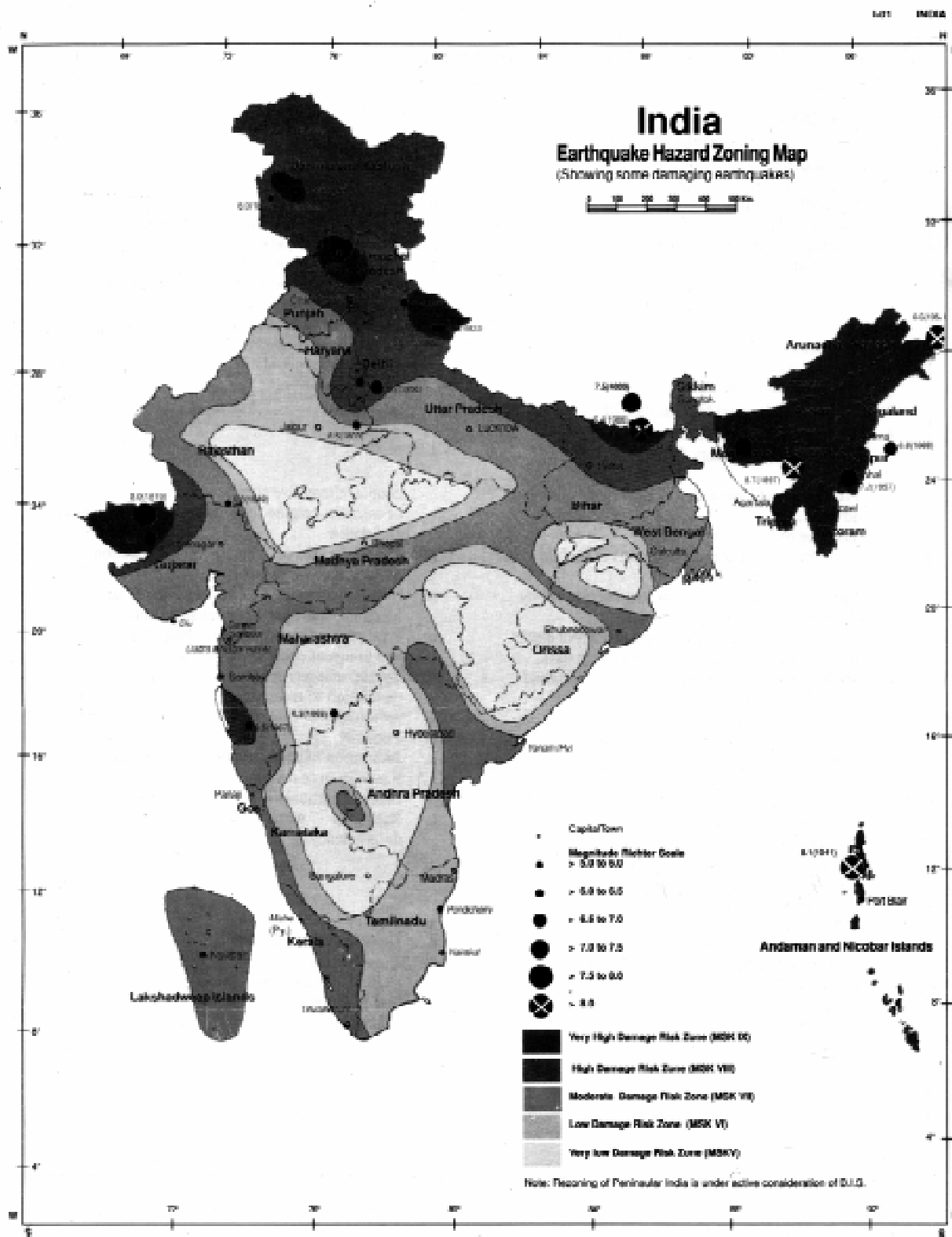
In the conventional method, maps are very precise and accurate but the time required for their preparation is more compared to the available modern methods mentioned later. While the baseline maps must be done by conventional methods, their updating and revision can be planned with the other one. This combination will

give quick results and also be cost-effective. The method to be adopted will depend upon the actual area to be surveyed and the purpose of survey, whether new map or revised map, the time required for completion and quality of the product in relation to the purpose and the availability of funds.



BMTPC: Vulnerability Atlas Consultant: Dr. Arund S. Arya Map is based on: Flood Atlas, 1967, G.W.C., G.O.I. Cyclone and PHF Atlas, 1971-1974, I.M.U. G.O.I.





BMTPC : Vulnerability Atlas

Consultant : Dr. Anand S. Arya

Map is based on : Seismic Zoning Map, I.S.:1893-1984

Earthquake Catalogue (M&S), I.M.D., G.O.I.

Quick Response

QUICK RESPONSE FLOW CHART

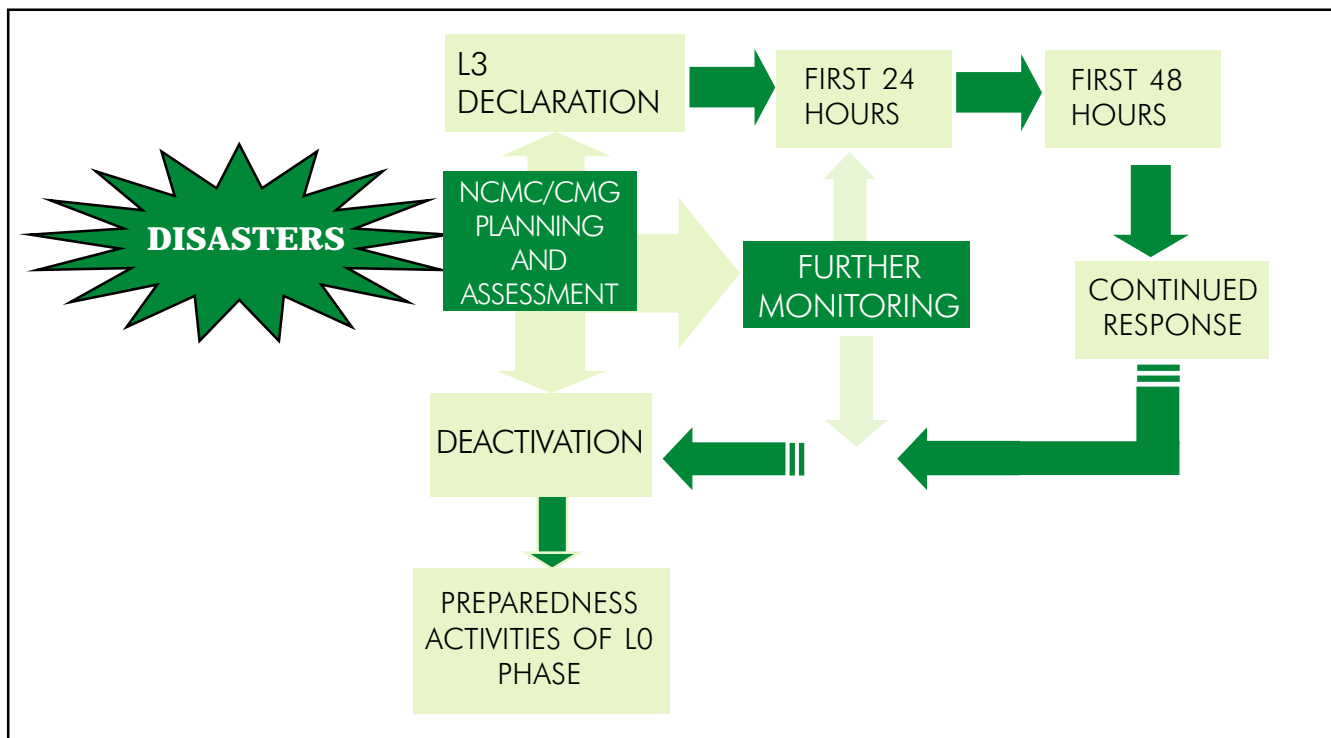
All activities that are important to be a part of the quick response mechanism must adhere to the following sequence of events:

In case of any disaster the CMG Meeting and assessment of the situation either after the disaster or after the alert stage is the next step. However, after the meeting and after the assessment there could be three possible scenarios according to the disaster, which will lead to further action of an L3 declaration, further monitoring or if the disaster is well within the control of the State departments, can lead to deactivation. The chart (V.1) below summarizes the activities of quick response.

The quick response mechanism is greatly or largely dependent on the preparation that has been done during the L0 phase and how well equipped and prepared the disaster team is. Therefore, in order to provide maximum response during the initial phase of a disaster, it is imperative to maintain a calendar of dry drills and constant equipment checks throughout the year.

The quick response mechanism begins

Precise actions, procedures and responsibilities have to be laid down well in advance in order to ensure timely response in case of any disaster. Therefore, a mechanism that takes into account multiple hazards and basic preparedness has to be articulated in the form of Quick Response Teams, Quick Assessment Teams, Reporting Procedures, Checklists and Handbooks. The mechanism also lays down crucial parameters, requirements and organizational composition of Emergency Operations Centres and Incident Command Systems.



with a pre-disaster warning during the alert stage. This may not be feasible in cases where a reasonable warning may not be possible such as earthquakes and flash floods or accident related disasters.

PRE-DISASTER WARNING AND ALERTS

Case I - Warning

Onset of disaster is indicated through forecasting, and the information should be communicated to the community likely to be affected through a warning system.

[Indiscriminate warning may result in

non-responsiveness of the people. It is therefore necessary that with respect to every disaster, a responsible officer is designated to issue the warning].

Disasters for which adequate warning is possible include floods, droughts, cyclones, heat and cold waves, pest attacks, epidemics, industrial and chemical disasters, fires, and landslides.

Agencies authorised to issue warning

At the National Level, the designated authority is solely responsible to issue the warning.

Disasters	Agencies
Earthquakes	Indian Meteorological Department
Floods	Indian Meteorological Department
Adverse climatic conditions & Cyclones	Indian Meteorological Department
Epidemics	Public Health Department
Road accidents	Police
Industrial and chemical disaster	Industry, Police, (Designated Agency)
Landslides	Indian Meteorological Department
Fires	Fire Brigade, Police

As soon as the warning has been issued the District/State level machinery should get into the act of response through detailed preparation of the following:

Important Elements of Warning

The following aspects may be considered for dissemination of warning:

- ◆ Dissemination of warning to common people. This system may range from alarms (fires), sirens (industrial disaster), to public announcement systems like radio, television, loud speakers, hoisting of flags (cyclones, floods, and landslides).
- ◆ Once the warning is issued, it should be followed up with subsequent warnings in order to keep the people informed of the latest situation.
- ◆ Evacuation.
- ◆ Stand-by material resources.
- ◆ Stand-by human resources.
- ◆ Updated inventories.
- ◆ Updated communication system.
- ◆ Designation of an Incident Commander.

Planning assumptions

- ◆ Amount of time needed for evacuation will depend on the nature and intensity of the disaster.
- ◆ If the event can be monitored, such as a cyclone, the authorities would have a day or two to get ready.

Factors

- ◆ Shelter sites should be within one hour walk and within 5 km of dwellings.
- ◆ Alternate routes are to be planned in case of flood.
- ◆ All evacuations should be reported to the District Collector and the Superintendent of Police prior to the evacuation.

- ◆ For appropriate security and law and order, evacuation should be carried out with assistance from community leaders and NGOs.

- Care should be taken such that the evacuation routes are not blocked.
- Always evacuate the entire family together as a unit.
- In view of inadequate transport or limited time, encourage community emergency evacuation in the following order:
 1. Seriously injured and sick
 2. Children, women and physically challenged
 3. Old

Emergency evacuations

- ◆ Checklists should be issued for evacuation for each family in vulnerable areas.

Evacuation of marooned persons

- ◆ Evacuation must be carried out within the shortest possible time.
- ◆ The marooned persons must be transferred to the transit camps.
- ◆ Emergency transport for the seriously injured by appropriate means such as speed boats etc should be ensured.
- ◆ A senior medical officer should accompany the rescue team.
- ◆ Water and food supply should be according to the “Standards of Food” on the lines recommended by “SPHERE”

Standards to be developed for evacuation during alerts

- ◆ Manual for evacuation
- ◆ Factors to be considered for evacuation
- ◆ Standards for Food

DISASTER SPECIFIC WARNINGS

Tropical Cyclones

Severe tropical cyclones are responsible for large casualties and considerable damage to property and agricultural crop. The destruction is confined to coastal districts, and the maximum destruction being within 100 km from the centre of the cyclones and on the right side of the storm track. Principal dangers from a cyclone are:

- I. Very strong winds
- II. Torrential rains
- III. High storm tides

The following section exemplifies the warning systems in India for tropical cyclones.

Cyclone Warning System In India

The Indian Meteorological Department (IMD) is responsible for providing tropical cyclone warnings in India. The tropical cyclone warning service is one of the most important functions of the IMD and it was the first service undertaken by the Department, which is now 125 years old. In fact, the cyclone warning system started in India (which included at that time other countries of the sub-continent) in a nominal way in as early as 1865 but was not supported by adequate meteorological observation and analysis capabilities at that time. With time, the cyclone warning services of IMD have continuously been updated and today, **it is one among the modern cyclone warning services in the world.** Details of cyclone warning system in India are available in the Cyclone Manual (IMD, 1979, updated time to time) and also WMO TCP report No. 21, 26 and 28 (Mandal, 1991).

Organization

The Indian Meteorological Department has a well established organizational set-up for observing, detecting, tracking and

forecasting cyclones and issuing cyclone warnings whenever a cyclone develops in the Bay of Bengal or the Arabian Sea. Cyclone warnings are provided through three Area Cyclone Warning Centres (ACWCs), located at Kolkatta, Mumbai and Chennai and three Cyclone Warning Centres (CWCs) at Bhubaneshwar, Vishakapatnam, and Ahmedabad. These centres have distinct responsibilities area wise covering both the east and west coasts of India and the oceanic areas of the Bay of Bengal and the Arabian Sea, including Andaman and Nicobar Islands and Lakshadweep. The cyclone warning bulletins are issued to All India Radio and Doordarshan for broadcast/telecast in different languages. On an All India basis such warnings are issued to All India Radio and Doordarshan, New Delhi from the Cyclone Warning Division at HQ office where RSMC-Tropical Cyclones, New Delhi is co-located. IMD, through its HQ office at New Delhi provides cyclone information to the Control Room and Crisis Management Group set up in the Ministry of Agriculture, Government of India which is finally responsible for co-ordinating actions of various other Central Government Agencies for taking effective disaster mitigation measures. Cyclone Warning Division at New Delhi also caters to the need of international requirements such as issue of Tropical Weather Outlook and Cyclone Advisories to its neighbouring countries which are members of the WMO/ESCAP Panel on Tropical Cyclones. Considering the cyclone warning capabilities of IMD, New Delhi has been designated as Regional Specialized Meteorological Centre (RSMC) by WMO which is one among six such centres in the world trusted with cyclone warning services for their area of responsibility. The entire cyclone warning work is coordinated by the Deputy Director General of Meteorology (Weather Forecasting) at Pune and Deputy Director General of Meteorology (Cyclone Warning) at New Delhi.

Forecasts

Cyclone warnings are not issued before twenty four hours anywhere in the world. Sudden changes in track or intensity often go undetected. Anomalous cyclones, like looping cyclone, though a least probable event, are difficult to predict. Therefore, disaster planning and management strategy has to take into account such limitations. Means must be kept ready to evacuate a large number of people at short notice, even in inclement weather.

Tropical cyclone warnings

The bulletins and warnings issued in connection with tropical cyclone in India may be divided into the following broad categories:

- (i) Warning bulletins for shipping on the high seas,
- (ii) Warning bulletins for ships plying in the coastal waters,
- (iii) Port warnings,
- (iv) Fisheries warnings,
- (v) Warnings for the State and Central Government officials (two stage warnings),
- (vi) Warnings for recipients who are registered with the department (Album page warnees),
- (vii) Aviation,
- (viii) Warnings for the general public,
- (ix) Farmer's Weather Bulletin.

Cyclone Advisories

Information concerning tropical cyclones and warnings is included in the cyclone advisory/cyclone warning bulletins. Normally during the alert stage, one advisory every six hours may be sufficient. However, in the case of a sudden change in intensity and path, special bulletins are issued at any time. When the cyclone is close to the coast, the advisories are issued at more frequent

intervals. Normally, the following items are included in a cyclone advisory:

- ◆ Advisory heading (date, time, name or identification of the cyclone, name of the forecasting office and type of the message).
- ◆ Location (bearing and distance of the centre of the cyclone from some important city in the area where it is expected to make landfall), present direction, movement and speed.
- ◆ Indication of the cyclone's current intensity in terms of wind speed and central pressure
- ◆ Forecast movement of the centre
- ◆ Landfall point and landfall time (if close to the coast, from warning stage onwards).
- ◆ Forecast weather- that is, maximum wind speed, heavy rainfall areas, height of the storm surge and areas likely to be affected.
- ◆ Advisory for evacuation (Optional).
- ◆ Cautionary advices to the ports and small craft.
- ◆ Advice to fishermen.
- ◆ Time and source of next advisory bulletin.

In India and in many countries, in addition to the information regarding wind speed, its effect on coastal area is also mentioned in the cyclone advisory bulletins. For this the Saffir-Simpson Hurricane Scale (SSH), modified to suit local conditions, is employed. The language of the advisory may differ for different groups being warned to the extent that the advice pertinent to each group may be different although general information regarding the cyclone position, intensity, expected direction of movement and speed, etc., remains the same. For example, advice contained in warning issued to ports or near and offshore

activities may not be pertinent to inland activities.

Example of Cyclone Warning Bulletins

TTT Cyclone warning Bay of Bengal 040300 utc. Ships observations absent. But believe cyclonic storm with estimated central pressure 992 hpa west central bay centred within half degree latitude fifteen degree north longitude eight and half degrees east moving north-west at eight knots. Affecting an area extending two hundred nautical miles wind force 37 knots, occasionally increasing to 47 knots in central bay to a distance of 100 nautical miles from centre.

meteorological centres in the maritime States include suitable warnings for fishermen. These general bulletins are broadcast at a fixed time at midday by the AIR stations and are intended to meet the requirements of the public in general and the needs of various categories of officials in particular.

In addition, special AIR bulletins containing cyclone alert messages issued 48 hours prior to the commencement of the adverse weather and tropical cyclone warning messages issued 24 hours prior to the commencement of the adverse weather in the coastal areas due to an approaching tropical cyclone are broadcast. These broadcasts are

Expected wind speed	Expected damage
6-90 km/h	Tree branches broken off; so damage to Kutchha houses
90-120 km/h	Trees uprooted, Pucca houses damages, communications disrupted
Above 120 km/h	Big trees uprooted; widespread damage to houses and installations. Total disruption of communications

May intensify and recurve northwards during next 24 hours.

Tropical Cyclone Bulletins to All India Radio (AIR) for Broadcast.

In general, weather bulletins are issued by the meteorological offices to the AIR stations for broadcast in the midday transmissions. Areas covered by the bulletins are the areas served by the respective AIR stations. These bulletins include (i) a summary of the past weather, (ii) special weather warnings for public services such as the Public Works Department, Irrigation, P & T, Railways, etc., and (iii) a general forecast including warnings. (ii) and (iii) are valid until the morning of the second day. The summary of weather includes information about tropical cyclone and depressions affecting the area. The centre of the system is included with reference to the nearest well-known place, latitude and longitude. Warnings in bulletins once included are repeated in the subsequent daily bulletins also as long as adverse weather is anticipated. In addition,

meant to alert the agencies entrusted with the responsibility of carrying out cyclone preparedness works and also the general public.

The coastal districts likely to be affected by the storm are mentioned in the first sentence of the bulletins and the same is repeated again at the end of the bulletin. The type of damage likely to be caused by strong winds of various magnitudes along with the expected wind speed is included. For the purpose of indicating the type of damage, the help of the table given above is taken. These bulletins are serially numbered.

Note: The above stages are being revised to include more steps above 120 km/h in a similar line as is being used in USA. USA uses Saffir-Simpson Hurricane Scale (SSH scale), which consists of five stages (categories), to indicate expected damage. According to SSH scale, the category I storm is the weakest hurricane (64-82 knots) and category 5 is the strongest (with 135 knots or more). Recently Charles Guard and Mark Lander have suggested modification to the

scale named as Saffir-Simpson Tropical Cyclone Scale (STCS).

The height of the storm surge is included in the bulletin in meters and it represents height above the normal tide level.

Example

Very severe cyclonic storm (vscs) situated at 18 1200 utc about 250 km south east of Ongole likely to strike coast between Ongole and Machilipatnam in the next 12 to 24 hours.

Cyclone bulletin no ——— issued by cyclone warning centre ——— at ——— hrs IST of ——— (date) for repeated broadcast aaa cyclone warning for Nellore, Prakasam, Guntur, Krishna, west and east Godavari and Visakhapatnam districts aaa very severe cyclonic storm (vscs) located about 250 km south east of ongole near lat ———n, long ———e this evening aaa expected strike coast between Ongole and Machilipatnam by midday saturday nineteenth aaa strong winds reaching 150 kmph uprooting big trees and causing widespread damage to houses and installations and total disruption of communications likely Prakasam, Guntur, Krishna and west Godavari districts from saturday early morning aaa tidal waves five meters above normal tide likely inundate coastal areas these districts midday saturday at the time of cyclone crossing coast aaa very heavy rain likely cause floods in these and Nellore, east Godavari and Visakhapatnam districts aaa “state of sea likely to be phenomenal” aaa fishermen are not to go out in the sea aaa. Information

about storm warning signals is also included aaa above warning is for Nellore, Prakasam, Guntur, Krishna, west and east Godavari and Visakhapatnam districts.

These bulletins are generally issued at the time of each sea area bulletin. The frequency of the bulletin can be raised when the tropical storm is tracked with the help of radar and previous warnings issued need modification.

A third set of bulletins issued to AIR is the coastal weather bulletins. Whenever a cyclonic storm is likely to affect the Indian coastal areas, Coastal weather bulletins issued by the Indian Meteorological Department are broadcast in the All India News Cycles of All India Radio from New Delhi in English and in the regional language of the area affected. These bulletins are issued three times a day.

Depending on the scale and extent of predicted disasters, in some cases the Central Government will have to actively participate in the pre-disaster preparedness stage and subsequently if the disaster is declared L3. These disasters are as follows:

◆ Floods

◆ Droughts

The active participation of the Central Government will include the following:

- ◆ Deploy adequate defence services
- ◆ Do aerial surveys as part of preparedness
- ◆ Identify key access routes

1. Kolkata	Coastal districts of West Bengal and Andaman and Nicobar Islands
2. Bhubaneswar	Coastal districts of Orissa
3. Visakhapatnam	Coastal districts of Andhra Pradesh
4. Chennai	Coastal districts of Tamil Nadu, Pondicherry, Kerala, Karnataka and Lakshadweep
5. Mumbai	Coastal districts of Maharashtra and Goa.
6. Ahmedabad	Coastal districts of Gujarat states

- ◆ Structural protection for railway stations/airports
- ◆ Deploy and send relief materials to affected areas
- ◆ Ensure deployment of special air and rail transport

(These activities, however, will be in support of the State initiatives and their requirements of assistance.)

Case II - No Warning

In case of no warning the activities and inventories maintained during the L0 stage have to become operational.

Disasters for which warning is not possible include earthquakes, landslides, mud flows, tornado, flash floods, hurricanes, dam bursts, snow avalanches, thunder and lightning, mine fires, chemical and industrial disasters, nuclear disasters, all accident related disasters and food poisoning.

De-Warning

In case the disaster does not occur as predicted, the Indian Meteorological Department issues a de-warning that is in turn to be issued by the likely affected Districts and State. This will initiate the process of retrieval of extra resources (man/material) that have been kept as part of preparedness after the warning was issued.

The de-warning by IMD will initiate the following:

- ◆ Dissemination of De-warnings by respective districts and states
- ◆ EOC will start functioning for L0 activities again
- ◆ The defence/search and rescue/medical teams will also return to L0 activities
- ◆ Material resources will be returned/stored back

RESPONSE PLANNING

Planning of the operations has to be done quickly and at regular intervals. To mobilise resources at a national level the National

Crisis Management Committee under the Cabinet Secretary plays a crucial role. All planning aspects are taken care of by NCMC and the execution of these is undertaken by the CMC (Crisis Management Committee).

Once the alert stage has been activated, within the first **two hours** of the disaster event the Central Relief Commissioner's office or the Emergency Operation Centre is responsible for holding a meeting of the empowered group of ministers and the Central Coordinating Officer of each ESF. They will meet as and when needed at the request of the CRC. This group under the leadership of the CRC is responsible for the following during the course of this meeting:

- ◆ Review situation reports received from the affected state.
- ◆ Review and document the resources (manpower and material) support that has already been dispatched from the Centre.
- ◆ Address response issues and problems that require national level decisions or policy direction.
- ◆ Take decisions on more resources and relief material that will be required.

Location of the meeting

The meeting will be held at the CRC office in the NCCM or NDM-Control room under the Nodal Ministry (Ministry of Agriculture).

The first meeting should be held within two/three hours of the event parallel to the other activities that have been initiated at the declaration of L3. The activities that get initiated parallel to the CRC meeting are as follows:

- ◆ Briefing of personnel at the central ministries for the first assessment.
- ◆ Departure of first assessment team.

- ◆ Departure of first search and rescue team with MFR and CSSR personnel, if required.
- ◆ Aerial survey of damage.

ARRIVAL POINT

Material/Manpower Flow chart of Central Information and Arrival Centre at Airport

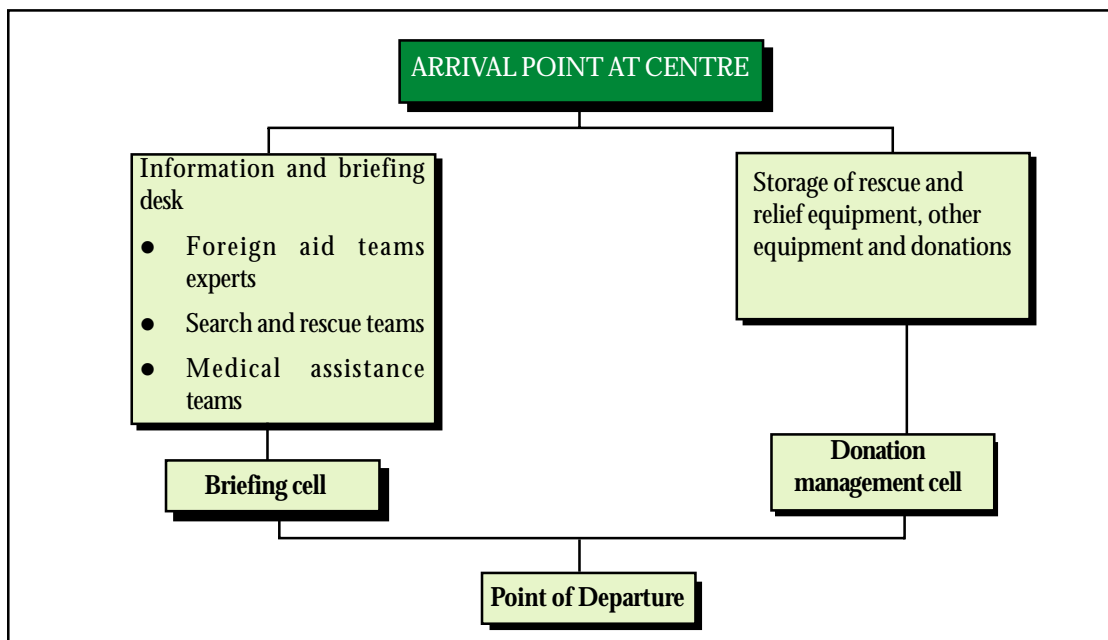
The response activities require active and effective coordination of ground operations. The traffic junctions such as airports, railway stations and bus terminals require to establish 'Information and Arrival Centres' that are the key points for arrival and dispatch of relief materials and rescue workers. The incoming assets from within and outside the country have to be clearly allotted and assigned to disaster sites with the help of various information centres. This information centre will function at a national level and therefore will have to account for all international aid and related formalities.

- ◆ **Arrival point:** The transport junctions where relief materials as well as manpower can be collected for response

activities. It could be the international/national airports or railway stations.

- ◆ **Information and briefing desk:** The manpower will be briefed on the status of disaster, the most affected areas and the key agencies and personnel at the affected state. It will also assist international agencies, arrival of relief material as a priority task.
- ◆ **Storage:** Storage facility at the arrival point where material is categorised and if needed, packed for dispatch.
- ◆ **Briefing cell:** This cell will give specific briefing for different types of field workers.
- ◆ **Donation management cell:** The donations from other states and international agencies are packed and accounted for further distribution.
- ◆ **Point of departure:** Material and manpower are dispatched according to the requirements issued by the EOC at the centre.

V.2



Material/Manpower Flow chart - Information and Arrival Centre at Airport - Affected State

This **Emergency Operations Centre (EOC)** is activated at the discretion of the CRC based on the resource and coordination scale of the particular disaster. A similar information centre is also required at the state level where all the relief and other facilities can be directed to the affected areas directly according to the needs of the incident commanders and the state EOC.

NATIONAL DISASTER QUICK RESPONSE MECHANISM

Declaration of L3

The declaration of the L3 is done after

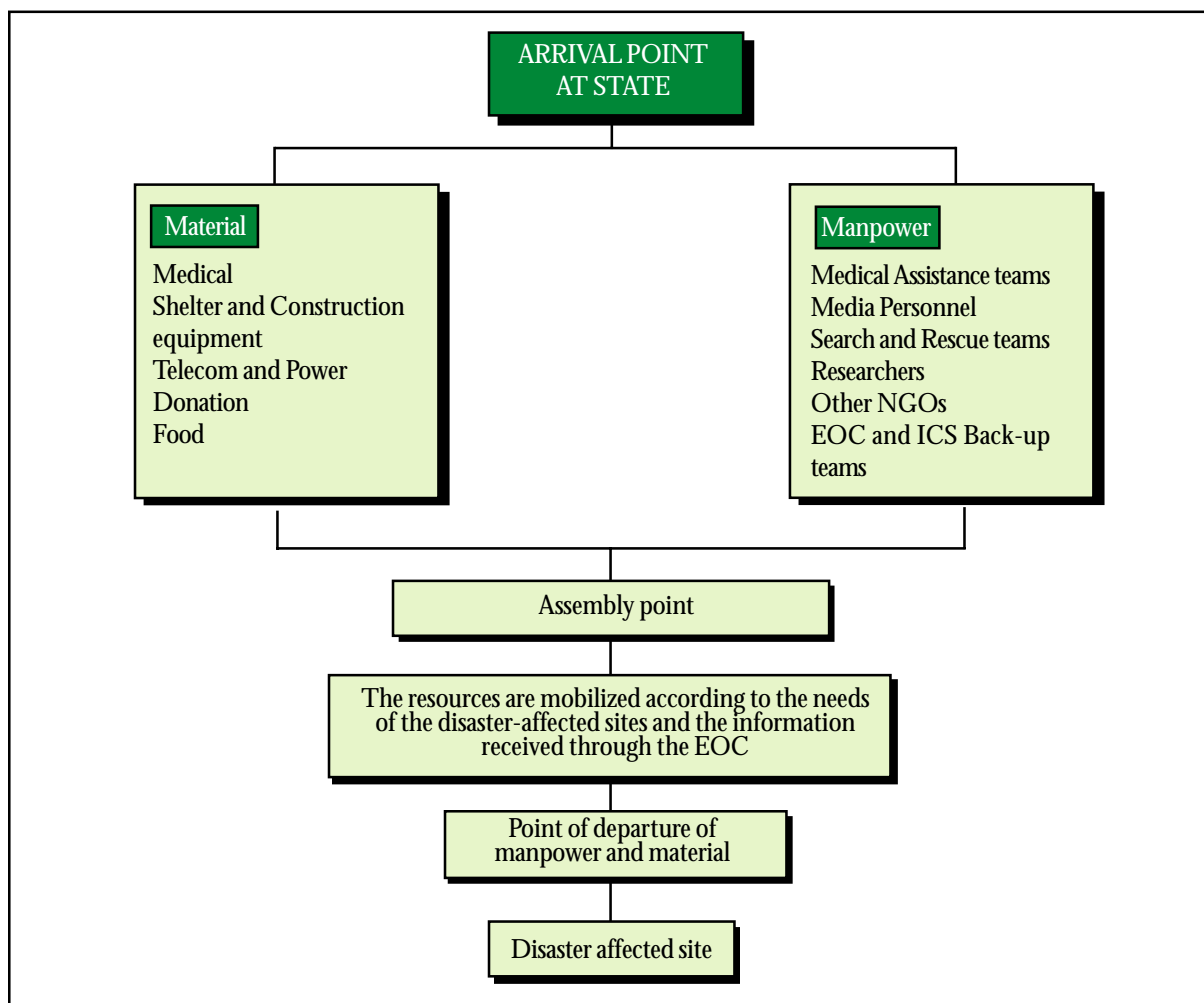
the event has occurred by the Central Relief Commissioner in consultation with the NCMC and the Empowered Group of Ministers

Factors taken into considerations for the declaration of L3

- Parametres set by designated technical authority
- Capacity of State and District to manage the disaster independently

The first assessment team is also headed by the Nodal Officer (Joint Secretary/Secretary) of the Ministry of Agriculture/Home. The CRC's primary responsibility is to coordinate response activities at the Centre and not go to the disaster site. The CRC should be informed by the nodal officer (Ministry of Agriculture)

V.3



before the first assessment team has left.

FORMATS REQUIRED:

Format of declaration of L3

Format of deployment of first assessment team

Handbook for CRC for first 24 hours

Proposed responsibilities of the CRC for the First Meeting

- ◆ Official declaration of L3
- ◆ Information on meetings of the CMG and Crisis Management Group.
- ◆ Arranging for all required inventories from the concerned ministries
- ◆ Official appointment (according to inventories) of all nodal officers for each ESF
- ◆ Once the CRC has been informed about the first assessment team, it is left to the CRC's discretion to nominate any other concerned ministry to be part of the first assessment team
- ◆ Activation of EOC at Centre
- ◆ Information of situation to all cabinet ministries
- ◆ Identify the nodal transport points for the affected state

After the declaration of L3, the first CMG meeting as well as the first assessment team are parallel functions that should be completed within 2 hours of the event.

Quick Response Teams

The Centre requires quick and well-trained teams for responding to a disaster. The magnitude might be so large that medical and other response teams might be required even before any initial assessment. However, a quick assessment for further planning is also required. Therefore, the response teams can be divided into two sections:

- ◆ Assessment Teams – Medical, Power, Telecom, Infrastructure take prime importance

- ◆ Response Teams - Medical, Power and Telecommunication take prime importance.

First 24 hours

First assessment team

The first assessment team will mainly comprise of senior (joint secretary level) officers that are required to make a first/preliminary assessment of damage.

Composition of the designated officers and resources for assessment

Ministry of

- ◆ **Home, Agriculture, Health, Communication, Power, Defence, Aviation**

Apart from these seven ministries, any further addition is left to the discretion of the CMG

- ◆ **Science and Technology, Railway, (for example)**

Checklist(1) of Survival kit

Checklist(1) of Assessment equipment

Formats for National First Assessment

National Media Release

National Assessment Report which should contain

- a) geographic estimate of damage area;
- b) injury and fatality report;
- c) lists of damaged facilities;
- d) resources needed for response operations and;
- e) Prioritisation of the above or immediate priorities.

Materials required for Assessment Team

Survival kit, assessment equipment, SAT-phones and HAM radios

Task at hand:

Assessment according to given formats

First Reports of assessment according to given format

Media releases according to given format

In case of extreme disasters such as high magnitude earthquakes, bomb blasts, terrorist attacks and chemical explosions, the EOC, all emergency phones and other alternate communication lines should be established within the first 24 hours.

Base Report after First Assessment

After the first assessment team has prepared the preliminary report, the CMG and the NCMC re-assess the situation at the site for taking further action. The first assessment team report should include the following:

Extent of Damage in terms of:

- Geographical area
- Expected affected population
- Districts/Areas worst affected
- Damage to infrastructure according to each ESF
- Report by the SRC of the affected State
- Operational access points
- Areas still under high risk (after shocks, fires and other related disasters)
- Condition of the State and District Government buildings and communication infrastructure

Overall need for central assistance in terms of:

- Search and Rescue teams
- Medical first response teams
- Communication equipments
- Labour or volunteers
- Donations
- Specialised technicians for each ESF

In case the EOC has already begun to function, then the reports must also contain summary reports from each ESF and their immediate requirements.

Activation Steps of the EOC in case of a disaster:

Step 1: The activation of the EOC should be followed once the nodal technical agency has issued a warning.

Step 2: The EOC is activated at orders by Centre and EOC Incharge is designated.

Step 3: Orders are sent out by fax from NCMC to related ministries for additional resources for ESFs for the disaster situation and they are asked to prepare and send the first assessment report to the EOC within 4-8 hours of activation.

According to this report the decisions that will be taken by the CRC can be categorised into two possibilities:

Prepare for next 48 hours

- ◆ To reinforce rescue operations through dispatch of relief material and manpower assistance
- ◆ To strengthen communication and coordination with the affected area EOC
- ◆ To accept relief and assistance from international agencies
- ◆ To strengthen the donation management desk at the centre and sort and organise donations for easy distribution at site
- ◆ To call situation-update meetings at regular intervals for close coordination and immediate relief response (Every 2 hours tapering down to thrice a day and so on)
- ◆ To send out additional Search and Rescue and Medical First Response teams

Deactivate response and relief operation at Centre and resume L0 activities

- ◆ If the situation is under control of the State, then to withdraw and deactivate response mechanism at the Centre, step by step, in coordination with the State.
- ◆ Send out deactivation notification to all Cabinet ministries.
- ◆ Send out NCCM team for taking stock and documentation of resources used and other preparedness activities during the alert and initial quick response phase of the disaster after the State has completed its response activities.

First 24-48 hours – Operations

Concept of operations at the EOC

- ◆ The nucleus of the EOC along with a core staff remains operational throughout the year at L0 level of maintenance in order to take care of the following activities:
 - Updation/Maintenance and addition of inventories
 - Keeping updated with other disasters around the world
 - Dry exercises and preparedness/ training exercises
- ◆ The Central Relief Commissioner – or his/her designee – will initiate the activation of the emergency services of the EOC as established.
- ◆ The individual who declares the L3 Emergency shall announce the location of the EOC in case it is not the PMO.
- ◆ The CRC – or designee – will determine what staff he/she deems necessary to effectively operate the EOC apart from the prescribed staff.
- ◆ The designated officers of the Home Guards at the EOC will provide

security to the EOC entrance points. Only individuals authorized by the Home Guards will be authorized to enter the EOC.

In case of extreme disasters such as chemical disasters, bomb blasts and terrorist attacks, national security and control takes precedence. The Ministry of Home has to establish special measures to ensure the security of the nation by sealing and evacuating strategic government and national institutions well within 3-4 hours of the occurrence. National borders, air and sea space also have to be protected and if need be, sealed off.

Individuals staffing the EOC are responsible for establishing communications (radio, telephone) with their respective departments.

For effective communication at the Centre and the State, five Nodal Points have been determined. They are as follows:

1. EOC at Centre
2. EOC at State
3. EOC at neighbouring States
4. Information and arrival points at the functional transport junction at State/ neighbouring State
5. Information and arrival point at the international airport

Essential Communication Links at the National EOC

The EOC at National level must have communication links with the following:

- ◆ Crisis State EOC
- ◆ Crisis State SRC
- ◆ Other State EOCs
- ◆ All concerned Ministries
- ◆ Information and arrival point at the Centre

- ◆ Information and arrival point at the affected State

Task at hand

- ◆ Establish EOC at State and Centre airport with:
 - Point of arrival
 - Point of departure
 - Assembly point
- ◆ Set up General Information Desk at airport EOC
- ◆ Establish and activate emergency phone lines and helplines immediately within few hours of the disaster
- ◆ Set up separate desks for each ESF and international aid /NGO
- ◆ Set up desks for donations (cash and material)
- ◆ Establish contact with the affected State EOC
- ◆ Set up EOC at neighbouring States
- ◆ Establish contact with NRSA/ISRO/Defence for aerial and satellite imageries of the affected area
- ◆ Provide information and standard operating procedures for civilian population such as media, researchers, volunteers, field workers, etc. through:
 - Handbook for Operations
 - Handbooks for
 - International NGO
 - N G O
 - Media Personnel
 - Researchers/Students
 - Field/Relief workers
 - Government functionaries
- ◆ Organise/coordinate aerial surveys for rescue operations
- ◆ Establish contact with the disaster site which will have Incident Command Systems placed at the disaster site based on the scale of the disaster
- ◆ Deploy Incident Commanders in consultation with the Centre at strategic incident commands

Within the next 48 hours the EOC at the State as well as the Centre will be jointly involved in the following:

- ◆ Set up information desks at critical locations
- ◆ Identify and channelise different categories of workers under the following at the information desks and provide identification tags for the following:
 - Media
 - Researchers
 - NGO/International Agency
 - Field workers/Volunteers
 - Government officials
- ◆ Place situation reports at bulletin boards outside information desks and EOC
- ◆ Direct Central and international agencies to priority areas (worst affected areas)
- ◆ Identify locations for international and other NGO agencies to set up their site offices for the uniform distribution of aid in all parts of the affected area.
- ◆ Communicate with the District Magistrate and the SRC for local information through:
 - Information flow chart of Information and Arrival Centre at airport
 - Material/Manpower flow chart of Information and Arrival Centre at airport
 - Information flow chart of EOC at Centre
 - Information flow chart of desk for ESF
 - Information flow chart of NGOs
 - Information flow chart of media
 - Information flow chart of researchers
 - Material/Manpower flow chart of

Information and Arrival centre at airport at centre

These charts will be part of the handbooks as well.

The EOC Incharge at the EOC will be responsible for the dissemination of information to the following as given in priority:

- ◆ Standing committee of group of ministers – Home Minister
- ◆ National Steering Committee – Agriculture minister
- ◆ Cabinet Secretary
- ◆ N C C M

Structural set-up of EOC at the centre

1. EOC Incharge
2. Operation sections
3. Emergency Support Functions

Tasks for internal functions at EOC

- ◆ Determine policies during disaster and post-disaster periods
- ◆ Adjudicate conflicting claims and/or requests for emergency personnel, equipment, and other resources
- ◆ Designate responsibilities and duties, as necessary to maintain the optimal use of national resources
- ◆ A Mobile Command Vehicle will be requested to respond to the National EOC.
- ◆ Provide operating units with requested resources for sustained operations
- ◆ Operate staging areas for incoming equipment and personnel
- ◆ Provide for medical care, feeding, and housing of emergency workers
- ◆ Maintain documentation of resource allocation and availability

Checklists for EOC set-up:

- ◆ Minimum standards handbook of layout and dimensions, equipments, etc for EOC

The hotlines, V-SAT and wireless communications should be established at the EOC with the following:

- ◆ State Relief Commissioner
- ◆ Cabinet Secretary
- ◆ IMD
- ◆ Related Ministries (Primary agencies)

Manpower requirements of the EOC

- ◆ Regular staff
 - Deputy Relief Commissioner
 - EDP Manager
- ◆ Staff on call
 - 2 Deputy Secretaries
- ◆ Staff on Disaster Duty
 - Incident Commander
 - Sector/ESF expert
 - ESF Commanders

Checklist for each ESF desk

- ◆ Matrix of primary and secondary functions of each ESF
- ◆ Do's and don't's to be followed during disaster times in EOC
- ◆ Schedule for regular staff
- ◆ Schedule for staff on call
- ◆ Schedule for staff on disaster duty

Brief Material Requirements

- ◆ Data bank of maps and plans at district, state and national level
- ◆ Hardware
- ◆ GIS software
- ◆ State-of-the-art communication equipment
- ◆ Inventories related to all ESFs and relief materials

Transport with wireless equipments (Mobile Command Vehicle)

CONTINUED RESPONSE

The response and rescue operations continue till the local administration is able to take full charge of the situation. Each ESF will

continue their work in a planned manner unless the concerned department is ready to take over the charge. Some of the ESFs may have to continue their assistance for a longer period depending on the extent of damage.

Similarly, some of the ESFs may be required later for rehabilitation and restoration activities. ESFs such as Shelter and Drinking Water may also have to cater to the needs of the relief workers after the first 48 hours.

DEACTIVATION AND DOCUMENTATION

Each agency will discontinue emergency

response operations when advised that their assistance is no longer required in support of the State and Local authorities, or when their statutory responsibilities have been fulfilled.

Upon determination that applicable law enforcement goals and objectives have been met, that no further immediate threat exists, and that Central disaster response actions are no longer required, the Cabinet Secretary, in consultation with the concerned ministry, shall order deactivation. The Central EOC will deactivate and discontinue emergency response operations and undertake detailed documentation of activities and other LO activities.



National Emergency Operations Centres

For the effective management of resources, disaster supplies and other response activities, nodal points or centres will have to be established. These points will have to be well networked starting from the Centre to the State and finally leading to the disaster site. Emergency Operations Centres at the Centre and the State and Incident Command Systems at the disaster site are the designated nodal points that will coordinate overall activities and the flow of relief supplies from the Centre. The Emergency Operations Centre stays operational through-out the year in order to take care of the extended L0 activities of data management and training, essential for the smooth functioning of the EOC during crisis situations, whereas the Incident Command System is activated only during the disaster to take care of site-specific activities.

In order to ensure the integrity of the administration of national resources and assets, an Emergency Operations Centre (EOC) will be maintained and run throughout the year which will expand to undertake and coordinate activities during a disaster. Once the prescribed authority has issued warnings/alerts, the EOC will become fully operational.

Back-up EOC

It is recommended that an 'alternate EOC' must also be established. This EOC will be a mirror image of the National EOC and will be a back-up to handle any eventuality at the National EOC. It is proposed that the EOC be established at the NCDM/NCCM so that it can also function as a hub for all L0 activities.

Aim of the Emergency Operations Centre

The aim of EOC at the National level shall be to provide centralized direction and

control of any or all of the following functions:

- ◆ Emergency operations
- ◆ Communications and warning
- ◆ Requesting additional resources during the disaster phase from neighbouring States of the affected area
- ◆ Coordinating overseas support and aid
- ◆ Issuing emergency information and instructions specific to Central ministries; consolidation, analysis, and dissemination of Damage Assessment data
- ◆ Forwarding of consolidated reports to NCCM, Cabinet Secretary and Ministry of Agriculture.

Location of EOC

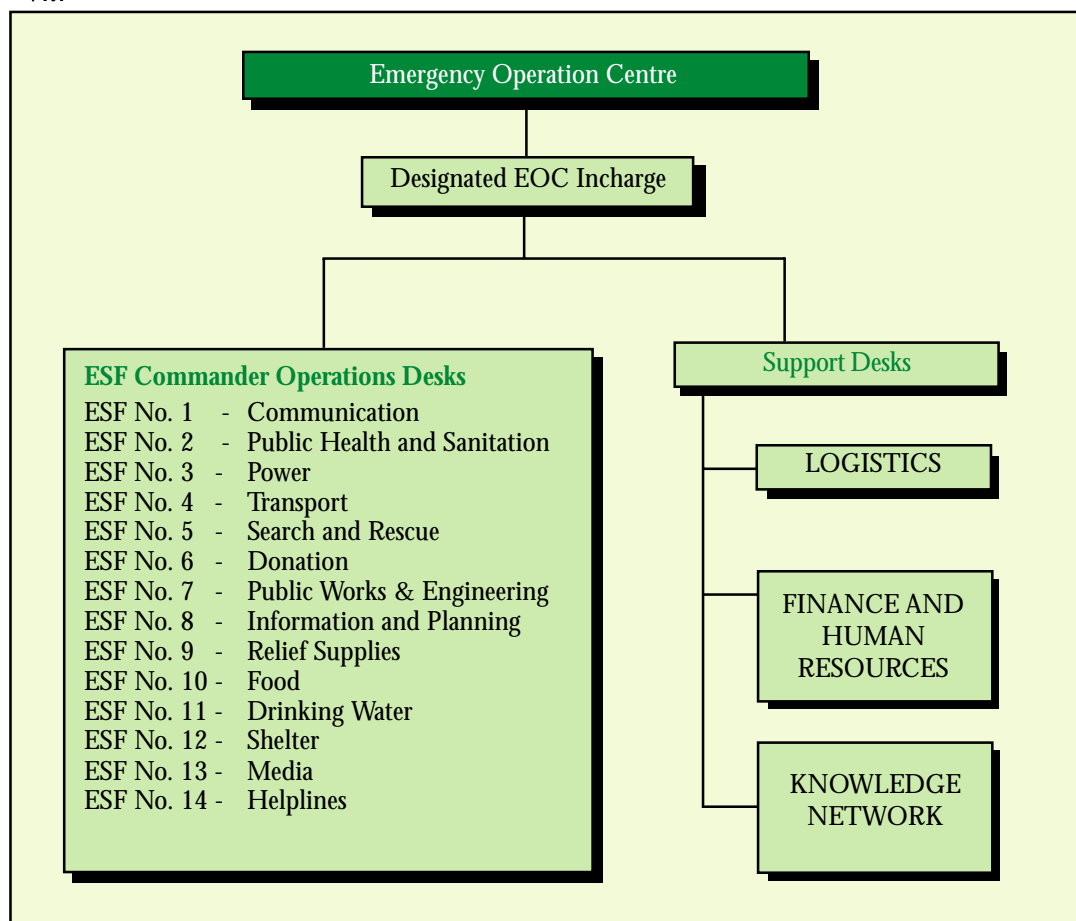
The EOC will be set up at a suitable location

with all infrastructure as per the given layout.

Concept of Operations at the EOC

- ◆ The Central Relief Commissioner or his/her designee will initiate the activation of emergency services of the EOC as established.
- ◆ Activation of the EOC should immediately follow the declaration of a National Level Emergency.
- ◆ The individual who declares the L3 Emergency shall announce the location of the EOC in case of any eventuality to the National EOC.
- ◆ Individuals staffing the EOC are responsible for establishing communications such as radio and telephone with their respective departments.

VI.I



- ◆ The CRC – or designee — will determine what staff he/she deems necessary to effectively operate the EOC apart from the prescribed staff.
- ◆ The designated officers of the Home Guards at the EOC will provide security to the EOC entrance points. Only individuals allowed by the Home Guards will be authorized to enter the EOC.

The 'EOC Incharge' will be responsible for the dissemination of information to the following as given in priority:

- ◆ Standing committee of group of ministers - Home Minister
- ◆ National Steering Committee - Agriculture Minister
- ◆ Cabinet Secretary
- ◆ NCCM

Activation steps of the EOC in case of a disaster

Step 1: The EOC is activated on orders from NCMC (National Crisis Management Committee)

Step 2: The activation of the EOC should be followed after the declaration of L3 disaster

Step 3: Orders are sent out by fax from the NCMC for setting up ESFs for the disaster situation and are asked to prepare and send the First Assessment Report to the EOC within the time period laid out by NCMC

Organizational set-up of EOC at the Centre

1. EOC Incharge
2. Operation Sections
3. Emergency Support Functions

EOC Incharge: He/She is the primary role player in the EOC with considerable years of experience in the area of disaster response. He/She is responsible for the

overall coordination and decision making at the EOC.

Operation Sections: For the smooth and planned functioning of the EOC, organisational sections of the EOC have to be maintained throughout the year. These sections are as follows:

(i) Executive Section

- ◆ Determines policies during disaster and post-disaster periods
- ◆ Adjudicates conflicting claims and/or requests for emergency personnel, equipment, and other resources
- ◆ Designates responsibilities and duties, as necessary, to maintain the optimal use of national resources.

A Mobile Command Vehicle will be requested to respond to the National EOC.

(ii) Logistics Section

- ◆ Provides operating units with requested resources for sustained operations
- ◆ Operates staging areas for incoming equipment and personnel
- ◆ Provides for medical care, feeding, and housing of emergency workers
- ◆ Maintains documentation of resource allocation and availability

(iii) Finance and Human Resource Section

Emergency Support Functions

- ◆ Communication
- ◆ Power
- ◆ Transport
- ◆ Health and Medical Care (Mobile hospitals)
- ◆ Food
- ◆ Information and Planning
- ◆ Search and Rescue
- ◆ Public Works and Engineering

- ◆ Relief Supplies
- ◆ Donation Coordination
- ◆ Drinking Water (Water tankers/ Water treatment plant)
- ◆ Shelter
- ◆ Media
- ◆ Helplines

The hotlines, V-SAT and wireless communications should be established at the EOC with the following:

- ◆ State Relief Commissioner
- ◆ Cabinet Secretary
- ◆ IMD
- ◆ Related Ministries (Primary agencies)

Manpower requirements of the EOC

- ◆ Regular Staff
 - Deputy Relief Commissioner
 - EDP Manager
- ◆ Staff on call
 - 2 Deputy Secretaries
- ◆ Staff on disaster duty
 - Incident Commander
 - Sector/ESF Expert
 - ESF Commanders

(These are mainly indicative, the details of which can be drawn up by the CRC)

Equipment Requirements

- ◆ Data bank of maps and plans at District, State, and National level within a GIS set-up.
- ◆ Hardware
- ◆ GIS software
- ◆ State-of-the-art communication equipment
- ◆ Inventories related to all ESFs and relief materials

- ◆ Transport with wireless equipments (Mobile Command Vehicle)
- ◆ Checklist for each ESF desk
- ◆ Matrix of primary and secondary functions of each ESF

A Disaster Supplies Kit should include:

- ◆ a 3-day supply of water (one gallon per person per day) and non-perishable food
- ◆ one change of clothing and footwear per person
- ◆ one blanket or sleeping bag per person
- ◆ a first aid kit, including prescription medicines
- ◆ emergency tools, including a battery-powered Weather Radio and a portable radio, flashlight, and plenty of extra batteries
- ◆ special items for infant, elderly, or disabled family members

INCIDENT COMMAND SYSTEM

ICS is an effective model for centralized management. It can clearly define staff roles and responsibilities and lines of communications. In the ICS model the base of operations for response to a disaster (incident) is the Command Centre.

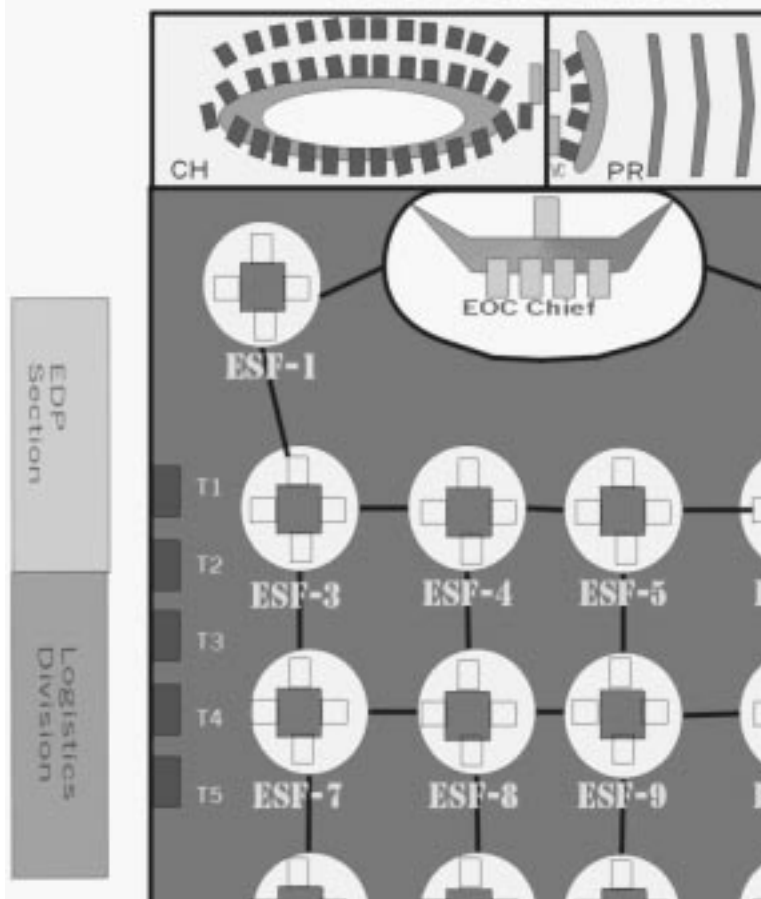
Incident Commander—Upon activation of the plan, the Incident Commander will establish the Command Centre and initiate ICS.

Staffing Positions

Positions include:

- ◆ Incident Commander
- ◆ Information Officer
- ◆ Safety Officer
- ◆ Inter-agency Coordinator
- ◆ Operations Officer
- ◆ Planning Officer
- ◆ Logistics Officer
- ◆ Finance Officer

EMERGENCY OPERATIONS: PROPOSED LAYOUT

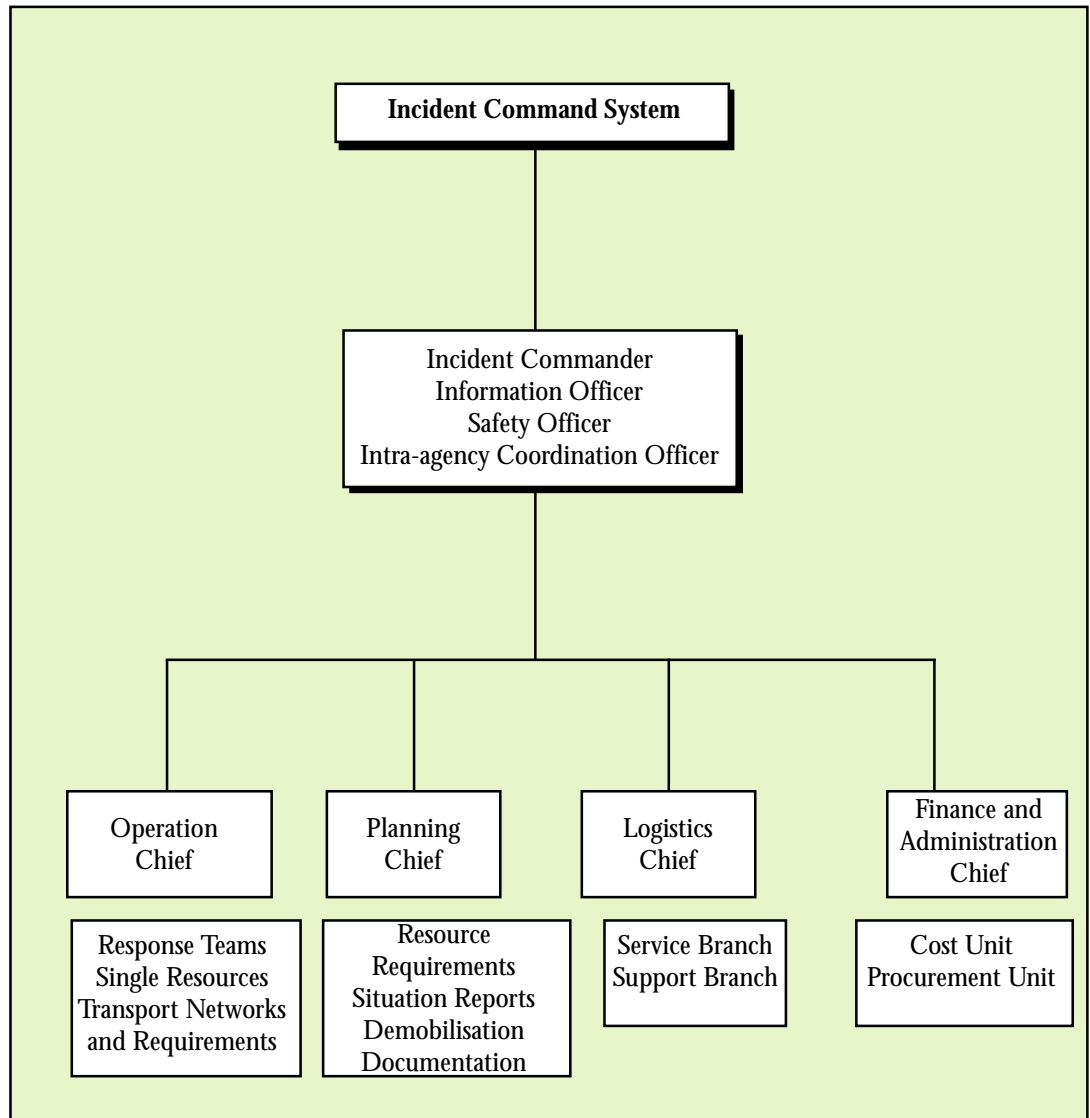


All EOC facilities should be disaster resistant.

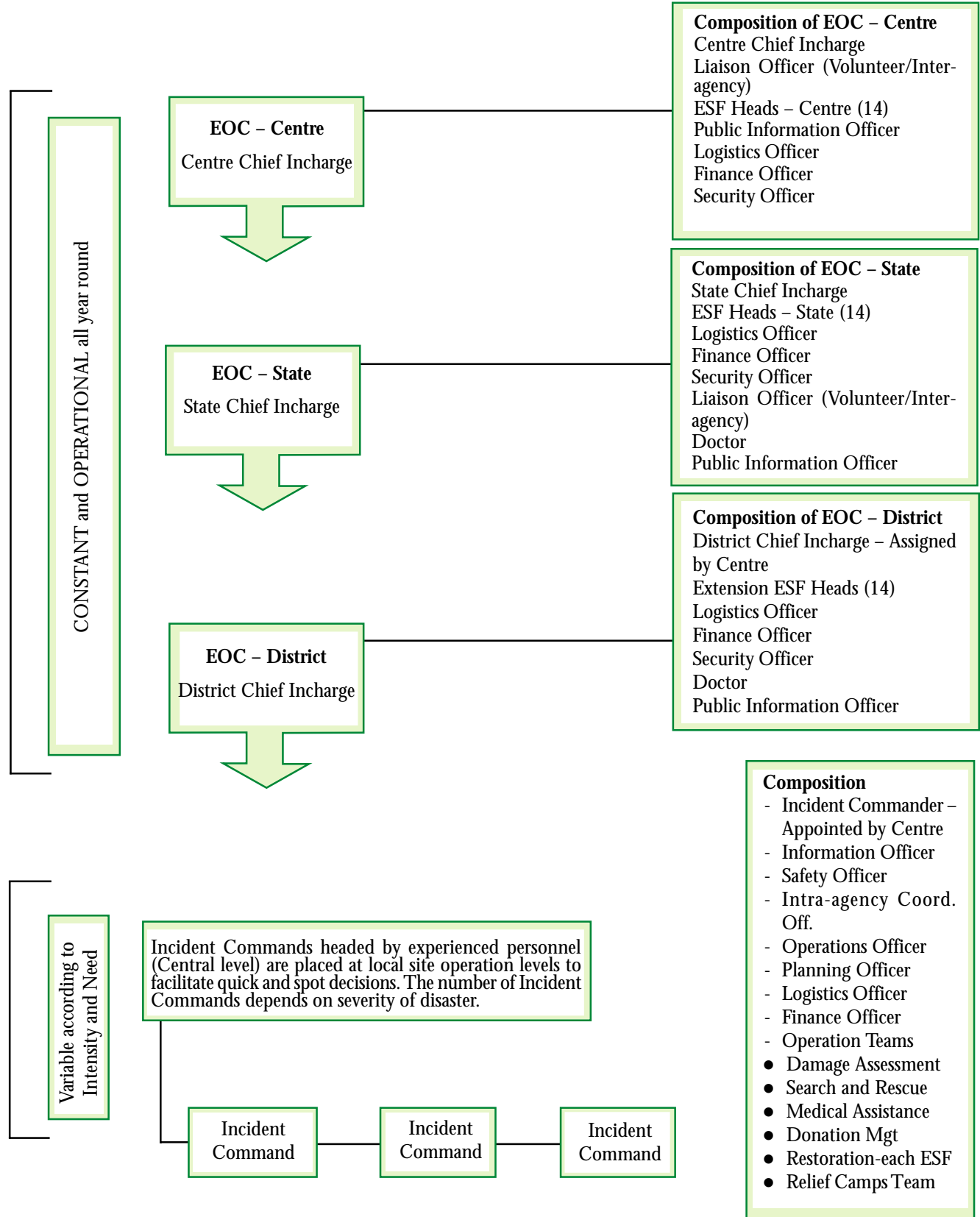
The following chart provides a brief explanation of the command structure of Incident Command System which will have

to be further detailed out by each of the States.

VI.2



Flow Chart (EOC and ICS)



Emergency Support Functions

The interdependence of facilities and their management creates a difficult situation for disaster managers during a disaster. Therefore, a crisis situation demands the attention and assistance of experts from different fields and sectors in order to ensure a quick and effective recovery. However, if the assistance provided is not predefined and coordinated it can lead to slow progress and relief work gets adversely affected. Keeping this aspect of disaster management in view, fourteen Emergency Support Functions have been conceptualised to take care of various response and infrastructure facilities, imperative for immediate as well as long-term response to disasters.

Emergency Support Functions are the essentials of Emergency Management comprising of various coordinating agencies, which manage and coordinate specific kinds of assistance common to all disasters types. Each ESF is headed by a lead organisation/ ministry responsible for coordinating the delivery of goods and services to the disaster area, and is supported by numerous other organisations. These ESFs form an integral part of the Emergency Operation Centres and each ESF should coordinate its activities from the allocated EOC. Extension teams and workers of each ESF will be required to coordinate response procedures at the affected site.

In the National Response Plan, the proposed Emergency Support Functions have been conceptualised as an integral part to carry out response activities. In the period immediately after a major disaster or emergency requiring Central response, primary agencies, when directed by NCCM, will take actions to identify requirements and mobilise and deploy resources to the affected area to assist the State in its response actions under fourteen ESFs (Emergency Support

Functions). Each ESF is headed by a primary agency, which has been selected based on its authority, resources and capabilities to support the functional area.

The ESF will coordinate directly with their functional counterpart, State agencies, to provide the assistance required by the State. Request for assistance will be channelled from District level through the designated State agencies for action. Based on the State-identified response requirements, appropriate Central response assistance will be provided by an ESF to the State or at the State's request, directly to an affected area.

PRIMARY AND SECONDARY AGENCIES

The designated primary agency, acting as the Central agency will be assisted by one or more support agencies (secondary agencies) and will be responsible for managing the activities of the ESF (Emergency Support Functions) and assisting the State in the rescue and relief activities and ensuring that the mission is accomplished. The primary and secondary agencies have the authority to execute response operations to directly support the State needs.

PLANNING ASSUMPTIONS

In disaster situations, effective utilisation of resources can be ensured if conditions of the disaster are assessed and taken into consideration during the planning phase. Disasters cause loss of property, injury and disruption of normal life and have an impact on social and physical infrastructures.

The extent of casualties and damage will be based on factors such as the time of occurrence, severity of impact, weather conditions, population density, type of constructions and possible triggering of secondary events such as fires and floods. When planning for a response for disasters, these assumptions can benefit planning of effective response for the crisis situation.

This chapter also attempts to conceptualise the activities and handbooks that will have to be developed by the concerned ministries for efficient execution of the plan. These ESFs are proposed in the National Response Plan and they are perceived as an effective tool for the management of disasters. The ESFs are in the conceptual stage and continuous updation of the same should be carried out with the changing scenario so as to make them more effective during a disaster.

In the National Response Plan, the following ESFs have been conceptualised as an integral part in carrying out response activities. The following ministries can be considered as the primary agencies for each ESF

- ESF No. 1 - Communication
- ESF No. 2 - Public Health and Sanitation
- ESF No. 3 - Power
- ESF No. 4 - Transport
- ESF No. 5 - Search and Rescue
- ESF No. 6 - Donation
- ESF No. 7 - Public Works and Engineering
- ESF No. 8 - Information and Planning
- ESF No. 9 - Relief Supplies
- ESF No. 10 - Food
- ESF No. 11 - Drinking Water
- ESF No. 12 - Shelter
- ESF No. 13 - Media
- ESF No. 14 - Helplines

Primary Agency for Each ESF

- ESF No. 1 - Communication - Ministry of Communication
- ESF No. 2 - Public Health and Sanitation - Ministry of Health and Family Welfare

- ESF No. 3 - Power – Ministry of Power
- ESF No. 4 - Transport – Ministry of Transport
- ESF No. 5 - Search and Rescue – Ministry of Defence/ Ministry of Home Affairs
- ESF No. 6 - Donation – Ministry of Agriculture
- ESF No. 7 - Public Works and Engineering – Ministry of Urban Affairs and Poverty Alleviation
- ESF No. 8 - Information and Planning – Ministry of Information Technology
- ESF No. 9 - Relief Supplies – Ministry of Planning and Programme Implementation
- ESF No. 10 - Food - Ministry of Food and Civil Supplies
- ESF No. 11 - Drinking Water – Ministry of Water Resources
- ESF No. 12 - Shelter - Ministry of Urban Affairs and Poverty Alleviation
- ESF No. 13 - Media – Ministry of Information and Broadcasting
- ESF No. 14 - Helplines - Ministry of Disaster Management (Proposed)

LIST OF MINISTRIES

Ministry of Agriculture	- MoA
Ministry of Defence	- MoD
Ministry of Surface Transport	- MoST
Ministry of Power	- MoP
Ministry of Health and Family Welfare	- MoH&FW
Ministry of Water resources	- MoWR

Department of Animal Husbandry	- DoAH
Ministry of Urban Development and Poverty Alleviation	- MoUDPA
Ministry of Planning and Programme Implementation	- MoPPI
Ministry of Home Affairs	- MHA
Ministry of Rural Development	- MoRD
Ministry of Information Technology	- MoIT
Ministry of Information and Broadcasting	- MoI&B
Ministry of Communication	- MoC
Ministry of Heavy Industries	- MoHI
Ministry of Social Justice and Empowerment	- MoSJ&E
Ministry of Civil Aviation	- MoCA
Ministry of Non-Conventional Energy Sources	- MoNES
Ministry of Petroleum and Natural Gas	- MoP&NG
Ministry of Finance	- MoF
Ministry of External Affairs	- MEA
Ministry of Commerce and Industry	- MoC&I
Ministry of Science and Technology	- MoSc&T
Ministry of Labour	- MoL
Ministry of Consumer Affairs and Public Distribution	- MoCA&PD
Voluntary Agencies	- VA
Department of Drinking Water	- DDW
Department of Food and Public Distribution	- DFPD
Ministry of Disaster Management	- MoDM
Ministry of Railways	- MoR
Ministry of Food and Civil Supplies	- MoFCS

PRIMARY AND SECONDARY AGENCIES FOR EMERGENCY SUPPORT FUNCTIONS

Primary Agency **P** **S** Secondary Agency

ES	ES F1	ES F2	ES F3	ES F4	ES F5	ES F6	ES F7	ES F8	ES F9	ES F10	ES F11	ES F12	ES F13	ES F14
MoA														
MoDM						P			P					P
MoD					P									
MoHFW		P												
MoIB													P	
MoIT								P						
MoST				P			P							
MoC	P													
MoRD										P				
MoHI														
MoUDPA												P		
MoWR											P			
MoAH		S												
MHA		S		S	S		S					S		
MoP	S	S	P	S			S	S	S			S		
MoCA	S			S	S					S				S
MoNES														
MoPNG														
MoF														
MEA														
MoCI														
MoScT					S			S				S		S
MoL							S					S		
MoCAPD										S				
MoR				S					S					

EMERGENCY SUPPORT FUNCTION 1

Communication

Primary Agency

- ◆ Ministry of Communication

Secondary Agency

- ◆ Ministry of Civil Aviation
- ◆ Ministry of Defence
- ◆ Ministry of Surface Transport
- ◆ Ministry of Agriculture
- ◆ Ministry of Power
- ◆ Ministry of Information Technology
- ◆ Ministry of Heavy Industries

Purpose

ESF1 will ensure the provision of nationwide telecommunication support to the Centre, State and District in response efforts.

Planning Assumptions

- ◆ Initial reports of damage will be collected and this may not provide a complete picture of the extent of damage
- ◆ The affected region's ability to communicate with the rest of the country will be impaired and key officials may be isolated from their regional offices

- ◆ Initially the main focus of the State and the Local governments will be on the coordination of lifesaving activities concurrent with re-establishing control of the disaster affected area

Activities on the Receipt of Warning or Activation of EOC

- ◆ Establish radio communication with the State EOC and Local Incident Commander
- ◆ Appoint a Nodal Officer-Communication at the national level
- ◆ Renew and update precautionary measures and review with the staff the precautions to be taken to protect equipment
- ◆ Establish an emergency tool kit including cable cutters, cutting pliers, spanners, ropes, cross cut saws, pulley blocks with ropes and hand gloves

Initial Actions

- ◆ Identify operational telecommunication facilities within the affected area
- ◆ Identify telecommunication facilities that need to be transported to the affected site to establish emergency operational services
- ◆ Identify the actual and planned action of private telecommunication companies towards reconstruction of their facilities
- ◆ Establish a temporary communication facility through mobile exchanges, on priority, for use by State EOC on priority basis, as well as district officials, members of the State government

machinery, officials of transit and relief camps, and NGOs

- ◆ Establish a temporary communication facility for public use
- ◆ Carry out an assessment of overall damage to the following:
 - ◆ Overhead route damage
 - ◆ Cable damage
 - ◆ Specific equipment damage

Responsibilities

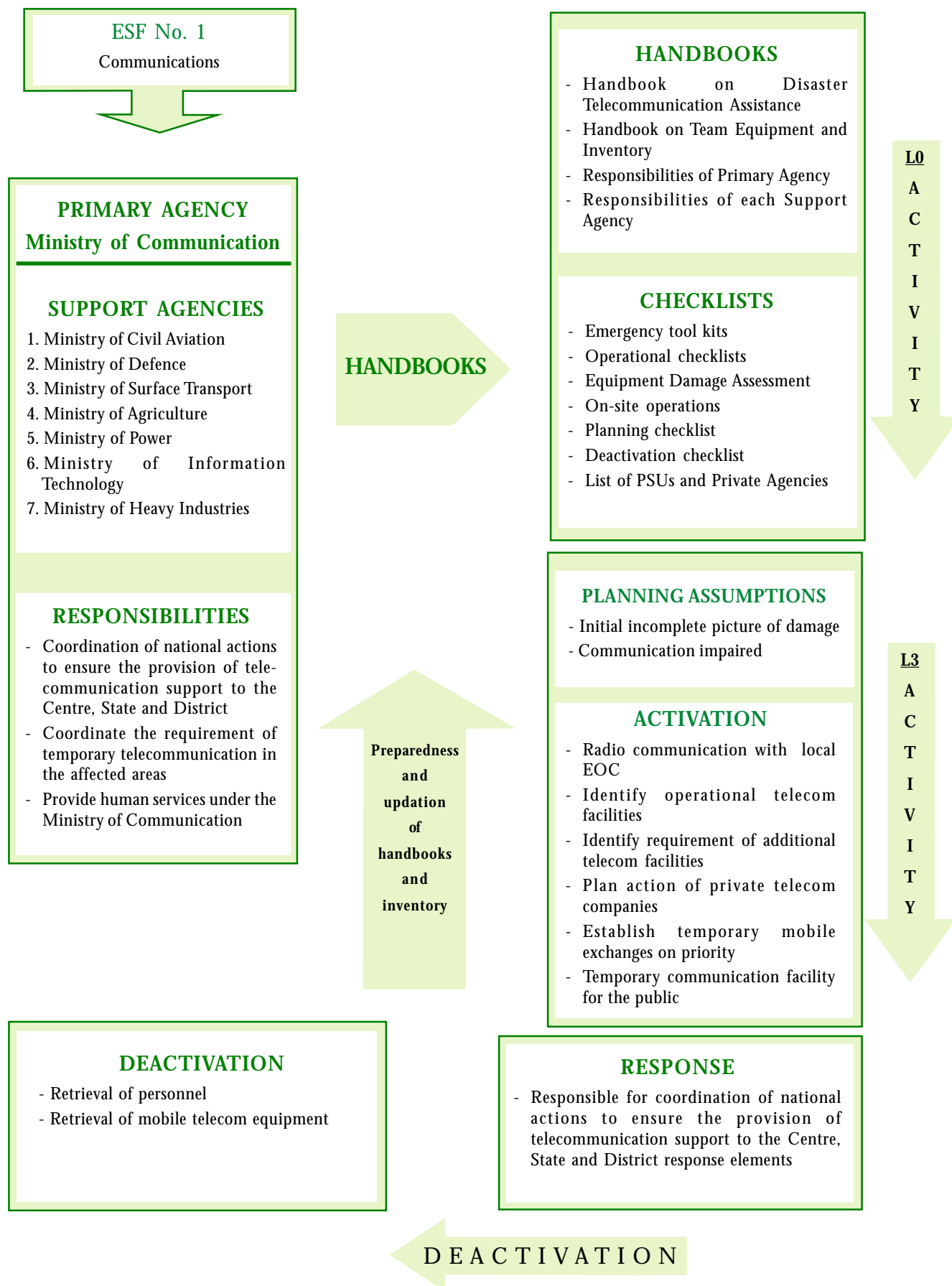
The ESF is responsible for the coordination of national actions to ensure the provision of telecommunication support to the Centre, State and District response elements.

It will coordinate the requirement of temporary telecommunication in the affected areas.

It will extend support that includes government furnished communication and private communication.

Minimum Standards Required

- ◆ Checklist of tool kits
- ◆ Handbook on Disaster Telecommunication Assistance
- ◆ Handbook on Team Equipment and Inventory
- ◆ Responsibilities of Primary Agency
- ◆ Responsibility of each Support Agencies
- ◆ Emergency toolkits
- ◆ Operational checklists
- ◆ Equipment Damage Assessment
- ◆ On-site operations
- ◆ Planning check list
- ◆ Deactivation checklist
- ◆ List of PSUs and Private Agencies



EMERGENCY SUPPORT FUNCTION 2

Public Health and Sanitation

Primary Agency

- ♦ Ministry of Health and Family Welfare

Secondary Agencies

- ♦ Ministry of Transport
- ♦ Ministry of Power
- ♦ Ministry of Defence
- ♦ Ministry of Animal Husbandry and Dairying
- ♦ Ministry of Agriculture
- ♦ Ministry of Communication
- ♦ Ministry of Home
- ♦ Ministry of Urban Development and Poverty Alleviation
- ♦ Ministry of Water Resources
- ♦ Voluntary Agencies and PSUs

Purpose

The purpose of ESF2 is to provide Government of India coordinated assistance to supplement State and Local resources in response to public health and medical care needs following a significant natural or man-made disaster. Under ESF 2 Ministry of Health and Family Welfare directs sanitation and medical assistance to the affected State. Resources will be furnished when the State and District resources are overwhelmed and medical and/or public health assistance is requested from the Central government.

Planning Assumptions

- ♦ Sudden outbreak of epidemic or medical emergency as an aftermath of disaster such as earthquake, flood, landslide, fire, etc.
- ♦ Contamination of water and food

- ♦ Unhygienic and unclean surroundings in the disaster affected site
- ♦ Disruption of communication and transport facilities as a result of other disasters
- ♦ Disruption of laboratory and hospital facilities
- ♦ The damage and destruction by any natural disaster will produce urgent need for counselling for disaster victims and response personnel
- ♦ Disruption of sanitation services and facilities, loss of power and massing of people in shelters may increase the possibility of disease and injury

Activities on Receipt of Warning or Activation of National EOC

- ♦ ESF2 should become operational within 2 hours of notification
- ♦ Appoint one personnel as Nodal Health Officer for the affected area
- ♦ Ensure that personnel working within the State come under the direction and control of State Nodal Health Officer
- ♦ The National level personnel once deployed will directly come under the control of the Nodal Health Officer at the State
- ♦ Determine types of injuries, illnesses expected, drugs and other medical items required, and accordingly ensure that extra supply of medical items can be obtained quickly
- ♦ Provide information to the entire hospital staff about the disaster, likely damage and effects, and information about ways to protect equipment and property
- ♦ Prepare an area of the hospital for receiving large number of casualties

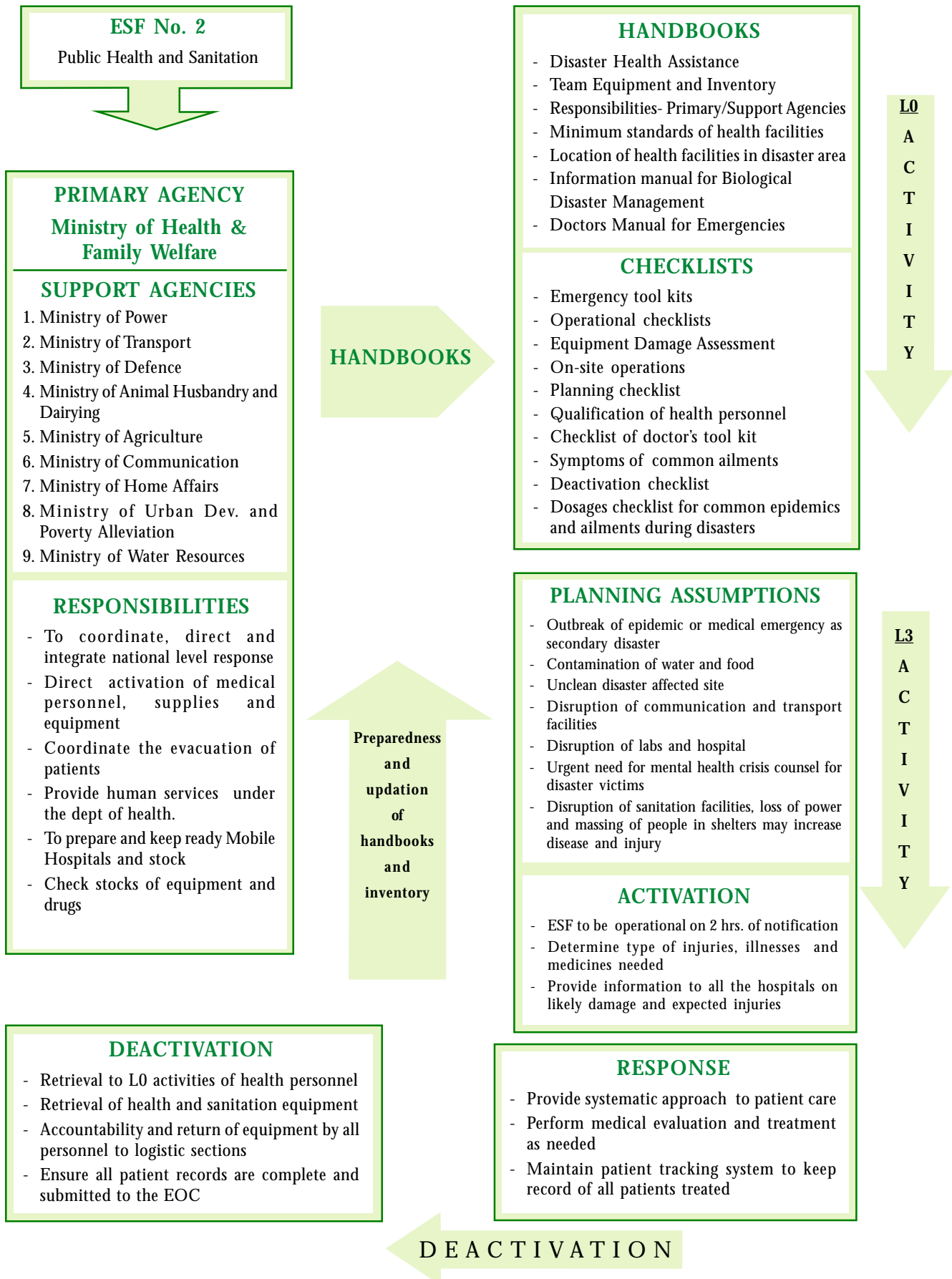
Responsibilities of Primary Agencies

- ◆ To coordinate, direct and integrate national level response to provide medical and sanitation health assistance to the affected area.
- ◆ Till the State ESF2 becomes operational, collection, analysis and dissemination of requests for medical and public health assistance will be the responsibility of National ESF2 with the assistance of Department of Health. Once State ESF2 is operational the responsibility will be transferred to it and it will act as support to the State for providing medical assistance.
- ◆ Direct the activation of health/medical personnel, supplies and equipment in response to the request for national assistance.
- ◆ Coordinate evacuation of patients from the disaster area when it is considered important by the State authorities according to the nature of injury and the priority of evacuation. Patients whose injuries do not pose any threat to their health are discharged after first aid.
- ◆ Provide human services assistance under the Department of Health.
- ◆ To prepare and keep ready Mobile Hospitals and stock them with emergency equipment that may be required after the disaster.
- ◆ Check stocks of equipment and drugs which are likely to be required after the disaster. These can be categorised as:
 - ◆ Treatment of cuts and fractures such as tetanus, toxoid, analgesics and antibiotics.
 - ◆ Drugs used for the treatment of water-borne diseases including oral rehydration supplies.
 - ◆ Burns and fire infections
 - ◆ Detoxification including breathing equipment.

- ◆ Fissure material
- ◆ Surgical dressing
- ◆ Plaster rolls
- ◆ Disposable needles and syringes
- ◆ Local antiseptics
- ◆ There should be a specialised team of doctors for a particular kind of injury.

Minimum Standards Required

- ◆ Detailed checklist of symptoms of common diseases along with medicine dosages
- ◆ Checklist of doctor's tool kit for specialised doctors
- ◆ Checklist for maintaining hygienic conditions
- ◆ Disaster Health Assistance and the emergency services
- ◆ Team Equipment and Inventory
- ◆ Responsibilities- Primary/Support agencies
- ◆ Minimum standards of health facilities
- ◆ Location of health facilities in the disaster area (map)
- ◆ Information manual for biological disaster
- ◆ Doctors manual for emergency relief
- ◆ Emergency toolkits
- ◆ Operational checklists
- ◆ Equipment Damage Assessment
- ◆ On-site operations
- ◆ Planning check list
- ◆ Qualification of health personnel
- ◆ Checklist of doctor's tool kit
- ◆ Symptoms of common ailments
- ◆ Deactivation checklist
- ◆ Dosages checklist for common epidemics and ailments during a disaster.



EMERGENCY SUPPORT FUNCTION 3

Power

Primary Agency

- ◆ Ministry of Power

Secondary Agencies

- ◆ Ministry of Agriculture
- ◆ Ministry of Defence
- ◆ Ministry of Transport
- ◆ Ministry of Heavy Industries and Public Enterprises
- ◆ Ministry of Non-Conventional Energy Sources
- ◆ Ministry of Petroleum and Natural Gas

Purpose

To facilitate restoration of energy systems after a natural disaster.

Planning Assumptions

- ◆ There will be wide spread prolonged electricity failure
- ◆ There will be panic hoarding of fuel in some parts of the affected area
- ◆ Accessibility to the affected area is difficult

Activities on the Receipt of Warning or Activation of EOC

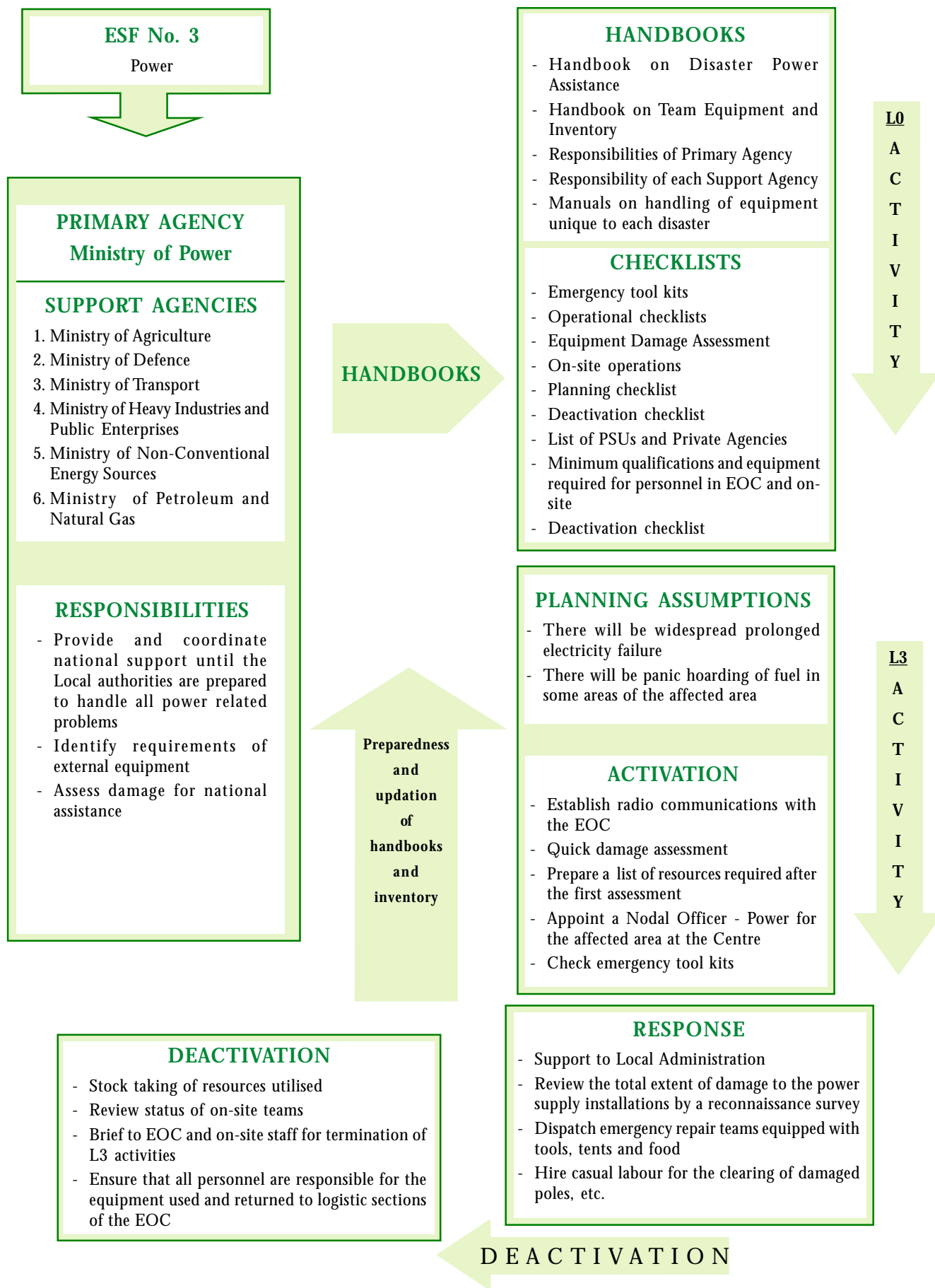
- ◆ Establish radio communications with the EOC
- ◆ Do a quick damage assessment which should include the following:
 - ◆ High tension lines
 - ◆ Substations
 - ◆ Transformers
 - ◆ Insulators
 - ◆ Poles
 - ◆ Other equipment

- ◆ Prepare a First Assessment Report in conjunction with other ESFs for the CRC to take further decisions
- ◆ Prepare a list of resources required after the first assessment
- ◆ Appoint a Nodal Officer – Power for the affected area at the Centre
- ◆ Check emergency tool kits
- ◆ Assist authorities to reinstate generators for public facilities such as
 - ◆ Hospitals
 - ◆ Water supply and drainage board
 - ◆ Police stations
 - ◆ Telecommunication buildings
 - ◆ Meteorological stations
- ◆ Review the total extent of damage to power supply installations by a reconnaissance survey
- ◆ Dispatch emergency repair teams equipped with tools, tents and food
- ◆ Hire casual labour and brief them about the situation for clearing of damaged poles, etc.
- ◆ Prepare a detail report of the damage
- ◆ Establish temporary electricity supplies for relief material warehouses

Minimum Standards Required

- ◆ Handbook on Disaster Power Assistance
- ◆ Handbook on Team Equipment and Inventory
- ◆ Responsibilities of Primary Agency
- ◆ Responsibility of each Support Agency
- ◆ Manuals on handling of equipment which is unique to a particular disaster
- ◆ Emergency tool kits
- ◆ Operational checklists

- ◆ Equipment Damage Assessment
 - ◆ On-site operations
 - ◆ Planning checklist
 - ◆ Deactivation checklist
- ◆ List of PSUs and Private Agencies
 - ◆ Minimum qualifications and equipment required for personnel in EOC and on-site
 - ◆ Deactivation checklist



EMERGENCY SUPPORT FUNCTION 4

Transport

Primary Agency

Ministry of Surface Transport/Ministry of Railways

Secondary Agencies

Ministry of Agriculture

Ministry of Defence

Ministry of Home Affairs

Ministry of Civil Aviation

Ministry of Communications

Ministry of Power

Ministry of Urban Development and Poverty Alleviation

Purpose

The purpose of ESF4 is to provide for the coordination of Central transport support to the State and the Local government. ESF 4 coordinates the use of transportation resources to support the needs of emergency support forces requiring transportation capacity to perform their emergency response, recovery and assistance missions. It also works with outside agencies for transportation coordination and prepares resource requests for assistance when needed.

Planning Assumptions

- ◆ The State civil transportation infrastructure will sustain damage, limiting access to the disaster area.
- ◆ Access will improve as routes are cleared and repaired or as detours are built.
- ◆ The requirements of the transportation capacity will exceed the capacity of the State control or accessible assets, demanding assistance from the National Government.

- ◆ The movement of relief supplies will create congestion in the transportation services and hamper restoration of the system.

Activities on Receipt of Warning or Activation of EOC

- ◆ Arrange for transport to the affected area
 - ◆ Tractor shovel
 - ◆ Tipper
 - ◆ Auxiliary jeeps
- ◆ All new construction and repair activities should be halted and secured with sandbags, tarpaulins, etc.
- ◆ Polythene for the protection of freight and equipment should be arranged for
- ◆ All perishable and breakable items should be loaded in lorries and padlocked
- ◆ Reserve stocks for fuel should be checked
- ◆ Inspection of all bridges by a bridge engineer including an under water survey of foundations, piers and abutments should be done. A full check on all concrete and steel works should be included and repairs carried out
- ◆ Continuous regular weeding and cleaning of ditches should be carried out by the maintenance engineer staff

Responsibilities

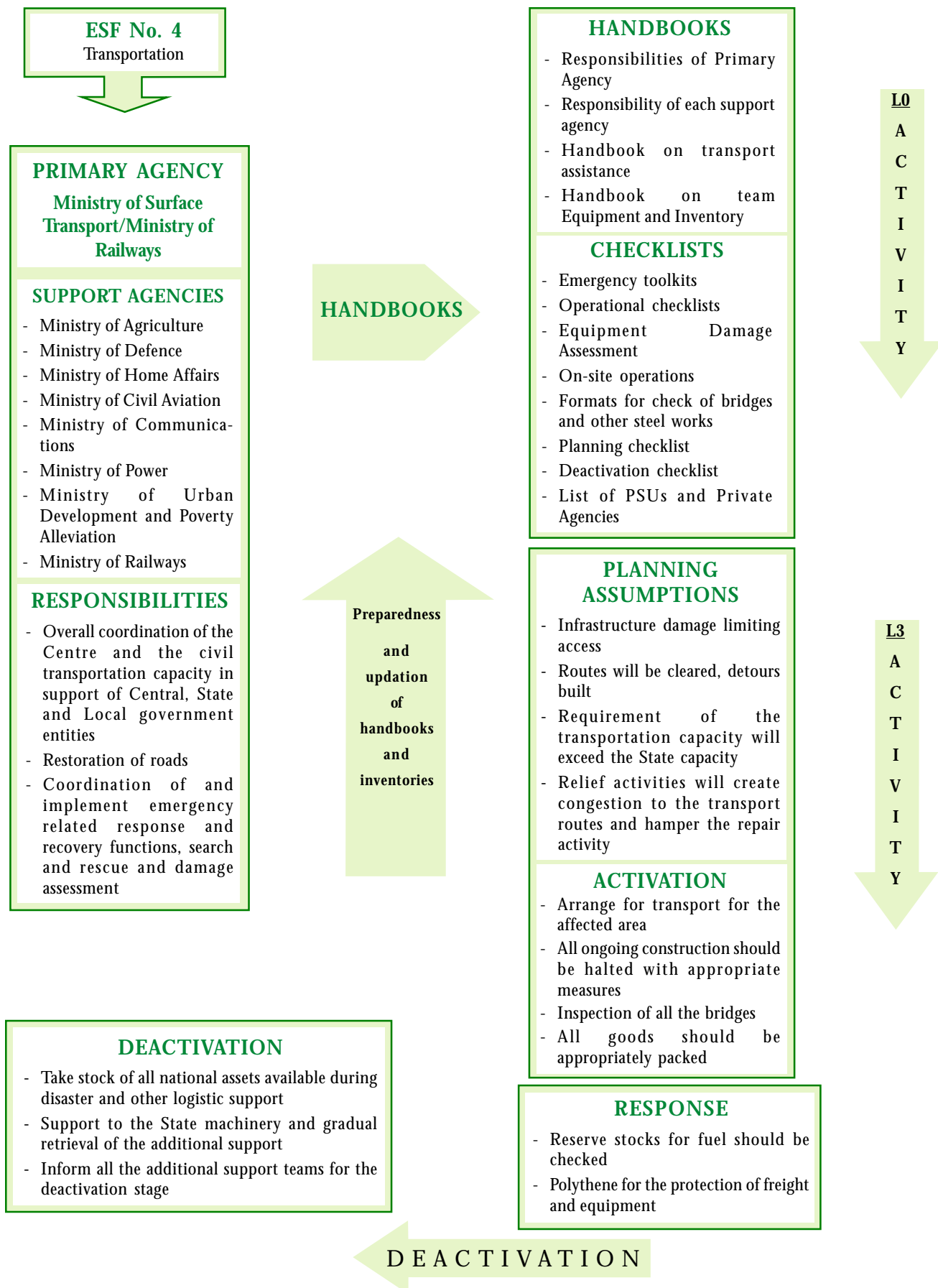
- ◆ Overall coordination of the Centre and the civil transportation capacity in support of Central, State and Local government entities
- ◆ Restoration of roads and the emergency supply routes should be carried out first
- ◆ Coordination and implementation of

emergency related response and recovery functions performed under the Ministry of Surface Transport including the prioritisation and/or allocation of civil transport, air and marine traffic control, search and rescue and damage assessment.

Minimum Standards Required

- ◆ Inventories of available transport facilities
- ◆ Responsibilities of Primary Agency
- ◆ Responsibility of each Support Agency
- ◆ Handbook on transport assistance

- ◆ Handbook on Team Equipment and Inventory
- ◆ Emergency toolkits
- ◆ Operational check slists
- ◆ Equipment Damage Assessment
- ◆ On-site operations
- ◆ Formats for check of bridges and other steel works
- ◆ Planning checklist
- ◆ Deactivation checklist
- ◆ List of PSUs and Private Agencies



EMERGENCY SUPPORT FUNCTION 5

Search and Rescue

Primary Agency

- ◆ Ministry of Defence

Secondary Agencies

- ◆ Ministry of Agriculture
- ◆ Ministry of Science and Technology
- ◆ Ministry of Health and Family Welfare
- ◆ Ministry of Heavy Industries and Public Enterprises
- ◆ Ministry of Home Affairs
- ◆ Ministry of Surface Transport
- ◆ Ministry of Civil Aviation
- ◆ Voluntary Agencies and PSUs

Purpose

The purpose of ESF 5 is to provide specialised life saving assistance to state and Local authorities in the event of a major disaster or emergency. Its operational activities include locating, extricating and providing on-site medical treatment to victims trapped in collapsed structures

Planning Assumptions

- ◆ State and Local machinery will be overwhelmed and unable to respond to all requirements.
- ◆ Local residents, workers or volunteers may initiate some search and rescue but will lack specialised techniques. Spontaneous volunteers will require coordination.
- ◆ Access to damage area will be limited. Some sites may be accessible only through air or water.

Activities on the Receipt of Warning or Activation of EOC

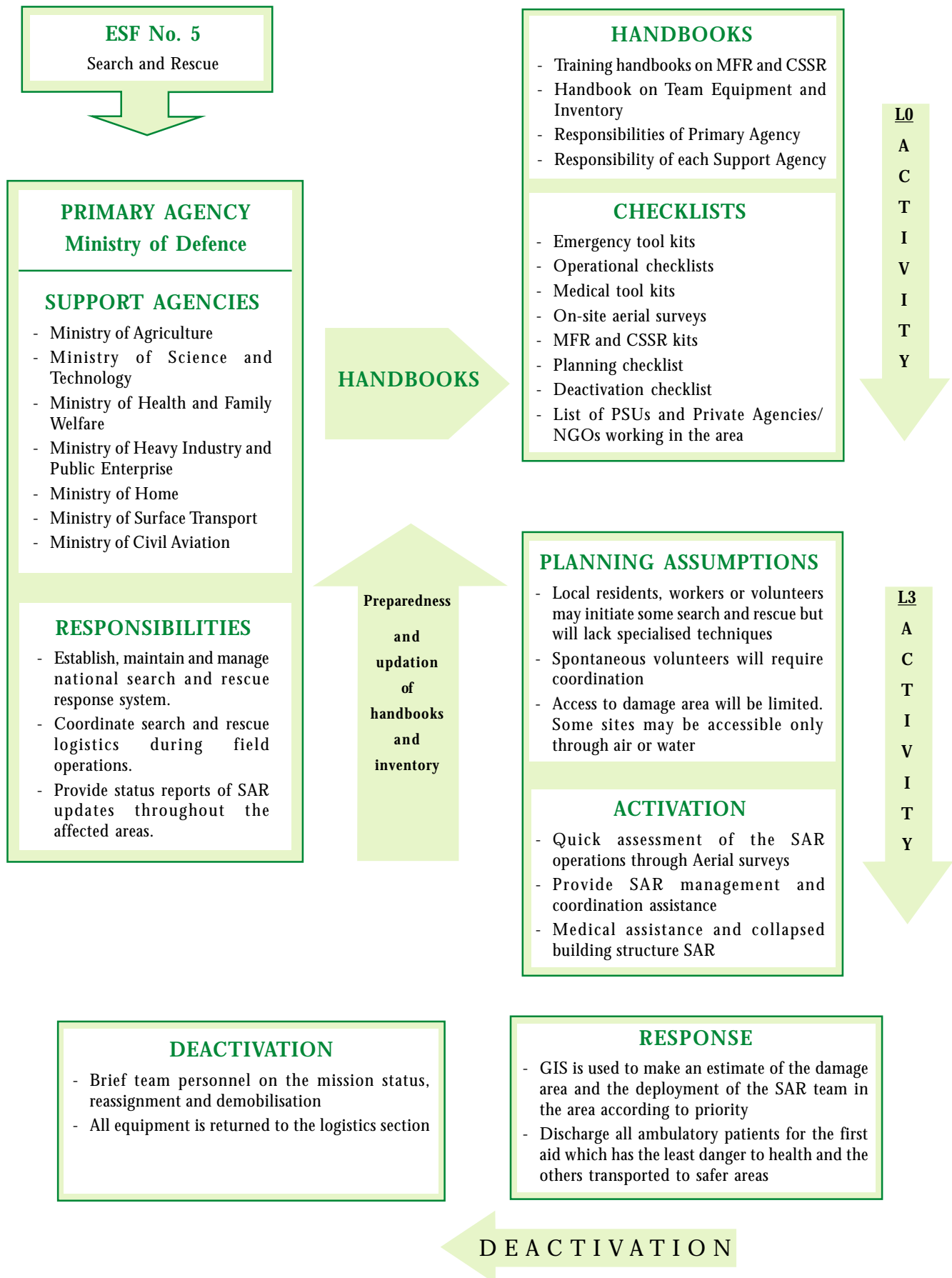
- ◆ Conduct a quick and comprehensive SAR which needs assessment
- ◆ Provide SAR management and coordination assistance to the affected State EOC team
- ◆ SAR should include teams specialised in:
 - ◆ Medical first response
 - ◆ Collapse structure search and rescue
- ◆ Discharge all ambulatory patients whose release does not pose health risk to them. If possible they should be transported home
- ◆ Non-ambulatory patients such as should be relocated to safer areas following:
 - ◆ Seriously injured and sick
 - ◆ Children, women and handicapped
 - ◆ Old
 - ◆ Able-bodied

Responsibilities

- ◆ Establish, maintain and manage national search and rescue response system. These responsibilities include equipment purchase and evaluation of operation readiness.
- ◆ Provide on the site quick lessons to the volunteers so as to have a coordinated SAR of the victims.
- ◆ Coordinate search and rescue logistics during field operations.
- ◆ Provide status reports of SAR updates throughout the affected areas.

Standards to be Developed

- ◆ Training handbooks on MFR and CSSR
- ◆ Inventory of volunteers who have already completed the course successfully and can be utilised in the search and rescue operations
- ◆ Handbook on Team Equipment and Inventory
- ◆ Responsibilities of Primary Agency
- ◆ Responsibility of each support agency
- ◆ Emergency tool kits
- ◆ Operational checklists
- ◆ Medical tool kits
- ◆ On-site aerial surveys
- ◆ MFR and CSSR kits
- ◆ Deactivation checklist
- ◆ List of PSUs and Private Agencies/ NGOs working in the area



EMERGENCY SUPPORT FUNCTION 6

Donation Management

Primary Agency

- ♦ Ministry of Disaster Management

Secondary Agencies

- ♦ Ministry of Finance
- ♦ Ministry of Defence
- ♦ Ministry of External Affairs
- ♦ Ministry of Transport
- ♦ Ministry of Civil Aviation
- ♦ Ministry of Commerce and Industry

Purpose

Donation management is necessary to control the flow of goods and services into a disaster area. If trucks, trains, ships and planes are allowed into the disaster area to drop their donations, they can easily interfere with other ongoing disaster response operations. Uncontrolled shipments of donations can also put undue burden on disaster response operations as they require the scarce response resources. Above all, it is necessary to manage the flow of donated goods to be sure that the needs of disaster victims are being met as effectively as possible.

The purpose of this function is to expedite the delivery of voluntary goods and services to support relief effort in a coordinated manner.

Concept of Operations

A team of voluntary agency representative (VASUDEVA) and Ministry of Social Justice and Empowerment are the best to manage donations. The Director, Rehabilitation Council of India can act as the Central Coordinating Officer for Donation Coordinating Centre. The Donation Coordination Team will be operating at the

State level with State Donation Coordinator. The key is to give the public the opportunity as early as possible after a disaster or in case of imminent disasters (cyclone) to interact with the Central Coordinating Officer and the voluntary agency representative to find out what is really needed by the disaster victims, whom to send the goods to and how to send the goods.

Planning Assumptions

- ♦ Donation Management response activities are necessary before the declaration of a disaster as L3 and hence require rapid coordination to mitigate potential donations problems in the response phase of disaster operations.
- ♦ In the event of a disaster causing large-scale loss of life and destruction of property, donors both national and international will offer assistance of virtually any kind, including cash (PM Relief Fund), goods, equipment and loan of equipment and services of an individual.
- ♦ Offers of assistance will be made available directly to all levels of government-Centre, State and local, as well as voluntary organisations.
- ♦ In less than L3 level of disaster or high visibility disasters, donation management will be handled by voluntary organisations with or without Centre and State involvement.

Donation Sectors

- ♦ Donations come from a variety of sources:
 - ♦ General public (Citizens)
 - ♦ Public and Private sector organisations
 - ♦ Civic Associations (Clubs etc.)
 - ♦ International Community

Types of Donations

- ◆ Food and water
- ◆ Clothes
- ◆ Medicines
- ◆ Tools, generators, vehicles
- ◆ Cleaning supplies
- ◆ Building supplies
- ◆ Monetary help
- ◆ Baby items

The Need

Experienced voluntary agencies and local community leaders best determine the needs in the disaster area. Moreover, the voluntary agencies know their capacity to accept offers.

The entire donation should reach the Collection Point from the Point of Departure. The Donation Coordinating Team (DCT)

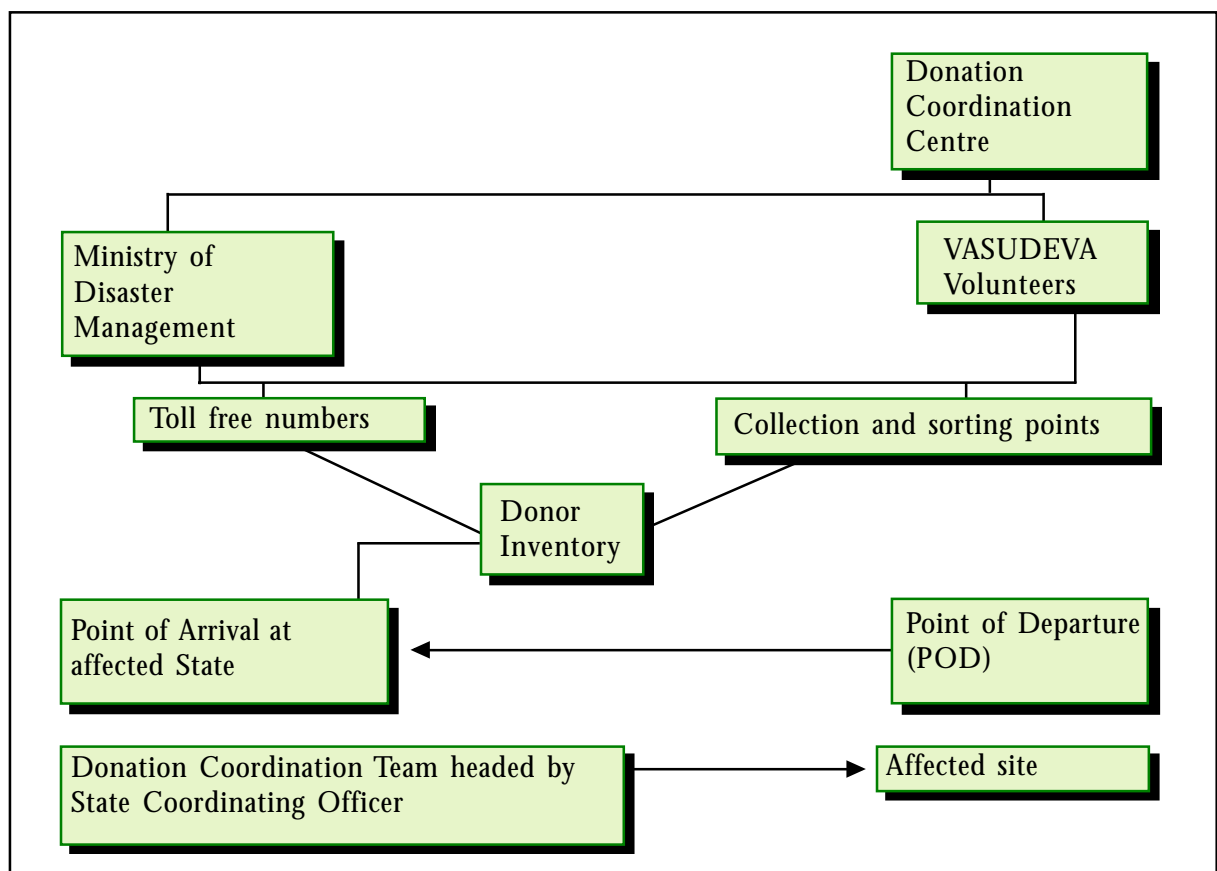
based at the State will coordinate with the Donation Coordinating Centre to distribute the donations as per the need of the victims.

In each State there should be the provision for **toll free** numbers and people can use these numbers and request for their needs and what donation they would like to make. Such information will be put into the database and transmitted immediately to the DCT at the State. The team of donation specialists in the field will call back the donor to inform of the special needs and arrange the shipping, receiving and distribution of goods by the Donation Coordinating Centre.

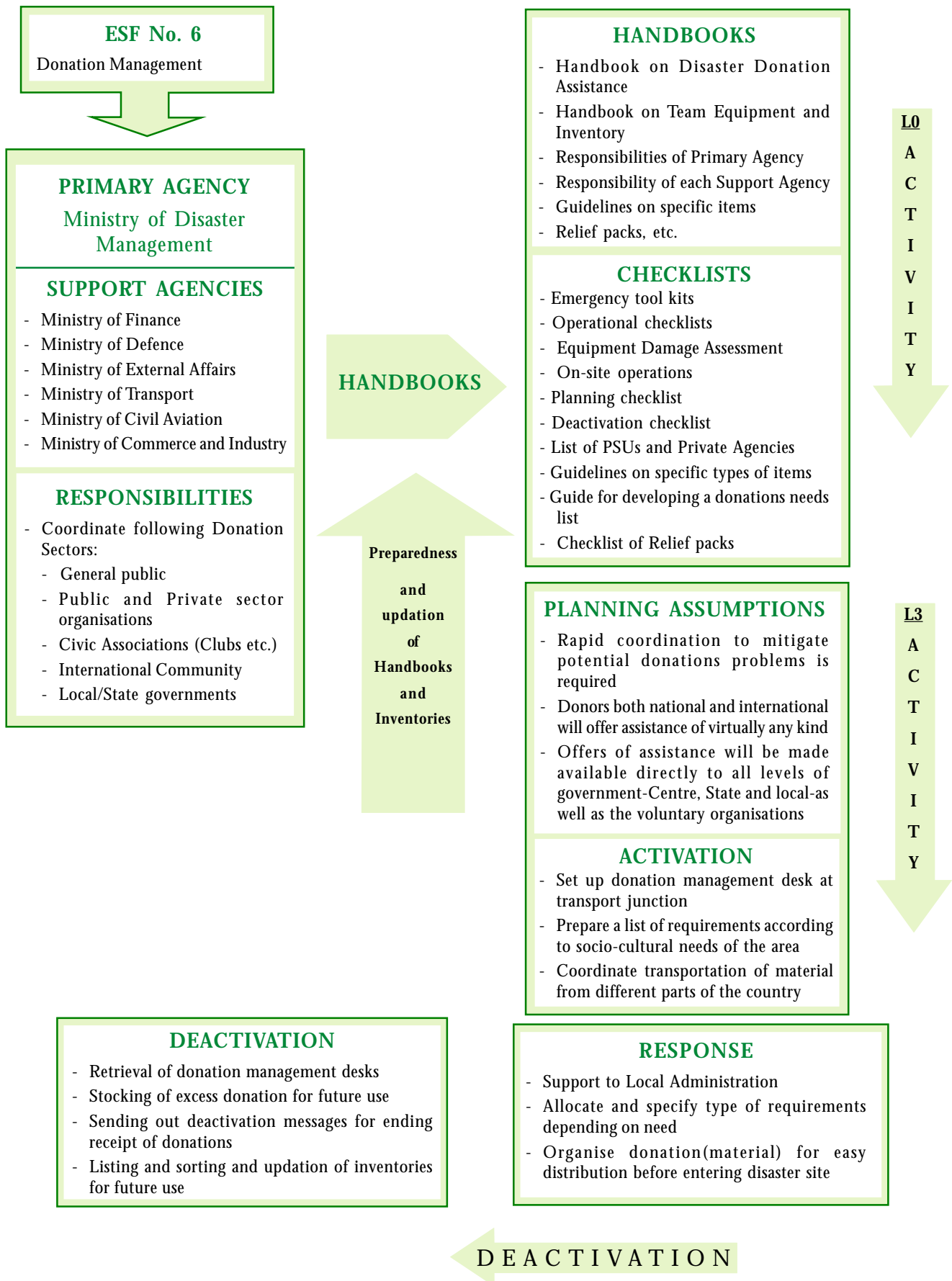
Minimum Standards Required

- ◆ Guidelines on specific types of items
- ◆ Guide for developing a donation needs list to be prepared by the Voluntary

VII.1 Manpower/Material Flow Chart of Donations



- Agencies (family pack or mass relief pack, colour coding)
- ◆ Emergency toolkits (first aid items)
- ◆ Equipment Damage Assessment
- ◆ On-site operations check list and the coordinating field station map
- ◆ Planning checklist
- ◆ Deactivation checklist
- ◆ List of PSUs and Private Agencies
- ◆ Guidelines on specific types of items
- ◆ Guide for developing donations needs list
- ◆ Handbook on Disaster Donation Assistance
- ◆ Handbook on team Equipment and Inventory
- ◆ Responsibilities of Primary Agency
- ◆ Responsibilities of each support agency
- ◆ Guidelines on specific items and continued response for donation and relief management



EMERGENCY SUPPORT FUNCTION 7

Public Works and Engineering

Primary Agency

- ◆ Ministry of Surface Transport

Secondary Agencies

- ◆ Ministry of Defence
- ◆ Ministry of Power
- ◆ Ministry of Home Affairs
- ◆ Ministry of Labour
- ◆ Ministry of Communications
- ◆ Ministry of Water Resources
- ◆ Ministry of Urban Development and Poverty Alleviation

Purpose

Provides technical advice and evaluation, engineering services, contracting for construction management and inspection, contracting for emergency repair of water and waste water treatment facilities, potable water, emergency power, real estate support to assist the States in meeting goals related to life sustaining actions, damage mitigation and recovery activities following a major disaster. Provide public works and engineering support to assist needs related to life saving or life protecting support prior to, during and immediately following an event. Perform immediate damage assessment of the infrastructure.

Planning assumptions

- ◆ Access to disaster area will depend upon the re-establishment of ground and water routes
- ◆ Early damage assessment may be incomplete, inaccurate and general and rapid assessment may be required to determine response time

- ◆ Significant number of persons having engineering skills will be required from outside the disaster area
- ◆ Previously inspected structures will require re-evaluation if aftershocks occur following an earthquake

Activities on the Receipt of Warning or Activation of EOC

- ◆ All technical officers should be notified and should meet the staff to review emergency procedure
- ◆ Review and update precautionary measures and procedures that should be taken to protect equipment and the post disaster procedures to be followed
- ◆ Inspect all roads, bridges including under water inspection of foundations and piers. A full check should be made on all concrete and steel works
- ◆ Inspect all buildings and structures of the State government by a senior engineer and identify structures which are endangered by the impending disaster
- ◆ Emergency tool kit should be assembled for each block of the affected area
- ◆ Establish a priority list of roads which will be opened first which should include roads to hospitals and main trunk roads
- ◆ Identify locations for setting up transit and relief camps, feeding centres and inform the state EOC
- ◆ All work teams should be issued two-way communication link
- ◆ Provide a work team carrying emergency tool kits, depending on the nature of disaster and essential equipment such as

- ◆ Towing vehicles
- ◆ Earth moving equipment
- ◆ Cranes
- ◆ Each unit should mobilise a farm tractor with chain, cables and a buffer stock of fuel
- ◆ Adequate road signs should be installed to guide and assist relief work
- ◆ Begin clearing roads. Assemble casual labour to work with experienced staff, mobilise community assistance by contacting community organisation and burning or removal of debris and repair all paved and unpaved road surfaces
- ◆ Construct temporary roads to serve as access to temporary transit, relief camps and medical facilities

Responsibilities

- ◆ Pre-positioning assessment teams headed by the State coordinating officer and deployment of other advance elements
- ◆ Emergency clearing of debris to enable reconnaissance of the damaged areas and passage of emergency personnel and equipment for life saving, property protection and health and safety
- ◆ Removal and disposal management of debris from public property
- ◆ Emergency restoration of critical public facilities
- ◆ Inspection of all the buildings in the affected area so as to check the safety of the building for the aftershock and to reduce further damage

Standards to be developed

- ◆ By-laws for all disasters
- ◆ Check list of tool kit
- ◆ Inventory of engineering equipment
- ◆ Disaster specific and area specific
 - Handbook on Disaster Engineering Assistance
 - Handbook on Team Equipment and Inventory
 - Responsibilities of Primary Agency and each Support Agency
 - Guidelines on specific types of items/situations for specific disasters
 - Inventory of equipment/agencies/personnel
 - Emergency tool kits
 - Operational checklists for team heads and team members
 - Equipment Damage Assessment
 - Handling of heavy equipments
 - Deactivation checklist
 - Guidelines on specific types of items for each disaster
 - Guide for by-laws to be followed
 - Qualification of labour /other site assistants

ESF No. 7

Public Works and Engineering

PRIMARY AGENCY

Ministry of Urban Affairs & Poverty Alleviation

SUPPORT AGENCIES

Ministry of Power
Ministry of Home Affairs
Ministry of Labour
Ministry of Surface Transport
Ministry of Communications
Ministry of Water Resources
Ministry of Urban Development and Poverty Alleviation

RESPONSIBILITIES

- Pre-positioning assessment teams headed by the state coordinating officer
- Emergency clearing of debris to enable reconnaissance
- Coordinate road clearing activities to assist local relief work
- Begin clearing roads. Assemble casual labour
- Provide a work team carrying emergency tool kits, depending on the nature of disaster, and essential equipment such as
 - Towing vehicles
 - Earth moving equipments
 - Cranes
- Construct temporary roads
- Keep national and other main highways clear from disaster effects such as debris etc.

DEACTIVATION

- Retrieval of heavy equipment
- Stocking of equipment for repair etc
- Sending out deactivation messages to concerned officials on-site
- Termination orders for labour and site assistants from L3 activities
- Listing, sorting and updation of inventories for future use

HANDBOOKS

Preparedness
and
updation
of
handbooks
and
inventory

HANDBOOKS

- Handbook on Disaster Engineering Assistance
- Handbook on Team Equipment and Inventory
- Responsibilities of Primary Agency and each Support Agency
- Guidelines on specific types of items/situations for specific disasters
- Inventory of equipment / agencies/ personnel

CHECKLISTS

- Emergency tool kits
- Operational checklists
- Equipment Damage Assessment
- Handling of heavy equipments
- Planning checklist
- Deactivation checklist
- Guidelines on specific types of items for each disaster
- Guide for by-laws to be followed
- Qualification of labour /other site assistants

PLANNING ASSUMPTIONS

- Access to disaster area will depend on reestablishment of ground/water routes
- Early damage assessment may be inaccurate and rapid assessment may be required to know response time
- Significant number of persons having engineering skills will be required
- Previously inspected structures will require re-evaluation if aftershocks occur following an earthquake

ACTIVATION

- All technical officers should be notified
- Review and update precautionary measures and procedures
- Inspect all roads, bridges
- Inspect all buildings and structures of the State government

RESPONSE

- Establish a priority list of roads which will be opened first
- Identify locations for transit /relief camps
- Adequate road signs should be installed to guide and assist in relief work

DEACTIVATION

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EMERGENCY SUPPORT FUNCTION 8

Information and Planning

Primary Agency

- ♦ Ministry of Information Technology

Support Agencies

- ♦ Ministry of Information and Broadcasting
- ♦ Ministry of Urban Affairs and Poverty Alleviation
- ♦ Ministry of Power
- ♦ Ministry of Science and Technology

Purpose

To collect, process and disseminate information about an actual or potential disaster situation to facilitate the overall activities of all responders in providing assistance to an affected area.

The ESF on Information and Planning should maintain a database of all disaster related information in the form of a GIS enabled 'Disk net' that will allow easy access and retrieval of information during a disaster. The Disk net will be the hub /storage point for activities that should be carried out for response activities and at the same time continue to update itself during the L0 phase. It would enable and speed up the transfer of digital information and prepare a mammoth knowledge base that can be tapped for assistance during a disaster. The database at the Centre can be linked with nodal knowledge institutions for various disasters. These institutions in turn can be linked to State level and subsequently local level information institutions in order to form a well networked country wide database.

During the response phase of a disaster all EOCs and each ESF can be directly linked to the Disk net in order to access and know

about the status of relief and other requirements through out the country.

Planning Assumptions

- ♦ There will be an immediate need for information by all officials, NGO's and the country at large
- ♦ There will be need for a central collection point where information can be compiled and further planning of response operations can be carried out
- ♦ Initial information centre may require at least 24 hours to be fully operational

Activities on the Receipt of Warning or Activation of EOC

- ♦ ESF 9 should immediately commence operation at the receipt of a warning before the disaster
- ♦ It should establish contact with the concerned local authorities, active NGO's and the Centre at the earliest
- ♦ Extra staff should be deployed at the disaster site with communication equipment to enable recovery planning
- ♦ Documentation of all response/relief and recovery measures should be done
- ♦ Situation reports should be prepared and adequately completed every 3-4 hours during the initial response phase of a disaster
- ♦ Disk net should be updated and allowed access to information by key government agencies

Responsibilities

- ♦ Enable local authorities to establish contact with the state authorities
- ♦ Coordinate planning procedures between District, State and the Centre
- ♦ Document all procedures
- ♦ Provide ready formats for all reporting procedures

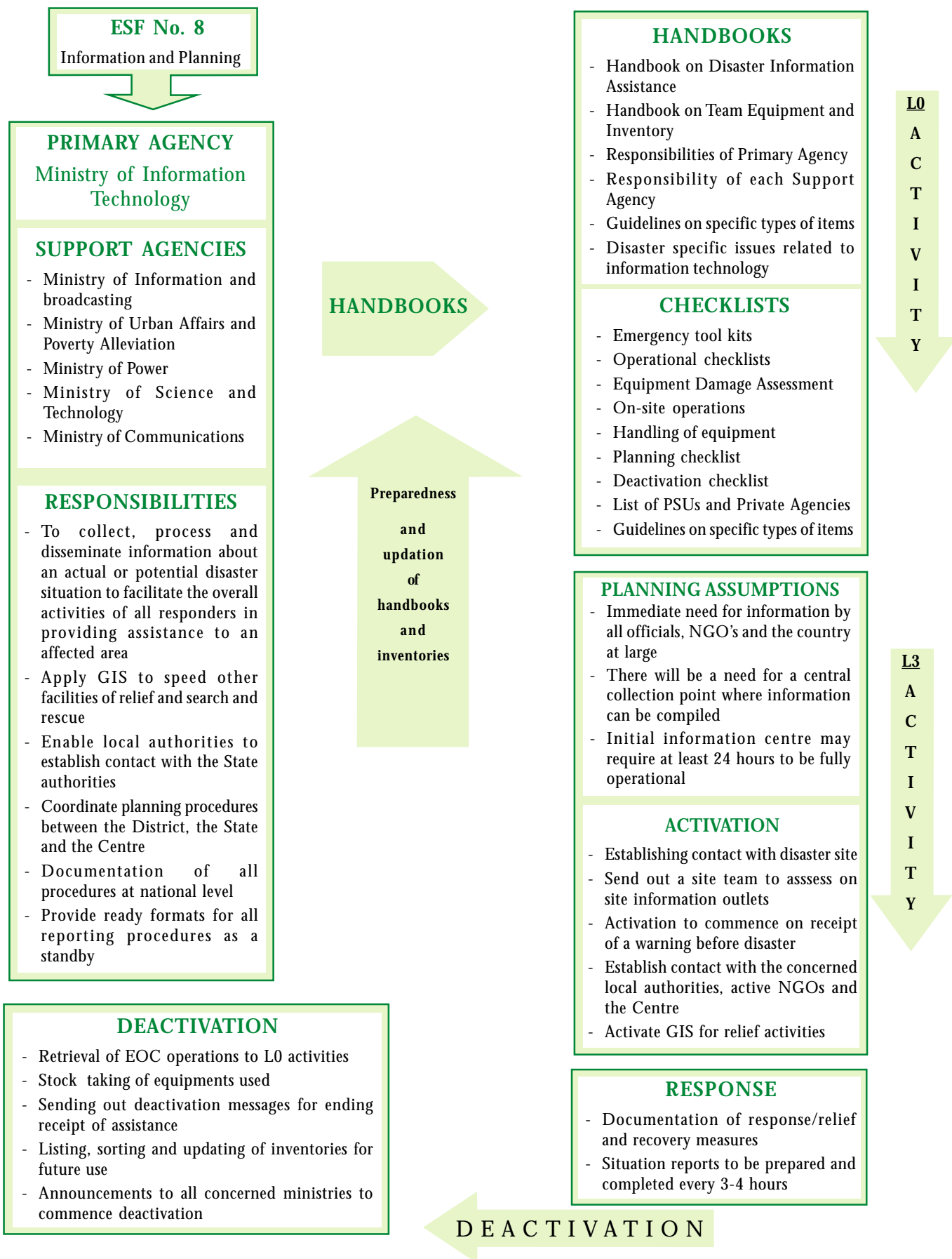
- ◆ Provide handbooks and checklists to all government functionaries

Minimum Standards Required

- ◆ Handbook on Disaster Information Assistance
- ◆ Handbook on Team Equipment and Inventory
- ◆ Responsibilities of Primary Agency
- ◆ Responsibility of each Support agency
- ◆ Guidelines on specific types of items
- ◆ Disaster specific issues related to

information technology

- ◆ Emergency tool kits
- ◆ Operational checklists
- ◆ Equipment Damage Assessment
- ◆ On-site operations
- ◆ Handling of equipment
- ◆ Planning checklist
- ◆ Deactivation checklist
- ◆ List of Public Sector Units and Private Agencies
- ◆ Guidelines on specific types of items



EMERGENCY SUPPORT FUNCTION 9

Relief Supplies

Primary Agency

- ◆ Ministry of Planning and Program Implementation

Support Agencies

- ◆ Ministry of Communication
- ◆ Ministry of Information and Broadcasting
- ◆ Ministry of Railways
- ◆ Ministry of Surface Transport
- ◆ Ministry of Power
- ◆ Ministry of Agriculture

Voluntary agencies

- ◆ VASUDEVA

Purpose

The purpose is for coordinating activities involved with the emergency provisions of temporary shelters, emergency mass feeding, and bulk distribution of coordinated relief supplies for victims of disaster. In some instances, services may also be provided to disaster workers and logistical and resource support to local entities involved in delivering emergency and recovery efforts, shelter, food, and emergency first aid following a disaster. Operate a Disaster Welfare Information (DWI) System to collect, receive, and report the status of victims and assist family reunification; and coordinate bulk distribution of emergency relief supplies.

Planning Assumptions

- ◆ Inventory of all relief supplies should be prepared during peace time or L0 phase of a disaster by the concerned departments
- ◆ All inventories are updated to suit the disaster needs

- ◆ Most of the local resources might be disrupted and outside resources (neighbouring States and Centre) may need to be tapped

- ◆ Transport of resources may require a mobilization centre at nearest functional transport junctions

Activities on the Receipt of Warning or Activation of EOC

- ◆ Establish a mobilization Centre at the airport/railway station for the movement of relief supplies
- ◆ Deploy special aircrafts and trains for the movement of relief supplies as planned in the L0 phase
- ◆ Inform all suppliers of relief material within 2-3 hours of the disaster to keep the required supplies ready
- ◆ Arrange motor equipment for transportation of relief supplies
- ◆ Provide assistance in establishing local offices, relief camps etc., by providing beddings, furniture etc
- ◆ Provide survival kits to relief workers before they leave for the disaster site

Responsibilities

- ◆ Locate, procure and issue resources to Central agencies involved in disaster response
- ◆ Locate and coordinate space for disaster management activities
- ◆ Coordinate and determine the availability of and provide non-edible relief supplies stocked during the L0 phase
- ◆ Provide support for procurement of telecom equipment for ESF No.2
- ◆ Coordinate the transfer of extra Central property and dispose it where required

- ◆ Procure required stocks from vendors and supply them to the disaster area

Minimum Standards Required

- ◆ Handbook on Relief supplies Assistance
- ◆ Handbook on Team Equipment and Inventory
- ◆ Responsibilities of Primary Agency and each Support Agency
- ◆ Guidelines on specific types of items for each disaster
- ◆ Manual on disaster specific relief operations

- ◆ Emergency tool kits
- ◆ Operational checklists for team leaders and team members
- ◆ Handling/storage of relief supplies
- ◆ On-site operations
- ◆ Planning checklist
- ◆ Deactivation checklist
- ◆ List of PSUs and Private Agencies
- ◆ Guidelines on specific types of items for each disaster
- ◆ Guide for developing relief supplies needs list

ESF No. 9
Relief supplies

PRIMARY AGENCY
Ministry of Planning &
Program Implementation

SUPPORT AGENCIES

- Ministry of Communication
- Ministry of information and Broadcasting
- Ministry of Railways
- Ministry of Surface transport
- Ministry of Power
- Ministry of Agriculture
- VASUDEVA

RESPONSIBILITIES

- Coordinate activities involved with the emergency provisions
- Temporary shelters
- Emergency mass feeding
- Bulk distribution
- To provide logistical and resource support to local entities
- Operate a Disaster Welfare Information (DWI) System to collect, receive, and report the status of victims, assist family reunification; and coordinate bulk distribution of emergency relief supplies
- In some instances, services also may be provided to disaster workers

HANDBOOKS

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HANDBOOKS

- Handbook on Relief supplies Assistance
- Handbook on Team Equipment and Inventory
- Responsibilities of Primary Agency and each Support Agency
- Guidelines on specific types of items for each disaster
- Manual on disaster specific relief operations

CHECKLISTS

- Emergency tool kits
- Operational checklists
- Handling/storage of relief supplies
- On-site operations
- Planning checklist
- Deactivation checklist
- List of PSUs and Private Agencies
- Guidelines on specific types of items for each disaster
- Guide for developing relief supplies needs list

PLANNING ASSUMPTIONS

- Rapid coordination to mitigate potential donations problems is required
- Donors both national and international will offer assistance of virtually any kind
- Offers of assistance will be made available directly to all levels of government-Centre, State and local as well as voluntary organisations

ACTIVATION

- Set up donation management desk at transport junction
- Prepare a list of requirements according to socio-cultural needs of the area
- Coordinate transportation of material from different parts of the country

RESPONSE

- Support to Local Administration
- Allocate and specify type of requirements depending on need
- Organise donation(material) for easy distribution before entering disaster site

DEACTIVATION

- Retrieval of EOC operations and personnel
- Stocking of excess supplies for future use
- Sending out deactivation messages for ending receipt of supplies
- Listing, sorting and updation of inventories for future use

DEACTIVATION

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EMERGENCY SUPPORT FUNCTION 10

Food

Primary Agency

- ◆ Ministry of Food and Civil Supplies

Support Agencies

- ◆ Ministry of Surface transport
- ◆ Ministry of Civil Aviation
- ◆ Ministry of Railways
- ◆ Ministry of Social justice and Empowerment

Purpose

To identify the basic needs of food in the aftermath of a disaster or emergency. To obtain appropriate supplies and transporting such supplies to the disaster area and identify, secure, and arrange to transport food assistance to the affected areas, and authorise food stamp assistance following a major disaster or emergency requiring Central response.

Planning Assumptions

- ◆ Most of the food processing units and supplies may be disrupted
- ◆ Water supply and potable water systems may be unusable
- ◆ There may be a total disruption of energy sources
- ◆ Activities on the receipt of warning or activation of EOC
 - ◆ Determine the critical need of food for the affected area people
 - ◆ Catalogue of available resources of food
 - ◆ Ensure that food distributed is fit for human consumption
 - ◆ Allocate food in different packs that can be given to families on a take-

home basis while others that can be distributed in relief camps

- ◆ Initiate, direct and market procurement of critical food available from different inventories

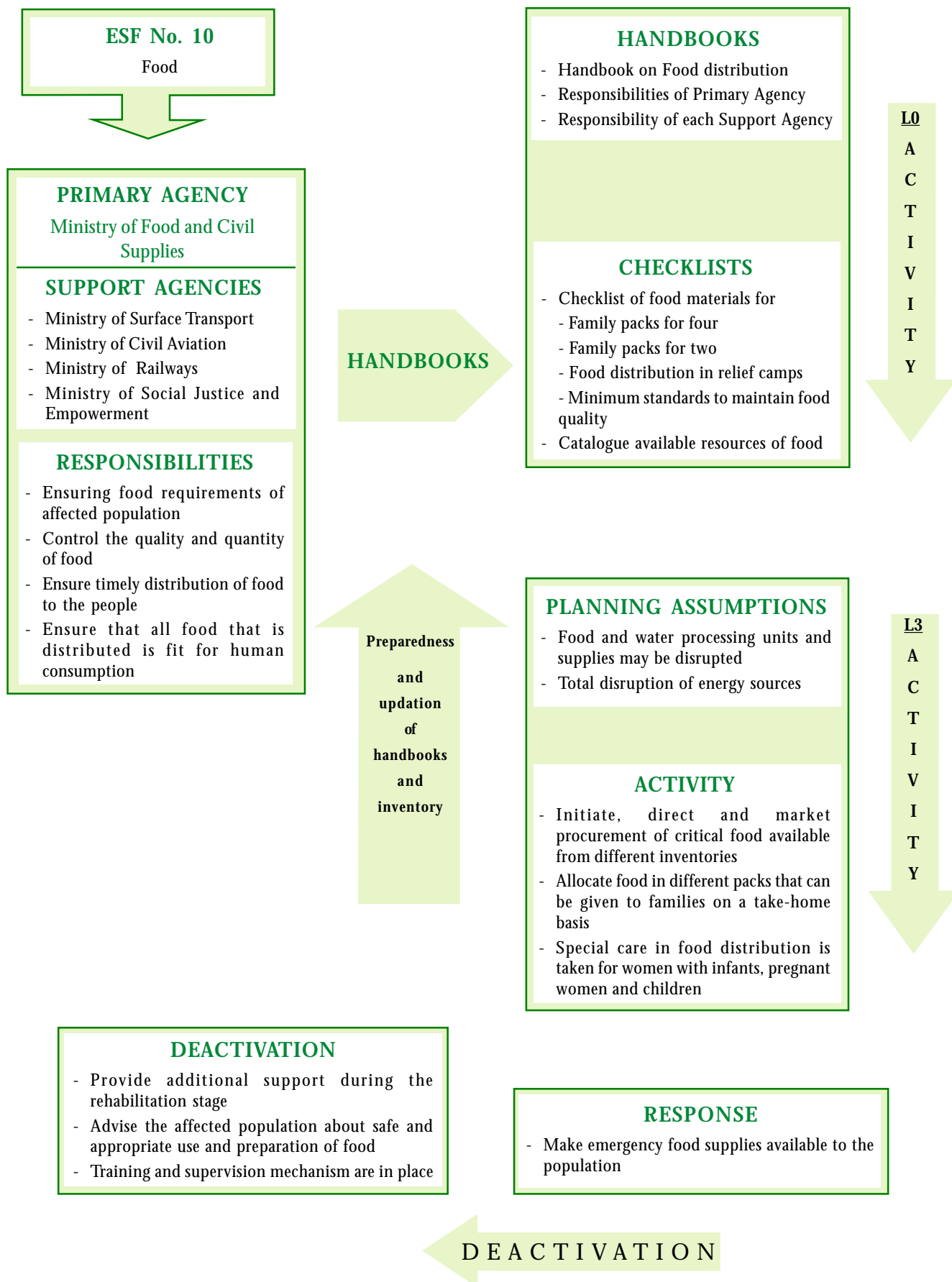
Responsibilities of Primary Agency

- ◆ Coordinate with local authorities and State officials to determine requirement of food for affected population
- ◆ Make emergency food supplies available to State from national resources
- ◆ Ask other States that are geographically close to the affected areas to send food to the site
- ◆ Mobilise and coordinate with other ESFs for air dropping of food to affected site
- ◆ Ensure quality and control the type of food
- ◆ Prepare separate food packs for relief camps and for air dropping and distribution
- ◆ Prepare family packs as well as large quantity containers according to the need and ease of distribution as well as transportation
- ◆ Control the quality and quantity of food that is distributed to the affected population
- ◆ Develop a plan that will ensure timely distribution of food to the people
- ◆ Ensure that special care in food distribution is taken for women with infants, pregnant women and children

Standards Required

- ◆ Checklist of food materials for:
 - ◆ Family packs for four

- ◆ Family packs for two
- ◆ Food distribution in relief camps
- ◆ Minimum standards to maintain food quality
- ◆ Catalogue available resources of food
- ◆ Handbook on food distribution
- ◆ Responsibilities of Primary Agency
- ◆ Responsibility of each Support Agency



EMERGENCY SUPPORT FUNCTION 11

Drinking Water and Water Supply

Primary Agency

- ◆ Ministry of Water Resources

Support Agencies

- ◆ Ministry of Rural Development
- ◆ Ministry of Health and Family welfare
- ◆ Ministry of Consumer Affairs and Public Distribution
- ◆ Ministry of Agriculture

Purpose

To provide a minimum quantity of clean drinking water and to reduce the spread of diseases through water during disaster times and to allow people to perform daily tasks.

Planning Assumptions

- ◆ Most of the water available will be unfit for drinking
- ◆ Existing storage bodies of water will be damaged and unusable
- ◆ There will be an urgent need of water to assist victims in rescue operation

Activities on the Receipt of Warning or Activation of EOC

- ◆ Setting up water points in key locations and in relief camps
- ◆ Maintaining and providing clean water

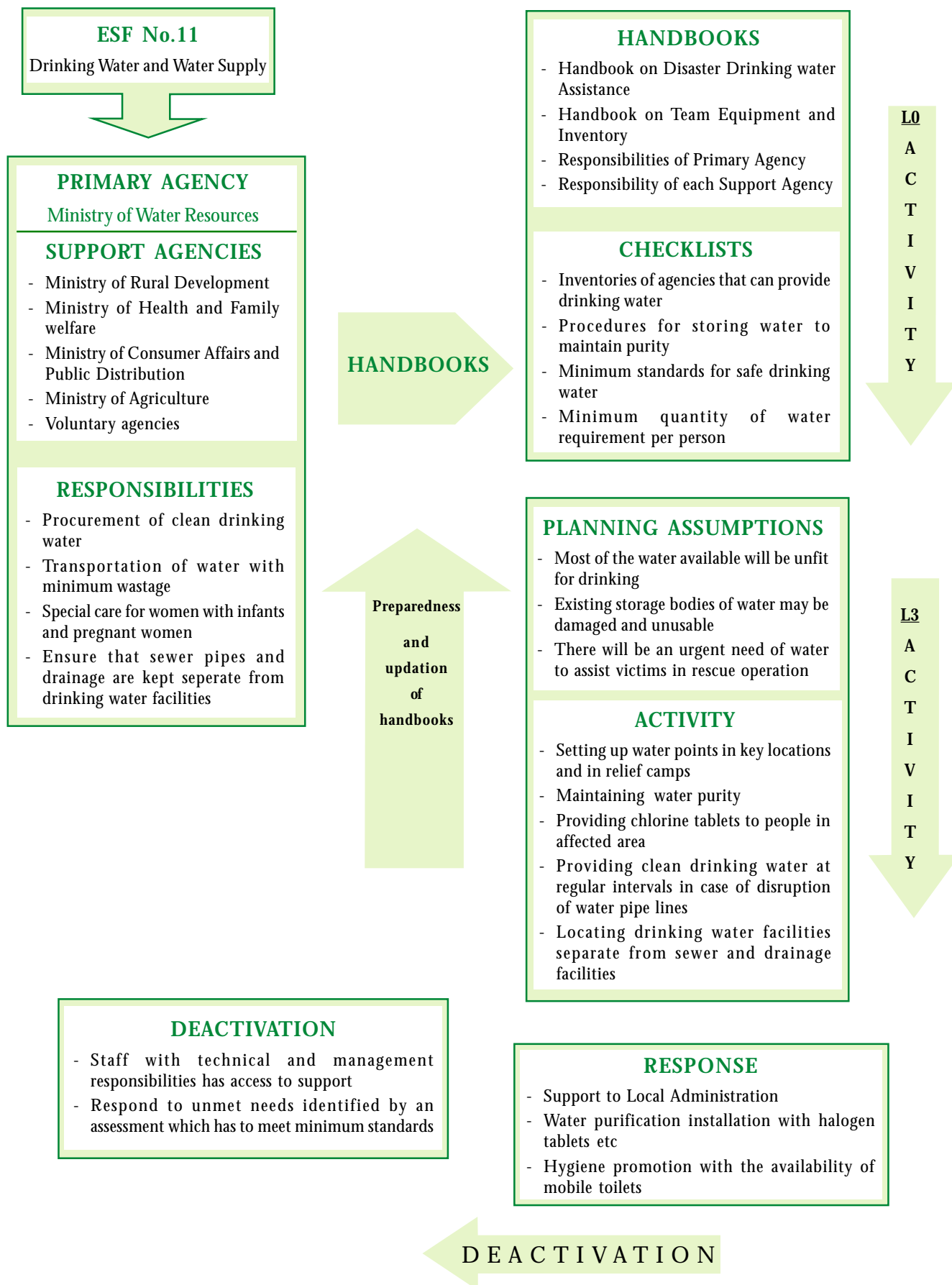
Responsibilities

- ◆ Procurement of clean drinking water
- ◆ Transportation of water with minimum wastage
- ◆ Special care for women with infants and pregnant women

- ◆ Ensure that sewer pipes and drainage lines are kept separate from drinking water facilities
- ◆ Provide chlorine tablets to people in affected area
- ◆ Providing clean drinking water at regular intervals in case of disruption of water pipe lines
- ◆ Locate drinking water facilities separate from sewer and drainage facilities
- ◆ Ensure that the remaining or unaffected sources of water do not get contaminated and the distribution of water is equal to all victims in the area.
- ◆ Identify and mark damaged water pipelines and contaminated water bodies and inform disaster victims against using them
- ◆ Inform other related ESFs of damaged pipelines for repair work

Minimum Standards Required

- ◆ Handbook on Disaster Drinking water Assistance
- ◆ Handbook on Team Equipment and Inventory
- ◆ Responsibilities of Primary Agency
- ◆ Responsibility of each Support Agency
- ◆ Inventories of agencies that can provide drinking water
- ◆ Procedures for storing of water to maintain purity
- ◆ Minimum standards for safe drinking water
- ◆ Minimum quantity of water requirement per person



EMERGENCY SUPPORT FUNCTION 12

Shelter

Primary Agency

- ◆ Ministry of Urban Affairs and Poverty Alleviation

Support Agencies

- ◆ Ministry of Power
- ◆ Ministry of Home affairs
- ◆ Ministry of Labour
- ◆ Ministry of Surface Transport
- ◆ Ministry of Communications
- ◆ Ministry of Water Resources
- ◆ Ministry of Heavy Industries and Public Enterprise
- ◆ Central Building Research Institute (CBRI)

PSUs

- ◆ HUDCO
- ◆ BMTPC

Purpose

To meet the physical needs of individuals, families and communities for safe, secure and comfortable living space. The ESF should also be able to meet primary social needs of incorporating self-management in the process.

Planning Assumptions

- ◆ Most of the existing structures may be severely damaged
- ◆ The offices of the local authorities and PWD departments may be affected adversely
- ◆ Local sources of heavy machinery and clearance equipment may also not be accessible
- ◆ External sources of heavy machinery for

clearance may be required from existing inventories

- ◆ Large population in the affected area may be rendered homeless
- ◆ Some of the open areas that can be used as relief and shelter sites may also be badly affected

Activities on the Receipt of Warning or Activation of EOC

- ◆ Locate adequate relief camps based on survey of damage
- ◆ Quick assessment of functional and stable building structures
- ◆ Clear areas for setting up relief camps
- ◆ In case of damage to offices, assist local authorities to establish and house important telecom equipment and officials at the earliest
- ◆ Develop alternative arrangements for the population living in structures that might be affected even after the disaster (earthquakes, floods etc.)
- ◆ Set up relief camps and tents using innovative methods that save time

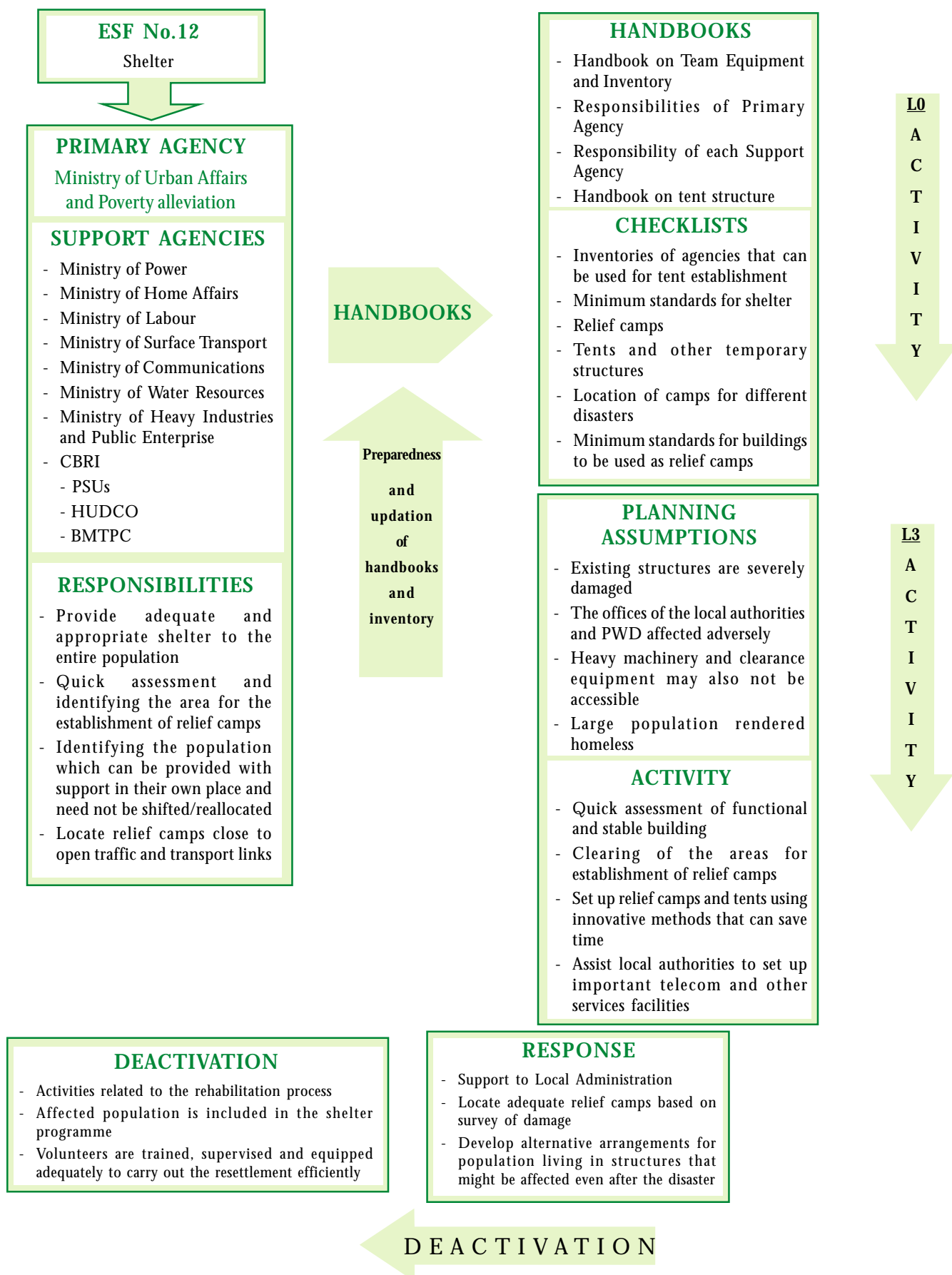
Responsibilities

- ◆ A quick assessment of damaged areas and areas that can be used for relief camps for the displaced population
- ◆ Survey of population that can be provided assistance at their own place and need not be shifted to relief camps
- ◆ Locate relief camps close to open traffic and transport links
- ◆ Provide adequate and appropriate shelter to the entire population
- ◆ Adhere to minimum standards for setting up relief camps
- ◆ Provide shelter structures in accordance with the climate of the area and transportation conditions

- ◆ Keep families together as far as possible in relief camps. If not, then mothers and their children should be kept together
- ◆ Ensure that temporary shelters are not prone to leakage and breakage as far as possible
- ◆ Assist other ESFs in equipping shelter and relief sites with basic needs of communication and sanitation

Minimum Standards Required

- ◆ Inventories of manufacturing agencies
- ◆ Procedures of storage
- ◆ Minimum standards for relief camps
- ◆ Minimum standards of requirements of space per person
- ◆ Handbook on Team Equipment and Inventory
- ◆ Responsibilities of Primary Agency
- ◆ Responsibility of each Support Agency
- ◆ Handbook on tent structure and other collapsible structures
- ◆ Handbook on assembling of structures
- ◆ Inventories of agencies that can be used for the tent establishment
- ◆ Minimum standards for shelter
- ◆ Relief camps
- ◆ Tents and other temporary structures
- ◆ Location of camps for different disasters
- ◆ Existing locations that can be used for shelter
- ◆ Minimum standards for buildings to be used as relief camps



EMERGENCY SUPPORT FUNCTION 13

Media

Primary Agency

- ◆ Ministry of Information and Broadcasting

Support Agencies

- ◆ Ministry of Information Technology
- ◆ Ministry of Transport
- ◆ Ministry of Communication
- ◆ Ministry of Health and Family Welfare
- ◆ Ministry of Agriculture
- ◆ Ministry of Science and technology
- ◆ Press Trust of India (PTI)

Voluntary Agencies

- ◆ VASUDEVA
- ◆ Indian Red Cross

Purpose

To provide and collect reliable information on the status of the disaster and disaster victims for effective coordination of relief work at the State level as well as the national and international levels.

Planning Assumptions

- ◆ Most of the existing media network would have undergone heavy damage
- ◆ It may not be possible to get accurate information from the affected area within the first few hours of the disaster

Activities on the Receipt of Warning or Activation of EOC

- ◆ Send news flashes of latest updates/donation requirements for disaster area all over the country
- ◆ Use appropriate means of disseminating information to all victims in the affected area

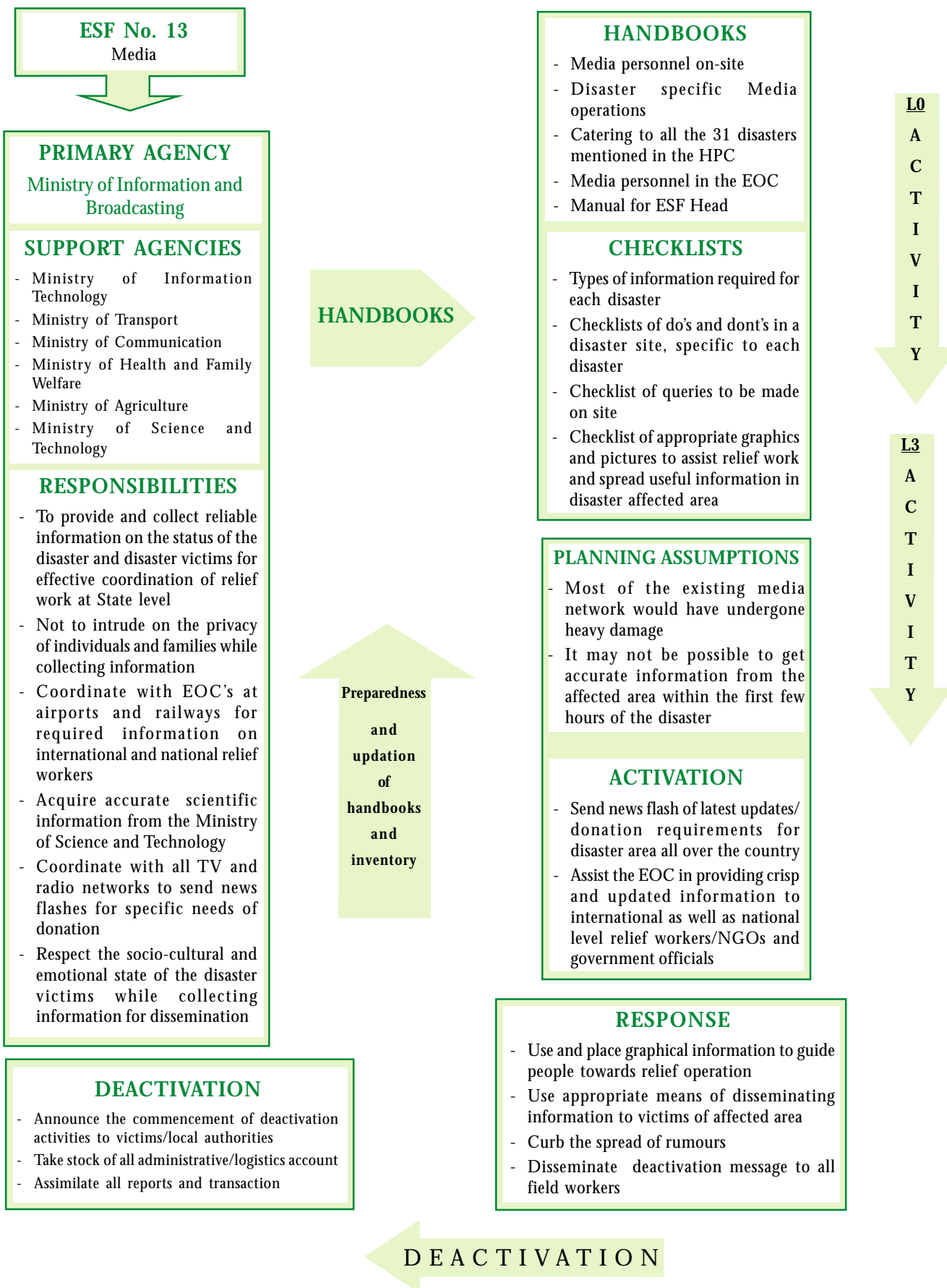
- ◆ Curb the spread of rumours
- ◆ Caution the victims about the do's and don'ts during a disaster

Responsibilities

- ◆ Acquire accurate scientific information from the Ministry of Science and Technology
- ◆ Coordinate with all TV and radio networks to send news flashes for specific needs of donation
- ◆ Develop appropriate graphics and pictures to assist relief work and spread useful information in the disaster affected area
- ◆ Not to intrude on the privacy of individuals and families while collecting information
- ◆ Coordinate with the EOCs at the airport and railways for required information for international and national relief workers
- ◆ Deploy trained media personnel who are experienced
- ◆ Provide information of emergency numbers and other key contact numbers on television, through newspapers, loud speakers and radio networks
- ◆ Keep the rest of the country updated and well informed about the status of the disaster
- ◆ Help victims as well as emergency workers in providing information regarding hospitals, help desks etc
- ◆ Acquire and flash names of disaster victims on television and radio networks
- ◆ Provide information on basic do's and don'ts
- ◆ Flash warning signals on all TV and radio networks
- ◆ Inform unaffected population about hospitals where they can find victims and where assistance is required
- ◆ Inform unaffected population of blood banks

Minimum Standards Required

- ◆ Media personnel on-site
- ◆ Disaster specific media operations
- ◆ Catering to all the 31 disasters mentioned in the HPC
- ◆ Media personnel in the EOC
- ◆ Manual for ESF Head
- ◆ Types of information required for each disaster
- ◆ Checklists of do's and don'ts in a disaster site, specific to each disaster
- ◆ Checklist of queries to be made on site
- ◆ Checklist of appropriate graphics and pictures to assist relief work and spread useful information in the disaster affected area
- ◆ Standard operating procedures and responsibilities of Radio and TV stations



EMERGENCY SUPPORT FUNCTION 14

Helplines

Primary Agency

Ministry of Disaster Management

Secondary Agencies

Ministry of Health and Family Welfare

Ministry of Home Affairs

Ministry of Power

Ministry of Civil Aviation

Ministry of Communications

Ministry of Science and Technology

Purpose

The purpose of ESF 14 is to collect, process and disseminate information about the welfare of citizens of the affected area and managing the tremendous flow of information. The speed with which information is received and with which it changes, requires that a system be developed to ensure accuracy as well as easy and appropriate access. The helplines will be responsible for providing, directing, and co-ordinating logistical/resource operations.

Planning Assumptions

- ◆ Access to disaster area will depend upon the re-establishment of ground and water routes
- ◆ Early damage assessment may be incomplete, inaccurate and general and rapid assessment may be required to determine response time
- ◆ There will be a flood of information and confusion about the injured population
- ◆ The communication with the affected area is partially impaired

Activities on the Receipt of Warning or Activation of EOC

- ◆ One of the most critical needs will be having a simplified way of identifying and tracking victims and providing assistance to them
- ◆ Identify locations for setting up transit and relief camps, feeding centres and setting up of helplines at the nodal points in the State and providing people the information about numbers
- ◆ Setting up of toll free numbers and trying to establish the estimation of the damage and the victims in the area from other sources
- ◆ All technical officers should be notified and should meet the staff to review emergency procedure
- ◆ Review and update precautionary measures and procedures that should be taken to protect equipment and the post-disaster procedures to be followed
- ◆ Emergency tool kit should be assembled for each block of the affected area
- ◆ All work teams should be issued a two way communication link

Responsibilities

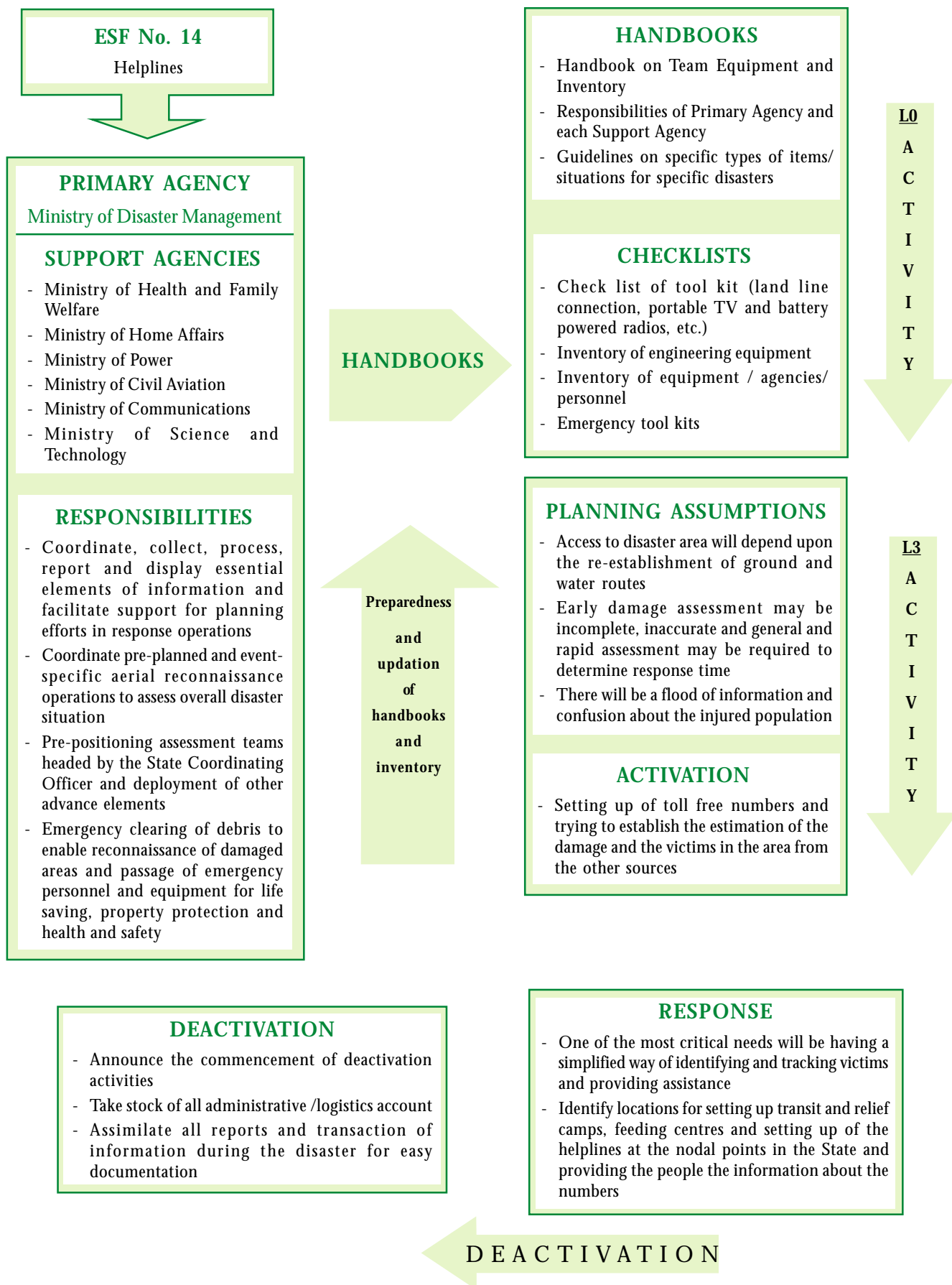
- ◆ Coordinate, collect, process, report and display essential elements of information and facilitate support for planning efforts in response operations
- ◆ Coordinate pre-planned and event-specific aerial reconnaissance operations to assess the overall disaster situation
- ◆ Pre-positioning assessment teams headed by the State Coordinating Officer and deployment of other advance elements
- ◆ Emergency clearing of debris to enable reconnaissance of damaged areas and passage of emergency personnel and

equipment for life saving, property protection and health and safety

Standards to be Developed

- ◆ Check list of tool kit (land line connection, portable TV and battery powered radios, etc.)
- ◆ Inventory of engineering equipment
- ◆ Area Specific handbook on Team Equipment and Inventory
- ◆ Responsibilities of Primary Agency and each Support Agency

- ◆ Guidelines on specific types of items/situations for specific disasters
- ◆ Inventory of equipment/agencies/personnel
- ◆ Emergency tool kits
- ◆ Operational checklists for team heads and team members
- ◆ Equipment Damage Assessment
- ◆ Deactivation checklist
- ◆ Guidelines on specific types of items for each disaster



Disaster Specific Modules

Each disaster brings with it a unique set of problems and situations. If these situations have not been anticipated well in advance, then the difficulties faced by the victims as well as the disaster managers increase enormously. Therefore, there is a need to address the characteristics of each disaster separately. In essence, although the back end activities during a disaster can be addressed through a multi-hazard approach, the front end or site specific needs have to be addressed through separate disaster specific modules. These modules will have to be developed further, keeping in view the brief outline provided in the following chapter.

A response to any situation should occur at two levels; one, there should be a general preparedness for averting all disasters outlined by the HPC; two, there should be adequate preparedness for disaster mitigation. However, each disaster creates unique and unprecedented situations that might require a specific and an in-depth approach in order to tackle it. Although most factors are common and a multi-hazard approach caters to them, specific inventories especially in the area of health, search and rescue, warning and monitoring systems change according to each disaster. Therefore, emergency operators should be well prepared to address the unique problems of each disaster also. There is thus a need to prepare plans that cater to and integrate with the multi-hazard disaster plan. In this section a general introduction to earthquakes and other subgroups has been attempted, in order to highlight the specific needs arising from disasters in terms of:

- ◆ Information Requirement
- ◆ ESF inventories and duties

EARTHQUAKE

Emergency Support Function	Requirements
1) Communication Assess damage to and reinstate communication facilities Establish communication with and from disaster site at the earliest	VSATs, battery charged communication equipment Inventory of mobile communication facilities
2) Public Health and Sanitation Assess extent and type of injuries Special care for epidemic outbreaks Distribute chlorine tablets Ensure purity of drinking water, free from contamination Provide drugs and medications for water borne diseases	Specialised medical team to handle orthopaedic and surgery related injuries, epidemics, preventive medicine practitioners Mobile hospitals
3) Power Assess damage to electric poles and stations etc Short circuiting measures Restore facilities at local and State level on priority	Inventory of power installations of the area Generators etc
4) Transport Provide transport for relief supplies Coordinate with other ESF for clearing of roads and other means of transport Provide appropriate transport for easy access to damaged areas	Inventory of transport/water way facilities in the area
5) Donation Compile information on the specific needs of the people for type of donations required Distribute donations by means of air dropping and boats to marooned victims	Socio-economic needs Cultural needs
6) Search and Rescue Aerial survey for victims Specialised sniffer dogs Collapsed structure search and rescue experts	Equipment cache
7) Public Works and Engineering Clear areas for relief camps Clear roads for easy access Seal areas and buildings that are likely to cause further damage Build temporary bridges, access ways for ease of access	Specialised equipment for large debris Specialised equipment for bridges and other temporary structures
8) Food Provide food packs that contain dry and non-perishable food items	Inventory of non-perishable food items
9) Information and Planning Release flood related information to all ESF Provide access to resource inventories and document all situation- reports and procedures	Disk net All Inventories
10) Relief Supplies Provide basic logistic materials required for local administration Provide other relief materials such as batteries, flash lights etc., to victims and rescue workers	Inventory of relief supplies

11) Drinking water Provide clean drinking water Ration existing water supplies for even distribution Mark and warn people against contamination Isolate contaminated sources of water	Inventory of water sources of the area
12) Shelter Provide weather resistant shelter Place shelters in a safe area Shelters should adhere to the climatic conditions of the area	Inventory of specific type of shelters for earthquakes
13) Media Information on current status	
14) Helplines Provide information on marooned victims Hospitals Receive messages of victims and forward them to relatives outside the disaster area Provide emergency phone lines	Inventory of emergency phone numbers

Depending on the nature of disaster some ESFs may be more actively involved than others. However, for an L3 disaster all ESFs require to be on alert and be prepared.

The following example of the EARTHQUAKE module briefly lists down variables of the disaster and related action/information

EARTHQUAKE MODULE

1. Earthquakes

- National Threat L3
- Vulnerability to earthquakes
- Vulnerability Map
- List of areas that should plan for L3 vulnerability to earthquakes

2. Anticipated Intensity

- ◆ Magnitude
- ◆ Characteristics

3. List of Secondary disasters

Secondary disasters could include major road closures, extensive damage to structures, loss of public utilities, and multiple injuries and deaths. The demands upon public safety agencies

will be overwhelming. Non-public responders such as the Volunteer Center will play a major role in recovery.

- ◆ Floods
- ◆ Urban/Wild Fires
- ◆ Hazardous Material Incidents
- ◆ Accidents -Road, Railway

4. Response Activities

The National Response Plan incorporates common ESF functions and responsibilities. The response to the following areas of functions will have to be specific to earthquakes.

Checklist Incident Command System

- ◆ Injuries: Designate First Aid area and report location to Incident Commander Check for injured and treat as appropriate; if possible move to First Aid area.
- ◆ Gas: If odour of gas is present (check outside as well as inside), get gas shut-off wrench from disaster supplies and shut off gas.
- ◆ Structural Condition: Be cautious — aftershocks may follow earthquakes.

Check for visible signs of damage. Evacuate if structural stability seems questionable (err on side of safety). If possible, retrieve any cellular phones but do not place yourself or others at risk to do so.

- ◆ Telephone and Communications: If electrical power is off, a non-Centrex phone system will probably not work; Centrex systems do not require power to operate and therefore should be a better option. If electrical power is off, the telephone on your fax machine will also probably not work. If available, use cellular phone(s), but only if no other telephones are working.
- ◆ Power: If power is out, do not light candles during an earthquake. There are two dangers — from explosion

caused by gas leak and ignited by spark from match, and from candles falling and starting fires. For lighting, use flashlights, lanterns and lightsticks. Use a generator, if one is available.

- ◆ Building Tenants: Check on welfare of other tenants in the building if appropriate.
- ◆ Hazards: Rope off areas where electrical lines are downed and structural hazards exist. Inform Incident Commander of downed lines, gas leaks and water line breaks. Remove anything blocking street, which may prevent access by emergency vehicles except downed electrical lines.
- ◆ Damage Assessment: Conduct detailed damage assessment as soon as possible and photograph or video record the damage.

MODEL FRAMEWORK FOR DISASTER-SPECIFIC APPROACH – SUB GROUP I

Floods and Drainage Management

Emergency Support Function	Requirements
1) Communication Warn people against areas that are likely to get flooded Assess damage to communication facilities	VSATs, battery charged communication equipment
2) Public Health and Sanitation Assess the advent of infectious diseases Warn people on special measures against epidemics Special care for waterborne diseases and epidemic outbreaks Distribute chlorine tablets Ensure purity of drinking water, free from contamination Provide drugs and medications for water borne diseases	Specialised medical team to handle epidemics, cases of drowning, and water borne diseases
3) Power Damage to electric poles and stations etc., due to flooding Short circuiting measures Restore facilities at local and State level	Inventory of power installations of the area
4) Transport Provide boats as a means of transport	Inventory of transport/water way facilities in the area
5) Donation Compile information on specific needs of the people Distribute donations by means of air dropping and boats to marooned victims	Socio-economic needs Cultural needs
6) Search and Rescue Aerial survey for marooned victims	Deep sea divers S&R boats Equipment cache

7) Public Works and Engineering Clear areas for relief camps Clear roads for easy access Seal areas and buildings that are likely to cause further damage Build temporary bridges for ease of access	Specialised equipment for functioning in flood prone areas inventory Specialised equipment for bridges and other temporary structures
8) Food Provide food packs that contain dry and non-perishable food items	Inventory of non-perishable food items
9) Information and Planning Release flood related information to all ESF Provide access to resource inventories and document all situations-reports and procedures	Disk net All Inventories
10) Relief Supplies Provide basic logistic materials required for local administration Provide relief materials such as batteries, flash lights to victims/ rescue workers	Inventory of relief supplies
11) Drinking water Provide clean drinking water Ration existing water supplies for even distribution Mark and warn people against contamination and isolate contaminated sources	Inventory of water sources of the area
12) Shelter Provide weather resistant shelter Place shelters in a safe area Shelters should adhere to the climatic conditions of the area	Inventory of specific type of shelters for cyclones and floods
13) Media Information on current status	
14) Helplines Provide information on marooned victims and hospitals Receive messages for victims and forward them to relatives outside disaster area Provide emergency phone lines	Inventory of emergency phone numbers

Cyclones, Tornadoes, Hurricanes

Emergency Support Function	Requirements
1) Communication Warn people against areas that are likely to get flooded Assess damage to communication facilities	VSATs, battery charged communication equipment
2) Public Health and Sanitation Assess the advent of infectious diseases Warn people on special measures against epidemics Special care for waterborne diseases and epidemic outbreaks Distribute chlorine tablets Ensure purity of drinking water, free from contamination Provide drugs and medications for water borne diseases	Specialised medical team to handle epidemics, cases of drowning, water borne diseases
3) Power Damage to electric poles and stations etc., due to flooding Short circuiting measures Restore facilities at local and State level	Inventory of power installations of the area

4) Transport Provide boats as a means of transport	Inventory of transport/water-way facilities in the area
5) Donation Compile information on the specific needs of the people for the type of donations required Distribute donations by means of air dropping and boats to marooned victims	Socio-economic needs Cultural needs
6) Search and Rescue Aerial survey for marooned victims	Deep sea divers S&R boats Equipment cache
7) Public Works and Engineering Clear areas for relief camps Clear roads for easy access Seal areas and buildings that are likely to cause further damage Build temporary bridges for ease of access	Inventory of specialised equipment for functioning in flood prone areas and for bridges and other temporary structures
8) Food Provide food packs that contain dry and non-perishable food items	Inventory of non-perishable food items
9) Information and Planning Release flood related information to all ESF Provide access to resource inventories and document all situation- reports and procedures	Disk net All Inventories
10) Relief Supplies Provide basic logistic materials required for local administration Provide other relief materials such as batteries, flash lights etc., to victims and rescue workers	Inventory of relief supplies
11) Drinking water Provide clean drinking water Ration existing water supplies for even distribution Mark and warn people against contamination Isolate contaminated sources of water	Inventory of water sources of the area
12) Shelter Provide weather resistant shelter Place shelters in a safe area Shelters should adhere to the climatic conditions of the area	Inventory of specific type of shelters for cyclones and floods
13) Media Information on current status	
14) Helplines Provide information on marooned victims Hospitals Receive messages of victims and forward them to relatives outside the disaster area Provide emergency phone lines	Inventory of emergency phone numbers

Hailstorm, Cloud Burst, Snow Avalanches, Heat & Cold Waves, Thunder & Lightning

Emergency Support Function	Requirements
1) Communication Warn people against areas that are likely to be hit Assess damage to communication facilities	VSATs, battery charged communication equipment
2) Public Health and Sanitation Assess the advent of infectious diseases Warn people on special measures against epidemics Special care for waterborne diseases and epidemic Ensure purity of drinking water, free from contamination Provide drugs and medications for water borne diseases Prevent occurrence of dehydration, burns	Specialised medical team to handle epidemics, cases of drowning, frost bites, heat strokes, burns, water borne diseases
3) Power Damage to electric poles and stations etc., due to flooding Short circuiting measures Restore facilities at local and State level	Inventory of power installations of the area
4) Transport Provide boats as a means of transport	Inventory of transport/water way facilities in the area
5) Donation Compile information on the specific needs of the people for type of donations required Distribute donations by means of air dropping and boats to marooned victims	Socio-economic needs Cultural needs
6) Search and Rescue Aerial survey for marooned victims	Deep sea divers S&R boats Equipment cache
7) Public Works and Engineering Clear areas for relief camps Clear roads for easy access Seal areas and buildings that are likely to cause further damage Build temporary bridges for ease of access	Inventory of specialised equipment for functioning in vulnerable areas and for bridges and other temporary structures
8) Food Provide food packs that contain dry and non-perishable food items	Inventory of non perishable food items
9) Information and Planning Release related information to all ESF Provide access to resource inventories and document all situation—reports and procedures	Disk net All Inventories
10) Relief Supplies Provide basic logistic material required for local administration Provide other relief materials such as batteries, flash lights etc., to victims and rescue workers	Inventory of relief supplies

11) Drinking water Provide clean drinking water Ration existing water supplies for even distribution Mark and warn people against contamination Isolate contaminated sources of water	Inventory of water sources of the area
12) Shelter Provide weather resistant shelter Place shelters in a safe area Shelters should adhere to the climatic conditions of the area	Inventory of specific type of shelters for cyclones and floods
13) Media Information on current status	
14) Helplines Provide information on marooned victims Hospitals Receive messages of victims and forward them to relatives outside the disaster area Provide emergency phone lines	Inventory of emergency phone numbers

Sea Erosion

Emergency Support Function	Requirements
1) Communication Warn people against areas that are likely to get flooded Assess damage to communication facilities	VSATs, battery charged communication equipment
2) Public Health and Sanitation Assess the advent of infectious diseases Warn people on special measures against epidemics Special care for waterborne diseases and epidemic outbreaks Distribute chlorine tablets Ensure purity of drinking water, free from contamination Provide drugs and medications for water borne diseases Monitor situation	Specialised medical team to handle epidemics, cases of drowning, and water borne diseases
3) Power Damage to electric poles and stations etc., due to flooding Short circuiting measures Restore facilities at local and State level Monitor situation	Inventory of power installations of the area
4) Transport Provide boats as a means of transport Provide transport for evacuation Monitor situation	Inventory of transport/water way facilities in the area

5) Donation Compile information on the specific needs of the people for type of donations required Distribute donations by means of air dropping and boats to marooned victims	Socio-economic needs Cultural needs
6) Search and Rescue Aerial survey for marooned victims	Deep sea divers S&R boats Equipment cache
7) Public Works and Engineering Clear areas for rehabilitation sites Seal areas and buildings that are likely to cause further damage Build temporary bridges for ease of access	Specialised equipment for functioning in prone areas inventory Specialised equipment for bridges and other temporary structures
8) Food Provide food packs that contain dry and non-perishable food items	Inventory of non-perishable food items
9) Information and Planning Release related information to all ESF Provide access to resource inventories and document all situation- reports and procedures	Disk net All Inventories
10) Relief Supplies Provide basic logistic materials required for local administration Provide other relief materials such as batteries, flash lights, etc., to victims and rescue workers	Inventory of relief supplies
11) Drinking water Provide clean drinking water Ration existing water supplies for even distribution Mark and warn people against contamination Isolate contaminated sources of water	Inventory of water sources of the area
12) Shelter Provide weather resistant shelter Place shelters in a safe area Shelters should adhere to the climatic conditions of the area	Inventory of specific type of weatherproof shelters for temporary rehabilitation
13) Media Information on current status	
14) Helplines Provide information on marooned victims Hospitals Receive messages of victims and forward them to relatives outside the disaster area Provide emergency phone lines	Inventory of emergency phone numbers

Droughts

Emergency Support Function	Requirements
1) Communication Warn people against areas that are likely to be affected General Alert and Assistance	
2) Public Health and Sanitation Assess diseases Warn people on special measures against malnutrition Distribute ORS Ensure purity of drinking water Provide drugs and medications for water borne diseases	Specialised medical team to handle malnutrition and starvation related disorders
3) Power General Alert and Assistance	
4) Transport General Alert and Assistance	
5) Donation Compile information on specific needs of the people for type of donations required Distribute donations by means of air dropping	Socio-economic needs Cultural needs
6) Search and Rescue Locate survivors	
7) Public Works and Engineering Clear areas for relief camps	Inventory of specialised equipment for functioning in prone areas
8) Food Provide food packs that contain dry and non-perishable food items	Inventory of non perishable food items
9) Information and Planning Release drought related information to all ESF Provide access to resource inventories and document all situation- reports and procedures	Disk net All Inventories
10) Relief Supplies Provide basic logistic materials required for local administration Provide other relief materials such as batteries, flash lights etc., to victims and rescue workers	Inventory of relief supplies
11) Drinking water Provide clean drinking water Ration existing water supplies for even distribution Mark and warn people against contamination	Inventory of water sources of the area

12) Shelter Provide weather resistant shelter Place shelters in a safe area Shelters should adhere to climatic conditions of the area	Inventory of specific type of shelters for cyclones and floods
13) Media Information on current status	
14) Helplines Provide information on marooned victims Hospitals Receive messages of victims and forward them to relatives outside the disaster area Provide emergency phone lines	Inventory of emergency phone numbers

Sub group II has been addressed in the framework presented for earthquakes on page 102.

MODEL FRAMEWORK FOR DISASTER-SPECIFIC APPROACH – SUB GROUP III

Chemical, Industrial, Nuclear - Special care should be taken to maintain the security precautions during such disasters

Emergency Support Function	Requirements
1) Communication Assess damage to and reinstate communication facilities Establish communication with and from disaster site at the earliest Special care on Security matters	VSATs, battery charged communication equipment Inventory of mobile communication facilities
2) Public Health and Sanitation Assess extent and type of injuries Special care for epidemic out-breaks Distribute chlorine tablets Ensure purity of drinking water, free from contamination Provide gas masks	Specialised medical team to handle orthopaedic and surgery related injuries, epidemics, preventive medicine practitioners Mobile hospitals
3) Power Assess damage to electric poles and stations etc Short circuiting measures Restore facilities at local and State level on priority	Inventory of power installations of the area Generators etc
4) Transport Provide transport for relief supplies Coordinate with other ESF for clearing of roads and other means of transport Provide appropriate transport for easy access to damaged areas	Inventory of transport/water way facilities in the area
5) Donation Compile information on the specific needs of the people for type of donations required Distribute donations by means of air dropping and boats to marooned victims	Socio-economic needs Cultural needs

6) Search and Rescue Aerial survey for victims Specialised sniffer dogs Collapsed structures search and rescue experts	Equipment cache
7) Public Works and Engineering Clear areas for relief camps Clear roads for easy access Seal areas and buildings that are likely to cause further damage Build temporary bridges, access ways for ease of access	Specialised equipment for large debris Specialised equipment for bridges and other temporary structures
8) Food Provide food packs that contain dry and non-perishable food items	Inventory of non perishable food items
9) Information and Planning Release flood related information to all ESF Provide access to resource inventories and document all situation- reports and procedures	Disk net All Inventories
10) Relief Supplies Provide basic logistics materials required for local administration Provide other relief materials such as batteries, flash lights etc., to victims and rescue workers	Inventory of relief supplies
11) Drinking water Provide clean drinking water Ration existing water supplies for even distribution Mark and warn people against contamination Isolate contaminated sources of water	Inventory of water sources of the area
12) Shelter Provide weather resistant shelter Place shelters in a safe area Shelters should adhere to the climatic conditions of the area	Inventory of specific types of shelter for earthquakes
13) Media Information on current status	
14) Helplines Provide information on marooned victims Hospitals Receive messages of victims and forward them to relatives outside the disaster area Provide emergency phone lines	Inventory of emergency phone numbers

MODEL FRAMEWORK FOR DISASTER-SPECIFIC APPROACH – SUB GROUP IV

Accident related disasters – Special care should be taken to maintain the security precautions in speculative accidents

Emergency Support Function	Requirements
1) Communication Assess damage to and reinstate communication facilities Establish communication with and from disaster site at the earliest Special care on Security matters	VSATs, battery charged communication equipment Inventory of mobile communication facilities
2) Public Health and Sanitation Assess extent and type of injuries Special care for epidemic outbreaks Distribute chlorine tablets Ensure purity of drinking water, free from contamination Provide gas masks	Specialised medical team to handle orthopaedic and surgery related injuries, epidemics, preventive medicine practitioners Mobile hospitals
3) Power Assess Damage to electric poles and stations etc Short circuiting measures Restore facilities at local and state level on priority	Inventory of power installations of the area Generators etc
4) Transport Provide transport for relief supplies Coordinate with other ESF for clearing of roads and other means of transport Provide appropriate transport for easy access to damaged areas	Inventory of transport/water way facilities in the area
5) Donation Compile information on the specific needs of the people for type of donations required Distribute donations by means of air dropping and boats to marooned victims	Socio-economic needs Cultural needs
6) Search and Rescue Aerial survey for victims Specialised sniffer dogs Collapsed structures search and rescue experts	Deep sea divers, Equipment cache, Medical First Responders, Collapsed structure search and rescue responders, Fire personnel, Home guards, Police
7) Public Works and Engineering Clear areas for relief camps Clear roads for easy access Seal areas and buildings that are likely to cause further damage Build temporary bridges, access ways for ease of access Check strength of existing structures	Specialised equipment for large debris Specialised equipment for bridges and other temporary structures
8) Food Provide food packs that contain dry and non-perishable food items	Inventory of non perishable food items

<p>9) Information and Planning</p> <p>Release flood related information to all ESF</p> <p>Provide access to resource inventories and document all situation- reports and procedures</p>	<p>Disk net</p> <p>All Inventories</p>
<p>10) Relief Supplies</p> <p>Provide basic logistic materials required for local administration</p> <p>Provide other relief materials such as batteries, flash lights etc., to victims and rescue workers</p>	<p>Inventory of relief supplies</p>
<p>11) Drinking water</p> <p>Provide clean drinking water</p> <p>Ration existing water supplies for even distribution</p> <p>Mark and warn people against contamination</p> <p>Isolate contaminated sources of water</p>	<p>Inventory of water sources of the area</p>
<p>12) Shelter</p> <p>Provide weather resistant shelter</p> <p>Place shelters in a safe area</p> <p>Shelters should adhere to the climatic conditions of the area</p>	<p>Inventory of specific type of shelters for earthquakes</p>
<p>13) Media</p> <p>Information on current status</p>	
<p>14) Helplines</p> <p>Provide information on marooned victims</p> <p>Hospitals</p> <p>Receive messages of victims and forward them to relatives outside the disaster area</p> <p>Provide emergency phone lines</p>	<p>Inventory of emergency phone numbers</p>



MODEL FRAMEWORK FOR DISASTER-SPECIFIC APPROACH – SUB GROUP V

Biological related Disasters

Emergency Support Function	Requirements
1) Provide communication assistance to medical teams	VSATs, battery charged communication equipment for field operations, inventory of mobile communication facilities
2) Public Health and Sanitation - Assess extent and type of diseases. Establish cause. Network with medical institutions for specialised diagnosis and cure. Isolate infected patients. Take medical measures to curb epidemics etc. Special care for epidemic outbreaks. Distribute chlorine tablets. Ensure purity of drinking water, free from contamination. Provide gas masks	Specialised medical team to handle orthopaedic and surgery related injuries, epidemics, preventive medicine practitioners. Mobile hospitals
3) Provide power backup for medical operators and hospitals for uninterrupted power supply. Provide mobile power backup for field operations	Inventory of power installations of the area, generators etc
4) Provide transport for relief supplies and medicines	Inventory of transport/water way facilities in the area
5) Compile donation information on the specific needs of the people for type of donations required. Distribute donations by means of air dropping and boats to marooned victims	Socio-economic needs, Cultural needs
6) Search and Rescue-Search and isolate infected people	Protective gear
7) Public Works and Engineering-Isolate and barricade affected areas and hospitals	Protective gear
8) Food-Provide clean food according to need	Inventory of non –perishable food items
9) Information and Planning-Release flood related information to all ESF. Provide access to resource inventories and document all situation-reports and procedures	Disk net All Inventories
10) Relief Supplies-Provide specific need of relief	Inventory of relief supplies
11) Drinking water-Provide clean drinking water Ration existing water supplies for even distribution. Mark and warn people against contamination. Isolate contaminated sources of water	Inventory of water sources of the area
12) Shelter-Provide isolated structures and temporary structures for displaced/unaffected people	Inventory of specific type of shelters for earthquakes
13) Media-information on current status	
14) Helplines-Provide information on marooned victims. Hospitals-Receive messages of victims and forward them to relatives outside the disaster area and provide emergency phone lines	Inventory of emergency phone numbers

Follow-Up Actions

The document of the National Disaster Response Plan was evolved out of intensive consultations and study of various mechanisms of disaster responses followed in different parts of the world. In the process, many new ideas and concepts have been developed and incorporated. These concepts have been included in order to develop a framework for the plan which will have to be dealt with in detail as part of the follow-up actions to be undertaken after the first document of the Response Plan. The follow-up actions will have to address the need for meticulous planning and preparedness in the form of handbooks and checklists for response activities at all levels. The exact specifications of EOCs, the activities and responsibilities of each ESF and detailed disaster-specific modules are some of the priority areas that will have to be looked into for further detailing of the Response Plan.

This document of the National Disaster Response Plan incorporates many new concepts and has tried to build these concepts into the existing framework and functioning of the Government of India. The response to a disaster requires both indigenous systems as well as effective planning and preparedness strategies. Since the damage and effect of the disasters are so extreme, in case of a response situation multiple players have to effectively coordinate and communicate with each other for a quick and efficient recovery and control over the situation. However, the responses require detailed and unique responses from all the players.

Therefore it is recommended that all involved ministries and other agencies should prepare and detail out their role as evident in various parts of the document.

Primarily, all Emergency Support Functions will have to further detail out their operations based on the guidelines mentioned in the document. Other activities that can greatly decrease response time such as maps, equipment caches and directories will also have to be developed by

the concerned authority. The four key areas that require follow-up actions are:

- ◆ Developing checklists, handbooks and guidelines
- ◆ GIS maps
- ◆ EOC and ICS layouts and databases
- ◆ ESFs
- ◆ Preparing Disaster-Specific Modules

LIST OF CHECKLISTS AND HANDBOOKS

Documents Required for Quick Assessment and Response

1. Declaration of L3 - Format
2. Deployment of Assessment Team - Format
3. CRC Responsibilities - Handbook
4. Survival Kit - Checklist
5. Assessment Equipment - Checklist
6. National Assessment - Format
7. National Media Release
8. Handbooks for
 - ◆ International NGO
 - ◆ NGO
 - ◆ Media Personnel
 - ◆ Researchers/Students
 - ◆ Field/Relief Workers
 - ◆ Government Functionaries
9. EOC Set-up - Checklists
10. Layout and dimensions, equipment, etc., for EOC - Minimum standards Handbook
11. ESF Desk - Checklist
12. Matrix of primary and secondary functions of each ESF
13. Do's and don'ts to be followed during disaster times in EOC
14. Regular staff - Schedule and Checklist

15. Staff on Call - Schedule and Checklist
16. Staff on Disaster Duty - Schedule and Checklist

DOCUMENTS FOR EACH ESF

ESF 1 - Communication

- ◆ Checklist of tool kits
- ◆ Handbook on Disaster Telecommunication Assistance
- ◆ Handbook on Team Equipment and Inventory
- ◆ Responsibilities of Primary Agency
- ◆ Responsibility of each Support Agency
- ◆ Emergency tool kits
- ◆ Operational checklists
- ◆ Equipment Damage Assessment
- ◆ On-site operations
- ◆ Planning checklist
- ◆ Deactivation checklist
- ◆ List of PSUs and Private Agencies

ESF 2 – Public Health and Sanitation

- ◆ Detailed checklist of symptoms of common diseases along with medicine dosages for each disaster
- ◆ Checklist of doctor's tool kit for specialised doctors
- ◆ Checklist for maintaining hygienic conditions
- ◆ Disaster Health Assistance and emergency services
- ◆ Team Equipment and Inventory
- ◆ Responsibilities- Primary /Support Agencies
- ◆ Minimum standards of health facilities
- ◆ Location of health facilities in disaster area (map)
- ◆ Information manual for biological disaster

- ◆ Doctor's manual for emergency relief
- ◆ Emergency toolkits
- ◆ Operational checklists for health officials
 - Equipment Damage Assessment
 - On-site operations
- ◆ Planning checklist
 - Qualification of health personnel
 - Checklist of doctor's tool kit
 - Symptoms of common ailments
- ◆ Deactivation checklist
- ◆ Dosages checklist for common epidemics and ailments during a disaster

ESF 3 - Power

- ◆ Handbook on Disaster Power Assistance
- ◆ Handbook on Team Equipment and Inventory
- ◆ Responsibilities of Primary Agency
- ◆ Responsibility of each Support Agency
- ◆ Manuals on handling of equipment which is unique to a particular disaster
- ◆ Emergency toolkits
- ◆ Operational checklists
- ◆ Equipment Damage Assessment
- ◆ On-site operations
- ◆ Planning checklist
- ◆ Deactivation checklist
- ◆ List of PSUs and Private Agencies
- ◆ Minimum qualifications and equipment required for personnel in EOC and on-site
- ◆ Deactivation checklist

ESF4 - Transport

- ◆ Inventories of available transport facilities
- ◆ Responsibilities of Primary Agency
- ◆ Responsibility of each Support Agency

- ◆ Handbook on transport assistance
- ◆ Handbook on Team Equipment and Inventory
- ◆ Emergency tool kits
- ◆ Operational checklists
- ◆ Equipment Damage Assessment
- ◆ On-site operations
- ◆ Formats for check of bridges and other steel works
- ◆ Planning checklist
- ◆ Deactivation checklist
- ◆ List of PSUs and Private Agencies

ESF 5- Search and Rescue

- ◆ Training handbooks on MFR and CSSR
- ◆ Inventory of volunteers who have already completed the course successfully and can be utilised in the search and rescue operations.
- ◆ Handbook on team Equipment and Inventory
- ◆ Responsibilities of Primary Agency
- ◆ Responsibility of each Support Agency
- ◆ Emergency toolkits
- ◆ Operational checklists
- ◆ Medical tool kits
- ◆ On-site aerial surveys
- ◆ MFR and CSSR kits
- ◆ Deactivation checklist
- ◆ List of PSUs and Private Agencies/ NGOs working in the area

ESF 6 - Donation

- ◆ Guidelines on specific types of items
- ◆ Guide for developing donations which needs a list to be prepared by the Voluntary Agencies (family pack or mass relief pack, colour coding)

- ◆ Emergency tool kits (first aid items)
- ◆ Equipment Damage Assessment
- ◆ On-site operations checklist and the coordinating field station map
- ◆ Planning checklist
- ◆ Deactivation checklist
- ◆ List of PSUs and Private Agencies
- ◆ Handbook on disaster donation assistance
- ◆ Handbook on Team Equipment and Inventory
- ◆ Responsibilities of Primary Agency
- ◆ Responsibility of each Support Agency
- ◆ Guidelines on specific items and continued response for donation and relief management

ESF 7- Public Works and Engineering

- ◆ By-laws for all disasters
- ◆ Checklist of tool kit
- ◆ Inventory of engineering equipment
 - ◆ Disaster specific
 - ◆ Area specific
- ◆ Handbook on Disaster Engineering Assistance
- ◆ Handbook on Team Equipment and Inventory
- ◆ Responsibilities of Primary Agency and each Support Agency
- ◆ Guidelines on specific types of items/ situations for specific disasters
- ◆ Inventory of equipment / agencies/ personnel
- ◆ Emergency tool kits
- ◆ Operational checklists for team heads and team members
- ◆ Equipment Damage Assessment
- ◆ Handling of heavy equipments

- ◆ Deactivation checklist
- ◆ Guidelines on specific types of items for each disaster
- ◆ Guide for by-laws to be followed
- ◆ Qualification of labour /other site assistants

ESF 8 – Information and Planning

- ◆ Handbook on Disaster Information Assistance on Disknet
- ◆ Handbook on Team Equipment and Inventory
- ◆ Responsibilities of Primary Agency
- ◆ Responsibility of each Support Agency
- ◆ Guidelines on specific types of items
- ◆ Disaster specific issues related to information technology
- ◆ Emergency tool kits
- ◆ Operational checklists
- ◆ Equipment Damage Assessment
- ◆ On-site operations
- ◆ Handling of equipment
- ◆ Planning checklist
- ◆ Deactivation checklist
- ◆ List of PSUs and Private Agencies
- ◆ Guidelines on specific types of items

ESF 9 – Relief Supplies

- ◆ Handbook on Relief Supplies Assistance
- ◆ Handbook on Team Equipment and Inventory
- ◆ Responsibilities of Primary Agency and each Support Agency
- ◆ Guidelines on specific types of items for each disaster
- ◆ Manual on disaster-specific relief operations
- ◆ Emergency tool kits

- ◆ Operational checklists for team leaders and team members
- ◆ Handling/Storage of relief supplies
- ◆ On-site operations
- ◆ Planning checklist
- ◆ Deactivation checklist
- ◆ List of PSUs and Private Agencies
- ◆ Guidelines on specific types of items for each disaster
- ◆ Guide for developing relief supplies needs list

ESF 10 - Food

- ◆ Checklist of food materials for
 - ◆ Family packs for four
 - ◆ Family packs for two
 - ◆ Food distribution in relief camps
- ◆ Minimum standards to maintain food quality
- ◆ Catalogue of available resources of food
- ◆ Handbook on food distribution
- ◆ Responsibilities of Primary Agency
- ◆ Responsibility of each Support Agency

ESF 11 – Drinking Water

- ◆ Handbook on disaster drinking water assistance
- ◆ Handbook on Team Equipment and Inventory
- ◆ Responsibilities of Primary Agency
- ◆ Responsibility of each Support Agency
- ◆ Inventories of agencies that can provide drinking water
- ◆ Procedures of storing water to maintain purity
- ◆ Minimum standards for safe drinking water

- ◆ Minimum quantity of requirement of water per person

ESF12 - Shelter

- ◆ Inventories of manufacturing agencies
- ◆ Procedures of storage
- ◆ Minimum standards for relief camps
- ◆ Minimum requirement of space per person
- ◆ Handbook on Team Equipment and Inventory
- ◆ Responsibilities of Primary Agency
- ◆ Responsibility of each Support Agency
- ◆ Handbook on tent structure and other collapsible structures
- ◆ Handbook on assembling of structures
- ◆ Inventories of agencies that can be used for putting up tents
- ◆ Minimum standards for shelter
- ◆ Relief camps
- ◆ Tents and other temporary structures
- ◆ Location of camps for different disasters
- ◆ Existing locations that can be used for shelter
- ◆ Minimum standards for buildings to be used as relief camps

ESF13 - Media

- ◆ Media personnel on-site
- ◆ Disaster-specific media operations
- ◆ Catering to all the L3 disasters mentioned in the HPC
- ◆ Media personnel in the EOC
- ◆ Manual for ESF Head
- ◆ Types of information required for each disaster

- ◆ Checklists of do's and don'ts in a disaster site, specific to each disaster
- ◆ Checklist of queries to be made on site
- ◆ Checklist of appropriate graphics and pictures to assist relief work and spread useful information in the disaster affected area
- ◆ Standard operating procedures and responsibilities of Radio and TV stations

ESF14 - Helplines

- ◆ Checklist of tool kit (land line connection, portable TV and battery powered radios, etc....)
- ◆ Inventory of engineering equipment
- ◆ Area Specific Handbook on Team Equipment and Inventory
- ◆ Responsibilities of Primary Agency and each Support Agency
- ◆ Guidelines on specific types of items/situations for specific disasters
- ◆ Inventory of equipment / agencies/ personnel
- ◆ Emergency tool kits
- ◆ Operational checklists for team heads and team members
- ◆ Equipment Damage Assessment
- ◆ Deactivation checklist

GIS MAPS

A GIS enabled system that can be integrated with all EOCs and the Disk net should also be developed. Each State as well as each ESF must prepare a vulnerability map of their specific area, which can be added with attributes of variables and characteristics of that area. Maps should have all disaster-related facilities and vulnerable groups marked on them. Total population and

strategic installations are the areas that need to be identified on them. These maps need to be constantly updated and can further be used as base maps for preparedness, mitigation and developmental activities.

EOC AND ICS LAYOUTS AND DATABASES

The EOC should emerge as a specialised area, following standard specifications for ease of operations. The EOC must have prescribed spaces for all operators along with state-of-the-art equipment and technology. It should have a meeting room, EOC incharge room, a communication room and a common hall for operations, fitted with LCD projectors to view current status, and GIS maps for further planning and communications. The EOC should also have a media room partitioned by a glass wall from the main operations room for media briefings and update along with a view of the projectors for 24 hours surveillance and monitoring.

An example of the Mumbai Mantralaya is given below:

BRIEF OUTLINE OF AN EMERGENCY OPERATION CENTRE

The EOC should have a Nucleus that comprises of

- ◆ Workstations for each ESF
- ◆ Room for EOC Incharge
- ◆ Media/ Conference briefing room
- ◆ LCD Projectors
- ◆ TV sets for news channels
- ◆ Phone networks with nodal ministries and other links
- ◆ FAX facilities
- ◆ Video conferencing facilities
- ◆ Computer networks

- ◆ Internet connectivity
- ◆ Mobile phones

The EOC should provide the following services to its staff

- ◆ Living quarters
- ◆ Pantry (2 weeks storage)
- ◆ EDP section
- ◆ Power/Generator backup systems
- ◆ Medical room

The structure in which the EOC is housed should be

- ◆ Disaster resistant
- ◆ Secure
- ◆ Self contained in terms of equipment, extra food storage and other such facilities

Emergency Support Functions

Each of the ESF given in the document needs further elaboration and detailing according to the specifics to each area of the

primary ministry. Each primary agency (the specific concerned ministry) will have to develop their own plans and their operations on site as well as at the EOC. The primary agencies must take into account other supporting agencies and outline their responsibilities as well. Each ESF has to work in coordination with the other which should be reflected in their respective plans.

DISASTER-SPECIFIC MODULES

The framework of the disaster-specific module has been introduced in this document. These will have further elaboration by identifying the distinct characteristics of each disaster. The approach to response towards sudden disasters such as earthquakes, floods, landslides differs from response to slow creeping disasters such as droughts, community strifes and the like. Therefore it is important to develop and address the typical situations created by various disasters in the form of separate modules.



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ACRONYMS

Ministry of Agriculture	-	MoA
Ministry of Defence	-	MoD
Ministry of Surface Transport	-	MoST
Ministry of Power	-	MoP
Ministry of Health and Family Welfare	-	MoH&FW
Ministry of Water Resources	-	MoWR
Department of Animal Husbandry	-	DoAH
Ministry of Urban Development and Poverty Alleviation	-	MoUD&PA
Ministry of Planning and Programme Implementation	-	MoP&PI
Ministry of Home Affairs	-	MHA
Ministry of Rural Development	-	MoRD
Ministry of Information Technology	-	MoIT
Ministry of Information and Broadcasting	-	MoI&B
Ministry of Communication	-	MoC
Ministry of Heavy Industries	-	MoHI
Ministry of Social Justice and Empowerment	-	MoSJ&E
Ministry of Civil Aviation	-	MoCA
Ministry of Non-Conventional Energy Resources	-	MoNCR
Ministry of Petroleum and Natural Gas	-	MoP&NG
Ministry of Finance	-	MoF
Ministry of External Affairs	-	MEA
Ministry of Commerce and Industry	-	MoC&I
Ministry of Science and Technology	-	MoSc&T
Ministry of Labour	-	MoL
Ministry of Consumer Affairs and Public Distribution	-	MoCA&PD
National Crisis Management Committee	-	NCMC
Crisis Management Group	-	CMG
Emergency Support Function	-	ESF
Incident Command System	-	ICS
National Remote Sensing Agency	-	NRSA
High Powered Committee	-	HPC
Geographic Information System	-	GIS



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NDRP & RELATED STUDIES

National Response Plan Chapters

1. Introduction
2. Methodology
3. Approach
4. Maps
5. Quick Response
6. National Operation Centres
7. ESF
8. Disaster Specific Modules
9. Follow up Actions

Annexures

Acronyms

Sub- Group Reports NATIONAL PLAN

1. Water and Climate
2. Geological
3. Biological
4. Accident related
5. Chemical and Nuclear

Sub- Group Reports STATE PLAN

1. Geological
2. Biological
3. Accident related

Sub – Committee Reports

1. Trigger Mechanism
2. Insurance
3. District Disaster Management Report

Technical Reports

- Knowledge Network
- Electronic Media
- Print Media
- Civil Defence
- Armed Forces

Research Reports

- Role of GIS in Disaster Management
- National Disaster Information System
- Early Warning
- Capacity Building
- Socio- Psychological Aspects
- Minimum Standards of Relief
- Emergency Support Functions

ANNEXURES*

**The Annexures as indicated here are available on a CD attached to the NDRP Document*

I. Disaster Assessment Systems

References

- ADPC
- UNDAC
- UN-OCHA

II. Site Operation System

References

- OSOCC - UNOCHA
- Incident Command System

III. Search and Rescue Systems

References

- INSARAG
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IV. Disaster Medical Assistance

References

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V. Equipment Cache

References

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VI. Knowledge Network

References

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VII. Inventory Management System

- Manpower
- Relief Supplies

References

- SUMA
- Donations FEMA

VIII. Minimum Standards of Relief and Response

References

- SPHERE

IX. Central Disaster Management Directory

- List of Acronyms
- List of Members of HPC
- References
- Content

Follow-up Actions

- Checklists and Handbooks
- Maps
- ESFs
- Specific Disaster Modules

Annex 3

<http://mdmu.maharashtra.gov.in/pages/State/multidisasterShow.php>

1. INTRODUCTION

The need for a comprehensive Disaster Management Action Plan (DMAP) for the state of Maharashtra, to strengthen and assist district authorities to manage disasters in the state, and to play a supportive and coordinating role, was realised in the wake of the Killari earthquake of September 30, 1993, and a number of disasters such as Mowad floods, industrial accidents at IPCL, and the increased road accidents in the state.

The Government of Maharashtra (GOM) therefore, appointed consultants for the preparation of DMAP at the State level and district level, through a consultative process at inter-departmental as well as district levels.

The state Disaster Management Action Plan (DMAP) has been prepared for its operationalisation by various departments and agencies of the Government of Maharashtra and other Non-Governmental Agencies expected to participate in disaster management. This plan provides for institutional arrangements, roles and responsibilities of the various agencies, interlinks in disaster management and the scope of their activities. An elaborate inventory of resources has also been formalised.

The purpose of preparing this plan is to evolve a system to

- Assess the status of existing resources and facilities available with the various departments and agencies involved in disaster management in the state.
- Assess their adequacies in dealing with a disaster.
- Identify the requirements for institutional strengthening, technological support, upgradation of information systems and data management, for improving the quality of administrative response to disasters at state level.
- make the state DMAP an effective response mechanism as well as a policy and planning tool.

The state DMAP addresses the state's response to demands from the district administration and in extraordinary emergency situations at multi-district levels. It is associated with disasters like road accidents, major fires, earthquakes, floods, cyclones, epidemics and off-site industrial accidents. The present plan is a multi-disaster response plan for the disasters which outlines the institutional framework required for managing such situations.

The state DMAP specifically focusses on the role of various governmental departments and agencies, vis-a-vis the Emergency Operations Centre, in the event of any of the above mentioned disasters. This plan concentrates primarily on the response strategy, whereas there are separate documents which have addressed themselves to the Risk and Vulnerability Analysis and Preparedness and Mitigation Strategies.

1.1 Objectives of the DMAP

Emergency Response Plan (ERP) means a detailed program of action, to control and/or minimize the effects of an emergency, requiring prompt corrective measures beyond normal procedures, to protect human life, minimize injury, optimize loss control and reduce the

exposure of physical assets and the environment. In other words, ERP is the process by which the response to an extraordinary event is galvanised urgently, through an activation of functional components and assignment of responsibilities for each component, to the appropriate individual or agency.

This action plan can function optimally only if a prior study of the risks and vulnerability of the area is undertaken, and the institutional setup responsible for their mitigation and response is understood clearly.

An action plan provides for a uniformity in approach and perception of the various issues at hand thus avoiding undue complications. The plan at the same time provides for the coordination mechanisms for different agencies right from the field level to the central government. Thus it ensures efficiency of the response and enables maintaining certain standards as also optimal utilisation of resources. Above all, an action plan becomes essential for the management of disasters as the very presence of such a plan can boost the morale of the functionaries and keep them in a state of readiness for facing any eventuality. The objective is to provide a quick and effective response in emergency situations.

Although disaster-specific plans are effective and have been prepared by different authorities, there is a growing awareness to opt for multi-disaster response action plan, in order to tackle multi-faceted effects of disaster. The multi-disaster action plan essentially concentrates on the institutional setup and information flow, and provides for hazard-specific responses along with specification of primary agencies that are involved. Such an approach allows flexibility in response at the local level, while still under the direct supervision and control of the state or regional level.

Thus, while there may be multiple agencies and institutions with varied duties and responsibilities, working at the disaster site, they all form the umbrella structure of a central authority under a unified command. It has the advantage of immediate identifiability and fixing of responsibilities in any disaster situation.

While the action plan assumes an element of preparedness on the part of the administrative authority, it also invokes a substantial involvement of NGOs and private initiatives. The Plan envisages community participation as one of the most effective inputs for the management of disasters. Training of community and key social functionaries thus become essential elements for the successful execution of an action plan.

The Action Plan therefore identifies the operational structure and the coordination mechanisms, the roles and responsibilities of various agencies along with the standards of service expected from them, the information and monitoring tools and modes of communication, and the monitoring and evaluation component.

1.2 Policy Statement

A well coordinated and unified response of various state departments and agencies, appropriate to the demands of the district administration in the management of disasters, will minimise the hardships and improve the process of recovery. This calls for a well-defined plan and procedures, which will allow developing appropriate policies and systematic mobilisation of resources, both at state level and through central and multi-lateral agencies.

Although the containment of disasters will basically be at the district level, the process of confidence building and self reliance at the district level, can best be promoted through a timely, supportive and well-thought-of interventions by the state.

In addition to Disaster Preparedness and Mitigation Strategies as in the case of floods, the results of disaster-specific response strategies, adopted so far by the state administration have demonstrated their efficiency. However, un-anticipated disasters have claimed disproportionate toll, as such specific response strategies did not have adequate flexibility to respond to situational demands. Prompted by such a situation it is expected that a multi-disaster response strategy may offer a better option.

A Disaster Management Plan is backed by continuous preparedness. Only a sustained effort at preparedness can make a disaster management plan effective.

2. INSTITUTIONAL ARRANGEMENTS

Under this multi-disaster action plan,

- All disaster specific mechanisms would come under a single umbrella
- Allowing for attending to all kinds of disasters.

The existing arrangements therefore will be strengthened by defining this administrative arrangement. This arrangement proposes

- Chief Secretary as the team leader
 - supported by the Relief Commissioner through
 - the Branch arrangements at the Emergency Operations Centre (EOC).

The objective is to have a simplified and uncluttered system of response in a disaster situation.

2.1 Emergency Operations Centre

The Emergency Operations Centre will be the hub of activity in a disaster situation. This is however, not to underestimate its normal time activities. The EOC, the key organizational structure, is flexible to expand when demands increase, and contract when the situation slows down. There is no one best way to organize an EOC. The primary function of an EOC is to implement the Disaster Management Action Plan which includes :

- Coordination
- Policy-making
- Operations management
- Information gathering and record keeping.
- Public information
- Resource management.

The EOC, its system, and procedures are designed in such a way that information can be promptly assessed and relayed to concerned parties. Rapid dissemination contributes to quick response and effective decision-making during emergency. As the master coordination and control point for all counter-disaster efforts, the EOC is the place of decision-making, under a unified command.

The EOC under the normal circumstances will work under the supervision of Relief Commissioner. It is the nerve centre to support, co-ordinate and monitor the disaster

management activities at the district level. In a disaster situation, the EOC will come under the direct control of Chief Secretary or any other person designated by the Chief Secretary as Chief of Operations.

2.1.1 Normal time activity of the EOC

The normal-time activities of EOC through the office of the Relief Commissioner are very crucial for its efficiency of response in a disaster situation. These activities are primarily the responsibility of Relief Commissioner's office which will be maintaining the EOC.

The GOM has set up a Disaster Management Centre in Yashwantrao Chavan Academy of Development Administration, Pune. This centre has a permanent faculty, and facilities of documentation and data base management. This centre will assist the EOC on a regular basis in the discharge of its normal time activities.

The normal time activity of the EOC through the office of the Relief Commissioner will be to

- Ensure through appropriate statutory instruments that
 - District Disaster Management Action Plan (DDMAP) is operationalised
 - Standard Operating Procedures for various departments are operationalised
- Ensure that all districts continue to update DDMAP on a regular basis
- Encourage districts to prepare area-specific plans prone to specific disasters
- Receive reports on preparedness from the district control room as per the directives every six months. Based on these, the EOC will prepare a summary report for the consideration of the Chief Secretary
- Setup study groups and task force for specific vulnerability studies and submit the reports to Chief Secretary
- Identify and interact with central laboratories, research institutions such as MERI, IIT, BARC, within the state, and NGOs for ongoing collaborations, to evolve mitigation strategies
- Serve as a data bank to all line departments and the planning department with respect to risks and vulnerabilities, and ensure that due consideration is given to mitigation strategies in the planning process
- Receive appropriate proposals on preparedness, risk reduction and mitigation measures, from various state departments/agencies and place the same for consideration of the Chief Secretary
- Convey policy guidelines and changes, if any, in the legal and official procedures, eligibility criteria, with respect to relief and compensation
- Upgrade and update state DMAP according to changing scenarios in the state
- Dissemination of state DMAP to other departments of the GOM and state level agencies
- Update data bank
- Monitor preparedness measures undertaken at the district levels, including simulation exercises undertaken by various departments
- Monitor the training imparted to state level officials, private sector and NGOs by YASHADA.
- Organise post-disaster evaluation and update state DMAP accordingly
- Prepare an actions-taken report for Chief Secretary
- Receive reports and documents on district level disaster events, and submit the same to Chief Secretary, Revenue Minister and Chief Minister
- Warning and communication systems, and other equipments in the control room are in working condition.

- Inform district control room about the changes, if any, in legal and official procedures, with respect to loss of life, injuries, livestock, crop, houses, to be adopted (death certificates, identification procedures, etc.).

2.1.2 Warning or Occurrence of Disaster

On the receipt of warning or alert from any such agency which is competent to issue such a warning, or on the basis of reports from Divisional Commissioner/District Collector of the occurrence of a disaster, all community preparedness measures including counter-disaster measures will be put into operation. The Chief Secretary/Relief Commissioner will assume the role of the Chief of Operations for Disaster Management.

It is assumed that the district administration would be one of the key organisations for issuing warnings and alerts. Additionally, the following agencies competent for issuing warning or alert are given below.

Disaster	Agencies
Earthquakes	IMD, MERI, BARC
Floods	Meteorological Department, Irrigation Department
Cyclones	IMD
Epidemics	Public Health Department
Road Accidents	Police
Industrial and Chemical Accidents	Industry, MARG, Police, DISH, BARC, AERB
Fires	Fire Brigade, Police

The occurrence of the disaster will be communicated to

- Governor, Chief Minister, Home Minister, State Cabinet, Guardian Minister of the district, and non-officials namely MPs and MLAs from the affected district.
- PMO, Cabinet Secretary, Secretary, Home and Defence
- Secretary, Agriculture, and Joint Secretary, NDM, Ministry of Agriculture, GOI
- Maharashtra-Gujarat Area Command : HQ, Mumbai

The occurrence of the disaster would essentially bring into force the following :

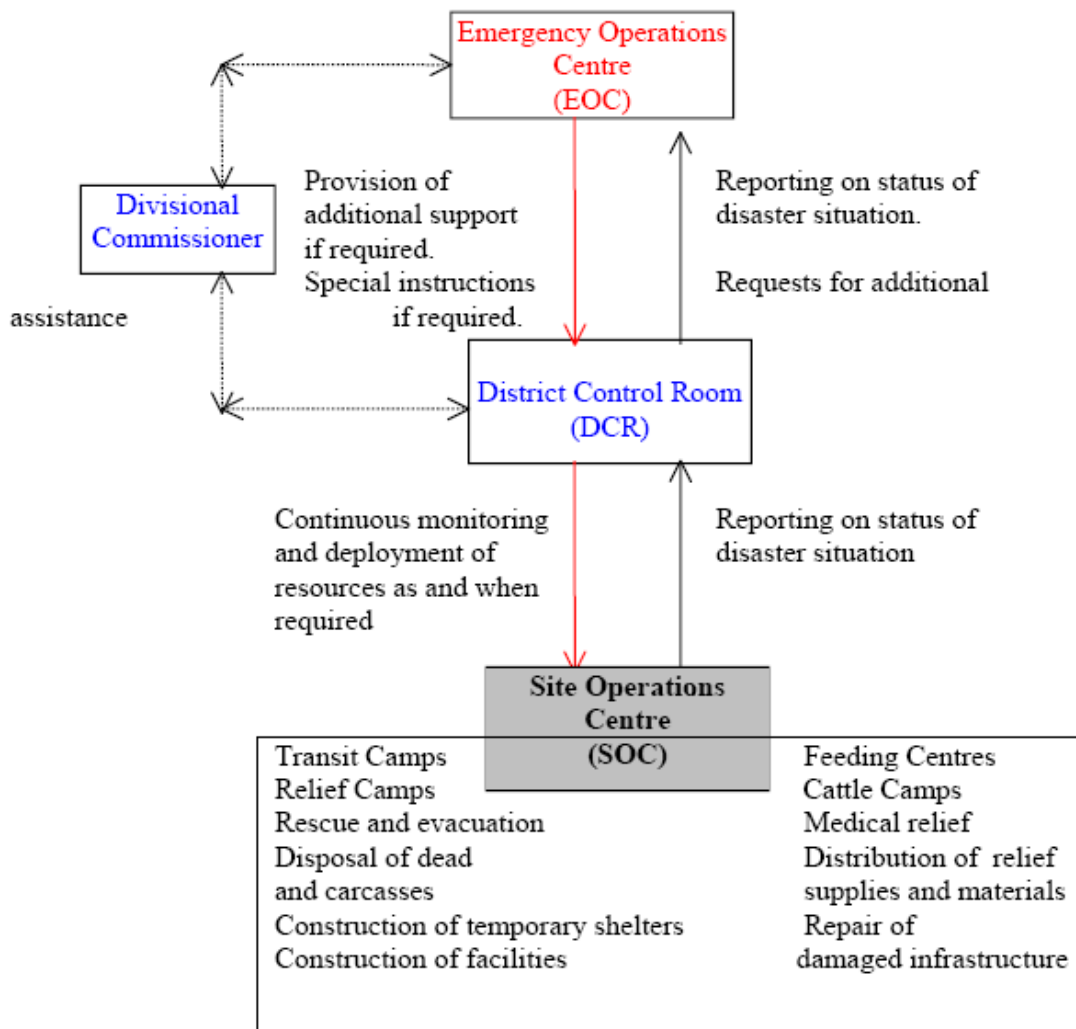
- The Emergency Operations Centre will be put on full alert and expanded to include Branch arrangements, with responsibilities for specific tasks, depending on the nature of disaster and extent of its impact. The number of branches to be activated will be decided by the Chief of Operations
- All Branch Officers and Nodal Officers will work under the overall supervision and administrative control of the Chief of Operations. All the decisions taken in the EOC have to be approved by the Chief of Operations.
- Immediate access to the disaster site

- An on-going VSAT, wireless communication and hotline contact with the Divisional Commissioner, and Collector/s of the affected district/s will be activated.

The EOC in its expanded form will continue to operate as long as the need for emergency relief and operations continue and the long-term plans for rehabilitation are finalised. For managing long-term rehabilitation programmes, such as construction of houses, as in Latur earthquake, the responsibilities will be that of respective line departments. This will enable EOC to attend to other disaster situations, if the need be.

ORGANISATION OF EMERGENCY OPERATIONS CENTRE

Flow of Information between EOC, DCR and SOC during disaster conditions



2.2 Emergency Operations Centre Components (On occurrence of disaster, Branch functions in EOC at Mantralaya)

Chief of Operations

- Establishing priorities
- Spelling out policy guidelines, if necessary
- Coordinate the services of
 - Defence, State Reserve Police, Central Reserve Police Force, Home Guards, Coast Guards, Central Industrial Security Force
 - Fire Brigade, Civil Defence
 - Telecommunications, Railways, Civil Aviation, Port Trust, Food Corporation of India,
 - TV, Radio, Mass Media
 - Maharashtra State Electricity Board, Maharashtra Water Supply and Sewage Board, Maharashtra State Road Transport Corporation, Public Works Department, BEST for Mumbai
 - Indian Meteorological Department, Maharashtra Earthquake Research Institute, BARC
- Coordinate with national and international aid agencies.
- Enlist services of GOI/GOM laboratories and expert institutions for specialised services

Branch	Functions
Operations Branch (In-charge from Revenue Department)	<p>A. Planning Support for Response Action for</p> <ul style="list-style-type: none"> • Emergency supplies of water and cooked food • Rescue and evacuation • Salvage operations • Disposal of dead • Transit camps (in accordance with standards laid down) • Inform the district control room about sanctions for various relief items. <p>B. Implement procurement/purchase/hire/requisition plans of materials which are not available at the district level.</p> <p>C. Establishing communication links with</p> <ul style="list-style-type: none"> • Appropriate central government departments, agencies and institutions, such as railways, defence services, IMD • Police, fire brigade, PWD, MSEB, Irrigation, MWSSB, and all other state departments • Private donors. <p>D. Reporting</p> <ul style="list-style-type: none"> • Receive Preliminary Information Report as given by the Collector • Identify specific items for follow-up actions through the office of the Chief Secretary • Receive all informations and additional information demanded by Chief Secretary, from district control room.

	<ul style="list-style-type: none"> • Report to Chief Secretary on deployment and reinforcements of staff and resources. <p>E. General</p> <ul style="list-style-type: none"> • Inform district control room about the changes, if any, in legal and official procedures, eligibility criteria with respect to relief and compensation, for loss of life, injuries, livestock, crop, houses, required to be adopted • Maintenance of duty records.
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Services Branch (In-charge from Revenue Department)	<p>A. Assess search and rescue requirements as per information from the district control room and take necessary actions</p> <p>B. Direct, supervise and provide assistance wherever necessary for the following</p> <ul style="list-style-type: none"> • Relief camps (in accordance with standards laid down) • Cattle camps • Relief supplies to relief camps or to Site Operation Centre • Supplies of fodder and cattle-feed to cattle camps • Supply of seeds, agriculture inputs and services to Site Operations Centre • Law and order (e.g., prevent looting and theft) <p>C. Ensure adequate material resources at the disposal of the District Disaster Manager (Collector)</p> <p>D. Coordinate NGO activities through necessary support to ensure community participation</p> <ul style="list-style-type: none"> • Identification and coordination with NGOs for relief activities • Identification of NGOs to serve on committees, task force • Set-up a coordination group representing different NGOs • Assigning well-defined area of operations • Assigning specific response functions to specialised NGOs • Reporting upon procurement and disbursement of relief materials received through government and non-government channels.
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<p>Infrastructure Branch</p> <p>(In-charge from PWD/Irrigation /MSEB)</p>	<p>A. Coordinate with respective departments for restoration of damaged infrastructures, like</p> <ul style="list-style-type: none"> • Roads • Power • Water • Telephones • Public buildings • Bridges • Wharves • Canals. <p>B. Coordinate with respective departments for construction of facilities like</p> <ul style="list-style-type: none"> • Shelters with sanitation and recreation facilities • Provision of hand-pumps and borewells • Temporary structures for storage • Educational facilities • Medical facilities • Postal facility • Helipads.
<p>Logistics Branch</p> <p>(In-charge from Revenue Department)</p>	<ul style="list-style-type: none"> • Respond to reinforcement needs including manpower and deployment of inter-departmental and inter-district resources as per information received from the district control room • Ensuring receipt, safe storage, and transport of relief supplies and materials from airport, railways and handling of the required formalities • Direct supplies distributed by NGOs and other organisations including private donors to district control room • Ensure proper maintenance of vehicles and equipments at the Emergency Operations Centre.

<p>Health Branch</p> <p>(In-charge from Public Health Department)</p>	<p>A. Organise mobile medical teams of specialists from within the state (and outside if the need arises) for immediate response</p> <p>B. Coordinate with adjoining districts on request from district control room for supply of</p>
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	<ul style="list-style-type: none"> • Medical relief for the injured • Number of ambulances required and locate hospitals where they could be sent, (public and private) • Medical equipment and medicines required • Special information required regarding treatment as for epidemics etc. • Blood. <p>C. Monitor</p> <ul style="list-style-type: none"> • Treatment of the injured and sick • Disposal of dead bodies • Disposal of carcasses • Preventive medicine and anti-epidemic actions • Reports on food, water supplies, sanitation and disposal of waste and coordinate the services of investigation laboratories, for support services at district level. <p>D. Ensure supervision of maintenance of standards in</p> <ul style="list-style-type: none"> • Transit and relief camps for cooking arrangements, sanitation, water supply, disposal of waste, water stagnation and health services. • Communities for storage of rations, sanitation, water supply, disposal of waste, water stagnation and health services.
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Communication and Information Management Branch (DGIPR)	<p>A. Set-up a media centre in DGIPR's office to organise sharing of information with radio, television channels, print media and community</p> <p>B. Monitor disaster warnings and weather conditions in coordination with and on the advice of</p> <ul style="list-style-type: none"> • IMD • Irrigation • MERI, BARC • Industries. <p>C. General</p> <ul style="list-style-type: none"> • Send Out-Messages on behalf of Chief Secretary/Relief Commissioner and maintain In-Message, Out-Message Register • Collect and process information received from District Control room and any other information as may be required by Chief Secretary
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	<ul style="list-style-type: none"> • Serve as data bank, required for policy making, in disaster situations. <p>D. Make all the information contained in state DMAP readily available</p> <ul style="list-style-type: none"> • Planning Information required including maps incorporated in DDMAP • Disaster site map and indications of the extent, to which other areas may be affected, etc. • Information regarding approach, alternate routes, water sources, layout of essential services which may be affected, etc.
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Resources Branch (In-charge from Revenue Department)	<p>A. Manage disbursement of Relief Funds</p> <p>B. Collect and Collate records from district control room on</p> <ul style="list-style-type: none"> • Receipt of all relief materials • Issue of all relief materials • All expenses incurred on administration and disaster management. • All gratuitous relief • All relief given. <p>C. All payments of approved expenses, dues, claims, daily wages to staff.</p>
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Branch arrangements provide for division of tasks, information gathering and record keeping. Each Branch officer is accountable to the Chief of Operations for specific functions. Each Branch should have a Branch Officer of the rank of Deputy Secretary or Joint Secretary.

The Branch Officers for Operations, Services, Logistics, and Resources will be drawn from Mantralaya from the Revenue Department; for Health Branch, Branch Officer will be drawn from the Public Health Department; for Infrastructure Branch, from the Public Works Department/Irrigation/MSEB and for Communication and Information Management Branch, the DGIPR will officiate.

The capacity of various Branches to coordinate amongst themselves, and with the field units will ultimately decide the quality of response. Such function of coordination is contingent upon the EOC's resources to effectively keep a track on communications received, and the decisions taken. Pro forma for "In and Out Messages and Register" are given in Annexure I and II.

2.3 Facilities/Amenities Provided in the EOC

2.3.1.1 Room

The Emergency Operations Centre has

- Adequate space for a large workstation
- Various Branches during disaster situations.

There is a conference room adjacent to the control room.

The EOC is equipped with

- Necessary furniture and storewells for keeping

- Files of messages
- Stationery
- Other office equipment.

- Action Plans

- Maps

- List of key contact persons during emergencies.

[Are accessible with clear labels, and not under lock and key].

Important phone numbers, which are frequently required, would be displayed on the wall so that they could be seen easily, while other phone numbers, names and addresses etc., are maintained on the computer, to facilitate easy retrieval and cross-referencing.

Some provision is made for

- First-aid and other basic medical relief for the staff
- An adjoining toilet
- A rest room with adequate facilities and
- A lunch room.

[This would be required especially during disaster, when staff may have to be on duty for long hours at a stretch].



I. Control Room (Main Message Room)

[The existing police wireless system in the control room at Mantralaya continues to function in the reorganised EOC].

In addition, the following facilities are available in the control room

- Telephones
- Intercom units for contact within Mantralaya

- VSAT connection to the divisional commissioner and collector
- Hotline to
 - Police Control Rooms
 - BMC Control Room
- Networking of Computers
- One PC with printer
- Mobiles and Pagers (where necessary)
- Photocopying machine
- Television unit and major newspapers to be monitored for news.

During disaster, hotlines from control room to be connected to

- Divisional Commissioner/s of the affected district/s
- District Collector/s of the affected district/s
- Superintendent of Police of the affected district/s



Separate tables are provided for each communication instruments such as

- VSAT
- Telephones
- Fax
- Computer
- Printer
- Typewriter
- NIC terminal and
- Civil wireless within BMC area.

The phones, i.e. intercom, STD phone, EPBX extension, hotline etc., would be of different colours, and with distinct rings if possible, to enable them to be distinguished from each other. An emergency light, fire extinguishers, and a generator for the computer and fax machine would also be provided in the control room.

Branch Units

Each of the seven branches would have

- An independent phone with STD facility
- Intercom units for contact within Mantralaya for all Branch Officers/Nodal Officers.
- Hotline for all Nodal officers to be connected to their respective departments/agencies.
- Office space for central secretarial facility has been clearly identified.

[These telephones with STD facilities will be installed in EOC and kept in working condition under lock and key during normal circumstances].

[As a backup arrangement, in case of damage to the EOC, District Control Room for Mumbai will act as state EOC. Planning for DCR in Mumbai would consider this eventuality and plan accordingly.]

2.3.2 Transport

Provision would be made for a car with wireless communication to be assigned to EOC during normal times. Additional vehicles will be requisitioned, as per the requirements, during the emergency.

2.3.3 Staffing requirements for control room

Three categories of staff are being suggested for the control room: Regular, Staff -on-call and Staff on Disaster Duty.

2.3.3.1 Regular Staff

The regular staff will be posted permanently in the control room and will be responsible for manning the Control Room on a 24-hour basis. The regular staff recommended would include the following:

- Branch Officer - Control Room

A Deputy Secretary in Mantralaya from the Relief Commissioner's Office will function as the Branch Officer - Control Room. He will be in charge of the day-to-day operation of the control room during official working hours. He will be assisted by Deputy Secretaries from Mantralaya in rotation during non-working hours.

- EDP Manager

EDP Manager will be a technical person thoroughly conversant with computer technology. He will be responsible for the maintenance of the LAN and network, and also information processing and data management.

- Computer Operator

The person holding this position will provide all secretarial assistance to the control room. The person should be computer literate and should be able to operate database systems.

- Communication operators (for 24 hours)



The communication operator will attend to wireless set in the control room.

- Driver cum Messenger/Attendant (for 24 hours)

Drivers will be required for the vehicle attached to the control room and kept on stand-by duty. These drivers should also be trained to operate the wireless fitted in the vehicle attached to the control room.

2.3.3.2 Staff-on-call

Staff-on-call will be available for immediate duty in case of a disaster. Two Deputy Secretaries will make up the Staff -on-call. During a disaster, these officers should always be available "on call." Preferably, these deputy secretaries should have their residence in the vicinity of Mantralaya. The staff-on-call should be appointed in rotation from some identified departments. The rotation period could be of at least a month, to ensure some degree of continuity.

2.3.3.3 Staff on Disaster Duty

Staff on Disaster Duty will be additional staff, who are required to shoulder additional responsibility in case of a disaster. These additional staff will be of "reserve nature" and may be drawn from various departments, who are also experienced in control room and EOC operations. All Deputy Secretaries will have to familiarise themselves with the functioning of control room and EOC branches. Nodal Officers, who are likely to be drawn from various departments and agencies, will have to be provided orientation through training programmes to be organised by YASHADA. These staff will be responsible for managing the Branch arrangements mentioned earlier. Central facility for secretarial assistance will be made available to all branch officers during the emergency period.

2.3.4 Services and facilities to be provided by the EOC

- The EOC will have to monitor continuously the preparedness and the response capacity of each district as per the details given in the Document on "Mitigation Strategy". A constant review of the district situation will imply making provisions of such services and facilities, under the government as well as the private sponsorship, at the district level so that these can be mobilised at a very short notice.



- It will be difficult for the EOC to maintain an inventory of all the resources at the state level. Therefore, identification of agencies and institutions, for locating inventory items for specialised services becomes an important function of the EOC. EOC will also ensure the availability of the inventory items as and when required.

- For instance, speed boats for rescue operations can be located with Irrigation department, Navy, Coast guards at different locations. The EOC/District Control Room can press these boats from the nearest locations into relief operations during emergencies. It will be useful if the state agencies such as Irrigation Department in consultation with other agencies like Coast Guard, have a special plan for locating these facilities.

- Similarly, civil hospitals can be equipped for trauma care with mobile trauma vans and CT Scan facilities, so that each district will be in a position to handle such emergencies, and the mobile trauma vans can be mobilised from few adjoining districts at a short notice during disaster.

2.4 Coordination between EOC and District Control Room

The need for coordination in disaster management between different levels of government, is based on the necessity for having a unified command, and coordinated action by all the agencies. The objective is to ensure that state action is organized in a disaster situation to:

- Effectively and efficiently meet needs
- Avoid waste and-duplication of effort
- Ensure that resources are distributed equitably and to areas of greatest need.

Priorities must be clearly defined and understood by all agencies. This is mainly done at the state level, while preparing the standard operating procedures for each department, during the disaster cycle. Effective coordination is largely dependent upon an effective data collection, processing and reporting machinery.

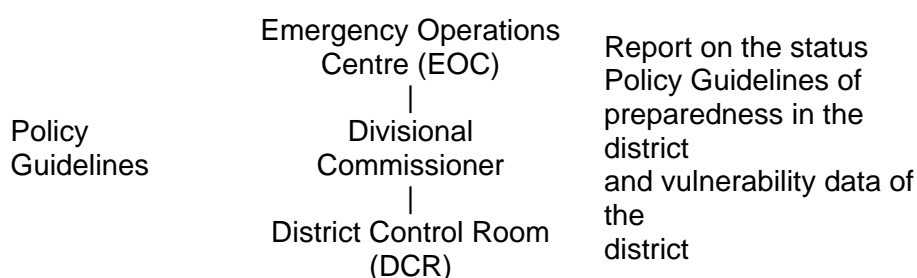
The link of the DCR with the EOC will be through:

- Hotlines
- VSAT
- Telephones
- Police wireless network
- fax
- NICNET.

The flow of information between EOC and DCR may be described under two scenarios viz., During Disaster and under Normal Conditions. Figure 2 and 3 show the channels for information between these set-ups under the above two scenarios.



Flow of Information between EOC, DCR during normal conditions



[Flow of Information between EOC, DCR and SOC during disaster conditions - \(pdf\)](#)

2.5 Multi-district Disasters

In case of disasters which have an impact on more than one district in a division, the role of the Divisional Commissioner comes into prominence. The Commissioner's responsibilities shall include exercising general supervision over the work of preparation of contingency plan undertaken by the Collectors in his Division, and also on the relief and rehabilitation operations in those districts.

At the Divisional Commissioner's level all the state departments and agencies have a regional head. It is very practical for the Divisional Commissioner to seek the support of these regional heads towards the commitment of regional resources to a disaster situation.

For a disaster in more than one district (within or across the division), the role of Divisional Commissioner is to:

- Provide a unified command through inter-district control room
- Ensure need-based resource allocations amongst districts
- Seek the support of regional heads of line departments for relief
- Direct and coordinate in response to requirements from district control room the services of

- MSRTC
- State Government departments
- SRP, CRPF, Home Guards, Coast Guards, CPWD, CISF
- Fire Brigade, Civil Defence
- Telecommunications.

- Maintain a close liaison with the EOC
- Seek policy guidelines, if necessary
- Mobilise services of Central/State government laboratories and recognised research centres for specialised services.

In such a situation, the Divisional Commissioner will act

- As the Additional Relief Commissioner for the disaster area,
- His powers will be analogous to that of Relief Commissioner in the EOC



- Will access funds from the state government for this purpose
- Will be assisted by Deputy Commissioner, Revenue, in discharge of disaster management functions, as is the normal practice.
- Will receive the support of other Deputy Commissioners and Assistant Commissioners and Line Department Heads.

[The district control rooms would continue to function in their respective districts and perform all the functions as per the DDMAP].

2.6 Non-governmental organisations (NGOs) and Voluntary Agencies

The non-governmental organisations and voluntary agencies play an important role in disaster management, and provide valuable resources and expert manpower. Their capacity to reach out to community groups, and their sensitivity to local traditions of the community give them added advantage, during the disaster situation. Some of the agencies, both from within and outside state, have evolved technical expertise and capabilities, which can be brought into managing typical issues. These organisations enjoy a fair degree of autonomy and flexibility and hence can respond to changing needs immediately.

During post-disaster phase, in the process of rehabilitation, therefore, efforts would be made to enlist partnership of some of the NGOs with relevant expertise, to assist the district administration. However, the choice and extent of their participation would be clearly defined, in order to avoid administrative confusion or undermining of coordination structure at the district level. Involvement of District Collectors in evolving partnership with such NGOs will be one of the tasks to be managed by Services Branch of the EOC.

The specific areas where the NGOs can be involved are:

- As a resource group
- Well-defined area of operations such as

- emergency first-aid
 - blood banks
 - management of Feeding Centres, Transit Camps, Relief Camps
 - construction of temporary shelters
 - trauma Care
 - community Counselling and Mental Health Services
 - recreational Services
 - legal Aid
 - educational Programmes
 - services for Vulnerable Groups (handicapped, destitutes, orphans, widows, separated families)
- As part of confidence building measures, managing Information Centres and acting as rumour control centres
 - Assist beneficiaries towards optimal utilisation of government assistance and compensation
 - Reconstruction
 - Social and economic rehabilitation which includes
 - Restoration of the community's asset base
 - Resuscitation of livelihood
 - Restoration of social units through processes such as adoption, foster-care, remarriage etc.



2.7 Community Participation

The DDMAP expects the district administration to enlist community participation in the entire disaster cycle. The EOC, therefore, is expected to ensure and monitor the nature of community participation sought at the disaster site. Identification of agencies to monitor and evaluate various aspects of community participation, and their impact on efficiency in operations, and in the recovery process is one of the responsibilities of EOC during post-disaster evaluation.

It is important to note that, the so-called “victims” are not all that helpless, and offer a tremendous manpower resource and ingenuity to overcome the crises. The participation of communities and their representatives would reduce the pressures on administration. Further, every attempt to enlist community support and participation will reassure the community about the administration's intent and seriousness about managing the disaster.

Community participation can be ensured by

- Identifying opinion and position leaders in the community, and voicing administration's confidence in their capabilities to undertake the tasks.
- Consultations and dialogues expressly indicating the need for assistance, would encourage the community and its leaders to come forward.
- Regular feedback meetings and an open book approach to demonstrate transparency.
- Involving community in decision making at local levels.

The major areas of community participation would include:

- During Evacuation

- Community leaders and community based organisations (CBOs) can assist in maintenance of security and law and order during evacuation.

- For emergency evacuations , the families can be encouraged to take along water, food, clothing and emergency supplies to last at least three days.

- Encourage families to assemble disaster supplies kit.

- Encourage people to keep fuel in their cars as petrol pumps may be closed during emergencies.

- Ensuring that electricity, gas and water at main switches and valves, are shut off before evacuation.

- With respect to livestock, community assistance can be sought to set the livestock free before evacuation.

- During the Disaster

- Seek the help of community leaders in containing panic, orderly movement towards community shelters (safe zones) and on other preventive steps to avoid injuries and accidents.

- During Relief and Rehabilitation

It is necessary to ensure that members of the community are continuously engaged in some sort of helping activity to draw them out of their depression.

Community assistance to relief authorities at the site to

- Organise cultural and recreational activities in order to protect the mental health and sustain the ethical and moral values.

- Encourage self-help

- Organise skill training

- Locate and identify the dead, disposal of dead bodies, disposal of carcasses and disposal of damaged food stocks

- Contribute labour (loading, unloading, distribution, temporary constructions, salvage and restoration of water supplies, food distribution centres, relief camps, cattle camps etc.)

- Update records of damages and losses

- Maintain law and order

- Maintain standards in sanitation and disposal of waste.

3. RESPONSE STRUCTURE

Disaster results from the impact of the occurrence of hazard on people, man-made structures, components and systems which are weak and incapable of resisting the forces unleashed.

“Sociologically, a disaster is a event, located in time and space, that produces the conditions whereby the continuity of the structure and processes of social units becomes problematic.”
(Russell R. Dynes, 1980. Participation in Social and Political Activities, San Francisco, Jossey-Bass Publishers.)

Disasters threaten sustainable economic development worldwide. In the past twenty years, earthquakes, floods, tropical storms, droughts road accidents, fires and other calamities have killed around three million people and inflicted injury, disease, homelessness, and misery on one billion others, and caused damage worth billions of dollars.

Disasters destroy decades of human effort and investments, thereby placing new demands on society for reconstruction and rehabilitation. The developing countries where two thirds of the world's population live, suffer the most debilitating consequences due to disasters.

Observing the Asian scenario, one comes to a conclusion that India has moderately high risks of facing natural events which may result in disasters. The risk of such events is quite high for floods or droughts and it is moderate for earthquakes or cyclones. However, considering the heavy damages earthquakes and cyclones inflict on the society, one has to be concerned about not only the degree of risk but also the magnitude of impact of the event.

A multi-disaster response structure on the occurrence of disaster has been diagrammatically represented below.



[Response Structure at State Level on occurrence of disaster](#)

3.1 Emergency Contact Persons

3.1.1 State Government Officials

Designation	Phone Number		Mantralaya Extension no	Other contact no (mobile)
	Office	Residential		
Chief Secretary	2025042	2023851	3444	PA:3597 Fax : 2028594
Additional Chief Secretary	2885144	2828134	3479	
Water Supply	2025357	2850595	3510	
Agriculture & ADF	2025113	2024807	3290	
General Adm. Deptt.	2029959	2026715	3487	
Home				
Relief Commissioner				
Secretary, Revenue	2024588	4951836	3486	PA: 3635

				Fax : 2850919
Secretary, Home	2029959	2026715	3487	PA : 3757 Fax : 2854646
Secretary, Health	2026579	2022916	3224	
Secretary, Medical Education	2026233	4152371	3304	PA : 3832 Fax : 2028612
Secretary, Finance	2029721	2047271	3489	PA : 3252 Fax : 2020717
Secretary, Irrigation	2023109	4974377	3480	PA : 3917 Fax : 2023213
Secretary, Public Works	2024800	4945043	3282	PA : 3324 Fax : 2023141
Secretary, Urban Development	2021444	2025047	3557	PA : 3244
Secretary, Housing	2023036	4952837	3475	PA : 3425 Fax : 2025939
Secretary, Agriculture	2025357	2850595	3510	PA : 3930 Fax : 2024916
Secretary, Food and Civil Supplies	2024851	2022080	3584	PA : 3372 Fax : 2025449
Secretary, Forest	2023363	2026089	3488	PA : 3220 Fax : 2023623
Secretary, Water Supply	2885144	2828134	3479	PA : 3962
Secretary, Industries	2025393	2871852	3500	PA : 3566
Secretary, Labour	2027433	2835913	3629	PA : 3789 Fax : 2824446
DGIPR	2027956			
Municipal Commissioner, BMC	2620251 2620525	4937290	3109	

3.1.2 State Level Organisations



Designation	Phone Number		Other contact no (mobile)
	Office	Residential	
Director General, Police	2026672 2620111/427	2021185	Fax : 3649055
Transport Commissioner	3084621		
Director of Health Services	2621006		

	2620292		
Managing Director, MSRTC			
Director, MPCB	2671356		
Director, Industrial Safety and Health			
Home Guards			

3.1.3 Monitoring Agencies

Designation	Phone Number		Other contact no (mobile)
	Office	Residential	
Director, Meteorology Department	2151606/ 0431 0405		Fax :2160824
Director, MERI	0253-512764 511628		
Director, BARC	5564716 5511910	3633356	

[Top](#) [Get DMP](#)

3.1.4 NGOs at State Level

Designation	Phone Number		Other contact no (mobile)
	Office	Residential	
Indian Red Cross	2611446		Fax:022-2670738
Ramkrishna Mission	6549581/9681 5391/1144/1180		Fax:6544346
Swami Narayan Trust	4411825 4143953 4142016		Fax:4141074
Bharat Sevashram	7826539		
CARE India, (Maharashtra), Mumbai	8368484		
CASA	3089896 3085872		Fax:3085400
CARITAS	040-3744395		Fax:040-293290

3.1.5 Contact Persons from Central Government

Designation	Phone Number		Other contact no (mobile)
	Office	Residential	
Cabinet Secretary	3016696		Fax : 3012095 3013623
Secretary, Home	3011989		Fax : 3015750 3017763
Secretary, Defence	3012380		Fax : 3386004
Secretary, Agriculture			
Maharashtra Gujarat, Area Command HQ, Mumbai			
Western Army Command, Pune	670660	672060	Fax:0212/670660
Western Naval Command, Mumbai			Fax:2660932
Western Air Command, Jodhpur			
Central Railway	2624555 2621551 Ext : 4000		Fax: 2017361
Western Railway			
Mumbai Port Trust	2618011		Fax:2611011
Airport Authority of India, Mumbai	8349890 8324769		
Department of Telecommunications	3719898		Fax:3782344
Doordarshan Kendra, Delhi	3387786 3710133 6218620		Fax:3382704 3715144
All India Radio, Delhi	3710300 3714061		Fax:3711956

3.2 Earthquakes

3.2.1 Nature and Occurrence

Earthquakes can occur anywhere. They may occur in an area not known to have experienced previous activity and may suggest a temporary increase of risk of the hazard in the area. Or they may occur in areas which have a previous history of subterranean sounds and seismic activities.

The impact of earthquakes differs for urban and rural areas, primarily because of the nature of infrastructure, quality of housing and occupational differences. In rural areas, it is primarily the housing and physical structures (including irrigation infrastructure) which may suffer extensive damage, without necessarily destroying the crops.

In urban areas, in addition to housing and physical infrastructures, it may also disturb the service infrastructure such as water supply, sewage, telephones, electricity, piped gas supply etc., which are essentially underground installations and hence exposed to direct impact.

Maharashtra and adjoining regions are prone to earthquakes of moderate magnitude as can be seen from the experience of several years. Based on the earthquakes occurred so far in the state and considering the seismicity pattern, a rezoning has been proposed by MERI for the state of Maharashtra.

During the 33 years of 1963 to 1996, the Koyna region has faced 98,309 earthquakes, out of which 75 were above magnitude of 4 (Richter scale) and seven were above magnitude of 5 (Richter scale).

Earthquake risk assessment is all the more difficult in the Maharashtra state because of lack of seismic instrumentation in large parts of the state. Maharashtra is no doubt the most seismically instrumented state in India, with 52 seismic risk observatories set up in the state. However almost all this instrumentation is concentrated in some pockets.

3.2.2 Possible Impacts

- Effects on Individual

- Loss of Life
- Injuries demanding surgical needs
- Family disruption.

Specific demands raised or required

- Orthopaedic surgery and fractures needing treatment
- Individuals trapped under debris need to be located and rescued, which calls for not only earth moving equipments, but the services of sniffer dogs.
- Expertise of fire brigade and defence services may be essential in the rescue operations.
- In case of separation of family members information counters would play an important role.
- In case of family disruption resulting from death of major earner, economic rehabilitation of the family may have to be planned as a long-term strategy.
- Loss of life, property and livestock may require damage assessment procedures to avoid litigations and delays in gratuitous relief and compensation.

- Damage caused

- Houses
- Personal belongings
- Livestock.

Specific demands raised or required

- Partially damaged houses needs technical inspection – to decide the habitation worthiness and the extent of repairs required.
- Certain partially damaged houses may require demolition.
- As far as possible, reconstruction should take place on the same sites to avoid delays, secure cultural continuity and avoid costly land purchase. In extreme situations, new sites for resettlement may have to be identified when removal of rubble and debris is non-viable.
- Salvaging personal belongings from the debris needs clearance from technical personnel to ensure safety of persons engaged.
- As far as possible, family members only should be permitted to salvage their individual family belongings.

- Damage to infrastructure resulting in disruption of services

- Buildings
- Dams
- Bridges
- Road surface and rail lines
- Power stations
- Piped gas
- Water pipelines and water tanks
- Sewer lines
- Underground cables.

Specific demands raised or required

- Care needs to be taken to ensure that all electrical supplies to damaged area are disconnected promptly by MSEB.
- Underground cables need thorough inspection before power is restored.
- Breaches or cracks in the dam need Irrigation Department to secure the breaches or grouting the cracks.
- In case of damage to bridges, relief operations may require temporary bridges which can be put up with the assistance of army.

- Certain roads needing resurfacing will need immediate action from PWD.
- MWSSB in consultation with health authorities should restore existing water supply with

necessary repairs. This may call for replacement of pipelines or arrangements for storage in portable PVC water tanks.

- In some cases, restoration of existing water supply may be time-consuming and therefore water tankers may have to be pressed into service.
- Identification of nearby water sources and checking the potability of the same may also be required.
- Damage to sewer lines is one of the most ticklish issue. Alternate arrangements by way of temporary latrines may have to be constructed.
- Piped gas supply should be immediately terminated in the affected area to avoid secondary consequences such as fires. If necessary, and feasible, gas cylinders should be supplied till the gas line is checked thoroughly and restored.
- Extensive damage to residential buildings, resulting in disruption of telecommunication facilities requires provision of public telephones (PCO) to facilitate communication.
- Damage to hospital, school buildings and other public facilities may disrupt the services. In such a case restoration of services through temporary arrangements is the first priority.
- PWD may have to take repairs or reconstruction of such public facilities on a priority basis.

- Environmental Effects

- Alteration in river and stream flow
- Liquefaction.

Specific demands raised or required

- Areas indicating signs of liquefaction should be declared out of bounds and strict vigil should be kept by police to prohibit trespassing.
- Foundations of the building in the area prone to liquefaction need technical assessment.
- Alteration in river and stream flow, particularly when it covers a settlement, demands immediate evacuation and relief till such time as the areas for new settlement identified and rehabilitation works can be executed.



- Economic and Social consequences

- Loss or disruption of livelihood
- Disruption of market and loss in production
- Migration
- Disruption of social structure including breakdown of social order and organisations
- Law and order problem
- Psychological after-effects such as individual trauma and depression.

Specific demands raised or required

In addition to immediate relief requirements for effective and early recovery process, checking migration

- Restoration of production units, and employment avenues
- Provision of individual counselling and community counselling
- Reconstruction of social structures and organisation of community, require a professional intervention, which can best come from non-governmental organisations. Voluntary agencies will have to be invited or co-opted for relief activities to ensure this aspect.
- For combating depression, engage people in all possible activities related to relief and rehabilitation through a deliberate strategy of community participation.
- Secondary effects
 - Fires
 - Rains
 - Landslides.



Specific demands raised or required

- Fires result from earthquake because of damage to infrastructure such as power supply and piped gas supply.
- Immediate service of fire brigade is essential to check further damage.
- Immediate discontinuation of both power and gas would restrict the possibility of occurrence to a large extent.
- Rains following earthquakes disrupt rescue and relief operations. Rescue and relief teams therefore must prepare themselves in anticipation and get community cooperation to overcome such difficulties.
- Rains also have implication for storage of food, fuel for cooking (firewood or coal) and fodder for the cattle. Protective structures becomes, therefore essential for the storage of all relief materials. Plastic materials and water-proof containers are required.
- Damage to road access due to landslides needs immediate clearing and PWD would keep itself prepared for such an eventuality.
- Settlements on the hill-slope prone to landslides need to be shifted to safer places.

3.3 Floods

3.3.1 Nature and Occurrence

Floods occur with warning, while flash floods occur with very little warning. This impacts the type of operations for these two similar hazards. For flash floods the operational priority is to warn the public and keep them out of the onset of the flood, while floods provide for a significant time to protect property as well as human life through diking operations.

Floods occur when water covers an area that is normally dry. River flooding takes place when flow in the river exceeds the capacity of the main channel, leaves its banks, and flows on to the floodplain.

Floods may develop suddenly (within minutes to a few hours following the triggering event) or take weeks to unfold. The faster a flood develops, the less warning time is available and the greater is the difficulty, for an organised response to reduce the impact. Frequently, floods happen so suddenly, that individuals have to respond on their own. Longer-cresting floods will provide longer lead times. Consequently, more accurate forecasts can provide valuable information to officials, so that effective response is possible.



Flash floods are precipitations, which occur within a very short period of time (up to 12 hours) after the event which caused them. They are frequently perceived as killer walls of water thundering down a mountain canyon, destroying everything in their path. Although a flash flood may sometimes form a wall of water, most do not. A second misconception is that they always occur in flat terrain; the truth is, mountains, hilly areas, and flat land are all at risk. Consequently, flash floods occur in urban and rural areas, in small rivers, streams, and very large rivers.

Floods in urban areas can also occur during monsoons due to faulty planning, choking of drainage systems and unplanned growth of settlements.

Flood prone areas in India are demarcated as either blue or red lines depending on the frequency of occurrence. Blue lines are those areas where floods can occur once every five years, whereas red lines are areas where floods can occur once every hundred years.

3.3.2 Possible Impacts

- Effects on Individual

- Loss of Life
- Injuries demanding medical attention
- Water-borne infection.

Specific demands raised or required

- In most cases, orthopaedic surgery, fractures, cuts and bruises need immediate attention.
- Cases of water-borne infection need medication.
- Mass immunisation, when necessary, to protect individuals from water-borne diseases.
- Marooned individuals, including those trapped on tree-tops and building terraces need to be located and rescued which calls for boats, or at times helicopter services.
- Alternatively, when large sections of community are marooned, instead of evacuation, it may be necessary to organise dispatch of relief supplies to marooned locations. This creates a special need for transport facility.
- Expertise of fire brigade and defence services (Navy, Coast Guards) may be essential in the rescue operations.

- Impact at family level

- Separated families
- Missing persons
- Family disorganisation.

Specific demands raised or required

- In case of separation of family members, information counters would play an important role.
- In case of family disruption, resulting from death of major earner, economic rehabilitation of the family may have to be planned as a long-term strategy.
- Loss of life, property and livestock may require damage assessment procedures to avoid litigations and delays in gratuitous relief and compensation.

- Damage caused

- Houses
- Personal belongings
- Livestock
- Crops and plantations
- Land.

Specific demands raised or required

- Partially damaged houses needs technical inspection, to decide the habitation-worthiness and the extent of repairs required.
- Certain partially damaged houses may require demolition.
- As far as possible, reconstruction should take place on the same sites to avoid delays, secure cultural continuity and avoid costly land purchase. In extreme situations, new sites for resettlement may have to be identified when removal of rubble and debris is non-viable.
- Salvaging personal belongings from the debris needs clearance from technical personnel to ensure safety of persons engaged.
- As far as possible, family members only should be permitted to salvage their individual family belongings.
- Damage to crops, plantations or agriculture land will need a long-term intervention.

- Damage to infrastructure and disruption of services

- Buildings
- Godowns and storages

- Dams
- Bridges
- Road surface and rail lines
- Power stations
- Water pipelines and water tanks
- Sewer lines
- Underground cables
- Ports and jetties
- Communication lines
- Gas pipelines.

Specific demands raised or required

- Care needs to be taken to ensure that all electrical supplies to damaged area are disconnected promptly by MSEB.
- Underground cables need thorough inspection before power is restored.
- Damage to electric poles and transmission lines needs restoration.
- Breaches or cracks in the dam need Irrigation Department to secure the breaches or grout the cracks.
- In case of damage to bridges, relief operations may require temporary bridges which can be put up with the assistance of army.
- Certain roads requiring resurfacing, will need immediate action from PWD.
- Roads blocked due to uprooting of trees and electric poles may need to be cleared on a priority basis.
- MWSSB in consultation with health authorities should restore existing water supply with necessary repairs. This may call for replacement of pipelines or arrangements for storage in portable PVC water tanks.
- In some cases, restoration of existing water supply may be time-consuming and therefore water tankers may have to be pressed into service.
- Identification of nearby water sources and checking the potability of the same may also be required.
- Damage or choking of sewer lines is one of the most ticklish issues. Alternate arrangements by way of temporary latrines may have to be constructed.
- Piped gas supply should be immediately terminated in the affected area to avoid secondary consequences. If necessary, and feasible, gas cylinders should be supplied till the gas line is checked thoroughly and restored.
- Extensive damage to residential buildings, resulting in disruption of telecommunication facilities, requires provision of public telephones (PCO) to facilitate communication.
- Damage to hospital, school buildings and other public facilities may disrupt the services. In such a case restoration of services through temporary arrangements is the first priority.

- PWD may have to take repairs or reconstruction of such public facilities on a priority basis.
- Disposal of damaged foodgrains is one of the major steps and needs community cooperation.
- Provision for distribution of cooked food or dry rations may have to be made.

- Environmental Effects

- Soil erosion
- Silting
- Water pollution
- Denudation of land
- Increase in salinity.



Specific demands raised or required

- Silting in residential areas and buildings is one of the major problems requiring extensive community involvement.
- NGOs have demonstrated a tremendous capacity to mobilise community participation in desilting operations for re-occupancy of the residences and also the wells providing drinking water.
- Agriculture department may have to undertake soil-testing and propose appropriate measures for restoration of agriculture land.

- Economic and Social consequences

- Loss or disruption of livelihood
- Disruption of market and Loss in production
- Migration
- Disruption of social structure including breakdown of social order
- and community organisations
- Law and order problem
- Psychological after-effects like depression, trauma etc.

Specific demands raised or required

In addition to immediate relief requirements for effective and early recovery process and checking migration

- Restoration of production units, and employment avenues
- Provision of individual counselling and community counselling
- Reconstruction of social structures and organisation of community, requires a professional intervention, which can come best from non-governmental organisations Voluntary agencies will have to be invited or co-opted for relief activities to ensure this aspect.

- For combating depression, engage people in all possible activities related to relief and rehabilitation through a deliberate strategy of community participation.

- Secondary effects

- Epidemics
- Landslides.



Specific demands raised or required

- Rescue and relief teams must be alert to the possibility of outbreak of epidemics and therefore ensure standards of services with respect to storage, cooking, and handling of food materials as also disposal of waste in relief camps, medical centres and feeding centres.

- Water-quality monitoring mechanisms will have to be set-up to prevent outbreak of epidemics.

- Rains also have implication for storage of food, fuel for cooking (firewood or coal) and fodder for the cattle. Protective structures therefore for the storage of all relief material becomes essential. Plastic materials and water-proof containers are required.

- Damage to road access due to landslides needs immediate clearing and PWD has to keep itself prepared for such an eventuality.

- Settlements on the hill-slope prone to landslides need to be shifted to safer places.

3.4 Cyclones

3.4.1 Nature and Occurrence

A cyclone is a violent natural phenomenon occurring in the atmospheric blanket enveloping our earth. In the tropics it occurs as a vast violent whirl, 150 to 300 kilometers across, 102 to 117 kilometers high, spiraling around the center and progressing along the surface of the sea, covering 300 to 500 kilometers a day. Wind speeds rise very high near the center (eye) of the cyclone upto 160 kilometers per hour or more.

Three major devastating effects associated with cyclones are storm surges, gale winds and very heavy rain. The pressure systems are classified as:

- Cyclonic storm (61-85 kilometers per hour)
- Severe cyclonic storm (86-115 kilometers per hour)
- Severe cyclonic storms with core of hurricane winds (equal to or exceeding 116 kilometers per hour).



Once a cyclone is formed, it will continue to move and expand, until it passes over land or over an area where the sea is cooler. Little is known about what makes these storms move and change direction, other than that they are affected by the high altitude winds and

rotation of the earth. So far, scientists have found it difficult to predict the movement of the cyclone, making this hazard one of the most dangerous.

The coastal areas are very much risk prone to cyclones. Maharashtra has a coastal belt of over 720 kilometers between Gujarat to Goa. Thus the Konkan region including Mumbai becomes prone to the risk of 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 storm have been recorded but only 19 systems have affected Maharashtra - Goa coast.

Mumbai is a coastal city which has faced many threats of cyclones in recent times. It has faced peripheral impact in 1982, 1988 and October 1996, and has been hit on two occasions by cyclones (1948 and June, 1996). It indicates that the city is prone to cyclones.

3.4.2 Possible Impacts

- Effects on Individual

- Loss of Life
- Injuries demanding surgical needs
- Family disorganisation.

Specific demands raised or required

- In most cases, orthopaedic surgery, fractures, cuts and bruises need immediate attention.
- Mass immunisation, when necessary, to protect individuals from water-borne diseases.
- Marooned individuals, including those trapped on tree-tops and building terraces (in case of tidal wave) need to be located and rescued, which calls for boats, or at times helicopter services.
- Alternatively, when large sections of community are marooned, instead of evacuation, it may be necessary to organise dispatch of relief supplies to marooned locations. This creates a special need for transport facility.
- Expertise of fire brigade and defence services (Navy, Coast Guards) may be essential in the rescue operations.



- Damage caused

[Cyclones may be accompanied by heavy rains, or at times tidal waves].

- Houses
- Personal belongings
- Livestock
- Crops and plantations
- Forests.

Specific demands raised or required

- Partially damaged houses need technical inspection, to decide the habitation-worthiness and the extent of repairs required.
- Certain partially damaged houses may require demolition.
- As far as possible, reconstruction should take place on the same sites to avoid delays, secure cultural continuity and avoid costly land purchase. In extreme situations, new sites for resettlement may have to be identified when removal of rubble and debris is non-viable.
- Salvaging personal belongings from the debris needs clearance from technical personnel to ensure safety of persons engaged.
- As far as possible, family members only should be permitted to salvage their individual family belongings.
- Damage to infrastructure and disruption in services
 - Buildings
 - Godowns and storages
 - Dams
 - Bridges
 - Road Surface and rail lines
 - Power stations and power lines
 - water tanks
 - Ports and jetties
 - Communication lines
 - Railway signals.



Specific demands raised or required

- Care needs to be taken to ensure that all electrical supplies to damaged area are disconnected promptly by MSEB.
- Overhead lines need thorough inspection before power is restored.
- Breaches or cracks in the dam need Irrigation Department to secure the breaches or grout the cracks.
- In case of damage to bridges, relief operations may require temporary bridges which can be put with the assistance of army.
- Certain roads requiring resurfacing will need immediate action from PWD.
- MWSSB in consultation with health authorities should restore existing water supply with necessary repairs. This may call for replacement of pipelines or arrangements for storage in portable PVC water tanks.
- In some cases, restoration of existing water supply may be time-consuming, therefore, water tankers may have to be pressed into service.

- Identification of nearby water sources and checking the potability of the same may also be required.
- Choking of sewer lines is one of the most ticklish issue. Immediate arrangements for clearing the sewer lines is necessary.
- Piped gas supply should be immediately terminated in the affected area to avoid secondary consequences. If necessary, and feasible gas cylinders should be supplied till the gas line is checked thoroughly and restored.
- Extensive damage to residential buildings resulting in disruption of telecommunication facilities requires provision of public telephones (PCO) to facilitate communication.



- Damage to hospital, school buildings and other public facilities may disrupt the services. In such a case restoration of services through temporary arrangements is the first priority.
- PWD may have to take repairs or reconstruction of such public facilities on a priority basis.
- Disposal of damaged foodgrains is one of the major steps and needs community cooperation.
- Provision for distribution of cooked food or dry rations may have to be made.
- Rains also have implication for storage of food, fuel for cooking (firewood or coal) and fodder for the cattle. Protective structures, therefore, for the storage of all relief material becomes essential. Plastic materials and water-proof containers are required.

• Environmental Effects

- Soil erosion
- Silting
- Water pollution
- Increase in salinity.

Specific demands raised or required

- Silting in residential areas and buildings is one of the major problems requiring extensive community involvement.
- NGOs have demonstrated a tremendous capacity to mobilise community participation in desilting operations for re-occupancy of the residences and also the wells providing drinking water.
- Agriculture department may have to undertake soil-testing and propose appropriate measures for restoration of agriculture land.



• Economic and Social consequences

- Loss of livelihood
- Disruption of market and loss in production

- Disruption of social structure including breakdown of social order and community organisations
- Migration
- Law and order problem
- Psychological after-effects.

Specific demands raised or required

In addition to immediate relief requirements, for effective and early recovery process and checking migration

- Restoration of production units and employment avenues
- Provision of individual counselling and community counselling
- Reconstruction of social structures and organisation of community requires a professional intervention, which can come best, from non-governmental organisations Voluntary agencies will have to be invited or co-opted for relief activities to ensure this aspect.
- For combating depression, engage people in all possible activities related to relief and rehabilitation, through a deliberate strategy of community participation.
- Secondary effects
 - Epidemics
 - Landslides.



Specific demands raised or required

- Rescue and relief teams must be alert to the possibility of outbreak of epidemics and therefore ensure standards of services with respect to storage, cooking, and handling of food materials as also disposal of waste in relief camps, medical centres and feeding centres.
- Water-quality monitoring mechanisms will have to be set-up to prevent outbreak of epidemics.
- Damage to road access due to landslides needs immediate clearing and PWD has to keep itself prepared for such an eventuality.
- Settlements on the hill-slope prone to landslides need to be shifted to safer places.

3.5 Epidemics

3.5.1 Nature and Occurrence

With the view of detecting epidemics at the earliest, an epidemiological cell has been established under the Jt. Director of Health Services (Pune). The following epidemics are monitored in Maharashtra :-

- Cholera
- Gastroenteritis

- Acute diarrhoea / dysentery
- Infective hepatitis
- Encephalitis
- Poliomyelitis
- Typhoid.



In addition to the above, the following outbreaks are also monitored

- Food poisoning
- Viral fever
- Meningitis
- Dengue fever.

In the state of Maharashtra, Public Health Department monitors epidemics through daily epidemic report, weekly health condition report and monthly report. High incidence of water borne diseases, such as gastroenteritis, cholera, dysentery, infective hepatitis, polio etc., has been observed in the state. This is mostly due to high contamination of drinking water which can be due to heavy rains, leakage in the pipeline, unsatisfactory sanitary conditions, improper disinfection of water etc.

The main districts in Maharashtra affected by malaria are Dhule, Jalgaon, Buldhana, Yeotmal. Chandrapur and Gadchiroli, the last being the most severely affected. The Annual Parasite Index (API) for Maharashtra state in 1988 stood at 1.2 and has been fluctuating from 0.7 to 1.4 in the previous years.

3.5.2 Possible Impacts

- Effects on Individual
 - Loss of life
 - Diseases needing epidemiological treatment

Specific demands raised or required

- Mass immunisation, when necessary, to protect individuals.
- In some cases, existing water supply may be contaminated and therefore water tankers may have to be pressed into service.
- Identification of nearby water sources and checking the potability of the same may also be required.
- Rescue and relief teams must be alert to the possibility of spread of epidemics and therefore ensure standards of services with respect to storage, cooking, and handling of food materials as also disposal of waste in relief camps, medical centres and feeding centres.
- Water-quality monitoring mechanisms will have to be set-up to prevent spread of epidemics.



- In case of vector-borne diseases, the exact vector and related control methods will have to be followed.
- Life-saving drugs including saline will be required in large quantities.
- Disposable kits for treatment of affected people and arrangements for proper disposal of these.
- Personal protection kits for medical personnel and volunteers assisting in treatment of patients.
- Arrangements for disposal of personal belongings and other solid waste materials.
- Monitoring arrangements including testing facilities with the help of laboratories and hospitals.
- Economic and social consequences
 - Migration
 - Evacuation
 - Law and order problem
 - Psychological after-effects especially isolation.



Specific demands raised or required

In addition to immediate medical relief requirements for effective and early recovery process and checking migration

- restoration of potable water supply
- provision of
 - quarantine of infected cases at family and hospital level
 - programme of immunisation
 - water quality monitoring
 - pathological testing laboratories
 - individual counselling
 - family counselling.
- Involvement of NGOs in mobilising community efforts for control of epidemics by ensuring standards of environmental sanitation, disposal of waste and personal hygiene.

3.6 Road Accidents

3.6.1 Nature and Occurrence

Roads in India have an annual fatal accident rate of about 2.65 deaths per 1000 registered vehicles with the figure for Maharashtra state being 1.87.

The State of Maharashtra has 72,000 km of national, state and major district roads vs. 376,000 km nationally. There are 107 accident prone spots on national highways serving the State and 50 on Maharashtra state highways. On an average in Maharashtra, 134 road accidents reportedly take place every day, leading to 81 persons being injured and 15 persons losing their lives.

Data on road accidents reportedly indicate that 70% of road accidents arise from driver failure. Apart from this factor, the generic reasons are

- poor road conditions
- mixed traffic
- poor vehicle maintenance
- mechanical failures
- poor driving habits
- lack of safety belts and helmets
- poor emergency services
- absence of pedestrian amenities and



Some of the most risk-prone roads are the ghat roads. Hazardous substance transport also poses a major accident risk. These accidents constitute 0.4-0.6% of the total road accidents that occurred in the state. The four most important highways which have a high traffic density both with respect to transport of passengers and hazardous / non-hazardous goods and which have a high incidence of accidents are :

NH 8 (Mumbai-Ahmedabad), NH 4 (Mumbai-Pune-Bangalore) and NH 3 (Mumbai-Agra), NH-17 (Mumbai-Goa).

3.6.2 Possible Impacts

• Effects on Individuals

- Loss of life
- Trauma care
- Burns
- Injuries demanding surgical treatment
- Poisoning or exposure to toxic material.

Specific demands raised or required

- In most cases, orthopaedic surgery and fractures need immediate attention.
- Individuals trapped in/under the vehicles, need to be rescued, which at times calls for metal cutting devices.
- Expertise of fire brigade and defence services may be essential when the accident involves vehicles carrying hazardous chemicals, toxic materials or explosives.
- Divers may be required, if the accident involves a vehicle falling off a bridge into water.
- The police may require to cordon off the area.
- Chemical accidents may generate a demand for treatment for burns and exposure to

poisonous substances, which may mean a specialised service not generally available along the highways.



- Nature of injuries may demand immediate transfer of injured to centres offering trauma care.

- Loss of life, property and goods may require damage assessment procedures to avoid litigations, delays in gratuitous relief and compensation including insurance.

- Damage caused

- Vehicles

- Goods.

Specific demands raised or required

- Salvaging the goods from the accident site needs clearance from technical personnel to ensure safety of persons engaged.

- Environmental Effects

- Air pollution, if vehicle, carrying hazardous chemicals are involved

- Disruption of services

- Road network

- Traffic.

Specific demands raised or required

- The spills from vehicles carrying hazardous materials may require stoppage of traffic and cleaning of road surface. Various materials are recommended depending on the nature of spill. Also, specialised agencies may have to be called for undertaking spill cleaning operations.

- Diversion of traffic resulting from such accidents may require traffic control, to give information at various entry points also located far away (which need quick identification) from the site of accident, so as to avoid inconvenience to the travellers.

- Special cranes may be required for clearing the accident site.

- Economic and social consequences

- Law and order problem



Specific demands raised or required

- Security and protection of goods and materials in the vehicles involved in the accident. The details of goods need to be officially recorded.
- Secondary Effects
 - Fires
 - Gas leak affecting settlements near the accident site.

Specific demands raised or required

- It may be necessary to inform the settlements around, to take necessary precautionary measures, if the accident involves leakage of toxic gases.
- It may be advisable to send a team of medical personnel from poison centres, to visit the settlements around the accident site, when toxic leak is reported.

3.7 Fires

3.7.1 Nature and Occurrence

Maharashtra is one of the states which does not have a State Fire Service. Presently, all fire stations are under the jurisdiction of the respective municipalities. There are 233 Municipal Councils and 13 Municipal Corporations in Maharashtra state. Of these, fire tenders are maintained in 96 councils and 12 corporations.

Fires could be caused by

- explosions
- chemical reactions
- short circuiting in the electrical system etc.

These occurrences could be due to carelessness, inadequate safety precautions or intentional arson and sabotage. The risk due to fire hazards could vary depending upon the level of preparedness of the emergency services, chiefly, fire and medical services.

The data on the number of fire calls attended by the fire services in the state is published every five years in the form of a Red Book. According to the records published for the period 1987-1991, the number of fire calls attended : 8722 and rescue calls attended : 4836.



A broad definition of the type of locations where potential of fire-hazard exists :-

- storage areas of flammable / explosive material.
- improper practices of storage of cooking fuel such as LPG, kerosene in hotels and restaurants.
- multistoreyed buildings with inadequate fire safety measures
- old buildings with poor internal wiring.

In Mumbai and other cities fire fighters face severe problems due to narrow lanes, congested, overcrowded buildings, old buildings and poor internal wiring.

Since the fire services are under the jurisdiction of respective municipalities, administrative clearance is required for crossing municipal limits.

3.7.2 Possible Impacts

- Effects on Individuals

- Burns
- Injuries demanding surgical treatment
- Loss of life.

Specific demands raised or required

- Serious burn cases may need immediate transport for admission to burn wards in the hospital.
- In many cases, panic behaviour may lead to injuries requiring treatment for orthopaedic surgery and fractures.
- Expertise of fire brigade may be essential in the rescue operations and control of fire particularly when population density is very high.
- In case of separation of family members information counters would play an important role. (This is normally observed in case of fires in large slums)
- In case of family disruption resulting from death of major earner, economic rehabilitation of the family may have to be planned as a long-term strategy.



- Loss of life, property and livestock may require damage assessment procedures to avoid litigations and delays in gratuitous relief and compensation.

- Damage caused

- House
- Personal belongings.

Specific demands raised or required

- Partially damaged houses needs technical inspection, to decide the habitation-worthiness and the extent of repairs required.
- Certain partially damaged houses may require demolition.
- Transit arrangements may have to be identified when the structure needs reconstruction.
- Salvaging personal belongings from the debris needs clearance from technical personnel to ensure safety of persons engaged.

- As far as possible, family members only should be permitted to salvage their individual family belongings.

- Damage to infrastructure and disruption of services

- Buildings
- Overhead lines
- Communication lines.



Specific demands raised or required

- Care needs to be taken to ensure that all electrical supplies to damaged area are disconnected promptly by MSEB officials in the area.
- Underground cables need thorough inspection before power is restored.
- Piped gas supply should be immediately terminated in the affected area to avoid chances of spread.
- Extensive damage to residential buildings resulting in disruption of telecommunication facilities requires provision of public telephones (PCO) to facilitate communication.
- Damage to hospital, school buildings and other public facilities may disrupt the services. In such a case restoration of services through temporary arrangements is the first priority.
- PWD may have to take repairs or reconstruction of such public facilities on a priority basis.
- Some fires may demand traffic control measures including identification of alternate routes and diversion of traffic.
- In congested areas curious onlookers may block movement of rescue and fire workers. The police will need to cordon off the area for smooth operations.
- Economic consequences
 - Loss of livelihood
 - Disruption of market
 - Loss in production.

Specific demands raised or required

In addition to immediate relief requirements for effective and early recovery process,

- Restoration of markets, production units, employment avenues
- Provision of damage assessment.



3.8 Industrial and Chemical Accidents

3.8.1 Nature

The main causes of such accidents are explosions due to electricity, fire works, excessive pressure of steam and air, gas, vapour etc., miscellaneous fires include backfire in boilers. The effects from industrial accidents and hazards such as fire or natural disasters, often lead to loss of human life, property and financial damage and considerable environmental pollution.

3.8.2 Possible Impacts

- Effects on Individual

- Loss of life
- Burns
- Injuries demanding surgical treatment
- Exposure to toxic material.

Specific demands raised or required

- In most cases, orthopaedic surgery and fractures need immediate attention.
- Expertise of fire brigade, mutual aid and response groups (MARG), may be essential.
- The police may require to cordon off the area.
- Chemical accidents may demand treatment for burns and exposure to poisonous substances, which may need a specialised service not generally available with medical practitioners.
- Nature of injuries may require immediate transfer of injured to poison centres.
- Loss of life, property and goods may require damage assessment procedures, to avoid litigations, delays in gratuitous relief and compensation including insurance.
- Areas indicating spread of toxic gases should be declared out of bounds and strict vigil should be kept by police to prohibit trespassing.
- When alteration in wind direction covers a settlement, there is a need for immediate evacuation and relief till an all-clear signal is given.



- Environmental Effects

- water pollution
- air pollution
- effect on vegetation.

Specific demands raised or required

- On a long-term basis monitoring of air, water and soil quality will have to be carried out.
- Disruption of services

- Road network
 - Electricity
 - Water supply
- Economic and social consequences
 - Loss of livelihood
 - Disruption of market
 - Damage to food stocks
 - Loss in production
 - Migration
 - Law and order problem
 - Social and psychological effects.

Specific demands raised or required

In addition to immediate relief requirements for effective and early recovery process and checking migration

- Restoration of production units, employment avenues
- Provision of individual counselling and community counselling
- For combating depression, engage people in all possible activities related to relief and rehabilitation through a deliberate strategy of community participation.



4. DISSEMINATION OF STATE DMAP

For the state DMAP to be effective it must be disseminated at three levels ;

- Central government departments, multilateral agencies (aid agencies), defence services, state level officials
- To the district authorities, government departments, NGOs and other agencies and institutions within the state and
- Through mass media to the general public.

The content of the plan should be explained through well designed and focussed awareness programmes.

The responsibility for dissemination of the plan should be vested with Relief Commissioner, at Mantralaya and carried out by YASHADA, as well as through awareness programmes organised by each of the agencies participating in disaster management. The Relief Commissioner should also involve state-level NGOs in preparing suitable public awareness material to be distributed to the public.

The awareness programmes should be prepared in the local language to ensure widespread dissemination. Media should be extensively used for public awareness programmes. These will include

- Newspapers
- TV

- Local cable networks
- Radio
- Publicity material.



Schools, colleges and other public institutions should be specifically targetted.

In addition to dissemination of literature related to the state DMAP, Relief Commissioner should ensure that disaster response drills are conducted by the district authorities and other agencies on a regular basis, especially in the disaster prone areas to maintain the readiness of communities and departments, as regards operational procedures, personnel and equipment and orderly response. Examples include tests of outdoor warning systems and the Emergency Broadcast System.

4.1 Plan Evaluation

The purpose of evaluation of the state DMAP is to determine

- The adequacy of resources
- Coordination between various agencies
- Community participation
- Partnership with NGOs.

The ease of understanding and using the plan will also be important considerations.

The plan will be updated when shortcomings are observed in

- Organizational structures
- Technological changes render information obsolete
- Response mechanisms during drills or exercises
- Assignments of state agencies.

Adaptation, improvisation and optimisation are corner stones of any planning pertaining to disasters. It must be emphasized that the documents or manuals prepared as disaster management plans have limited purpose. These can at best serve as reminder of tasks and activities.

Individuals and agencies assigned specific responsibilities within this plan will prepare appropriate supporting plans and related standard operating procedures, and periodically review and update alerting procedures and resource listings, and also maintain an acceptable level of preparedness.

4.1.1 Post-Disaster Evaluation

A post-incident evaluation should be done after the completion of relief and rehabilitation activities in order to assess

- the nature of state intervention and support
- adequacy of the organizational structure

- institutional arrangements
- adequacy of operating procedures
- monitoring mechanisms
- information tools
- equipment
- communication system, etc.



The impact of above operations for long-term preventive and mitigation efforts are to be undertaken.

At the community level, evaluation exercises may be undertaken to assess the reactions of the community members at various stages in the disaster management cycle, and to understand their perceptions about disaster response in terms of

- adequacy of training
- alert and warning systems
- control room functions
- communication plans
- security
- containment
- recovery procedures
- monitoring.

4.2 Plan Update

The state DMAP is a “living document” and the Relief Commissioner along with YASHADA will update it every year taking into consideration

- the resource requirements
- updates on human resources
- technology to be used
- coordination issues.

An annual conference for DMAP update will be organised by Relief Commissioner. All concerned departments and agencies would participate and give recommendations on specific issues.

The following guidelines should be adhered to while updating the state DMAP :

- A procedure should be in place to update the plan on a regular basis, to ensure that the items requiring updation are considered and are current.
- When an amendment is made to a plan, the amendment date should be noted on the updated page of the plan.
- A senior official in every agency should be designated, to ensure that all plan-holders are notified of changes as soon as possible. Plan-holders should be requested to verify that they have received the changes.

5. OPERATING PROCEDURE GUIDELINES AND STANDARDS

“Operating Procedure Guidelines and Standards for Monitoring” given in a separate document include procedures for warning, operating procedures for evacuation, comprehensive operating procedures for the departments as well as standards of services and specifications for relief camps, cattle camps, and feeding centres.



5.1 Operating Procedures for Warning

A warning system is essential to indicate the onset of a disaster. This may range from alarms (e.g., for fires) and sirens (e.g., for industrial accidents) to public announcements through radio, television etc. (e.g., for cyclones, floods) and other traditional modes of communication (eg. beating of drums, ringing of bells, hoisting of flags).

In most disaster situations, experience has shown that a loss of life and property could be significantly reduced by preparedness measures and appropriate warning systems. The importance of warning systems, therefore, hardly needs any emphasis. However, the opportunity for warning does not exist in all cases. Indiscriminate warnings may result in non-responsiveness of the people. It is, therefore, necessary that with respect to every disaster, a responsible officer is designated to issue the warnings.

The district administration is the prime agency responsible for issuing disaster warnings. Additional technical agencies authorised to issue warnings have been listed.

5.1.1 Important Elements of Warning

- Communities in disaster prone areas are made aware of the warning systems.
- Alternate warning systems must be kept in readiness in case of technical failures (eg, power failure).
- All available warning systems should be used.
- The warnings should, to the extent possible be clear about the severity, the duration and the areas that may be affected.
- Warnings should be conveyed in a simple, direct and non-technical language to incorporate day-to-day usage patterns.
- The do's and don'ts should be clearly communicated to the community to ensure appropriate responses.
- Warning statements should not evoke curiosity or panic behaviour. This should be in a professional language devoid of emotions.
- Spread of rumours should be controlled.
- All relevant agencies and organisations should be alerted.

- Wherever possible, assistance of community leaders and organised groups should be sought in explaining the threat.
- Once a warning is issued, it should be followed-up by subsequent warnings in order to keep the people informed of the latest situations.
- In the event of a disaster threat passing, an all clear signal must be given.

5.2 Operating Procedures for Evacuation

Disasters by their very nature will be different and may require evacuation of communities. It is important to understand the nature of threat and the procedures to be adopted. All agencies involved in evacuation must have a common understanding of their roles and responsibilities in order to avoid confusion and panic behaviour.

Different situations demand different priorities and hence the responsibility for ordering evacuation is assigned to different agencies.

All evacuations will be ordered only by the Collector, Police, Fire Brigade or by the Industries Security Officer. For appropriate security and law and order evacuation should be undertaken with assistance from community leaders. All evacuations should be reported to Collector or District Superintendent of Police immediately.

The following steps should be taken for evacuation :

- Shelter sites should be within one hour's walk or 3 miles (5 km) of dwellings.
- The evacuation routes should be away from the coast or flood-prone areas.
- Evacuation routes should not include roads likely to be submerged in floods, but may include pathways.
- Ensure proper evacuation by seeking community participation.
- Families should be encouraged to take along water, food, clothing and emergency supplies to last at least three days.
- People should listen to a battery-powered radio and follow local instructions.
- If the danger is a chemical release, then people should be instructed to evacuate immediately.

In case of marooned persons, evacuation must be carried out as soon as possible and the persons transferred to transit camps. If evacuation is not possible within 3 hours of the disaster, marooned people must be provided with water, medicines, first-aid and cooked food. Emergency transport for the seriously injured can be arranged through speed boats or helicopters. A senior medical officer should accompany the rescue team along with required medical kits and ensure priority shifting of those seriously injured or requiring immediate medical attention.



5.3 Operating Procedures for Departments

Operating procedures for different departments include the Preamble, Planning Assumptions, Normal Time Activity, Action Plan Objective in a Disaster Situation, Activities

on Receipt of Warning or Activation of District DMAP (DDMAP), Evacuation, Relief and Rehabilitation – Field Office Priorities and Head Office Priorities. These Operating Procedures are given for the following departments : MSEB, Police, Public Health Department, Irrigation Department, Agriculture Department, Animal Husbandry, MWSSB, Public Works Department, DOT, Railways and AAI.

6. INFORMATION AND MONITORING TOOLS

The institutional framework and the response structure would not be effective unless it is operationalised through information tools and monitoring mechanisms. Such tools define the direction and content of information as also the source. The flow of information calls for accountability and the source provides the authenticity. The Information and Monitoring Tools are given in a different document.

In this context, this section presents information and monitoring tools for agencies during preparedness, alert or warning, activation of plan, damage assessment and relief and recovery stages. The tools are evolved keeping in view the requirements of an effective administrative response, efficiency in decision making, evaluation and assessment of on-going disaster stages and requirements of future preparedness. These tools are also expected to help administration in identification and reaching out to the most vulnerable and devastated groups.

WORKING GROUP ON MAHARASHTRA DISASTER MANAGEMENT ACTION PLAN

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Project Leader, Advisor and Chairman, Committee on Earthquakes	:	Shri Johny Joseph, Secretary and Special Commissioner, Earthquake Rehabilitation, GOM, Mantralaya, Mumbai
Chairman, Committee on Floods and Cyclones	:	Shri R.C. Iyer, Secretary, Agriculture, GOM, Mantralaya, Mumbai
Chairman, Committee on Industrial and Chemical Accidents	:	Shri Vinay Bansal, Secretary, Industry, GOM, Mantralaya, Mumbai
Chairman, Committee on Epidemics	:	Shri R. Tiwari, Secretary, Health, GOM, Mantralaya, Mumbai

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1. OPERATING PROCEDURE GUIDELINES AND STANDARDS

This part on “Operating Procedure Guidelines and Standards for Monitoring” includes :

- Procedures for warning
- Operating Procedures for evacuation
- Comprehensive Operating Procedure Guidelines for the Departments
- . relief and recovery
- . the standards of services
- Checklists for monitoring.
- Monitoring relief and rehabilitation
- . standard arrangements for transit camps
- . relief camps
- . cattle camps
- . feeding centres
- . standards of service.



2. OPERATING PROCEDURE GUIDELINES FOR WARNING

Definition: Alert/ warning indicates the onset of a disaster for which a warning system is essential. This system may range from alarms (e.g., for fires), sirens (e.g., for industrial accidents) to public announcements through radio, television etc. (e.g., for cyclones, floods) and other traditional modes of communication (e.g. beating of drums, ringing of bells, hoisting of flags).

[In most disaster situations, experience has shown that loss of life and property could be significantly reduced due to preparedness measures and appropriate warning systems. The importance of warning systems therefore hardly needs any emphasis. However, not in all cases, the opportunity for warning exists. Indiscriminate warnings may result in non-responsiveness of the people. It is therefore necessary that with respect to every disaster a responsible officer is designated to issue the warnings].

2.1 Agencies authorised to issue warning

The district administration is the prime agency responsible for issuing the disaster warning.

Additionally the technical agencies authorised to issue warning are mentioned below.

Disaster	Agencies
Earthquakes	IMD, MERI, NGRI, GSI
Floods	IMD, Irrigation Department
Cyclones	IMD
Epidemics	Public Health Department
Road Accidents	Police
Industrial and Chemical Accidents	Industry, MARG, Police, BARC
Fires	Fire Brigade, Police

2.2 Important Elements of Warning

The following aspects may be considered for dissemination of warning :

- All warning systems and technologies are maintained in working condition and checked regularly
- Communities in disaster prone areas are made aware of the warning systems.
- Alternate warning systems must be kept in readiness in case of technical failure (e.g., power failure)
- Only the designated agencies/officers will issue the warning.
- All available warning systems should be used

[each warning system has a limited reach and multiple warning systems will help in reinforcement]

- The warning should, to the extent possible, be clear about the severity, the time frame, area that may be affected.
- Warning statements should be conveyed in a simple, direct and non-technical language, and incorporate day-to-day usage patterns.
- The do's and don'ts should be clearly communicated to the community to ensure appropriate responses.
- Warning statements should not evoke curiosity or panic behaviour. This should be in a professional language devoid of emotions.
- Rumour control mechanisms should be activated.
- All relevant agencies and organisations should be alerted.

- Wherever possible, assistance of community leaders and organised groups should be sought in explaining the threat.
- Once a warning is issued, it should be followed-up by subsequent warnings in order to keep the people informed of the latest situations.
- In the event of the disaster threat tiding away, an all clear signal must be given.



3. OPERATING PROCEDURES FOR EVACUATION

It is important to understand the nature of threat and the procedures to be adopted

All agencies involved in evacuation must have a common understanding of their roles and responsibilities in order to avoid confusion and panic behaviour.

Different situations demand different priorities and hence the responsibility for ordering evacuation is assigned to different agencies.

All evacuations will be ordered only by the Collector, Police, Fire Brigade or by the Industries Security Officer.

For appropriate security and law and order evacuation should be undertaken with assistance from community leaders.

All evacuations should be reported to Collector or District Superintendent of Police immediately.

3.1 Factors to be considered for Evacuation

3.1.1 Planning Assumptions

- Amount of time needed for evacuation will depend on the disaster.
- If the event can be monitored, like a cyclone, the GOM could have a day or two to get ready.
- In other disasters, it is mostly emergency evacuation of people .

3.1.2 Factors

- Shelter sites should be within one hour's walk and three miles (5 km) of dwellings.
- The evacuation routes should be away from the coast or flood-prone areas.
- Evacuation routes should not include roads likely to be submerged in flood, but may include pathways.
- Ensure proper evacuation by seeking community participation along the following lines:

.; Evacuation should be undertaken with assistance from community leaders and community based organisations (CBOs) for appropriate security and law and order

.; Care should be taken to see that evacuation routes are not blocked.

.; It is always preferable to encourage the entire family to evacuate together as a unit.

.; In case of inadequate transport or limited time, encourage community for emergency evacuation in the following order :

- " seriously injured and sick
- " children, women and handicapped
- " Old
- " Able-bodied.

[An evacuation plan on a priority basis helps avoid stampede and confusion.]



3.2 Emergency Evacuations

. Families should be encouraged to take along adequate supplies of water, food, clothing and emergency supplies.

. The families should be encouraged to assemble the following disaster supplies kit.

- . Adequate supply of water in closed unbreakable containers
- . Adequate supply of non-perishable packaged food and dry rations
- . A change of clothing and rain gear
- . Blankets and bedsheets, towels
- . Buckets, plates, glasses, mugs made of plastic
- . Soap, toothbrushes, toothpaste
- . A battery-powered radio, torch, lantern, matches
- . Cash and jewellery
- . Personal medicines
- . A list of important family documents including ration card, passport, bank passbook address/telephone book (of relatives), certificates, driving licence, property documents, insurance documents etc.

.; Special items including foods, for infants, elderly or disabled family members.

. Encourage people to keep fuel in their cars as petrol pumps may be closed during emergencies.

. Ask people to shut off electricity, gas and water at main switches and valves before leaving.

. Ask people to listen to a battery-powered radio and follow local instructions.

. If the danger is a chemical release, then people should be instructed to evacuate immediately.

. In other cases, advise people to follow these steps:



.Wear protective clothing

- . Secure their homes. Close and lock doors and windows.
- . Turn off the main water valve and electricity
- . Leave early enough to avoid being trapped.
- . Follow recommended evacuation routes. Shortcuts may be blocked.
- . Not to move or drive into flooded areas.
- . Stay away from downed power lines.
- . Animals may not be allowed in public shelters.
- . Community should set the livestock free
- . If possible, the community may be advised to carry the livestock along [if the evacuation does not involve transportation by vehicles].

3.3 Evacuation of Marooned Persons

In the case of marooned persons, if necessary

- . evacuation must be carried out within the shortest possible time
- . the marooned persons must be transferred to transit camps.
- . Within the shortest possible time (3 hours of the disaster), marooned people must be provided with
 - . water
 - . medicines
 - . first-aid
 - . cooked food.

[This can continue for 48 hours after the disaster].

- . Emergency transport for the seriously injured by
 - . speed boats
 - . A senior medical officer should accompany the rescue team along with required medical kit and ensure priority for shifting of those seriously injured or requiring immediate medical attention.
 - . Water supplied must be in accordance with acceptable standards of potable water. It is the responsibility of medical officer to check the water quality..
 - . The procedures for tagging as given in the standards should be followed.
[Tagging is a process of prioritising transfer of injured based on first hand assessment of chance of survival by the medical officer on the disaster site. The identification of patients is done by attaching a tag to each patient, usually color coded to indicate a given degree of injury and the priority for evacuation].
 - . For food supplies, the standards as given in the “Standards for Food” should be followed.

4. OPERATING PROCEDURE GUIDELINES AND STANDARDS FOR DEPARTMENTS

4.1 Planning Assumptions

The standards of services have been adopted from internationally accepted norms and have been at times modified to suit local conditions. Although it is difficult to maintain efficient service standards in a disaster, which presents a fluid and confused situation, all efforts should be made to reach as close to these norms as possible. Some of the standards make a lasting impact on the communities whereas others have an immediate impact in the field situation, e.g., lack of adequate space per person in relief camps can lead to mental health issues and the absence of adequate sanitation facilities can lead to epidemics.

The operating procedures developed for each department refer to standards of services to be delivered and the appropriate checklists for field monitoring. Hence, the standards and checklists go hand in hand with the operating procedures for every department.

These departments include MSEB, police, public health, irrigation, agriculture, animal husbandry, MWSSB, PWD, MTNL, railways, and airport authority.

5. OPERATING PROCEDURE GUIDELINES FOR POLICE

5.1 Planning Assumptions

- For effective preparedness, the police department must have a disaster response plan or disaster response procedures clearly defined, in order to avoid confusion, improve efficiency in cost and time.
- Operating procedures for mobilising community participation during various stages of disaster management have been given in section on “Areas of Community Participation”. The department is required to study these and adopt appropriate measures to ensure that community participates substantially.
- Orientation and training for disaster response plan and procedures accompanied by simulated exercises will keep the department prepared for such eventualities. Special skills required during emergency operations need to be imparted to the officials and the staff. Select personnel can be deputed for training as “NODAL OFFICER - Police” and “Officer-in-charge - Police” at the state and district level respectively.
- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be undertaken to improve departmental capacity to respond to a disaster.

5.2 Normal Time Activity

- Assess preparedness level and report the same as per the format to District Control Room every six months
- Maintain a list of disaster prone areas in the district
- Organise training on hazardous chemicals for police officers to facilitate handling of road accidents involving hazardous materials
- Designate an area, within police station to be used as public information centre

Action Plan Objective in a Disaster Situation

- Maintain Law and Order



5.3 Activities On Receipt of Warning or Activation of District DMAP (DMAP)

- Within the affected district/taluka, all available personnel will be made available to the District Disaster Manager. If more personnel are required, then out of station officers or those on leave may be recalled.
- All personnel required for disaster management should work under the overall supervision and guidance of District Disaster Manager/District Magistrate.
- Establish radio communications (and assist in precautionary evacuation activities) with
 - Emergency operations centre
 - Divisional commissioner
 - district control room and
 - departmental offices within the division.
- All district level officials of the department would be asked to report to the Collector.
- Appoint one officer as “NODAL OFFICER - Police” at the state level
- Appoint one officer as “Officer-in-Charge - Police” at the district level
- The District Collector to provide “Officer-in-Charge - Police” or the field staff as the need be, with all needed authorisations with respect to
 - Recruiting casual labourers.
 - Procuring locally needed emergency tools and equipment and needed materials.
 - Expending funds for emergency needs.
- The “Officer-in-Charge - Police” will ensure that all field staff and other officers submit the necessary reports and statement of expenditure in a format as required by District Collector
- Review and update precautionary measures and procedures and review with staff the precautions that have been taken to protect equipment and the post-disaster procedures to be followed.
- Fill department vehicles with fuel and park them in a protected area.
- Provide guards as needed for supply depots such as cooperative food stores and distribution centres.
- Provide convoys for relief materials.
- Identify anti-social elements and take necessary precautionary measures for confidence building.

5.3.1 Evacuation

All evacuations will be ordered only by the Collector, Police, Fire Brigade or by the Industries Security Officer.

For appropriate security and law and order evacuation should be undertaken with assistance from community leaders.

All evacuations should be reported to Collector or District Superintendent of Police immediately.

For evacuation follow the evacuation procedures as outlines in operating procedures for evacuation.

5.3.2 Relief and Rehabilitation

- Immediately after the disaster, dispatch officers to systematically identify and assist people and communities in life-threatening situations.
- Help identify the seriously injured people, and assist the community in organising emergency transport of seriously injured to medical treatment centres.
- Ensure that the police stations are functioning immediately after the disaster at all required locations, as may be requested by the district control room, and that staff are available for the variety of needs that will be presented.
- Assist and encourage the community in road-clearing operations.
- Identify roads to be made one-way, to be blocked, alternate routes, overall traffic management and patrolling on all highways, and other access roads to disaster site.
- Provide security in transit and relief camps, affected villages, hospitals and medical centres and identify areas to be cordoned off.
- Transport carrying transit passengers (that is, passengers traveling through trains or buses and passing through the district), should be diverted away from the disaster area.
- Provide security arrangements for visiting VVIPs and VIPs.
- Assist district authorities to take necessary action against hoarders, black marketers and those found manipulating relief material.
- In conjunction with other government offices, activate a public information centre to:
 - . respond to personal inquiries about the safety of relatives in the affected areas
 - . compile statistics about affected communities, deaths, complaints and needs
 - . respond to the many specific needs that will be presented
 - . serve as a rumor control centre
 - . Reassure the public.
- Make officers available to inquire into and record deaths, as there is not likely to be time nor personnel available, to carry out standard postmortem procedures.
- Monitor the needs and welfare of people sheltered in relief camps.
- Coordinate with military service personnel in the area.



The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Relief Commissioner. The Relief Commissioner will book this expenditure under Budget Head '2245' and reimburse the amount to police.

5.3.3 Preparedness Checklist for Police

(to be filled in by the Department Head and submitted to the District Collector before May every year.)

Preparedness measures taken	Details/Remarks
The department is familiar with disaster response plan and disaster response procedures are clearly defined.	
Orientation and training for disaster response plan and procedures undertaken.	
Special skills required during emergency operations imparted to the officials and the staff.	
Reviewed and updated Precautionary measures and procedures the precautions to be taken to protect equipment the post-disaster procedures to be followed.	
Adequate warning mechanisms established for evacuation.	
A officer has been designated as Nodal Officer for disaster management.	
Sources of materials required for response operations have been identified.	

Reported By :
Designation
Signature
Date

5.3.4 Checklist for Police

(to be filled in by "Officer-in-Charge" and submitted to district control room and the department head.)



Action Taken	Y/N	Details/Remarks
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Radio communications established with Emergency operations centre Divisional commissioner District control room Other police headquarters within the division.		
An officer appointed as "OFFICER-IN-CHARGE - Police"		
Police stations are functioning immediately after the disaster at all required locations as requested by the district control room.		
Anti-social elements identified Precautionary measures for confidence building taken.		
Community assisted in organising emergency transport of seriously injured to medical treatment centres.		
Community assisted in road-clearing operations.		
Overall traffic management and patrolling on all highways and other access roads to disaster site being carried out.		
The following roads have been identified To be made one-way To be blocked Alternative routes.		
Transport carrying transit passengers (that is, passengers travelling through trains or buses and passing through the district), are diverted away from the disaster area.		
Security being provided in Transit camps Feeding centres Relief camps		

Cattle camps		
Affected areas		
Hospitals and medical centres.		
Areas to be cordoned off identified.		
Guards provided for supply depots such as cooperative food stores and distribution centres.		
Security arrangements provided for visiting VVIPs and VIPs.		
District authorities assisted for taking necessary action against hoarders, black marketers and those found manipulating relief material.		
A public information centre activated.		
Officers made available to inquire into and record of deaths.		
Coordination with military service personnel in the area being carried out.		

Inspected By :

Designation:

Signature :

Date:



6. OPERATING PROCEDURE GUIDELINES FOR PUBLIC HEALTH DEPARTMENT

6.1 Planning Assumptions

- There is no substitute for maintaining standards of services and regular maintenance during normal times. This affects the response of the department to any disaster situation.
- Operating procedures for mobilising community participation during various stages of disaster management have been given in section on “Areas of Community Participation”. The department is required to study these and adopt appropriate measures to ensure that community participates substantially.
- For effective preparedness, the department must have a disaster response plan or disaster response procedures clearly defined in order to avoid confusion, improve efficiency in cost and time.
- Ensure that every hospital follows “The Guide to Health Management in Disasters”. The plan should be specifically developed for the facilities, equipment and staff of that particular hospital.

- Orientation and training for disaster response plan and procedures, accompanied by simulated exercises, will keep the department prepared for such eventualities. Special skills required during disaster situations need to be imparted to the officials and the staff. Coordinate training for treatment of people affected due to hazardous spills. Select personnel can be deputed for training as “NODAL OFFICER - Health Services” and “Officer-in-charge - Health Services” at the state and district level respectively.

- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be undertaken to improve departmental capacity to respond to a disaster.

- Ensure that standby generator exists for every hospital.

- Insure that least one kerosene-powered refrigeration unit exists for vaccines.

Action Plan Objective in a Disaster Situation

- Providing efficient and quick treatment

- Preventing outbreak of epidemics.

6.2 Normal Time Activity

- Assess preparedness level and report the same as per the format to district control room every six months.

- Ensure that hospital staff are aware of which hospital rooms/ buildings are damage- proof.

- In the case of hospitals located in proximity to industrial areas obtain chemical data sheets from various industries.

6.3 Activities on Receipt of Warning or Activation of District DMAP (DDMAP)

- Within the affected district/taluka, all available personnel will be made available to the District Disaster Manager. If more personnel are required, then out of station officers or those on leave may be recalled.

- All personnel required for disaster management should work under the overall supervision and guidance of District Disaster Manager.

- Establish radio communications with emergency operations centre, divisional commissioner, district control room and hospitals (including private) within the division.

- Ensure thatl personnel working within the district come under the direction and control of the collector/civil Surgeon.

- Appoint one person as “NODAL-OFFICER – Health Services” at the state level.

- The civil surgeon will act as “Officer-in-Charge - Health Services” at the district level.

- All district level officials of the department would be asked to report to the Collector.

- The district collector to provide “Officer-in-Charge - Health Services” or the field staff as the

need be, with all relevant authorisations with respect to

- .; Recruiting casual labourers.
- .; Procuring locally require emergency tools, equipments and materials.
- .; Expending funds for emergency needs.

- The “Officer-in-Charge -Health Services” will ensure that all field staff and other officers submit the necessary reports and statement of expenditure in a format as required by the collector.

- Review and update precautionary measures and procedures, and review with staff, the precautions that have been taken to protect equipment and the post-disaster procedures to be followed.

- Fill department vehicles with fuel and park them in a protected area.

- Stock emergency medical equipment which may be required after a disaster.

- Determine type of injuries/ illnesses expected and drugs and other medical items required, and accordingly ensure that extra supplies of medical items be obtained quickly.

- Provide information to all hospital staff about the disasters, likely damages and effects, and information about ways to protect life, equipment and property.

- Discharge all ambulatory patients whose release does not pose a health risk to them. If possible, they should be transported to their home areas.

- Non-ambulatory patients should be relocated to the safest areas within the hospital. The safest rooms are likely to be:

- . On ground floor
- . Rooms in the centre of the building away from windows
- . Rooms with concrete ceilings.

- Equipment supplies such as candles, matches, lanterns and extra clothing should be provided for the comfort of the patients.

- Surgical packs should be assembled and sterilised.

- A large enough number should be sterilised to last four to five days.

- The sterilised surgical packs must be stored in protective cabinets to ensure that they do not get wet. Covering the stock with polythene is recommended as an added safety measure.

- All valuable instruments, such as surgical tools, ophthalmoscopes, portable sterilisers, CGS, dental equipments, etc., should be packed in protective coverings and stored rooms considered to be the most damage-proof.

- Protect all immovable equipment, such as x-ray machines, by covering them with tarpaulins or polythene.

- All electrical equipments should be unplugged when disaster warning is received.

- Check the emergency electrical generator to ensure that it is operational and that a buffer stock of fuel exists. If an emergency generator is not available at the hospital, arrange for one on loan.

- All fracture equipment should be readied.

- If surgery is to be performed following the disaster, arrange for emergency supplies of anesthetic gases (usually supplied on a daily basis).

- Check stocks of equipments and drugs which are likely to be most needed after the disaster. These can be categorised generally as:

- Drugs used in treatment of cuts and fractures, such as tetanus toxoid, analgesics and antibiotics .

- Drugs used for the treatment of diarrhoea, water-borne diseases and flu (including oral rehydrating supplies).

- Drugs required to treat burns and fight infections.

- Drugs needed for detoxication including breathing equipments.

- Assess the level of medical supplies in stock, including:

- Fissure materials

- Surgical dressings

- Splints

- Plaster rolls

- Disposable needles and syringes

- Local antiseptics.

- Request central warehouse immediate despatch of supplies likely to be needed, to hospitals, on an emergency priority basis.

- Fill hospital water storage tanks and encourage water savings. If no storage tanks exist, water for drinking should be drawn in clean containers and protected.

- Prepare an area of the hospital for receiving large number of casualties.

- Develop emergency admission procedures (with adequate record keeping) .

- Orient field staff with DDMAP, standards of services, procedures including tagging.



- Hospital administrators should

- Establish work schedules to ensure that adequate staff are available for in-patient needs.

- Organise in-house emergency medical teams to ensure that adequate staff are available at all times to handle emergency casualties.

- Set up teams of doctors, nurses and dressers for visiting disaster sites.

6.3.1 Evacuation

All evacuations will be ordered only by the Collector, Police, Fire Brigade, Health Department or by the Industries Security Officer.

For appropriate security and law and order evacuation should be undertaken with assistance from community leaders.

All evacuations should be reported to Collector or District Superintendent of Police immediately.

For evacuation follow the evacuation procedures as outlined in “Operating Procedures for Evacuation” and “Areas for Community Participation - Evacuation”

For Marooned Persons

A senior medical officer will ensure that water supplied is in accordance with acceptable standards of potable water and is packed under appropriate conditions and containers.

A senior medical officer should accompany the rescue team along with required medical kit and ensure priority for shifting of those seriously injured or requiring immediate medical attention (the procedure for tagging as given in the Annexure should be followed).

6.3.2 Relief and Rehabilitation

Field Office Priorities

- Transport should be arranged for the transfer of seriously injured patients from villages and peripheral hospitals to general hospitals. If roads are blocked, a method should be established to request helicopter transport.

- Establish health facility and treatment centres at disaster sites.

- The provision of medical services should be coordinated by the district civil surgeon with district control room and SOC.

- Procedures should be clarified between

- Peripheral hospitals

- Private hospitals

- Blood banks

- General hospitals and

- Health services established at transit camps, relief camps and affected villages.

- Maintain checkposts and surveillance at each railway junction, ST depots and all entry and exit points from the affected area, especially during the threat or existence of an epidemic.



- An injury and disease monitoring system should be developed to ensure that a full picture of health risks is maintained. Monitoring should be carried out for epidemics, water and food quality and disposal of waste in transit and relief camps, feeding centres and affected villages.

- Plan for emergency accommodations for auxiliary staff from outside the area.

- Information formats and monitoring checklists should be used for programme monitoring and development and for reporting to Emergency Operations Centre. This is in addition to existing reporting system in the department.

- Seek security arrangements from district police authorities to keep curious persons from entering hospital area and to protect staff from hostile actions.
- Establishment of a public information center with a means of communication to assist in providing an organized source of information. The hospital is responsible for keeping the community informed of its potential and limitations in disaster situations.
- The local police, rescue groups, and ambulance teams should be aware of the resources of each hospital.

Head Office Priorities

On the recommendations of the EOC ("NODAL OFFICER-Health Services")/ collector/ district control room/ the Public Health Department will

- Send required medicines, vaccines, drugs, plasters, syringes, etc.
- Arrange for additional blood supply.
- Provide for sending additional medical personnel equipped with food, bedding, tents.
- Send vehicles and any additional medical equipments.

The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Relief Commissioner. The Relief Commissioner will book this expenditure under Budget Head '2245' and reimburse the amount to Public Health Department.

6.4 Standards of Service

6.4.1 Tagging

Tagging is a process of prioritising transfer of injured, based on first hand assessment of the medical officer on the disaster site. It is based on the medical criterion of chance of survival . Decision is made regarding cases which can wait for treatment, these which should be taken to more appropriate medical units, and these which have no chances of surviving. The grouping is based on the benefit that the casualties can expect to derive from medical care, not on the seriousness of the injuries.

Whenever possible, the identification of patients should be accomplished concurrently with triage. This is done by attaching a tag to each patient, usually color-coded to indicate a given degree of injury and the priority for evacuation.

· Red Tag

This tag signifies that the patient has a first priority for evacuation. Red-tagged patients need immediate care and fall into one of the following categories:

- 1) Breathing problems that cannot be treated at the site.
- 2) Cardiac arrest (witnessed).

- 3) Appreciable loss of blood (more than a liter).
- 4) Loss of consciousness.
- 5) Thoracic perforations or deep abdominal injuries.
- 6) Certain serious fractures:
 - a) Pelvis
 - b) Thorax
 - c) Fractures of cervical vertebrae
 - d) Fractures or dislocations in which no pulse can be detected below the site of the fracture or dislocation
 - e) Severe concussion
 - f) Burns (complicated by injury to the air passages).



· Green Tag

Identifies these patients who receive second priority for evacuation. Such patients need care, but the injuries are not life-threatening. They fall into the following categories:

- 1 Second-degree burns covering more than 30 per cent of the body.
- 2 Third-degree burns covering 10 per cent of the body.
- 3 Burns complicated by major lesions to soft tissue or minor fractures.
- 4 Third-degree burns involving such critical areas as hands, feet, or face but with no breathing problems present.
- 5 Moderate loss of blood (500-1,000 cc)
- 6 Dorsal lesions, with or without injury to the spinal column.
- 7 Conscious patients with significant craniocerebral damage (serious enough to cause a subdural hematoma or mental confusion). Such patients will show one of the following signs:
 - a) Secretion of spinal fluid through ear or nose
 - b) Rapid increase in systolic pressure
 - c) Projectile vomiting
 - d) Changes in respiratory frequency
 - e) Pulse below 60 ppm
 - f) Swelling or bruising beneath the eyes
 - g) Anisocoric pupils
 - h) Collapse
 - i) Weak or no motor response
 - j) Weak reaction to sensory stimulation (profound stupor).

· Yellow Tag

Used on patients who are given third priority for evacuation and who fall into the following categories:

Minor Lesions

- 1) Minor fractures (fingers, teeth, etc.).
- 2) Other minor lesions, abrasions, contusions.
- 3) Minor burns:
 - a) Second-degree burns covering less than 15 per cent of the body
 - b) Third-degree burns covering less than 2 per cent of the body surface
 - c) First-degree burns covering less than 20 per cent of the body, excluding hands, feet, and face.

Fatal Injuries

1. Second and third-degree with burns over more than 40 per cent of the body, with death seeming reasonably certain.
2. Second- and third-degree burns over more than 40 per cent of the body, with other major lesions, as well as major fractures, major craniocerebral lesions, thoracic lesions, etc.
3. Cranial lesions with brain tissue exposed and the patient unconscious.
4. Craniocerebral lesions where the patient is unconscious and has major fractures.
5. Lesions of the spinal column with absence of sensitivity and movement.
6. Patient over 60 years old with major lesions.

[It should be noted that the line separating these patients from red-tag casualties is very tenuous. If there are any red-tag patients, this system will have to be followed. If there are none, the yellow-tag patients with apparently fatal injuries become red-tag candidates. The reason is simple: if there are many red-tag patients with a chance to survive and there are yellow-tag patients who apparently cannot be saved because of their injuries, the time spent on the dying wounded could be better spent on the patients with a chance to survive].



· Black Tag

Black tags are placed on the dead, i.e., casualties without a pulse or respiration who have remained in that condition for over 20 minutes, or whose injuries render resuscitation procedures impossible.

Evacuation Procedures under the Following Conditions

1) Casualties not trapped or buried. Evacuate in the following order:

- a) Red-tag casualties
- b) Green-tag casualties
- c) Yellow-tag casualties

2) Casualties trapped or buried. Evacuate in the following order:

- a) Red-tag casualties
- b) Green-tag casualties
- c) Yellow-tag casualties
- d) Black-tag casualties not trapped or buried
- e) Trapped black-tag casualty..

6.4.2 Vector Control Standards

Vector control programmes should be planned so as to cope with two distinct situations:

- The initial phase immediately following the disaster, when control work should concentrate on the destruction, by a physical or chemical process, of vermin on persons, their clothing,

bedding, and other belongings, and on domestic animals. An emergency sanitation team should be available from the beginning for carrying out this disinfestation.

· The period after the disaster subsided, control work should be directed towards proper food, sanitation, safe disposal of wastes, including drainage, and general and personal cleanliness.

Suggested Vector Surveillance Equipment and Supplies

- Collecting bag
- Collecting forms
- Mouth or battery powered aspirators
- Tea strainer
- Flashlight and spare batteries
- Grease pencil
- Memo pad
- Sweep net
- Pencil
- Tweezers
- White enameled dipper
- Keys and other references
- Labels
- CDC light traps (optional)
- Collecting vials
- Aedes aegypti ovitraps (optional)
- Bulb syringe or medicine dropper
- Fly grill
- Mirror



Suggested Rodent Surveillance Equipment and Supplies

- Teaching aids
- Transfer bags
- Plastic bags
- Vials
- Plastic cups
- Alcohol
- Rubber bands
- Forceps
- Scissors
- Insecticide dusting pan
- Snap Traps
- Formaldehyde
- Live traps
- Acute rodenticides
- Gloves
- Anticoagulant rodenticides
- Flashlights and batteries.

6.4.3 Materials and Equipment

In the absence of clear indication from the field, a minimum kit comprising of the following materials and equipments should be carried by the advance party to the disaster site

- 1) Equipment for pediatric intravenous use :- 36
- 2) Tensiometers for children and adults :- 12
- 3) Assorted ferrules :- 2 boxes
- 4) Tracheal cannulae :- 36
- 5) Set of laryngoscopes for infants, children, and adults 1 each
- 6) Endotracheal tubes, No. 7 Murphy :- 36
- 7) Endotracheal tubes, No. 8 :- 36
- 8) Nasogastric probes :- 36
- 9) Oxygen masks, for adults and children :- 2 boxes
- 10) Large scissors for cutting bandages :- 3
- 11) Plastic linings :- 60
- 12) Phonendoscopes :- 15

Sterilization Unit Supplies

- 1) Tracheotomy set :- 6
- 2) Thorachotomy set :- 6
- 3) Venous dissection set :- 6
- 4) Set for small sutures :- 12
- 5) Bottles for drainage of thorax :-10
- 6) Hand scissors, No. 4 :- 6
- 7) Syringes (disposable) x 2 cc :- 60
- 8) Syringes (disposable) x 10 cc :- 90
- 9) Syringes (disposable) x 50 cc :- 60

Ambulance Fleet



The ambulances will carry the following equipment:

- 1) Oxygen, oxygen mask, and manometer.
- 2) Stretchers and blankets.
- 3) Emergency first aid kit.
- 4) Suction equipment.
- 5) Supplies for immobilizing fractures.
- 6) Venoclysis equipment.
- 7) Drugs for emergency use.
- 8) Minimal equipment for resuscitation maneuvers.

Each ambulance should be staffed by at least a physician, a nurse, a stretcher-bearer, and a driver. The medical and paramedical personnel should be experienced in procedures for the management of patients in intensive care units.

Equipment and Supplies required for Vermin control for a population of 10,000

Power sprayers :- 2

Hand-pressured sprayers, capacity 20-30 litres :- 50

Dusters (hand-operated, plunger type) :- 50

Dusters, power-operated :- 2

Space sprayer :- 1

Adequate supply of accessories and spare parts for the above equipment

Insecticides:

DDT, technical powder :- 0.5 tons

DDT, 75 % water wettable :- 1-2 tons

DDT, 10 % powder :- 1 ton

Dieldrin, 0.625-1.25 % emulsifiable concentrate or wettable powder :- 100 kg
 Lindane, 0.5 % emulsifiable concentrate or wettable powder :- 100 kg
 Chlordane, 2 % emulsifiable concentrate or wettable powder :- 100 kg
 Malathion, 1 % emulsifiable concentrate or wettable powder :- 100 kg
 Dichlorvos emulsion :- 100 litres
 Rodenticides, anticoagulant type (warfarin, etc.) :- 1-2 kg
 Rodent traps :- 100
 Screen, for fly control :- 10 rolls
 Garbage cans, capacity 50-100 litres :- 300-500

a* Quantity depends on availability and on distribution points

6.4.4 Preparedness Checklist for Public Health Department
 (to be filled in by the Civil Surgeon and District Health Officer and submitted to the District Collector before May every year)



Preparedness Measures taken	Details/ Remarks
The department is familiar with disaster response plan and disaster response procedures are clearly defined.	
A hospital plan for the facilities, equipment and staff of that particular hospital based on "The Guide to Health Management in Disasters" has been developed.	
Orientation and training for disaster response plan and procedures undertaken. Special skills required during disaster situations are imparted to the officials and the staff.	
Hospital staff are aware of damage-proof hospital rooms/ buildings.	
Reviewed and updated Precautionary measures and procedures. Precautions that have to be taken to protect equipment. the post-disaster procedures to be followed.	
All hospital staff have been informed about the possible disasters in the district, likely damages and effects, and information about ways to protect life, equipment and property.	
An area of the hospital has been identified for receiving large number of casualties.	
Emergency admission procedures with adequate record keeping developed.	
Field staff oriented about DDMAP	

Standards of services	
Procedures for tagging.	
An officer has been designated as Nodal Officer for Disaster Management.	
Sources of materials required for response operations have been identified.	

Reported By :

Designation:

Signature:

Date:



6.4.5 Checklist for Public Health Department

I. Checklist for Hospitals

(to be filled in by the OFFICER-IN-CHARGE and submitted to district control room and the department head)

Actions Taken	Y/N	Details/Remarks
Radio communications established with <ul style="list-style-type: none"> Emergency operations centre, Divisional commissioner, District control room Hospitals Private hospitals 		
The Civil surgeon designated as "OFFICER-IN-CHARGE - Health Services"		
The following emergency medical equipment are stocked <ul style="list-style-type: none"> Drugs used in treatment of cuts and fractures, such as tetanus toxoid, analgesics and antibiotics . Drugs used for the treatment of diarrhoea, water-borne diseases and flu (including oral rehydrating supplies). Drugs required to treat burns and fight infections. Drugs needed for detoxication including 		

breathing equipments.		
Discharge of all ambulatory patients whose release does not pose a health risk to them.		
Non-ambulatory patients relocated within the hospital to safest areas.		
Equipment supplies such as candles, matches, lanterns and extra clothing provided for the comfort of the patients.		
Emergency Generator available.		
Adequate supplies of anesthetic gases for surgery cases available.		
The hospital water storage tanks were filled.		
An area of the hospital designated for receiving large number of casualties.		
Emergency admissions <ul style="list-style-type: none"> Procedures developed. Records maintained. Work schedules to ensure availability of adequate staff. 		
In-house emergency medical teams to ensure that adequate staff available at all times to handle emergency casualties..		
Emergency accommodations provided for, for medical personnel from outside the area.		
Security arrangements made at hospitals.		
Public information center established at the hospital.		
The local police, rescue groups, and ambulance teams were made aware of the resources of each hospital.		

Inspected By :

Designation :

Signature:

Date



II. Checklist for Field Centres

(to be filled in by the OFFICER-IN-CHARGE and submitted to district control room and the department head)

Actions Taken	Y/N	Details/Remarks
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Surgical packs assembled and sterilised.		
Field Staff aware of tagging procedures.		
<p>Emergency admissions</p> <ul style="list-style-type: none"> Procedures developed. Records maintained. Work schedules to ensure that adequate staff is available. 		
Teams of doctors, nurses and dressers for visiting disaster sites set-up.		
Transport for the transfer of seriously injured patients from villages and peripheral hospitals to general hospitals available.		
Health facility and treatment centres established at disaster sites.		
<p>Water quality monitoring done at</p> <ul style="list-style-type: none"> Transit camps. Relief camps. Feeding centres. Sources of water. Affected areas. <p>Epidemic surveillance is being done at</p> <ul style="list-style-type: none"> Transit camps. Relief camps. Affected areas. Feeding centres. 		

Inspected By :
 Designation
 Signature
 Date

III. Casualty Treatment Post at camp sites and affected villages

(to be filled in by "OFFICER-IN-CHARGE-Health Services and submitted to district control room and the department head)

Action	Y/N	Details/Remarks
Liaise with SOC for suitable location		
Finalise suitable location <ul style="list-style-type: none"> • Near water supply • Clear access / egress routes • Communication link with SOC • Close to disaster site • Suitably protected against weather conditions • Sufficient privacy • Separate area for relatives and visitors • Adequate sanitation facilities for patients • Adequate sanitation facilities for staff • Adequate sanitation facilities for relatives and visitors. 		
Coordinating hospital Notified		
First Aid facilities available		
Inform Police of location		
Whether Police personnel posted at treatment post		
Request for additional medical assistance sent to <ul style="list-style-type: none"> • Civil hospital • District control room. 		

Stocks of triage tags are available on hand		
Records kept on <ul style="list-style-type: none"> Names and addresses of casualties (As far as possible) Type of injuries (As far as possible) Whether transferred for further treatment 		
Records communicated to <ul style="list-style-type: none"> Police SOC 		
Information about intentions to close Casualty Treatment Post communicated to <ul style="list-style-type: none"> SOC Police 		

Inspected By :
Designation
Signature
Date :



IV. Report and Checklist on Epidemics for each camp site and affected village

(to be filled in by "OFFICER-IN-CHARGE-Health Services and submitted to district control room and the department head)

Time : _____

Name of the village :

Name of the camp :

An epidemic exists at the location :

An active threat of epidemics does not exist at the location:

Brief description of type of epidemic / affected area / location :

Brief description of assessment of risk of epidemics in affected area / location and reasons thereof :

Services/ disciplines mobilised :

Discipline/Organisation	Notified (Y/N)	Time	Whether Mobilised (Y/N)	Standby (Y/N)	Alert (Y/N)	Contact person with address, phone no.

Compiled By :
Designation
Signature
Date



V. Checklist for epidemic situations

(to be filled in by "OFFICER-IN-CHARGE-Health Services and submitted to district control room and the department head)

Actions Taken	Y/N	Details/Remarks
Warning and Instructions to public issued		
Cordoning off of affected areas recommended		
Logistical support required		
Cordoning off of roads required		
Alternate routes to and from affected areas required		
Alternative communication		
Waste disposal system adequate		
Sterilisation systems adequate		
Life saving drugs adequate		

Facilities for inoculation and vaccination exist		
Supply of inoculation and vaccination exists		
Accommodation for required number exists		
Facilities for special diet exist		
Risk of spread exists		
Isolation of affected persons done		
Facilities for testing water / wastewater for contamination exist		
Facilities for treatment of contaminated water / wastewater exist		
Suitable protection of workers ensured		

Inspected By :
Designation
Signature
Date

7. OPERATING PROCEDURE GUIDELINES FOR MSEB

7.1 Planning Assumption

- There is no substitute for maintaining standards of services and regular maintenance during normal times. This determines the response of the department to any disaster situation.
- Operating procedures for mobilising community participation during various stages of disaster management have been given in section on “Areas of Community Participation” (p. no.). The department is required to study these and adopt appropriate measures to ensure that community participates substantially.
- For effective preparedness, the department must have a disaster response plan or disaster response procedures clearly defined, in order to avoid confusion, improve efficiency in cost and time.
- Orientation and training for disaster response plan and procedures accompanied by simulated exercises, will keep the department prepared for such eventualities. Special skills required during emergency operations need to be imparted to the officials and the staff. Select personnel can be deputed for training as “NODAL OFFICER - Power Supply” and “Officer-in-charge - Power Supply” at the state and district level respectively.
- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be undertaken to improve departmental capacity to respond to a disaster.

7.2 Normal Time Activity

- Assess preparedness level and report the same as per the format to District Control Room

every six months.

- Establish at each sub-station a disaster management tool kit comprising cable cutters, pulley blocks, jungle knives, axes, crowbars, ropes, hacksaws and spanners. Tents for work crews should also be in storage.

Action Plan Objective in a Disaster Situation

- Restore the power supply and ensure uninterrupted power to all vital installation, facilities and sites.

7.3 Activities On Receipt of Warning or Activation of District DMAP (DDMAP)

- Within the affected district/taluka, all available personnel will be made available to the District Disaster Manager. If more personnel are required, then out of station officers or those on leave may be recalled.
- All personnel required for Disaster Management should work under the overall supervision and guidance of District Disaster Manager.
- Establish radio communications with Emergency Operations Centre, divisional Commissioner, district control room and your departmental offices within the division.



- All district level officials of the department would be asked to report to the collector.
- Appoint one officer as “NODAL OFFICER - Power Supply” at the state level.
- Appoint one officer as “Officer-in-Charge - Power Supply” at the district level.
- Review and update precautionary measures and procedures and review with staff the precautions that have been taken to protect equipment and the post-disaster procedures to be followed.
- Assist the state authorities to make arrangements for standby generators in the following public service offices from the time of receipt of alert warning
 - . Hospitals
 - . Water department
 - . Collectorate
 - . Police stations
 - . Telecommunications buildings
 - . Meteorological stations.
- Fill department vehicles with fuel and park them in a protected area.
- The District Collector to provide “Officer-in-Charge - Power Supply” or the field staff as the need be, with all needed authorisations with respect to
 - . Recruiting casual labourers.
 - . Procuring locally needed emergency tools, equipment and materials.
 - . Expending funds for emergency needs.
- The “Officer-in-Charge -Power Supply” will ensure that all field staff and other officers

submit the necessary reports and statement of expenditure in a format as required by district collector

- Check emergency tool kits, assembling any additional equipment needed.
- Immediately undertake inspection from the time of receipt of alert warning of
 - . High tension lines
 - . Towers
 - . Substations
 - . Transformers
 - . Insulators
 - . Poles and
 - . Other equipment.
- Review the total extent of the damage to power supply installations by a reconnaissance flight, if possible.

On the recommendations of the collector/district control room/“ Officer-in-Charge - Power Supply” of the department in the district

- Instruct district staff to disconnect the main electricity supply for the affected area
- Dispatch emergency repair gangs equipped with food, bedding, tents, and tools.



7.3.1 Relief and Rehabilitation

Field office priorities

- Hire casual labourers on an emergency basis for clearing of damaged poles and salvage of conductors and insulators.
- Begin repair/reconstruction.
- Assist hospitals in establishing an emergency supply by assembling generators and other emergency equipments, if necessary.
- Establish temporary electricity supplies for other key public facilities, public water systems, etc.
- Establish temporary electricity supplies for transit camps, feeding centres, relief camps and SOC, district control room and on access roads to the same.
- Establish temporary electricity supplies for relief material godowns.
- Compile an itemised assessment of damage, from reports made by various electrical receiving centres and sub-centres.
- Report all activities to the head office.
- Plan for emergency accommodations for staff from outside the area.

Head office priorities

On the recommendations of the EOC (Nodal Officer-Power Supply)/collector/district control room, at the state level, MSEB will

- Send cables, poles, transformers and other needed equipment
- Send vehicles and any additional tools needed.
- Provide additional support as required.

The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Relief Commissioner. The Relief Commissioner will book this expenditure under Budget Head '2245' and reimburse the amount to MSEB.

7.3.2 Preparedness Checklist for MSEB

(to be filled in by the department head and submitted to the district collector before May every year)



Preparedness measures taken	Details/Remarks
The department is familiar with disaster response plan and disaster response procedures are clearly defined.	
Orientation and training for disaster response plan and procedures undertaken.	
Special skills required during emergency operations imparted to the officials and the staff.	
Reviewed and updated	
<ul style="list-style-type: none"> · Precautionary measures and procedures. <p>The precautions to be taken to protect equipments.</p> <p>The post-disaster procedures to be followed.</p>	
An officer has been designated as Nodal Officer for Disaster Management.	
Sources of materials required for response operations have been identified.	

Reported By :
 Designation
 Signature
 Date

7.3.3 Checklist for MSEB

(to be filled in by the “Officer-in-Charge” and submitted to district control room and the department head)

Actions taken	Y/N	Details/Remarks
Radio communications established with <ul style="list-style-type: none"> Emergency Operations Centre Divisional Commissioner District control room and Departmental offices within the division. 		
An officer appointed as “Officer-in-Charge- Power Supply”		
Standby arrangements for temporary electric supply or generators made for <ul style="list-style-type: none"> Hospitals Water department Collectorate Police stations Telecommunications buildings Meteorological stations Transit camps SOC Feeding centres Relief camps Cattle camps Godowns for storing relief materials Access roads. 		
Each depot provided with disaster management tool kit.		
Inspection, and repairs if needed, carried out for		
High tension lines		
Towers		

Substations		
Transformers		
Insulators		
Poles.		
Clearing of damaged poles carried out.		
Salvage of conductors and insulators done.		
Emergency accommodations undertaken for staff from outside the area.		
An itemised damage assessment carried out		

Inspected By :

Designation

Signature

Date



8. OPERATING PROCEDURE GUIDELINES FOR IRRIGATION DEPARTMENT

8.1 Planning Assumptions

- There is no substitute for maintaining standards of services and regular maintenance during normal times. This affects the response of the department to any disaster situation.
- Operating procedures for mobilising community participation during various stages of disaster management have been given in section on “Areas of Community Participation”. The department is required to study these and adopt appropriate measures to ensure that community participates substantially.
- For effective preparedness, the department must have a disaster response plan or disaster response procedures clearly defined in order to avoid confusion, improve efficiency in cost and time.
- Orientation and training for disaster response plan and procedures accompanied by simulated exercises will keep the department prepared for such eventualities. Special skills required during emergency operations need to be imparted to the officials and the staff. Select personnel can be deputed for training as “NODAL OFFICER - Irrigation” and “Officer-in-charge - Irrigation” at the state and district level respectively.
- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be undertaken to improve departmental capacity to respond to a disaster.

8.2 Normal Time Activity

- Assess preparedness level and report the same as per the format to District Control Room every six months.

- Identify flood prone rivers and areas and activate flood monitoring mechanisms in all flood prone areas from 1st of June every year.
- Water level gauges should be marked on rivers, dams and minor tank structures not having level gauges.

Action Plan Objective in a Disaster Situation

- Monitor flood situation
- Monitor and protect irrigation infrastructure
- Restore damaged infrastructure

8.3 Activities on Receipt of Warning or Activation of District DMAP (DDMAP)

- Within the affected district/taluka, all available personnel will be made available to the District Disaster Manager. If more personnel are required, then out of station officers or those on leave may be recalled.
- All personnel required for Disaster Management should work under the overall supervision and guidance of District Disaster Manager.
- Establish radio communications with Emergency Operations Centre, Divisional commissioner, district control room and your departmental offices within the division
- All personnel working within the district come under the direction and control of the collector.
- All district level officials of the department would be asked to report to the collector.
- Appoint one officer as “NODAL OFFICER - Irrigation” at the state level.
- Appoint one officer as “Officer-in-Charge - Irrigation” attached to district control room.
- The District Collector to provide “Officer-in-Charge - Irrigation” or the field staff as the need be, with all needed authorisations with respect to
 - . Recruiting casual labourers.
 - . Procuring locally needed emergency tools and equipments and materials.
 - . Expending funds for emergency needs.
- The “Officer-in-Charge -Irrigation” will ensure that all field staff and other officers submit necessary reports and statement of expenditure in a format as required by district collector
- Review and update precautionary measures and procedures and review with staff the precautions that have been taken to protect equipment and the post-disaster procedures to be followed.
- Fill department vehicles with fuel and park them in a protected area.
- Organise round the clock inspection and repair of
 - . Bunds of dams
 - . Irrigation channels
 - . Bridges

- . Oulverts
- . Control gates and
- . Overflow channels.

- . Organise round the clock inspection and repair
- . Of pumps
- . Generators
- . Motor equipments and
- . Station buildings.



- . The officer responsible for the tanks of an area should also be designated an emergency officer, knowledgeable about disasters, their effects, and understand well the appropriate emergency procedures.
- . Officers should ensure that all staff are well aware of precautions to be taken to protect their own lives and personal property.
- . Each technical assistant should have instructions and operating procedures for disaster conditions.
- . Irrigation engineers should review with technical assistants emergency actions that are required.
- . Emergency tool kits should be prepared for all technical assistants in disaster prone areas. These tool kits should include:
 - . Ropes
 - . Pulley blocks
 - . Jungle knives
 - . Shovels
 - . Cement in bags
 - . Concrete pans
 - . Gunny bags
 - . Cane baskets.
- . The emergency tool kits with each technical assistant should be checked.
- . The officers on site should ensure that, the level of impounding in the tanks is reduced to create increased capacity, and coordinate the same with officers on other dam sites and the district control room, if heavy rains are expected. The amount of lowering will depend on the rainfall forecast. In case of possibilities of flooding in the downstream, the settlements should be forewarned, and necessary warnings for evacuation should be given, to the adjoining districts and to those districts beyond the state borders.
- . The inlet and outlet to tanks should, be inspected to ensure that waterways are unobstructed by trees or vegetation.
- . Any repairs/under construction activity should be well secured with sandbags, rockfalls, etc.
- . Materials likely to be damaged by rains, such as concrete in bags, electric motors, office records, etc., should be covered with plastic and well secured, even though stored inside.

8.3.1 Relief and Rehabilitation

Field Office Priorities

- Continue round the clock inspection and repair of bunds of dams, irrigation channels, bridges, culverts, control gates, and overflow channels as may be necessary.
- Continue round the clock inspection and repair of pumps, generators, motor equipment and station buildings.
- The officers on site should continue to ensure that, the level of impounding in the tanks is reduced to create increased capacity, and coordinate the same with officers on other dam sites and the district control room, if heavy rains are expected. The amount of lowering will depend on the rainfall forecast. In case of possibilities of flooding in the downstream, the settlements should be forewarned, and necessary warnings for evacuation should be given to the adjoining districts and to those districts beyond the state borders.
- Clearing the inlet and outlet to tanks to ensure that waterways are unobstructed by trees or vegetation on an on-going basis.
- Information formats and monitoring checklists should be used for programme monitoring and development and for reporting to Emergency Operations Centre. This is in addition to existing reporting system in the department.



Head Office Priorities

On the recommendations of the EOC (“NODAL OFFICER-Irrigation”)/Collector/district control room, the Irrigation department will:

- Provide for sending additional support along with food, bedding, tents
- Send vehicles and any additional tools and equipments needed.
- Coordinate with other states about release of water and dissemination of warning

The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Relief Commissioner. The Relief Commissioner will book this expenditure under Budget Head ‘2245’ and reimburse the amount to the Irrigation Department.

8.3.2 Preparedness Checklist for Irrigation Department

(to be filled in by the department head and submitted to the district collector before May every year)

Preparedness measures taken	Details/Remarks
The department is familiar with disaster response plan and disaster response procedures are clearly defined.	
Orientation and training for disaster response plan and procedures undertaken.	
Special skills required during emergency operations imparted to the officials and the staff.	

Reviewed and updated	
Precautionary measures and procedures	
Precautions to be taken to protect equipment	
Post-disaster procedures to be followed.	
Flood monitoring mechanisms can be activated in all flood prone areas from 1 st of June.	
All staff are well aware of precautions to be taken to protect their own lives and personal property.	
Each technical assistant has instructions and knows operating procedures for disaster conditions.	
Methods of monitoring and impounding the levels in the tanks evolved.	
Methods of alerting officers on other dam sites and the district control room, established.	
Mechanisms evolved for	
Forewarning settlements in the downstream.	
Evacuation.	
Coordination with other dam authorities.	
An officer has been designated as Nodal Officer for Disaster Management.	
Sources of materials required for response operations have been identified.	

Reported By :
Designation
Signature
Date



8.3.3 Checklist for Irrigation Department

(to be filled in by the OFFICER-IN-CHARGE and submitted to district control room and the department head)

Action Taken	Y/N	Details/Remarks
Radio communications established with		
Emergency operations centre		

Divisional commissioner		
District control room and		
Departmental offices within the division.		
An officer appointed as “OFFICER-IN-CHARGE - Irrigation”		
Emergency tool kits for all technical assistants prepared.		
Water level gauges on minor tank structures not having level gauges marked.		
Repairs/under construction activity are well secured.		
Round the clock inspection and repair being carried out of		
Bunds of dams		
Irrigation channels		
Bridges		
Culverts		
Control gates, and		
Overflow channels as may be necessary.		
Round the clock inspection and repair being carried out of		
Pumps		
Generators		
Motor equipment and		
Station buildings.		
Level of impounding in the tanks reduced.		
Coordination of this action with other districts is done.		
Inlet and outlet to tanks are cleared.		

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Designation
Signature
Date

DEPARTMENT

9.1 Planning Assumptions

- There is no substitute for maintaining standards of services and regular maintenance during normal times. This affects the response of the department to any disaster situation.
- Operating Procedures for mobilising community participation during various stages of disaster management have been given in section on “Areas of Community Participation”. The department is required to study these and adopt appropriate measures to ensure that community participates substantially.
- For effective preparedness, the department must have a disaster response plan or disaster response procedures clearly defined in order to avoid confusion, improve efficiency in cost and time.
- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be undertaken to improve departmental capacity to respond to a disaster.
- Orientation and training for disaster response plan and procedures will keep the department prepared for such eventualities. Special skills required during disaster situations need to be imparted to the officials and the staff. Select personnel can be deputed for training as “NODAL OFFICER - Agriculture” and “Officer-in-charge - Agriculture” at the state and district level respectively.
- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be communicated to the community to prevent extensive loss of crops and plantations.

Action Plan Objective in a Disaster Situation

- Restore the Agricultural operations (including soil conditions)
- Crop Protection
- Restore agriculture produce market.



9.2 Activities on Receipt of Warning or Activation of District DMAP (DMAP)

- Within the affected district/taluka, all available personnel will be made available to the District Disaster Manager. If more personnel are required, then out of station officers or those on leave may be recalled.
- All personnel required for Disaster Management should work under the overall supervision and guidance of District Disaster Manager.
- Establish communications with divisional commissioner, district control room and agricultural colleges, seed banks, nurseries (private and public) within the division
- Appoint one officer as “NODAL OFFICER – Agriculture” at the state level

- The District Agriculture Officer will act as “Officer-in-Charge - Agriculture”
- The district collector to provide “Officer-in-Charge - Agriculture” or the field staff as the need be, with all needed authorisations with respect to
 - Recruiting casual labourers.
 - Procuring locally needed emergency tools and equipment and materials.
 - Expending funds for emergency needs.
- The “Officer-in-Charge - Agriculture” will ensure that all field staff and other officers submit the necessary reports and statement of expenditure in a format as required by district collector
- Review and update precautionary measures and procedures and review with staff the precautions that have been taken to protect equipment and the post-disaster procedures to be followed.
- Fill department vehicles with fuel and park them in a protected area.
- Check available stocks of equipments and materials which are likely to be most needed after the disaster.
- Stock agricultural equipments which may be required after a disaster
- Determine what damage, pests or diseases may be expected, and what drugs and other insecticide items will be required, in addition to requirements of setting up extension teams for crop protection, and accordingly ensure that extra supplies and materials, be obtained quickly.
- Provide information to all concerned, about disasters, likely damages to crops and plantations, and information about ways to protect the same.
- All valuable equipments and instruments should be packed in protective coverings and stored in room the most damage-proof
- All electrical equipments should be unplugged when disaster warning is received.
- Extension Officers should be assisted to
 - Establish work schedules to ensure that adequate staff are available
 - Set up teams of extension personnel and assistants for visiting disaster sites.

9.2.1 Relief and Rehabilitation



- Assess the extent of damage to soil, crop, plantation, micro-irrigation systems and storage facilities and the requirements to salvage or replantation
- Establish contact with soil and water testing laboratories
- Provision of agricultural services should be coordinated with irrigation department, DRDA district control room, SOC's
- Estimate the requirement of

- . Seeds
- . Fertilisers
- . Pesticides, and
- . Labour.

- . Organise transport, storage and distribution of the above with adequate record keeping procedures.

- . Ensure that adequate conditions through cleaning operations are maintained to avoid water-logging and salinity.

- . A pests and disease monitoring system should be developed to ensure that a full picture of risks is maintained.

- . Plan for emergency accommodations for agriculture staff from outside the area.

- . Information formats and monitoring checklists as given in the section on “Information and Monitoring Tools” should be used for programme monitoring and development and for reporting to district control room. This is in addition to existing reporting system in the department.

- . Establishment of a public information center with a means of communication, to assist in providing an organized source of information. The department is responsible for keeping the community informed of its potential and limitations in disaster situations.

- . The NGOs and other relief organisations should be aware of the resources of the department.

- . Assist farmers to re-establish their contacts with agriculture produce market and ensure that appropriate prices be offered to them.

The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Relief Commissioner. The Relief Commissioner will book this expenditure under Budget Head '2245' and reimburse the amount to the Agriculture Department.

9.2.2 Preparedness Checklist for Agriculture Department

(to be filled in by the department head and submitted to the district collector before May every year)



Preparedness Measures taken	Details/Remarks
The department is familiar with disaster response plan and disaster response procedures are clearly defined.	
Orientation and training for disaster response plan and procedures undertaken.	
Special skills required during emergency operations imparted to the officials and the staff.	
Reviewed and updated	

Precautionary measures and procedures	
Precautions to be taken to protect equipment	
Post-disaster procedures to be followed.	
Information provided to all concerned about the disasters, likely damages to crops and plantations, and information about ways to protect the same.	
The NGOs and other relief organisations are informed about the resources of the department.	
An officer has been designated as Nodal Officer for Disaster Management	
Sources of materials required for response operations have been identified.	

Reported By :

Designation

Signature

Date



9.2.3 Checklist for Agriculture

(to be filled in by the OFFICER-IN-CHARGE and submitted to district control room and the department head)

Action Taken	Y/N	Details/Remarks
Communication link within the division established with Divisional Commissioner District control room Agricultural colleges Seed banks Nurseries (private and public).		
The district agriculture officer designated as "OFFICER-IN-CHARGE - Agriculture".		
Agricultural equipments which may be required stocked.		
Contact established with soil and water testing laboratories.		
Extent of damage assessed for Soil		

Crop		
Plantation		
Micro-irrigation systems and		
Storage facilities		
Requirements for salvage or replantation assessed.		
Information provided to all concerned about the disasters, likely damages to crops and plantations, and information about ways to protect the same.		
Actions coordinated with		
rrigation Department		
DRDA.		
Organised transport, storage and distribution of		
Seeds		
Fertilisers		
Pesticides and		
Labour.		
Cleaning operations carried out to avoid water-logging and salinity.		
Surveillance for pests and diseases being carried out.		
Public information center established.		
NGOs and other relief organisations informed of the resources of the department.		
Farmers assisted to reestablish their contacts with agriculture produce market.		
Adequate facilities provided to field teams.		

Inspected By :
Designation
Signature
Date

10. OPERATING PROCEDURE GUIDELINES FOR ANIMAL HUSBANDRY DEPARTMENT

10.1 Planning Assumptions

- There is no substitute for maintaining standards of services and regular maintenance during normal times. This affects the response of the department to any disaster situation.
- Operating Procedures for mobilising community participation during various stages of disaster management have been given in section on “Areas of Community Participation”. The department is required to study these and adopt appropriate measures to ensure that community participates substantially.
- For effective preparedness, the department must have a disaster response plan or disaster response procedures clearly defined in order to avoid confusion, improve efficiency in cost and time.
- Orientation and training for disaster response plan and procedures accompanied by simulated exercises will keep the department prepared for such eventualities. Special skills required during disaster situations need to be imparted to the officials and the staff. Select personnel can be deputed for training as “NODAL OFFICER - Veterinary Services” and “Officer-in-charge - Veterinary Services” at the state and district level respectively.
- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be undertaken to improve departmental capacity to respond to a disaster.
- Hospital staff be aware of damage - proof hospital rooms/ buildings.
- A standby generator be made available for every hospital.
- At least one kerosene-powered refrigeration unit be made available for storage of drugs.
- Orientation and training for disaster response plan and procedures, accompanied by simulated exercises, will keep the department prepared for such eventualities. Special skills required during disaster situations need to be imparted, to the officials and the staff.
- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be communicated to the community to prevent extensive loss of livestock.

Action Plan Objective in a Disaster Situation

- Treatment of injured cattle
- Protection and care of abandoned/lost cattle.

10.2 Activities on Receipt of Warning or Activation of District DMAP (DMAP)



- Within the affected district/taluka, all available personnel will be made available to the District Disaster Manager. If more personnel are required, then out of station officers or those on leave may be recalled.
- All personnel required for Disaster Management should work under the overall supervision and guidance of District Disaster Manager.

- Establish radio communications with
 - . Emergency Operations Centre
 - . Divisional Commissioner
 - . District control room and
 - . Veterinary aid centres and hospitals (including private practitioners) within the division.
- Appoint one officer as “Nodal Officer – Veterinary Services” at the state level.
- The District Animal Husbandry Officer will act as “Officer-in-Charge - Veterinary Services”.
- The district collector to provide “Officer-in-Charge - Veterinary Services” or the field staff as the need be, with all needed authorisations with respect to
 - . Recruiting casual labourers.
 - . Procuring locally needed emergency tools, equipments and materials.
 - . Expending funds for emergency needs.
- The “Officer-in-Charge - Veterinary Services” will ensure that all field staff and other officers submit the necessary reports and statement of expenditure in a format as required by district collector.
- Review and update precautionary measures and procedures and review with staff the precautions that have been taken to protect equipments and the post-disaster procedures to be followed.
- Fill department vehicles with fuel and park them in a protected area.
- Stock emergency medical equipments which may be required after a disaster.
- Determine what injuries/ illnesses may be expected, and what drugs and other medical items will be required, in addition to requirements of setting up cattle camps, and accordingly ensure that extra supplies of medical items and materials be obtained quickly.
- Provide information to all staff of veterinary hospitals and centres about the disasters, likely damages and effects, and information about ways to protect life, equipment and property.
- Surgical packs should be assembled and sterilised.
- Enough stock of surgical packs should be sterilised to last for four to five days.
- The sterilised surgical packs must be stored in protective cabinets to ensure that they do not get wet. Covering the stock with polythene is recommended as an added safety measure.
- All valuable equipments and instruments should be packed in protective coverings and stored in room the most damage-proof
- All electrical equipments should be unplugged when disaster warning is received
- Check the emergency electrical generator, to ensure that it is operational, and that a buffer stock of fuel exists. If an emergency generator is not available at the hospital, arrange for one on loan.
- Arrange for emergency supplies of anesthetic drugs.

- Check stocks of equipments and drugs which are likely to be most needed after the disaster.
- Request from central warehouses, on an emergency priority basis, that those supplies likely to be needed be dispatched to the hospital immediately.
- Fill hospital water storage tanks and encourage water savings. If no storage tanks exist, water for drinking should be drawn in clean containers and protected.



- Prepare an area of the hospital for receiving large number of livestock.
- Develop emergency admission procedures (with adequate record keeping) .
- Cattle camps and hospital administrators should
- Establish work schedules to ensure that adequate staff are available
- Set up teams of veterinary doctors, and assistants for visiting disaster sites.

10.2.1 Relief and Rehabilitation

- Organise transfer of seriously injured livestock from villages to veterinary aid centres wherever possible.
- The provision of medical services should be coordinated by the District Animal Husbandry Officer with district control room, SOC's and cattle camps.
- Establish cattle camps and additional veterinary aid centres at disaster sites and designate an Officer In-charge for the camp.
- Estimate the requirement of water, fodder and animal feed, for cattle camps and organise the same.
- Ensure that adequate sanitary conditions through cleaning operations are maintained in order to avoid outbreak of any epidemic.
- An injury and disease monitoring system should be developed, to ensure that a full picture of risks is maintained.
- Plan for emergency accommodations for veterinary staff from outside the area.
- Information formats and monitoring checklists as given in Annexure should be used for programme monitoring and development and for reporting to Emergency Operations Centre. This is in addition to existing reporting system in the department.
- Establishment of a public information center with a means of communication, to assist in providing an organized source of information. The hospital is responsible for keeping the community informed of its potential and limitations, in disaster situations.
- The local police, and rescue groups should be aware of the resources of each veterinary aid centres and hospital.

The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Relief Commissioner. The Relief Commissioner will book this expenditure under Budget Head '2245' and reimburse the amount to Animal Husbandry Department.



10.3 Standards for Cattle Camps

1. The minimum number of cattle in the cattle camp should be about 100 and the maximum 500.
2. The cattle camps should be located at suitable sites, bearing in mind, that adequate supply of water and shade are most essential for the well being of the cattle.
3. Cattle sheds constructed should not exceed 20 sq.feet per animal. Suitable arrangements for water trough and manger(s) should be made.
4. The feeding centres for cattle should be located in such a manner that
 - . There is adequate supply of drinking water
 - . There is sufficient shade for cattle to rest during the afternoon
 - . They are located as near the rail head as possible
 - . They are conveniently located, not beyond a radius of 8 Km from the affected villages.

The cattle will require 6 Kg per cattle head per day of fodder, and 1 to 1 ½ Kg per cattle head per day, of concentrate like Bago molasses.

Each cattle camp will have a minimum of one camp manager, two labourers and two sweepers.

10.3.1 Preparedness Checklist for Animal Husbandry Department
(to be filled in by the department head and submitted to the district collector before May every year)

Preparedness measures taken	Details/Remarks
The department is familiar with disaster response plan and disaster response procedures are clearly defined.	
Orientation and training for disaster response plan and procedures undertaken.	
Special skills required during emergency operations imparted to the officials and the staff.	
Reviewed and updated	
Precautionary measures and procedures	
The precautions to be taken to protect equipment	
The post-disaster procedures to be followed.	

Hospital staff are aware of which hospital rooms/ buildings are damage-proof.	
All veterinary hospitals and centres staff have been informed about the possible disasters, likely damages and effects, and information about ways to protect life, equipment and property.	
An area of the hospital identified for receiving large number of livestock.	
Emergency admission procedures with adequate record keeping developed .	
An officer has been designated as Nodal Officer for Disaster Management.	
Sources of materials required for response operations have been identified.	

Reported By :
Designation
Signature
Date



10.3.2 Checklist for Field Activities of Animal Husbandry Department

(to be filled in by the OFFICER-IN-CHARGE and submitted to district control room and the department head)

Actions Taken	Y/N	Details/Remarks
Radio communications established with Emergency Operations Centre Divisional Commissioner District control room Veterinary aid centres and Hospitals (including private practitioners) within the division.		
The District Animal Husbandry Officer designated as “OFFICER-IN-CHARGE-Veterinary Services”		
Emergency medical equipments required are stocked.		
All veterinary hospitals and centres staff informed about the disasters, likely damages and effects, and ways to protect life, equipment and property.		
Emergency electrical generator arranged.		
Emergency supplies of anesthetic drugs arranged.		

Hospital water storage tanks filled		
An area of the hospital prepared for receiving large number of livestock.		
Emergency admission procedures developed (with adequate record keeping) .		
Transfer of seriously injured livestock from villages to veterinary aid centres and hospitals organised.		
Established at disaster sites		
Cattle camps		
Additional veterinary aid centres.		
Organised for cattle camps		
Water		
Fodder and		
Animal feed.		
Adequate sanitary conditions maintained		
Cleaning operations being carried out		
Epidemiological surveillance is being undertaken.		
Emergency accommodations available for veterinary staff from outside the area.		
Public information center established.		
The local police, and rescue groups informed of the resources of each veterinary aid centres and hospital.		

Inspected By :

Designation

Signature

Date

11. OPERATING PROCEDURE GUIDELINES FOR MWSSB



11.1 Planning Assumptions

- There is no substitute for maintaining standards of services and regular maintenance during normal times. This affects the response of the department to any disaster situation.
- Operating Procedures for mobilising community participation during various stages of disaster management have been given in section on “Areas of Community Participation”. The department is required to study these and adopt appropriate measures to ensure that

community participates substantially.

- For effective preparedness, the department must have a disaster response plan or disaster response procedures clearly defined in order to avoid confusion, improve efficiency in cost and time.

- Orientation and training for disaster response plan and procedures accompanied by simulated exercises will keep the department prepared for such eventualities. Special skills required during emergency operations need to be imparted to the officials and the staff. Select personnel can be deputed for training as “NODAL OFFICER - Water Supply” and “Officer-in-charge - Water Supply” at the state and district level respectively.

- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be undertaken to improve departmental capacity to respond to a disaster.

Action Plan Objective in a Disaster Situation

- Restoration of water supply to the affected area.

11.2 Activities on Receipt of Warning or Activation of District DMAP (DDMAP)

- Within the affected district/taluka, all available personnel will be made available to the District Disaster Manager. If more personnel are required, then out of station officers or those on leave may be recalled.

- All personnel required for Disaster Management should work under the overall supervision and guidance of District Disaster Manager.

- Establish radio communications with Emergency Operations Centre, divisional commissioner, district control room and your departmental and field offices within the division.

- Appoint one officer as “NODAL OFFICER - Water Supply” at the state level.

- Appoint one officer as “Officer-in-Charge - Water Supply” at the district level.

- The district collector to provide “Officer-in-Charge - Water Supply” or the field staff as the need be, with all needed authorisations with respect to

- ; Recruiting casual labourers.

- ; Procuring locally needed emergency tools and equipment and materials.

- ; Expending funds for emergency needs.

- The “Officer-in-Charge - Water Supply” will ensure that all field staff and other officers submit the necessary reports and statement of expenditure in a format as required by district collector.

- Review and update precautionary measures and procedures and review with staff the precautions that have been taken to protect equipment and the post-disaster procedures to be followed.

- Fill department vehicles with fuel and park them in a protected area.

- Make sure the hospital storage tank is full and the hospital is conserving water.
- Inform people to store an emergency supply of drinking water.



- Organise on the receipt of disaster warning continuous monitoring of

- . Wells
- . Intake structures
- . Pumping stations
- . Buildings above ground
- . Pumping mains and
- . The treatment plant.

- Standby diesel pumps or generators should be installed in damage-proof buildings.
- A standby water supply should be available in the event of damage, saline intrusion or other pollution of the regular supply.
- Establish procedures for the emergency distribution of water if existing supply is disrupted.
- Make provisions to acquire tankers and establish other temporary means of distributing water on an emergency basis.
- Make provisions to acquire containers and storage tanks, required for storing water on an emergency basis.
- Prepare plans for water distribution to all transit and relief camps, affected villages and cattle camps and ensure proper execution of these plans.
- A minimum level of stock should be maintained for emergencies, and should include extra lengths of pipe, connections, joints, hydrants and bleaching powder. Adequate tools should be on hand to carry out emergency repairs.
- Cover pumps and motors with adequate protection (if the building is not disaster-proof) to prevent damage.
- Make sure auxiliary generators and standby engines are in good working order.
- Acquire a buffer stock of fuel for the motors and store in a protected place.
- Establish emergency work gangs for immediate post-disaster repairs.

11.2.1 Relief and Rehabilitation



Field Office Priorities

- Carry out emergency repairs of all damages to water supply systems.
- Assist health authorities to identify appropriate sources of potable water.
- Identify unacceptable water sources and take necessary precautions to ensure that no water is accessed from such sources, either by sealing such arrangements or by posting the

department guards.

- Arrange for alternate water supply and storage in all transit camps, feeding centres, relief camps, cattle camps, and also the affected areas, till normal water supply is restored.
- Ensure that potable water supply is restored as per the standards and procedures laid down in "Standards for Potable Water".
- Plan for emergency accommodations for staff from outside the area.
- Report all activities to the head office.

Head Office Priorities

On the recommendations of the EOC ("NODAL OFFICER-Water Supply")/collector/ district control room/of the department in the district

- Provide for sending additional support along with food, bedding, tents
- Send vehicles and any additional tools and equipments needed.

The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Relief Commissioner. The Relief Commissioner will book this expenditure under Budget Head '2245' and reimburse the amount to MWSSB.

11.3 Standards of Service

11.3.1 Water Supply

Investigation of source

Piped Water

- After any repair on the distribution system, the repaired main should be flushed and disinfected with a chlorine solution of 50 mg/litre for a contact period of 24 hours, after which the main is emptied and flushed again with potable water.
- If the demand for water is urgent, or the repaired main cannot be isolated, the concentration of the disinfecting solution may be increased to 100 mg/litre and the contact period reduced to 1 hour.
- At the end of disinfection operations, but before the main is put back into service, samples should be taken for bacteriological analysis and determination of chlorine residue.
- When a water treatment plant, pumping station, or distribution system is so badly damaged that operation cannot be restored for some time, other methods described in the following paragraphs must be used.

Private systems (open well or tube)

- Water from these sources, with adequate chlorination as necessary, can be connected to a distribution system or hauled to the points of consumption.

Springs and wells (non-private)

- Ground water originating from deep aquifers (such as is obtained from deep wells and certain springs) will be free from contamination if certain simple protective measures are taken.

- When springs are used as a source of water supply for a disaster area, careful attention must be paid to geological formations. Limestone and certain rocks are liable to have holes and cracks, especially after an earthquake, that may lead to the contamination of ground water.

- A sanitary survey of the area surrounding a well site or spring is of utmost importance. This survey, which should be carried out by a qualified professional environmental health worker, should provide information on sources of contamination, geological structures (with particular reference to overlying soil and rock formations), quality and quantity of ground water, direction of flow, etc.

- The well selected as a source of water, should be at least 30 m away from any potential source of contamination, and should be located higher than all such sources. The upper portion of the well must be protected by an external impervious casing, extending at least 3 m below and 30 cm above ground level. The casing should be surrounded by a concrete platform at least 1 m wide, that slopes, to allow drainage away from the well; it should connect to a drain that will carry the spilled water away. The opening for drop pipes should be sealed to prevent outside water from entering the well. The rim of manholes should project at least 8 cm above the surrounding surface, and the manhole cover must overlap this rim.

- Immediately after construction or repair, the well should be disinfected. First the casing or lining should be washed, and scrubbed with strong chlorine solution containing, 100 mg of available chlorine per litre. A stronger solution is then added to produce a concentration of 50-100 mg/litre in the water stored in the well. After adequate agitation, the well water is left to stand for at least 12 hours, then pumped out. The well is then allowed to refill. When the residual chlorine of the water drops below 1 mg/litre the water may be used.

- Most of what is stated above applies also to the location and protection of springs. The following points may be added:

- . The collection installation should be so built as to prevent the entrance of light.
- . The overflow should be so located as to prevent the entrance of surface water at times of heavy rainfall.
- . The manhole cover and gates should be locked.
- . Before using the water, the collection chamber should be disinfected with a chlorine solution.
- . An area within a radius of 50 m around the spring should be fenced off to prevent ground surface contamination.

Surface water



- Surface water should be used as a source of water supply only as a last resort.
- Measures should be taken to protect the watershed from pollution by animals and people.

As it is usually difficult to enforce control regulations, the point of intake for water supply should be located above any tributary carrying grossly contaminated water. The pump intake should be screened and placed so that it will not take in mud from the stream bed or floating debris. The device can be something extremely simple, such as a perforated drum fixed in the middle of the stream.

Treatment

- Water should be tested for the presence of *Escherichia coli* and unsafe concentrations of nitrate as soon as possible. Detection of *E. coli* indicates contamination by human waste and therefore requires immediate protective and corrective measures.
- Monitoring of water quality should be restored or initiated immediately. During the disasters, daily determination of the chlorine residual in public water supplies is sufficient.

Disinfection

- Chlorine and chlorine-liberating compounds are the most common disinfectants. Chlorine compounds for water disinfection are usually available in three forms:
- Chlorinated lime or bleaching powder, which has 25 % by weight of available chlorine when fresh. Its strength should always be checked before use.
- Calcium hypochlorite, a more stable compound, sold under various proprietary names. This compound contains 70 % by weight of available chlorine. If properly stored in tight containers and in a dark cool place, it preserves its chlorine content for a considerable period.
- Sodium hypochlorite, usually sold as a solution of approximately 5 % strength under a variety of proprietary names. Its use in water disinfection is limited to small quantities under special circumstances.

Methods of chlorination

Gas chlorinators

- These machines draw chlorine gas from a cylinder containing liquid chlorine, mix it in water and inject it into the supply pipe. Mobile gas chlorinators are made for field use.

Hypochlorinators

- These are less heavy than gas chlorinators and more adaptable to emergency disinfection. Generally, they use a solution of calcium hypochlorite or chlorinated lime in water and discharge it into a water pipe or reservoir. They can be driven by electric motors or petrol engines and their output can be adjusted.
- Hypochlorinators are small and easy to install. They consist usually of a diaphragm pump and standard accessories, including one or more rubber-lined solution tanks, and a chlorine residual testing set. The usual strength of the solution is 0.1 %, and it seldom rises above 0.5 %.

The Batch Method

- In the absence of chlorinators, water is disinfected by the batch method. This method is more likely to be used in emergencies. It involves applying a predetermined volume of

chlorine solution of known strength to a fixed volume of water by means of some gravity arrangement. The strength of the batch solution should not be more than 0.65 % of chlorine by weight, as this is about the limit of solubility of chlorine at ordinary temperatures. For example, 10 g of ordinary bleaching powder (25 % strength) dissolved in 5 litres of water gives a stock solution of 500 mg/litre. For disinfection of drinking water, one volume of the stock solution added to 100 volumes of water gives a concentration of 5 mg/litre. If after 30 minutes contact the chlorine residual is more than 0.5 mg/litre, this dosage could be reduced.

- After the necessary contact period, excess chlorine can be removed to improve the taste by such chemicals as sulphur dioxide, activated carbon, or sodium thiosulphate. The first two are suitable for permanent installations, whereas sodium thiosulphate is more suitable for use in emergency chlorination. One tablet containing 0.5 g of anhydrous sodium thiosulphate will remove 1 mg/litre of chlorine from 500 litres of water.

Continuous Chlorination

- This method, in which porous containers of calcium hypochlorite or bleaching powder are immersed in water, is used mainly for wells and springs but is also applicable to other types of water supply. A free residual chlorine level of 0.7 mg/litre should be maintained in water, treated for emergency distribution. A slight taste and odour of chlorine after half an hour gives an indication that chlorination is adequate. In flooded areas where the water distribution system is still operating, higher chlorine residuals should be maintained. Occasionally, an unpleasant taste develops from the reaction of chlorine with phenolic or other organic compounds. This taste should be accepted, as it is an indication of safe disinfection.

Coagulation-Disinfection

- Removal of the organic matter greatly lessens the amount of chlorine needed for disinfection. There are many factors that govern the coagulation process. These include:

1. Hydrogen-ion concentration. The optimum pH value for coagulation is the value that provides the best floc formation and settling. The pH value of water changes when coagulants are used and has to be adjusted to its optimum value by the addition of alkalis or acids.

2. Mixing. Coagulants must be thoroughly mixed with the water to give satisfactory results. This may be accomplished by (a) pump action, whereby the coagulant solution is added to the suction pipe of the pump and the pump does the mixing; (b) the drip-bottle method, i.e., hanging a drip-bottle over the discharge pipe or hose of raw water that feeds the tank and letting the coagulant solution drip on to the water jet; or (c) dissolution, i.e., allowing the discharge of raw water to splash on to a basket containing solid coagulant.

3. Coagulant dosage. The amount of coagulant and chemicals required to adjust the pH value of water may be calculated when the pH and the type of alkalinity are known. However, optimum dosage for a given water may be determined approximately using the jar test.

Coagulation-Filtration-Disinfection



- In this method filtration is added to the procedures described above. If temporary reservoirs can be arranged, it is preferable to let the water settle before filtering it. In mobile purification

units, however, the water is filtered through a pressure filter without settling. They usually have a capacity of 4000-7000 litres per hour, and consist essentially of:

- . A centrifugal pump directly coupled to a gasoline engine
- . A filter (pressure, rapid sand filter)
- . A hypochlorinator
- . Chemical solution tanks (one for alum and one for soda ash)
- . A chlorine solution tank
- . Hose adapters
- . Valves (pump suction, inlet, drain, air release, outlet, flow control, etc.) and
- . A tool box. Instructions in the manuals supplied with such units must be followed.

Filtration-Disinfection

. In this method water is mixed with diatomaceous earth, then passed through the filter unit in which filtering partitions (septa) are installed. Mobile purification units using this process have been produced with capacities up to 50,000 litres per hour. They consist essentially of:

- . A centrifugal pump driven by a rope-started gasoline engine
- . A filter (diatomite)
- . A hypochlorinator
- . A slurry feeder and an air compressor
- . A precoat and recirculating tank
- . A chlorine solution tank
- . Hose adapters
- . Valves (pump suction, inlet, drain, outlet, flow control, air release, etc.) and
- . A tool box. Instructions in the manuals supplied with such units must be followed.

Physical protection

. In disaster situations, physical protection of water supplies for use, is a major consideration. In addition to such barriers as walls and fences, guards may be necessary to prevent mobs from overrunning and damaging treatment units, pumping stations, tankers, distribution stations, and temporary collection facilities. Intake structures, wells, and springs should also be protected against misuse. The character and extent of such protection will depend on the local situation.

Ice supply

- . Required ice should be supplied from a commercial manufacturing plant where it is made from safe water and where sanitary regulations are observed.
- . It should be distributed in trucks designed for the purpose, equipped with tools for the safe handling of ice.
- . After drinking water is secured within stricken areas, making water available for domestic uses (such as cleaning and washing) should be considered.



11.3.2 Stockpile of Equipment and Supplies

A tentative list of sanitation equipment and supplies required to satisfy the needs of 10,000 people is given below for guidance. The relief body and governmental departments concerned with relief work in each country should make a rational appraisal of their needs.

The equipment and supplies may be either stockpiled in one place or distributed to several regions with adequate provision for their immediate transfer from one region to another in the event of disaster.

Item	Quantity
For Water supply	
Mobile chlorinator, mounted on truck or trailer, with 2 liquid chlorine cylinders	1
Mobile hypochlorinator, mounted on truck or trailer, with solution tanks, hose and accessories	5
Mobile water purification unit, capacity 200-250 litres/min	4
Mobile workshop or repair unit: including repair and pipe laying tools, fittings, jointing materials, excavation tools, winch, pipe wrenches, valves, hose, welding equipment and materials, boots, working gloves, goggles, etc.	1
Tank trucks for water, capacity 7 m ³	10
Portable elevated storage tanks with supporting elements and accessories, easy to assemble, capacity 10-20 m ³	5-10
Well-driving equipment and well points	2 sets
Hand-operated pumps for water, capacity 15 - 20 litres/min	100
Electric or diesel -driven pumps, capacity 200-250 litres/min	4
Pipes (cast iron, galvanized, asbestos cement), diameter 1.25-10 cm, with valves and fittings	a*
Chlorinated lime (25-30 %), stored in a cool and dry place and renewed every 6 months	10-20 tons
Calcium hypochlorite (60-70 %), in powder or granule form, stored in a cool and dry place and renewed every 2 years	5-10 tons
Alum, ferric chloride, and other chemicals for water treatment	2-5 tons
Masonry tools, complete	2-5 sets
Carpentry tools, complete	2-5 sets
Truck-mounted generators	2

Mobile mud pump	2-5
Sludge pump (non-clogging diaphragm or other type)	2-5
Sludge tank trucks, capacity 7 ml	5
Mobile repair shop with necessary tools and equipment, masks, boots, working gloves, excavation tools, etc.	1 unit
Pipes (cast iron, asbestos cement, concrete), with joining materials and equipment, diameter 10-30 cm	a*
Moulds (iron or wood) for concrete pipes and slabs	10-20 sets
Timber, Bamboo mats, nails, etc.	a*
a* Quantity depends on availability and on distribution points	

11.3.3 The Sanitarian's equipment



Item	Quantity
Work equipment	
Comparator for chlorine residual and pH, together with orthotolidine and pH indicator solutions	1
Thermometer, 0-100° C, with protective casing	1
Tape measure, cloth or metal, 30 m, graduated in m and cm	1
Tape measure, metal, pocket size, 2 m	1
Standard household measuring cup, 500 ml	1
Clip board	1
Flashlight (pocket type) with spare batteries and bulbs	1
Magnifying glass (pocket type), 5x to 20x	1
Collection vials	1 dozen
Felt-tip ink marking pen	1
Pocket compass, with plastic case	1
Plumb rod	1
Spirit level	1
Mosquito larvae dipper	1
Aspirator with stoppered tubes, for collecting mosquitoes	1
Kit for membrane filter for water testing (complete)	1

Water pressure gauge, positive and negative pressure	1
Hand level	1
Rapid phosphate determination kit	1
Drawing board and instruments	As required

11.3.4 Preparedness Checklist for MWSSB

(to be filled in by the department head and submitted to the district collector before May every year)

Preparedness Measures Taken	Details/Remarks
The department is familiar with disaster response plan and disaster response procedures are clearly defined	
Orientation and training for disaster response plan and procedures undertaken	
Special skills required during emergency operations imparted to the officials and the staff.	
Reviewed and updated	
Precautionary measures and procedures	
the precautions to be taken to protect equipment	
the post-disaster procedures to be followed.	
Adequate warning mechanisms for informing people to store an emergency supply of drinking water have been developed.	
Procedures established for the emergency distribution of water if existing supply is disrupted.	
An officer has been designated as Nodal Officer for Disaster Management	
Sources of materials required for response operations have been identified.	

Reported By :

Designation

Signature

Date



11.3.5 Checklist for MWSSB

(to be filled in by the OFFICER-IN-CHARGE and submitted to district control room and the department head)

Actions Taken	Y/N	Details/ Remarks
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Radio communications established with Emergency Operations Centre Divisional Commissioner District control room Departmental and field offices within the division.		
One officer appointed as "OFFICER-IN-CHARGE - Water Supply".		
Ensured that the hospital storage tank is full and the hospital is conserving water.		
Informed people to store emergency supply of drinking water.		
Continuous monitoring carried out for Wells Intake structures Pumping stations Buildings above ground Pumping mains and The treatment plant.		
Standby diesel pumps or generators installed in damage-proof buildings.		
Provision for standby water supply made.		

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Procedures were established for the emergency distribution of water if existing supply was disrupted.		
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Actions Taken	Y/N	Details/ Remarks
Provisions to acquire tankers and establishing other temporary means of distributing water on an emergency basis carried out.		
Provisions to acquire containers and storage tanks required for storing water on an emergency basis carried out.		

Water distributed to		
All transit camps		
Relief camps		
Affected villages		
Cattle camps.		
Buffer stock of fuel for the motors acquired		
Emergency repairs of damages to water supply systems carried out.		
Appropriate sources of potable water identified.		
Unacceptable water sources identified		
Necessary precautions taken to see that no water is accessed from such sources.		
Alternate water supply arranged in		
Feeding centres		
All transit camps		
Relief camps		
Cattle camps, and		
The affected areas.		
Drinking water supply is disinfected as per the standards and procedures laid down.		
Emergency accommodations for staff from outside the area provided.		

Inspected By :
Designation
Signature
Date

12. OPERATING PROCEDURE GUIDELINES FOR PWD



12.1 Planning Assumptions

· There is no substitute for maintaining standards of services and regular maintenance during normal times. This affects the response of the department to any disaster situation.

- Operating procedures for mobilising community participation during various stages of disaster management have been given in section on “Areas of Community Participation”. The department is required to study these and adopt appropriate measures to ensure that community participates substantially.
- For effective preparedness, the department must have a disaster response plan or disaster response procedures clearly defined in order to avoid confusion, improve efficiency in cost and time.
- Orientation and training for disaster response plan and procedures accompanied by simulated exercises will keep the department prepared for such eventualities. Special skills required during emergency operations need to be imparted to the officials and the staff. Select personnel can be deputed for training as “NODAL OFFICER - PWD” and “Officer-in-charge - PWD” at the state and district level respectively.
- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be undertaken to improve departmental capacity to respond to a disaster.

Action Plan Objective in a Disaster Situation

- Restoration of roads to their normal condition
- Repair/reconstruction of public utilities and buildings.

12.2 Activities on Receipt of Warning or Activation of District DMAP (DDMAP)

- Within the affected district/taluka, all available personnel will be made available to the District Disaster Manager. If more personnel are required, then out of station officers or those on leave may be recalled.
- All personnel required for Disaster Management should work under the overall supervision and guidance of District Disaster Manager.
- Establish radio communications with Emergency Operations Centre, divisional commissioner, district control room and your departmental offices within the division.
- All district level officials of the department would be asked to report to the collector.
- Appoint one officer as “NODAL OFFICER - PWD” at the state level.
- Appoint one officer as “Officer-in-Charge – PWD” at the district level.
- The district collector to provide “Officer-in-Charge - PWD” or the field staff as the need be, with all needed authorisations with respect to
 - Recruiting casual labourers.
 - Procuring locally needed emergency tools and equipment and materials.
 - Expending funds for emergency needs.
- The “Officer-in-Charge -PWD” will ensure that all field staff and other officers submit the necessary reports and statement of expenditure in a format as required by District Collector.

- The “Officer-in-Charge -PWD” will be responsible for mobilising staff and volunteers to clear the roads in his section, should a disaster strike.

- The “NODAL OFFICER-PWD” should be familiar with pre-disaster precautions and post-disaster procedures for road clearing and for defining safe evacuation routes where necessary.

- All officers (technical officers) should be notified and should meet the staff to review emergency procedures.

- Review and update precautionary measures and procedures, and review with staff the precautions that have been taken to protect equipment, and the post-disaster procedures to be followed.



- Vehicles should be inspected, fuel tanks filled and batteries and electrical wiring covered as necessary.

- Extra transport vehicles should be dispatched from headquarters and stationed at safe strategic spots along routes likely to be affected.

- Heavy equipments, such as front-end loaders, should be moved to areas likely to be damaged and secured in a safe place.

- Inspect all roads, road bridges by a bridge engineer, including underwater inspection of foundations and piers. A full check should be made on all concrete and steelworks.

- Inspect all buildings and structures of the state government (including hospital buildings) by a senior engineer and identify structures which are endangered by the impending disaster.

- Emergency tool kits should be assembled for each division, and should include:

1. Crosscut saws
2. Axes
3. Power chain saw with extra fuel, oil
4. Sharpening files
5. Chains and tightening wrenches
6. Pulley block with chain and rope.

- The designation of routes strategic to evacuation and relief should be identified and marked, in close coordination with police and district control room.

- Establish a priority listing of roads which will be opened first. Among the most important are the roads to hospitals and main trunk routes.

- Give priority attention to urgent repair works that need to be undertaken in disaster affected areas.

- Work under construction should be secured with ropes, sandbags, and covered with tarpaulins if necessary.

- Emergency inspection by mechanical engineer of all plant and equipment in the district workshops.

- If people are evacuating an area, the evacuation routes should be checked and people assisted.
- Identify locations for setting up transit and relief camps, feeding centres and quantity of construction materials and inform DCR accordingly.

12.2.1 Relief and Rehabilitation

- All work teams should be issued two-way communication link.
- Provide a work team carrying emergency tool kits, depending on the nature of the disaster, essential equipments such as
 - .; Towing vehicles
 - .; Earth moving equipments
 - .; Cranes etc.
- Each unit should mobilise a farm tractor with chain, cables and a buffer stock of fuel.
- Adequate road signs should be installed to guide and assist the drivers.
- Begin clearing roads. Assemble casual labourers to work with experienced staff and divide into workgangs.
- Coordinate with Building and Construction Department of Zilla Parishad
- Mobilise community assistance for road clearing by contacting community organisations.
- Undertake cleaning of ditches, grass cutting, burning or removal of debris, and the cutting of dangerous trees along the roadside in the affected area through maintenance engineer's staff.
- Undertake repair of all paved and unpaved road surfaces including edge metalling, pothole patching and any failure of surface, foundations in the affected areas by maintenance engineer's staff and keep monitoring their conditions.
- Undertake construction of temporary roads to serve as access to temporary transit and relief camps, and medical facilities for disaster victims.
- As per the decisions of the district control room, undertake construction of temporary structures required, for organising relief work and construction of relief camps, feeding centres, medical facilities, cattle camps and SOC/s.
- An up-to-date report of all damage and repairs should be kept in the district office report book and communicate the same to the district control room.
- If possible, a review of the extent of damage (by helicopter) should be arranged for the field Officer-in-Charge, in order to dispatch most efficiently road clearing crews, and determine the equipments needed.



The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Relief Commissioner. The Relief Commissioner will book this expenditure under Budget Head '2245' and reimburse the amount to PWD.

12.3 Standards for Relief Camps

12.3.1 Tent Camps

· The layout of the site should meet the following specifications:

1. 3-4 hectares of land/1000 persons
2. Roads of 10 meters width
3. Minimum distance between edge of roads and tents of 2 mtrs
4. Minimum distance between tents of 8 meters
5. Minimum floor area/tent of 3 square meters per person.

· Water distribution in camp sites should consist of

1. Minimum capacity of tanks of 200 liters
2. Minimum capacity/capita of 15 liters/day
3. Maximum distance of tanks from farthest tent of 100 meters.

· Solid waste disposal containers in tent camps should be

1. Waterproof
2. Insect-proof and
3. Rodent-proof
4. The waste should be covered tightly with a plastic or metallic lid
5. The final disposal should be by incineration or by burial.

· The capacities of solid waste units should be, 1 litre/4-8 tents; or 50-100 liters/25-50 persons.

· Excreta and liquid waste should be disposed in bore-holed or deep trench latrines in tent camps. Specifications for these are:

1. 30-50 meters from tents
2. 1 seat provided/10 persons.
3. Modified soakage pits should be used for waste water by replacing layers of earth and small pebbles with layers of straw, grass or small twigs. The straw needs to be removed on a daily basis and burned.
4. Washing should take place with an ablution bench that is:

- . 3 meters in length
- . Double-sided
- . 2/100 persons.



12.3.2 Buildings

Buildings used to accommodate victims during relief should provide the following:

1. Minimum floor area of 3.5 sq.meters/person
2. Minimum air space of 10 sq.meters/person
3. Minimum air circulation of 30 cubic meters/person/hour and
4. There should be separate washing blocks for men and women.
5. Washing facilities to be provided are:
 - 1 hand basin/10 persons or

- 1 wash bench of 4-5 meters/100 persons and 1 shower head/50 persons in temperate climates
- 1 shower head/30 persons in hot climates.

6. Toilet accommodations in buildings housing displaced persons, should meet these requirements:

- 1 seat/25 women and
- 1 seat plus 1 urinal/35 men
- Maximum distance from building of 50 meters.

7. Refuse containers are to be plastic or metallic and should have closed lids. To be provided are:

- 1 container of 50-100 liters capacity/25-50 persons.

12.3.3 Preparedness Checklist for PWD

(to be filled in by the department head and submitted to the district collector before May every year)

Preparedness Measures taken	Details/Remarks
The department is familiar with disaster response plan and disaster response procedures are clearly defined	
Orientation and training for disaster response plan and procedures undertaken	
Special skills required during emergency operations imparted to the officials and the staff.	
Reviewed and updated	
Precautionary measures and procedures	
The precautions to be taken to protect equipment	
The post-disaster procedures to be followed.	
All officers are familiar with pre-disaster precautions and post-disaster procedures for road clearing and for defining safe evacuation routes where necessary.	
An officer has been designated as Nodal Officer for Disaster Management	
Sources of materials required for response operations have been identified.	

Reported By :
Designation
Signature
Date

12.3.4 Checklist for Public Works Department

(to be filled in by OFFICER-IN-CHARGE and submitted to district control room and the department head)

Action Taken	Y/N	Details/Remarks
Radio communications established with Emergency Operations Centre Divisional Commissioner District control room and Departmental offices within the division.		
An officer appointed as "OFFICER-IN-CHARGE - PWD"		
Extra transport vehicles dispatched from headquarters		
Work under construction secured		
Heavy equipment, such as front-end loaders, have been secured		
All work teams issued two-way communication link.		
Inspection and emergency repairs, if necessary, carried out for all Roads, Road bridges Underwater inspection of foundations and piers. Concrete and steelworks.		
Inspection and emergency repairs, if necessary, carried out for all buildings and structures of the state government (including hospital buildings)		
Emergency inspection by mechanical engineer of all plant and equipment in the District workshops carried out.		
Emergency tool kits assembled for each division		
Routes strategic to evacuation and relief marked		
Adequate road signs installed to guide and assist the drivers.		
Priority listing made for which roads to be opened first.		

Essential equipments such as Towing vehicles Earth moving equipments Cranes etc. made available.		
Begin clearing roads.		
Community assistance mobilised for road clearing.		
The following activities were undertaken Cleaning of ditches Grass cutting Burning or removal of debris and Cutting of dangerous trees along the roadside in the affected area.		
The following repair works were undertaken for All paved and unpaved road surfaces Pothole patching and Any failure of surface foundations in the affected areas.		
Construction work undertaken for temporary roads to serve as access to Temporary transit camps Relief camps Medical centres.		
Construction work undertaken for temporary structures required for organising relief work such as Relief camps Feeding centres Medical facilities Cattle camps and SOC/s.		
An up-to-date report of all damage and repairs kept in the district office report book.		

Inspected By :

Designation

Signature

Date

13.1 Planning Assumptions

- There is no substitute for maintaining standards of services and regular maintenance during normal times. This affects the response of the department to any disaster situation.
- Operating Procedures for mobilising community participation during various stages of disaster management have been given in section on “Areas of Community Participation”. The department is required to study these and adopt appropriate measures to ensure that community participates substantially.
- For effective preparedness, the department must have a disaster response plan or disaster response procedures clearly defined in order to avoid confusion, improve efficiency in cost and time.
- Orientation and training for disaster response plan and procedures accompanied by simulated exercises will keep the department prepared for such eventualities. Special skills required during emergency operations need to be imparted to the officials and the staff.
- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be undertaken to improve departmental capacity to respond to a disaster.

Action Plan Objective in a Disaster Situation

- Restoration of communication lines.

13.2 Activities on Receipt of Warning or Activation of District DMAP (DDMAP)

- Establish radio communications with Emergency Operations Centre, divisional commissioner, district control room and your departmental offices within the division.
- All personnel required for Disaster Management should work under the overall supervision and guidance of District Disaster Manager.
- Appoint one officer as “NODAL OFFICER - Communication” at the state level.
- Appoint one officer as “Officer-in-Charge - Communication” at the district level.
- The district collector to provide “Officer-in-Charge - Communication” or the field staff as the need be, with all needed authorisations with respect to
 - Recruiting casual labourers.
 - Procuring locally needed emergency tools and equipment and materials.
 - Expending funds for emergency needs.
- The “Officer-in-Charge - Communication” will ensure that all field staff and other officers submit the necessary reports and statement of expenditure in a format as required by the district collector
- Review and update precautionary measures and procedures, and review with staff the precautions that have been taken to protect equipments, and the post-disaster procedures to be followed.

- Ensure that all staff are aware of recommended precautions to protect life and personal property.
- Fill department vehicles with fuel and park them in a protected area.
- Inspect and repair all
 - Radio masts
 - Anchorages
 - Foundations and cables
 - Poles
 - Overhead circuits.
- Upgrade outside equipment to withstand wind speeds and other adverse weather conditions.
- Designate at each exchange a member of staff (such as an inspector) as a disaster officer.
- He must live in the area, be instructed in the likely effects of a disaster, and should be knowledgeable about necessary precautions and post-disaster procedures.
- House all electrical and switching equipment in damage-proof buildings.
- Store batteries clear of areas likely to be affected.
- All storage batteries should be charged fully during an alert, for use in the post disaster period, when the electricity supply is not likely to be available.
- Establish an emergency tool kit at each exchange, including:
 - a. cable cutters
 - b. Cutting pliers
 - c. Spanners
 - d. Ropes
 - e. Ratchet tension
 - f. Crosscut saws
 - g. Pulley blocks with rope
 - h. Hand gloves
- Check emergency tool kits and assemble any additional equipment needed.
- Provide at least two tarpaulins in every building with radio equipment, teleprinter equipment, and manual and auto-exchanges.
- Install standby generators in all exchange buildings for the recharging of batteries.
- Secure all outside equipment to the extent possible.
- Arrange for the transport of additional vehicles for inspectors.
- Assemble equipment and emergency stocks of materials likely to be necessary for

restoration of services.

- Arrange emergency standby cable for dispatch to the affected area immediately after the disaster.
- Remove fuses from the lines and disconnect the power supplies to equipment in disaster areas, if necessary.



13.2.1 Relief and Rehabilitation

Field priorities

- Give priority and concentrate on repairs and normalisation of communication in disaster areas.
- Identify the public services within the affected community for which communication links are most vital, and establish a temporary service, if feasible.
- Carry out an assessment of overall damage, listing specifically:
 - Overhead route damage (in miles/kilometers).
 - Cable damage (in yards/meters).
 - Specific equipment damaged.
- Establish a temporary communication facility, wherever necessary through mobile exchanges, on priority for use by
 - District control room
 - Non-officials (MLAs, MPs, Mayors, and ZP Presidents)
 - Transit, and relief camps
 - Cattle camps
 - Medical centres
 - Site operations centre and
 - Temporary establishment of all government and non-government agencies engaged in relief activities.
- Establish a temporary communication facility for use by the public
- Identify requirements, including:
 - Manpower needed
 - Vehicles needed
 - Materials and equipments needed.
- Begin restoration by removing and salvaging wires and poles from the roadways through recruited casual labourers.
- Establish a secure storage area for incoming equipments and salvaged materials.
- Carry out temporary building repairs for new equipments.
- Report all activities to head office

Head Office priorities

- Dispatch standby technical work groups to the affected area, ensuring that they take with them adequate food, bedding, tents, and tools.
- Dispatch additional vehicles, emergency equipment, and stocks for restoration of the affected area.
- Provide authorisations needed by staff, to effectively carry out emergency reconstruction.

The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Relief Commissioner. The Relief Commissioner will book this expenditure under Budget Head '2245' and reimburse the amount to DOT.



13.2.2 Preparedness Checklist for Telecommunications

(to be filled in by the department head and submitted to the district collector before May every year)

Preparedness Measures Taken	Y/N	Details/Remarks
The department is familiar with disaster response plan and disaster response procedures are clearly defined.		
Orientation and training for disaster response plan and procedures undertaken. Special skills required during emergency operations imparted to the officials and the staff.		
Reviewed and updated Precautionary measures and procedures Precautions to be taken to protect equipments Post-disaster procedures to be followed.		
All staff are aware of recommended precautions to protect life and personal property.		
An officer has been designated as Nodal Officer for Disaster Management.		
Sources of materials required for response operations have been identified.		

Reported By :

Designation

Signature

Date

14. OPERATING PROCEDURE GUIDELINES FOR RAILWAYS

14.1 Planning Assumptions



- For effective preparedness, the department must have a disaster response plan or disaster response procedures, clearly defined, in order to avoid confusion, improve efficiency in cost and time.
- Operating procedures for mobilising community participation during various stages of disaster management have been given in section on “Areas of Community Participation”. The department is required to study these and adopt appropriate measures to ensure that community participates substantially.
- Orientation and training for disaster response plan and procedures accompanied by simulated exercises will keep the department prepared for such eventualities. Special skills required during emergency operations need to be imparted to the officials and the staff.
- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be undertaken to improve departmental capacity to respond to a disaster.

Action Plan Objective in a Disaster Situation

- Restoration of rail lines
- Ensuring smooth rail movement for passenger and relief materials.

14.2 Activities on Receipt of Warning or Activation of District DMAP (DDMAP)

- Establish radio communications with Emergency Operations Centre, divisional commissioner, district control room and your departmental offices within the division.
- Appoint one officer as “NODAL OFFICER-Railways” at the state level.
- Appoint one officer as “Officer-in-Charge -Railways” at the district level.
- The district collector to provide “Officer-in-Charge -Railways” or the field staff as the need be, with all needed authorisations with respect to
 - . Recruiting casual labourers.
 - . Procuring locally needed emergency tools and equipments and materials.
 - . Expending funds for emergency needs.
- The “Officer-in-Charge -Railways” will ensure that all field staff and other officers submit the necessary reports and statement of expenditure in a format as required by the district collector
- Review and update precautionary measures and procedures, and review with staff the precautions that have been taken to protect equipments, and the post-disaster procedures to be followed.
- Officers should ensure that all staff are well aware of precautions to be taken to protect their own lives and personal property.

- Fill department vehicles with fuel and park them in a protected area.
- Plans should be finalised for sending auxiliary staff and repairmen into the affected areas to assist local staff.
- Maintenance and repairmen should be instructed to assemble and check repair equipments.  [Get DMP](#) 
- Contingency plans should be established for providing food and emergency shelter for local staff, and for auxiliary staff being sent into the affected area.
- Rail schedules should be revised and special trains brought into the area to assist the increased volume of traffic.
- A schedule, for the departure of the last trains prior to the disaster, should be developed by station masters and posted.
- An evaluation of the number and location of sidings and passing places should be carried out, to ensure that an increased number of trains can operate in an emergency situation.
- Emergency train operating procedures, such as the pilot working system, should be developed. All staff should be well trained to implement the emergency systems.
- Within the emergency operating framework, emergency procedures should be developed to provide the stationmasters with authority, to dispatch or hold trains, and take other emergency decisions in a disaster threatening situation.
- Systems should be developed for increasing the ability to carry increased number of passengers in an emergency situation.
- If halting or termination of passenger trains is intended, arrangements for alternate means of transport and availability of adequate food supplies must be ensured.
- Arrange for transport to the affected area
 - Tractor-shovel
 - Tripper, and
 - Auxiliary jeeps.
- All new construction and repair activities should be halted, and the work secured, as far as possible with sandbags, tarpaulins, etc.
- Polythene should be acquired for the protection of freight and equipments.
- All perishable and breakable items should be loaded into goods wagons and padlocked.
- For any coaches remaining in the area, shutters should be pulled down and doors closed.
- Reserve stocks of fuel should be checked.
- Inspection of all railroad bridges, by a bridge engineer including an underwater survey of foundations, piers and abutments. A full check on all concrete and steelworks should be included, and any repairs needed should be promptly carried out.

- Continuous regular weeding, cleaning of ditches and the burning and removal of debris should be carried out by the maintenance engineer's staff .

- Continuous inspection and repair by maintenance engineer of all

- . Railroad track
- . Ballasting,
- . Cess damage
- . Fish plates and
- . Holding down bolts.



14.2.1 Relief and Rehabilitation

- Emergency repairs of rail lines, if affected, must be carried out.
- A system for priority transport of relief goods and personnel must be developed.
- Relief goods may be considered for exemption from freight charges.
- Railway stations, particularly terminal and junction stations, should be equipped with emergency communication equipments.
- Every work gang should have tools which will be needed in an emergency. This should include crosscut saws, axes and rope. Each district tree - cutters gang should have a chain saw.
- Raincoats, caps and gumboots should be made available to workgangs in an emergency.

The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Relief Commissioner. The Relief Commissioner will book this expenditure under Budget Head '2245' and reimburse the amount to Railways.

15. OPERATING PROCEDURE GUIDELINES FOR AAI

15.1 Planning Assumptions

- For effective preparedness, the department must have a disaster response plan or disaster response procedures, clearly defined, in order to avoid confusion, improve efficiency in cost and time.
- Operating Procedures for mobilising community participation during various stages of disaster management have been given in section on "Areas of Community Participation". The department is required to study these and adopt appropriate measures to ensure that community participates substantially.
- Orientation and training for disaster response plan and procedures accompanied by simulated exercises will keep the department prepared for such eventualities. Special skills required during emergency operations need to be imparted to the officials and the staff.
- To the extent possible, preventive measures as recommended in the preparedness and

mitigation document of DMAP, should be undertaken to improve departmental capacity to respond to a disaster.



Action Plan Objective in a Disaster Situation

- Restoration of runways
- Ensuring smooth transport of passengers and relief materials.

15.2 Activities on Receipt of Warning or Activation of District DMAP (DDMAP)

- Airport officials in the district should coordinate with the district collector with regard to specific requirements of the disaster situation.
- Establish radio communications with Emergency Operations Centre, divisional commissioner, district control room and with other airports with respect to disaster situation.
- The district collector will provide all needed authorisations and reimbursements with respect to
 - Recruiting casual labourers.
 - Procuring locally needed emergency tools and equipment and materials.
 - Expending funds for emergency needs.
- Review and update precautionary measures and procedures, and review with staff the precautions that have been taken to protect equipment, and the post-disaster procedures to be followed and also the capacity for storage of cargo, resulting from possible disasters.
- Review and update flight schedules, and take other measures, and review with staff the effects of the additional passenger/flight pressures, and handling of cargo, that may be required for relief and rehabilitation.
- Inspect
 - Runways
 - Drainage systems inside the airport perimeter
 - Culverts
 - Ditches
 - Wind walls and
 - Foundations.
- Inspect and repair all buildings, stores, hangars, fuel dumps, with special attention to the disaster consequences.
- Inspect the radio tower and communications equipments, including lightening rods.
- Remove all serviceable aircrafts from the disaster area.
- Unless the hangar has been certified to be safe, it may be safer to move remaining airplanes from the hangar to outside tie-downs.
- Securely anchor all unserviceable aircrafts to holding-down bolts, if safe hangar space is

not available.

- Auxiliary equipments such as pumps, wagons, etc. should be moved indoors.
- All radio and weather instruments should be stored in a damage- proof room.
- Wind direction indicators should be removed.

· The amount of aviation fuel should be checked and auxiliary fuel stocks brought in.



- Contingency plans should be prepared for post-disaster use of the airport, including:
 - . Need for emergency control tower equipment.
 - . Need for emergency control tower staff.
 - . Need for emergency linemen for fueling.
 - . Emergency fuel supplies.
 - . Temporary storage facilities.
- The auxiliary electrical supply system, if available, should be checked.
- Large glass windows should be taped to prevent the shattering of glass.

15.2.1 Relief and Rehabilitation

- Provide priority clearance arrangements for relief supplies
- Provide priority travel facility to relief personnel.

The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Relief Commissioner. The Relief Commissioner will book this expenditure under Budget Head '2245' and reimburse the amount to AAI.

16. STANDARDS FOR RELIEF WORK, TRANSIT AND RELIEF CAMPS AND FEEDING CENTRES.

16.1 Standards for Food

16.1.1 For Marooned Persons

- A senior medical officer should accompany the rescue team along with required medical kit, and ensure priority of shifting seriously injured, or those requiring immediate medical attention. The procedure for tagging should be followed.
- Provision for both infants and adults must be included in the food supplies.
- Only non-perishable, ready to eat, and long-lasting food items should be included.

- Food must be packed in small packets for individual use.
- Drinking water should be packed in one litre bottles/plastic bags.
- Air-dropping should be done from minimum height with ropes and hooks to ensure that supplies reach the people with minimum damage.
- As far as possible, supplies should be dropped from stationary helicopters, and not when they are on the move.
- Use of boats should be preferred over helicopters, for supplies to marooned people.

16.1.2 Storage

- Keep food in the driest and coolest spot in the store - a dark area if possible.
- Keep food covered at all times.
- Wherever necessary, store food items in plastic bags and keep in tight containers to prevent from moisture.
- Open food boxes and cans carefully, so that they can be closed tightly after each use.
- Store packages susceptible to pests, like open packages of sugar, in screw-top jars or airtight cans.
- Store wheat, rice, dal and edible oil in sealed containers.
- Store powdered milk in packed cans for long term storage.
- Keep salt and spices air-tight in their original packages.
- Inspect all items daily, to make sure that the stocks are in good condition, and that there are no signs of degradation.
- Post guards at warehouses and supply depots, to prevent looting.
- Stimulate community action, to clear roads to warehouses and stores.
- Separate the damaged stocks from other stocks, to protect from odour and damage.
- Maintain food stock condition register, and report to appropriate authorities.
- Arrange for immediate disposal of all unusable food items.
- Maintain prompt transport schedules for delivery of perishable food stocks.
- Store kerosene and other combustible items, including pest control chemicals, in a separate room, away from food stores.

16.1.3 Cooking

- Food should be cooked using firewood, or a charcoal grill or kerosene stove, preferably outdoors.

- Canned foods should be heated in a different container and not in the supply can.
- Follow the checklists for feeding centres supplying cooked food, to ensure food sanitation.

16.1.4 Standard for assessment

Staff Required Number for
 1000 persons 2000 persons
 Cooks Food preparation 2 3
 Assistants 4 6
 Kitchen helpers 10 15
 Servers Food distribution 6 10
 Queue controllers 4 6
 Hygiene (washing up/garbage disposal) 4 6
 Total 30 46

16.2 Standards for Potable Water

- Warn people, of the hazard, of drinking contaminated water. Such sources should be identified and informed to the people.
- Sources located in the vicinity of sewage outfalls, chemical plants, solid waste disposal fields, abandoned mines, and other hazardous places should be considered suspect
- Malodorous, highly coloured, or highly polluted water should be avoided.
- Water suspected of contamination by human or chemical waste should not be used until it has undergone laboratory analysis.
- Wells which have been contaminated by disaster should be emptied immediately.
- It is important that all debris in the wells, such as leaves, sticks, silt and mud, etc. be removed after the water is pumped or dipped out.
- Topical chlorinated lime (TCL) or bleaching powder, should be added to all wells to avoid further contamination.
- The post-disaster emphasis for the provision of drinking water, should be on the restoration of local water sources, rather than on transporting water from outside the area.

16.2.1 Requirements

Minimum water requirements for drinking, cooking, and basic cleanliness are

- (1) Field hospitals and first aid stations: 40-60 litres per person per day.
 - (2) Mass feeding centres: 20-30 litres per person per day.
 - (3) Temporary shelters and camps: 15-20 litres per person per day.
 - (4) During Evacuation - 6 litres per person per day.
- [With no restrictions, use of water may approach 100 litres per person per day].

16.2.2 Storage



- Emergency storage of water can be improvised in plastic containers, with capacity up to 10 m3. Polyethylene containers erected in pits, dug to size, can provide upto 50 m3 storage

capacity. If the purpose of storage is only to provide contact time after chlorination, the minimum capacity should be such as to secure contact for at least 30 minutes. The total storage capacity for water distribution should be equal to the amount required for 12-24 hours. Elevated tanks can be set up within a short time by using drums, iron sheeting, or asbestos-cement tanks. Wooden poles, timber, or iron tubing can be used for the supports. In many countries, elevated storage tanks are manufactured in standard sizes with all parts prefabricated. They can be transported and erected rapidly.

- In long-term relief camps, all reservoirs should be covered, primarily, for protection from sunlight and consequent growth of algae, which produce tastes in water, and secondarily; for protection from birds, insects, and dust. The roof may be made of asbestos-cement sheets or corrugated iron sheets. An overflow pipe should be provided, care being taken that the overflow water should not endanger the foundations. The inlet pipe will normally discharge at the top of the reservoir and be fitted with a float valve. The outlet pipe should be about 5 cm above the bottom of the tank. A small drain pipe should be installed flush with the bottom of the tank, and a manhole on the roof is necessary to permit cleaning, inspection and repair. The openings of vent pipes should be screened to keep out insects and small birds.

16.2.3 Distribution

- In most disasters, water is distributed from tankers, which may be provided by fire brigades, the army, dairies, beverage plants, or other sources. Each family may be issued with a water container, made of plastic or galvanized iron. A tanker with a storage tank (or tanks) at the site should be able to provide water for 1000 persons. Environmental health workers are responsible for seeing that the tankers are filled from acceptable sources in a hygienic manner and chlorinated under their supervision.

- If there is a municipal distribution system within reasonable distance, it may be possible to extend this to a temporary camp, by means of light and quick-coupling steel or plastic pipes. In long-term camps, distribution pipes may be laid to feed water points.

- Water points usually have two or more taps, and one tap should be provided for every 100 persons. No shelter should be more than 100 m away from a water point.

16.3 Standards for Feeding Centres

- The location and layout of field centres for mass feeding should be selected and arranged in consultation with sanitation officers.

- Only potable water may be used in feeding premises. Where there is no piped supply, water must be transported, stored, and handled in a sanitary manner.

- Sufficient number of basins, each with soap, nail brush and a clean towel, must be provided exclusively for the use of food handlers.

- Separate washing place must be provided for washing all sorts of eating and cooking utensils.

- Before washing, any grease or food scraps on the utensils should be scraped into a refuse bin.

- Washed utensils should be disinfected by immersing in boiling water for 5 minutes.

- An alternative method of disinfecting washed utensils is, to immerse them in a sterilizing solution, preferably hot, of either chlorine (100 mg/litre for 30 seconds) or quaternary

ammonium compounds (200 mg/litre for 2 min).

- Wiping the utensils dry is unnecessary and undesirable.
- The baskets or trays being laid down for drying utensils must be in a dust-free place.
- Arrangements should be provided for washing all fruits and vegetables before cooking. The serving of raw vegetables and soft-skinned fruits should be forbidden.
- In special diet cases the vegetables and fruits must be thoroughly washed, immersed in a chlorine solution (100 mg/litre for 3 min), and rinsed until the smell of chlorine disappears.



- Sanitation facility for the staff should be provided close to the mass feeding centre with adequate standards.
- Liquid wastes from kitchens should be disposed of by sanitary methods, such as a soakage pit or covered cesspool. A strainer must always be provided and properly maintained to prevent choking.
- Solid wastes from kitchens must be deposited immediately in garbage bins. No filled bins should remain in preparation and cooking areas, without being tightly covered, and should be removed outside for collection and disposal, after every cooking session.
- Basins, tables, chopping blocks, and all other furniture and equipments must be kept as clean as possible when in use, and thoroughly cleaned after each meal.
- Only food that is to be used the same day may be kept in the kitchen. Food not in the process of preparation or cooking, or which has already been prepared, must be kept in fly-proof containers.
- Where refrigeration facilities are non-existent or inadequate, perishable foods should be bought on a daily basis and cooked and served as soon as possible.
- No non-vegetarian food should be made available through feeding centres.
- Supplies of powdered milk, biscuits and other food items for infants must be arranged.
- Left-over food shouldn't be used/served for next meal.
- Condensed or powdered milk must be reconstituted with potable water only, and under the best possible sanitary conditions. If natural milk is available for infants and hospital patients, it must be boiled before use.
- An adequate supply of detergents, disinfectants, brushes, cloths, brooms, and other housekeeping necessities must be provided to kitchen staff.
- Disposable (bio-degradable) plates, cups, etc. may be used in mass feeding centres and especially when disaster victims are on the march.
- Common drinking cups must not be tolerated.

16.4 Standards for Environmental Health Measures

16.4.1 During Search, Rescue and Evacuation

- There are very few sanitary measures that can be taken while people are being moved to transit or relief camps, and the journey should therefore be as short as possible. They should be told to take along as much food, water, and clothing as they will need.
- The relief or welfare authorities should be advised that, during this transitional period, only unperishable foods which do not require cooking should be distributed.
- It is very difficult to ensure sanitary excreta disposal while people are on the march, and not much can be done about refuse collection.
- At rest points, however, sanitation squads should bury excreta and solid wastes in holes or trenches at least 60 cm deep. After use, the hole or trench should be filled in with the excavated earth and trampled on.
- It may also be necessary to control body vermin by the application of insecticides.



16.4.2 Solid Waste disposal in the camps or in affected villages

16.4.2.1 Excreta disposal

Unsatisfactory disposal of excreta is common immediately after natural disasters. The measures applicable depend on the nature of the existing facilities.

1. Cities and towns with sewerage systems

- When a disaster occurs, sewerage and sewage treatment installations in cities and towns may be put out of service.
- Generally, any repairs made to sewer lines during the emergency should be of a permanent nature. However, temporary repairs may be necessary where a sewer line or manhole must be replaced quickly, to restore traffic on a main street. Asbestos-cement pipes, wooden conduits or some other type of quick-coupling pipes should be used to expedite emergency repairs.

2. Temporary shelters and camps

Depending on the time that temporary shelters or camps are expected to be in use, excreta disposal installations of different types, and varying service life, must be provided. The area must be adequately lighted and the approach road clearly demarcated. The most suitable types are:

- (a) Shallow trench latrines
- (b) Deep-trench latrines
- (c) Pit privies
- (d) Borehole latrines
- (e) Aqua (or septic) privies
- (f) Urinals; and
- (g) Mobile latrines.

As far as possible people must be discouraged from open defecation.

16.4.2.2 Community Latrines

- Attempts should be made to provide communal latrines with water, so that cleaning is practicable.
- Five seats should be provided for every 100 persons, in separate blocks for men and women.
- Latrines should be located downhill from any water source, and at least 15 m away from it.
- Where the groundwater is used for drinking or other purposes, the bottom of the latrine should be at least 1.5 m above the ground-water table. In the presence of limestone formations and fissured rocks, additional precautions are necessary to protect sources of water supply.
- The site should be dry, well drained, and above flood level; the immediate surroundings of latrines should be cleared of all vegetation, wastes and debris.

Various types of excreta disposal installation are described briefly below:



16.4.2.3 Shallow trench latrine

- This is simply a trench dug with ordinary tools (picks and shovels). The trench is 30 cm wide and 90 -150 cm deep.
- Its length depends on the number of users: 3-3.5 m are necessary for every 100 people.
- Separate trenches should be provided for men and women.
- The earth from the trench should be piled up at the side. Shovels should be left at the site, and people should be instructed to cover faeces with earth each time they use the latrine. However, these instructions may not be carried out, and it will be necessary for the sanitation squad to complete the work, twice a day, to keep the fly population and odour under control.
- It may be necessary to place lumber or boards along the sides of the trench, to provide for footing and to prevent the walls from caving in.
- Privacy may be secured by the use of brush, canvas, wood, or sheet-metal fencing.
- Water should be provided.
- The shallow trench is a rudimentary arrangement for a short period (up to one week). When the trench is filled to 30 cm below ground level, it must be covered with earth, heaped above ground level and compacted. If necessary, a new trench must be dug. Before a trench is abandoned, sanitation personnel should see that it is properly filled in.

16.4.2.4 Deep trench latrine

- This type of latrine is intended for camps of longer duration, from a few weeks to a few months.

- The trench is 1.8-2.5 m deep and 75-90 cm wide. The top of the trench is covered by a fly-proof floor.
- A squatting hole is provided.
- A superstructure is built for privacy and protection.
- Other requirements are the same as for shallow trenches.

16.4.2.5 Bore-hole latrine

- In estuaries and places where the subsoil does not contain rock, this type of latrine offers a fast solution for excreta disposal in disasters.
- Mass production of concrete slabs for the latrine floor may be undertaken on the site.

16.4.2.6 Aqua (or septic) privy

- This type of privy consists essentially of a watertight tank (filled with water) in which excreta are discharged, stored and digested.
- It has been used with success in some long-term camps as a communal latrine.
- Aqua privies take rather a long time to construct, and are not recommended during disasters, except, perhaps, for field hospitals, first-aid stations, and mass feeding centres.



16.4.2.7 Urinals

- These may be provided in communal blocks of latrines for men to reduce the number of seats needed.
- One urinal space for 25 males is recommended.
- Odour from urinals can be kept under control by applying chlorine solution.

16.4.2.8 Mobile latrines

- Mobile latrines are tanks mounted on a truck or a rail wagon; they are used in post-disaster situations.
- They are necessary in disaster areas where the ground-water table is high.
- Sanitation personnel are responsible for supervising the proper disposal of the tank contents and the washing, and disinfection of tanks after each emptying.

16.4.3 Miscellaneous installations

In temporary shelters and camps, communal facilities for maintaining personal cleanliness should be provided. These may include showers, washrooms, laundries, and disinfection and disinfection rooms. They will help to prevent skin diseases and infestations, that lead to vector-borne diseases. Disinfection rooms are necessary for preventing the spread of infectious diseases. Proper operation and maintenance of these services depend on

constant supervision by sanitation personnel.

16.4.3.1 Baths and showers

- One bath should be provided for every 100 persons.
- Over-all consumption of water for bathing should be calculated on the basis of 30-35 litres per person per week.
- For both hygienic and economic reasons, proper arrangements should be made for the disposal of waste water from baths.
- People should be discouraged from using ponds, and stagnated water for baths for both sanitary and safety reasons.

16.4.3.2 Laundries

- In temporary encampments people may be expected to wash their clothes in plastic or iron tubs.
- One washing stand for every 100 persons is recommended.
- Proper drainage and soap traps should be provided for the waste water.

16.4.3.3 Disinfection and disinfection

- Methods used in disinfection and disinfection involve the use of chemical agents such as sulfur dioxide, phenol, and carbolic acid. Some of these agents are dangerous, and should only be used under expert supervision.



16.4.3.4 Waste disposal

Waste disposal should be in a shallow, all purpose trench of the following dimensions:

- 10 centimeters deep X 45 centimeters wide X 3 meters long/1000 persons.

16.5 Facilities for Relief Workers

16.5.1 Sleeping and cooking equipments for a team of 5 relief workers

Tent :- 1
Blankets :- 5
Camp beds :- 5
Bed sheets :- 5
Sleeping bags :- 5
Pillows with spare covers :- 5
Kerosene or gas stove :- 1
Kerosene lantern :- 1
Flashlights (with spare batteries) :- 5
Rubber boots :- 5 pairs
Felt-covered water bottles :- 5
Cooking utensils (assorted) :- 1 set

Eating utensils (assorted) :- 1 set
Detergents, soap, water disinfecting tablets, etc. :- As required
Bath unit :- 1
Water containers (plastic or metal), capacity 10-20 litres :- 2
Kerosene containers (plastic or metal), capacity 10-20 litres :- 2
Camp chairs :- 5
Camp tables :- 2

16.6 Checklists for Transit Camps, Relief camps and Feeding Centres.

16.6.1 Checklist for each Transit Camp (to be inspected by Camp Officer and sent to SOC)

Action	Y/N	Details/Remarks
Location approved / conveyed to District Control Room Police Control		
Accommodation should provide for the following Protection against adverse weather conditions Treatment for minor ailments and minor injuries Control over access and egress evacuation routes. Equipped with a mobile PA system Update on disaster situation Drinking water Food arrangements Adequate lighting arrangements Sanitation facilities Easy accessibility for transport to and from the SOC. Facilities for storage of bulk belongings of evacuees Facilities for accommodation of cattle and pets		
Police personnel provided		
Information desk available		

Inspected By :
 Designation
 Signature
 Date

16.6.2 Checklist for Feeding Centre
 (to be filled in by site manager, SOC and submitted to district control room and the department head)

Action	Y/N	Details/Remarks
Managed By : Government Voluntary relief organisations Red Cross Salvation Army Meals on Wheels Religious organisations.		
Location approved by district control room		
Protection against adverse weather conditions		
Person In-charge designated for Overall In-charge of feeding centre Shifts(supervisor) Kitchen Stores / stock control Food distribution Hygiene and sanitation.		
Care and comfort and transport of volunteers		
Adequate arrangements made for Crowd control Police protection Food resources		

Storage of rations appropriate for control of insects and rodents in stores		
Infant foods		
Milk distribution centres		
Fire control measures		
Cleaning of premises where food is handled		
Area for eating on-site		
Drinking water		
Cleaning of utensils		
Disposal of leftovers		
Disposal of waste water		
Kitchen equipments		
Cooking		
Utensils		
Detergents, disinfectants, brushes, cloths, brooms, and other housekeeping necessities.		

Inspected By :
Designation
Signature
Date

16.6.3 Checklist for Relief Camps and transit camps of more than three days duration
(to be inspected by camp officer and sent to SOC)

Action	Y/N	Details/Remarks
Location approved /conveyed to district control room		
Protection against adverse weather conditions		
Whether the site has adequate building/s		
Site has adequate space for building temporary shelters		
Separation of groups necessary		
Separation of sexes necessary		

Is there sufficient slope for drainage during rains		
Managed by Government Voluntary relief organisations NGOs Religious organisations International relief organisations		
Person In-charge designated for Officer In-charge of Relief Camp Shifts(supervisor) Kitchen Stores / stock control Relief distribution Hygiene and sanitation		
Adequate arrangements made for Telephone lines and other communication links Easy accessibility for transport to and from SOC Facilities for storage of bulk belongings of evacuees Access points Exit points Fire fighting Crowd control Feeding centre (refer to checklist) Medical facility Potable water Water for other purposes		

Food storage		
Storage of relief materials		
Lighting		
Recreation space		
Educational facility		
Counselling facility		
Sanitation blocks		
Disposal of waste water		
Disposal of waste		
Police desk		
Arrangements for staff and volunteers		
Tents, bedding, etc.		
Transport		
Rest and recreation facility		
Space for office work		
Personal kits		
Sanitation blocks.		
Records or register for		
Expenses on administration and management		
Cash and credit vouchers		
Issue of relief tickets		
Issue of gratuitous relief		
Cash disbursements		
Issue of relief materials		
Issue of rations		
Receipt of relief materials		

Receipt of cash		
Receipt of rations		
Inventory of valuables with families		
Missing persons		
Persons requiring special assistance		
Births and deaths		
New arrivals		
Departures		
Inventory of non-consumables (dead stock register).		

Inspected By :
Designation
Signature
Date



1. INFORMATION AND MONITORING TOOLS

The institutional framework and the response structure would not be effective unless it is operationalised through information tools and monitoring mechanisms. Such tools define the direction and the content of information as also the source. The flow of information brings in the dimension of accountability and the source provides the authenticity.

It is in this context that this section presents information and monitoring tools for agencies during three main stages of the disaster cycle viz., pre-disaster, during disaster and post disaster.

- The pre-disaster stage includes activities related to preparedness, warning and evacuation
- The during disaster stage encompasses activities related to Activation of the plan and evacuation
- The post-disaster stage includes damage assessment, relief and recovery, and providing feedback for preparedness for a disaster, thereby completing the cycle.

It must be noted at this stage that these stages are fairly amorphous and many times may occur simultaneously. Disaster detection, information gathering and action decisions are the first steps in responding to a disaster. All these steps may occur over a short or protracted time period depending on the circumstances and magnitude of the disaster. The plan identifies the responsibility of the personnel having local level authority to evaluate the situation, assess the magnitude of the problem and activate DDMAP.

2. PREPAREDNESS FORMATS

The district control room will receive reports on preparedness from the relevant district level departments and other departments, as given in the Operating Procedure Guidelines for the Departments. The Collector will also forward Flood Preparedness Measures Format 1 to the Relief commissioner and Divisional Commissioner.

Format 1: Preparedness Status Checklist for floods

The checklist to be completed and sent to Relief Commissioner by every district collector two weeks before the onset of monsoon every year.

[With respect to floods, a regular mechanism to inform on the preparedness status to SCR is expected. The checklist given below can be used on a regular basis for reporting the preparedness and the same can also be used on the receipt of warning to monitor the administrative preparedness].

S.No	Action Taken	Y/N	Remarks
1	Flood Prone Rivers and areas identified by irrigation authorities		
2	Flood Gauges are in working condition		
3	Warning stages on each river are identified		
4	Arrangements for flood warnings • Through AIR and TV • through Public address systems • For local emergency communication system • For review of flood warning system • For Flash Flood warning		

Inspected By :

Date :

Signature :

3. ALERT / WARNING FORMATS

The existing warning system with respect to cyclones and floods has been sufficiently standardised. The format for cyclone warning and a sample warning for cyclone over land is given here for ready reference.

Format 2: CYCLONE WARNING BULLETIN

Severe Cyclone Warning bulletin No.1 issued by Area Cyclone Warning Centre, Bombay at 1330 hours IST of 5th Nov.AAA Severe Cyclone Warning for Goa, Ratnagiri, Sindhudurg, Raigad districts AAA Severe cyclone located within half a degree of Latitude Eleven decimal zero north and Longitude Seventy decimal zero degree east about 450 kilometers Southwest

(Direction) of Goa at 0830 hrs IST AAA Likely intensify further and move in Northeast direction and expected to strike coast near between Goa and Ratnagiri by Monday the 6th November evening AAA G ales reaching 150 kilometers per hour uprooting trees, damaging pucca houses and disrupting communications likely Goa Ratnagiri, Sindhudurg Raigad districts from Saturday 5th November night. Widespread rain with scattered heavy to very heavy falls likely commence in Goa, Ratnagiri districts from Saturday 6th November early morning. Tidal waves 2.0 meters above normal tide likely inundate coastal areas of Goa , Ratnagiri districts while issuing coast.

Format 3: SAMPLE MESSAGES FOR CYCLONES OVER LAND

SPECIAL WARNING FOR CYCLONE OVER LAND AREA MESSAGE NO. AAA ISSUED BY _____ AT _____ HRS AAA CYCLONIC STORM LIES CENTRE AT HRS _____ (DATE) LAT/LONG _____ KM DIRECTION (KNOWN STATION) AAA LIKELY INTENSIFY/WEAKEN/REMAIN UNCHANGED AND MOVE _____ DIRECTION AAA IN ASSOCIATION WITH ABOVE SYSTEM STRONG WINDS FROM _____ (DIRECTION) SPEED REACHING _____ KM,/HOUR LIKELY AFFECT _____ DISTRICTS COMMENCING FROM TIME _____ DATE AAA HEAVY/VERY HEAVY RAIN LIKELY _____ DISTRICTS COMMENCING FROM _____ TIME DATE AAA DAMAGE LIKELY TO BE CAUSED DUE TO STRONG WINDS AND HEAVY RAIN FALL MAY BE MENTIONED DISTRICTWISE.

4. PRELIMINARY REPORTS

The Collector will send the Preliminary Report and Action Taken Report within 48 hours of the event to the Chief Secretary/Relief Commissioner and Emergency Operations Centre with a copy marked to the Divisional Commissioner. After that daily reports on the losses and relief activities will be given.

Format 4 : Preliminary Report On The Disaster
To Be Sent By The Collector or RDC Immediately On The Receipt Of Report Of The Occurrence Of The Disaster Event to Emergency Operations Centre and Divisional Commissioner



Details	Remarks
Name of the district :	
Nature of disaster event :	
Estimates of number of villages/towns affected :	
Overall assessment of impact : <ul style="list-style-type: none"> • Estimated persons affected : • Estimated Loss of Lives : • Estimated Number of Injury : • Estimated Loss of crops : • Estimated Loss of houses : • Estimated Loss of livestock : 	

Damage to infrastructure : • Road Transport (Y/N) • Power Supply (Y/N) • Water supply (Y/N) • Telecommunication (Y/N) • Irrigation systems (Y/N)	
Immediate requirements : • Assistance for Search and Rescue (Y/N) • Food (Y/N) • Clothing (Y/N) • Water (Y/N) • Medical Assistance (Y/N) • Ambulances (Y/N) • Fire Brigades (Y/N) • Police (Y/N) • Transport (Y/N) • Manpower (Y/N)	

Name :
 Designation :
 Date :
 Signature :



Format 5: Actions Taken Report On The Disaster
 To Be Sent By The Collector or RDC Immediately On The Receipt Of Report Of The
 Occurrence Of The Disaster Event to Emergency Operations Centre and Divisional
 Commissioner

Actions Taken :	Remarks
• Evacuation of vulnerable population completed/underway _____	
• Transit shelters provided to evacuees (Y/N)	
Location of evacuees :	
Supplies of the following Arranged : • Food (Y/N) • Fuel (Y/N) • Water (Y/N) • Lighting (Y/N) • Medicine (Y/N)	
Established Contact with : • Superintendent of Police (Y/N) • Fire Brigade (Y/N) • Civil Surgeon (Y/N) • Defence Services (Y/N) • Railways (Y/N) • Taluka Headquarters (Y/N) • Divisional Commissioner (Y/N)	

<ul style="list-style-type: none"> • Superintendent Engineer (Irrigation) • Public Works Department (Y/N) • R.T.O (Y/N) • Mutual Aid and Response Group 	
Other Action taken :	

Name :
 Designation :
 Date :
 Signature :

Format 6: Daily Report to be sent by Collector to EOC



Information and description of the onset of disaster			Information and description of relief activities			Additional Requirements	Quantity	Amount
Loss	Number	Amount	Relief given	Quantity	Amount			
Deaths Injured Destitute Families Destitute Persons			Food Clothing Cash Materials Temporary Shelters					
Houses Collapsed Houses Partially Damaged			Water Supply and storage					
Damage to Public Buildings			Inoculation Done					
Cattle Lost			Supply of medicines					
			Restoration of damaged infrastructure					
Total			Total					

Format 7: Daily Resource Requirement Pro forma for relief
 (for items to be procured through EOC)

Name of the District : _____ Nature of Disaster : _____

Item	Number/Quantity	Cost

Name :
Designation :
Date : Signature :



5. DAMAGE ASSESSMENT

Formats for reporting on various losses such as loss of life, injuries, property, livestock, crops and plantations, have been evolved to monitor on a day to day basis the impact of the disaster.

Effort has also been made to capture the damage done to infrastructure. It is assumed that all these information would give a fairly good account of not just the losses but the requirements for relief and recovery as also the compensation.

Damage Assessment Reports will be submitted after the relief activities are over.

Format 8: Report on Details on loss of life and injuries
in Village/Town _____
due to disaster _____

S.No	Name of the victim	Age	Sex	Cause of the injury/death	Date and time of incident
					Total

Name :
Designation :
Date :
Signature :



Format 9 : Loss Assessment Pro forma For Livestock

Name of the Village/Town : _____

Nature of Disaster : _____

Name of cattle owner	Verification No	Livestock loss								Total Loss (in rupees)
		Cows	Buffaloes	Bullocks	Goats and sheep	Donkeys	He-buffaloes	Poultry	Pigs	
		D M	D M	D M	D M	D M	D M	D M	D M	
Total										

Name :

Designation :

Signature :

Date :

Format 10 : Loss Assessment Pro forma for Crops

Name of the Village/town : _____

Nature of Disaster : _____

S.NO	Name of the village	Types of crops cultivated		Damage (in Rupees)		Types of plantation		Damage (in rupees)		Total Loss (in rupees)
		Type	Area	Partial	Full	Name	Number	Partial	Full	
Total										

Name :

Designation :

Date :

Signature :

Format 11: Loss Assessment Pro forma for Public Utilities

Format 12: Loss Assessment Pro forma for Houses

Format 13: Damage Assessment Pro forma for Infrastructure and Services

Name of the Village/Town : _____

Nature of Disaster : _____

Infrastructure	Nature of damage			Approximate loss	Possibility of immediate restoration with temporary repairs (Y/N) with remarks	Needs immediate repairs/restoration (remarks)
	Partial damage	Total damage	Non-functional	(in rupees)		
1	2	3	4	5	6	7
Water supply						
Power Supply						
Road Transport						
Health Services						
Rail Transport						
Bridges						
Ports/Jetties						
Air services						
Telecommunication						
Post and Telegraph						
Education						
Dams						
Irrigation Infrastructure						
Sewer infrastructure						

Name :

Designation :

Date :

Signature :

[Format 14: Statement of Total Damage - \(pdf\)](#)

in the District _____ due to the disaster event _____

Name :
 Designation :
 Date :
 Signature :

Format 15: Statement of Total expenditure on payment of relief

District : _____
 Nature of disaster : _____
 Duration of disaster : _____

Nature of compensation	Number of beneficiaries	Amount spent
Loss of life		
Permanently incapacitated		
Temporary Injured		
Loss of crop		
Loss of plantation		
Loss of cattle		
Loss of other livestock		
Fully destroyed house		
Partially damaged house		
Loss of tools of trade/business		
Total		

Total
 Name :
 Designation :
 Date :
 Signature :

6. MONITORING RELIEF

For effective monitoring of the relief camps and cattle camps, information formats have been developed, which can be used for review of the situation at the local level as well as for keeping the authorities informed.

Surveillance reports on various specified diseases, water disinfection report and hospital reports on casualties is required to be sent.

Format 16: District level Information on Camp sites

(for all transit and relief camp sites to be filled in by District Collector and forwarded to Emergency Operations Centre)

Name of the district _____ Number of camp sites _____

As on / /97

S.NO	Name of the camp site	Managed By	Number of households	Number of persons in the household in the camp (including head of household)	
				Adults	Children
				M	M
				F	F
	Total				

Name :
Signature
Date



Format 17: District Level Information on Cattle Camp sites

(for all cattle camp sites to be filled in by District Collector and forwarded to Emergency Operations Centre)

Name of the district _____

Total number of cattle camp sites _____

As on / /97

Name of cattle camp site	Managed by	Number of livestock				
		Cows	Buffaloes	Bullocks	Goats and Sheep	Others

1	2	3	4	5	6	7
Total						

Name and Designation of Camp Officer :

Signature

Date

Health Department Reports

Format 18: Statement on status of epidemics and public Health activities undertaken in transit and relief camps and affected villages during the period

Nature of disaster :

Name of District

Name of village/campsite

Name of epidemic

Number of people affected

Number of deaths

Compiled By :

Designation :

Signature :

Date :

Health Department Reports

Format 19: Information on the deceased
(to be filled in for each deceased person)

Name of the Village /Town : _____

Nature of Disaster : _____

1. Identification No :

2. Name and address of the deceased :

3. Age :

4. Sex :
5. Occupation :
6. Caste :
7. Annual Family Income :
8. Whether residing in Maharashtra for more than 15 years :
9. Day, date and Time when the body was recovered :
10. Location where the body was found :
11. Identified by:
12. Panchnama Done : (Y/N)
13. Postmortem done : (Y/N)
14. Transferred to Mortuary : (Y/N)
15. Handed Over to relatives : (Y/N)
(Name and address of the relative to be recorded)
16. Disposed of as unclaimed : (Y/N)
17. Report sent to police (Y/N)

Name :
Designation :
Date :
Signature :



Health Department Reports

Format 20: Information on the injured

Name of the Village : _____
Nature of Disaster : _____

1. Identification No :
2. Name and address of the injured :
3. Occupation :
4. Caste :

5. Age :
6. Sex
7. Annual Family Income :
8. Whether residing in Maharashtra for more than 15 years :
9. Day, date and Time when reported :
10. Location where the injured reported :
11. Nature of injury or complaint :
12. First Aid Given at OPD : (Y/N)
13. Admitted as Indoor patient : (Y/N)
14. Admission No :
15. Date and time of admission :
16. Date and time of discharge :
17. Transferred to other hospital :
(Name and address of the hospital to be recorded)

Name :
Designation :
Signature :
Date :



Health Department Reports

Format 21: Compiled Report on treatment in hospitals
(to be compiled by DCR and sent to EOC)

Name of the district

Nature of disaster:

Period from / /97 to / /97

S.No	Name of hospital/medical centre	Number of patients given treatment	Number of patients received "on	Number of patients admitted	Number of patients treated	Number of patients discharged during	Number of patients transferred for	Number of patients expired
------	---------------------------------	------------------------------------	---------------------------------	-----------------------------	----------------------------	--------------------------------------	------------------------------------	----------------------------

		t	transfer ”		in OPD	the week	treatment to other hospitals	in the hospita l

Compiled By :
 Designation :
 Signature :



**Model Template for Preparation of
District Disaster Management Plan (DDMP)**

**January 2005
National Institute of Disaster Management
Ministry of Home Affairs
Government of India
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Preface

Disasters occur with unfailing regularity in India, causing immense losses of life, assets and livelihood. In the present executive structure of the country, the district administration is bestowed with the nodal responsibility of implementing a major portion of all disaster management activities. The increasingly shifting paradigm from a reactive response oriented to a proactive prevention mechanism has put the pressure to build a fool-proof system, taking into account the components of prevention, mitigation, rescue, relief and rehabilitation.

Pre-disaster planning is crucial for ensuring an efficient response at the time of a disaster. A well-planned and well-rehearsed response system can deal with the exigencies of calamities and also put up a resilient coping mechanism. Optimal utilization of scarce resources for rescue, relief and rehabilitation during times of crisis is possible only with detailed planning and preparation. Keeping in view the nodal role of the district administration in disaster management, preparation of District Disaster Management Plans (DDMP) is imperative. Each DDMP needs to be prepared on the basis of the vulnerability of the district to various disasters and the resources available.

The National Institute of Disaster Management (NIDM) had organized a workshop on 29th November 2004 attended by officials from the district and state administration, Ministry of Home Affairs, NIDM and UNDP. The available District Disaster Management Plans were critically examined and a final Template for DDMP was developed. The Template is only indicative of the components of a comprehensive District Disaster Management Plan and may be supplemented with district specific issues. The DDMP of Maharajganj, UP, which was highly rated by the participants is also included in this document for reference. The efforts of Prof Santosh Kumar, Ms Chandrani Bandyopadhyay, and Dr SVRK Prabhakar in bringing out this publication are commendable.

I hope this document is helpful to the district authorities to plan for future disasters for a Disaster Free India!

(S.P Gaur)
Executive Director, NIDM

Dated: 10th January 2005

Chapter 1

Guidelines for DDMP

1. Methodology Adopted for Developing Guidelines

A consultation workshop was conducted to review the existing district disaster management plans (DDMP) and to prepare a Template for District Disaster Management Plan to help the district administration in preparing their plans on 29 November 2004 at NIDM. The panel reviewed total 14 plans and came out with various guidelines and Template Plan provided in this Note.

The process followed was like this. Each resource person was assigned the pre-identified plan/s available with the NIDM and NDM division of MHA to review based on the technicality of the content, relevance, sequencing of the chapters and functionality of the document. The resource persons consisted of field level public administrators, who have the hands-on experience of managing the disasters, and the academicians of NIDM. After a half-day of review, all the participants made the presentations of their findings, which are also provided in this publication (Chapter 3). At the end of the presentations all the workshop deliberated on the model outline of the DDMP (Chapter 2). The list of experts/delegates who attended the workshop and the list of plans reviewed have been provided in the Annexure I.

2. Technicality and Type of Content

1. The district disaster management plan (or any plan in general) should have following characteristics.
 - It should be clear & precise
 - It should be comprehended at all levels, by all officials (not too technical or verbose)
 - The year of plan preparation should be clearly mentioned to facilitate updation.
 - Provide flexibility in execution: seasonality of hazards and roles should be clearly mentioned.
 - Should use all existing management information systems for maximum efficiency
 - Should mention about continuity in management in case of a change
 - Maximize the resource utilization
 - Include/link with the secondary/support plans such as specific departmental plans and industrial plans located in the district.
 - The Plan should be integrated with lower level plans such as Block or Village DMP and also with the State and national level policies and strategies.
 - Facilitate Coordination at all levels
 - Emphasize the training & practice such that the plan is executed with most precision and
 - Stress on the post-disaster evaluation and updation for continuous improvement of the same.
 - The plan should also be technically competent with no errors.
2. Hazard, risk and vulnerability analysis:
 - 2.1. A general observation had been that many plans missed on the part of hazard, risk and vulnerability (HRV) analysis. While some plans listed the hazard chapter first and the risk analysis later, some other plans 'assumed' some hazards as important and discussed them in detail. It is to be noted that the proper way of doing HRV

analysis is by establishing the most damaging hazard (by its frequency, impact and magnitude in comparison with other hazard), identifying the risk areas (areas which faces often such hazards), who and what is at risk, and finally identifying the vulnerability factors (factors that make people living in those areas susceptible to the hazard impacts). It is important to know that risk analysis encompasses the hazard and vulnerability analysis. For further help on HRV analysis, you are requested to consult the NDM Cells in your State Administrative Training Institute (ATI) or National Institute of Disaster Management (NIDM).

- 2.2. In HRV analysis and resources: Please mention whether the existing resources (various equipments and manpower) are sufficient in dealing with the major disasters identified above as it also leads to vulnerability of the location to the disasters. And, if the resources are not sufficient, please do provide what kind of contingency arrangements have been/to be made. This has to be clearly mentioned wherever the resources are discussed in the plan. Resource Inventory should be disaster specific.
- 2.3. Please mention the reliable resources only i.e. those which can be reliably utilized when need arises. Care should be taken such that the incapacitated/dysfunctional ones are excluded while estimating the infrastructural resources.
3. Latest maps and data should be included as far as possible. Wherever necessary, provide sources of information along with the year of data it originates from. Please note that the seismic zones have been changed from 2002 and new maps are available with the BMTPC and the new seismic map doesn't have areas under seismic zone I (merged with the Zone II).
4. Standard operational procedures should be specific for each department and should be classified under the heads Mitigation, response, relief and rehabilitation as the SOPs change from state to stage. Similarly, highlight if there are any hazard specific SOPs separately by listing the common ones first and the hazard specific ones later (See the template).
 - 4.1. The SOPs framed by the Armed Forces for disaster response should be shared with the district administration for better coordination.
 - 4.2. The SOPs should be standardized in a format
5. Linkages:
 - 5.1. Links with the developmental plans is important. This is done by sensitizing the developmental plans (and its designers) about the vulnerability aspects of the location and necessary changes needed in building the capacity of the government and other structures and institutions in dealing with such disasters. It is germane that the developmental plan is being more sensitive to disasters and its management rather than the disaster management plan getting more towards developmental plan. In fact, the developmental plan should use the disaster management plan as a resource in planning for future.
 - 5.2. Mention should also be made about links and roles of sub plans, departmental plans (fire, irrigation, agriculture, electricity etc), crisis management plans of major industrial establishments (both offsite and onsite), army etc. An elaboration is necessary on the role of army, ways of getting its help for search, rescue, and relief operations.
 - 5.3. The plan should also mention linkages with the NGOs and other organizations involved in disaster management at the district level. However, a mention should also be on the community level players such as community volunteers (disaster management teams) and how they are linked with the government disaster management systems for quick establishment of linkages in the wake of a disaster.

6. Meager or no emphasis has been made on updation, regular drills, monitoring, and evaluation. A plan that is not exercised is not made. Hence, a mention must be made, wherever appropriate (look at the template), on how the resources (infrastructure and manpower) and other components of disaster management and its progress in terms of implementation over the time. For this, clear guidelines must be given for continuous updating, monitoring, and evaluation of the plan.
7. DDM plan should emphasize on the mitigation (prevention and preparedness) and rehabilitation. Specific elaborate plans should be made for each of them and be made part of the overall DM plan. It is a good idea to have them in different volumes while the main DM plan mentions the gist of the plans.
8. Include thoroughly various forms, checklists, and other job-aides such as damage assessment, reporting, regular checking resources etc in the Annexure. Sample survey forms of the impact, reporting protocols would be useful including a checklist for updation
9. Relief management should be given priority in the response plan.
10. The DDMP should be prepared primarily as a Field Operations Guide, where, in a crisp matrix format, the main responsibilities of various functionaries can be put down. A job chart and checklist for Pre, During & Post disaster functions would be useful.
11. A provision for Volunteer Citizen Service (retired professionals) for manning Control Rooms etc along with Govt officials could be incorporated.
12. The DDMP should be financially, legally and administratively supported by the State Govt and institutionalized within the administrative framework. A clear note should be incorporated in the plan emphasizing the same.
13. Some decisions involving immediate response entail an element of risk for DM/Collectors. Therefore, financial administration should be absolutely clear and transparent.
14. Corporate sector operating within the district should be legally bound to support the district administration in times of crisis.
15. A Framework for involvement of public representatives in preparedness activities (MPLAD Fund) within DDMP would be useful.
16. Framework for dealing with public grievances, media management (stop rumor mongering & panic) should be developed: A Code of Ethics for media can be incorporated as an Annexure.

3. Content Presentation

1. Provide a gist of the Plan upfront after the Contents page. This helps in quick grasp of the plan and increases the functionality as well. Please refer to the Template Plan for more details.
2. Too much wordy explanations and big paragraphs should be avoided. As plans are expected to be functional, only the required information in crisp sentences may be given. List the important points in bullets.
3. As far as possible, avoid providing theoretical information such as classification of cyclones, how a hazard happens, and what kind of damages they cause. If you still wish to provide such information, a second volume of 'support handbook' may be prepared. However, leave the main plan document as functional as possible.
4. Flush all the big tables (exceeding more than half page) towards the end of the document as Annexure. As images convey the best in least possible time, it is suggested to present hazards as pie charts (e.g. % of total number of hazards happening in that area) and impacts as bar diagrams (types of damages such as comparing livestock and human losses) or line diagrams (number of losses occurring over the years). Assure that no repetition of data in tables and diagrams takes place.

Chapter 2

District Disaster Management Plan: An Indicative Outline

The following outline has been agreed upon by the Consultation Workshop to be recommended for development of District Disaster Management Plans. However, one can make modifications according to their specific need.

1. DDMP

This section includes the entire DDMP in nutshell. The format for this chapter should reflect all major aspects of DDMP and designed such a way that the entire plan is understood in a glimpse. The format is given in the Annexure II.

2. Introduction

- Discuss the necessity of the plan
- Changing context of disaster management
- Clearly lay down the objectives of the plan and how they are to be achieved
- Whose responsibility is the development of DDMP?
- When the plan was prepared and when it is destined to be reviewed
- Any other info that helps understand the context and relevance of the DM plan

3. District Profile

Introduce the district in terms of its climate, geography, and topography (temperatures, rainfall, geographical area, landholding pattern, cropping pattern, rivers, livelihood details, major drinking water sources, critical establishments etc), demography (literacy rate, poverty, economy, percapita income, main occupation of the people), climate and weather, rivers, roads, hospitals, and other critical infrastructure such as industries. This should not exceed two printed pages. The additional information may be provided in the Annexure.

4. Hazard, Risk, and Vulnerability Analysis

Hazard, risk and vulnerability analysis (HRV) is the most important part of the plan as the entire planning process will be based on its outcome. Any error in identifying the frequency, magnitude and projected impact leads to erroneous identification of major hazard and hence the erroneous plan. The necessary outcomes of the HRV analysis should be the type of hazards that the state is prone to, history of hazards, impact analysis of the worst case, the area, people and infrastructure that is prone to the risk of these hazards and their vulnerability of being damaged by such disasters due to their vulnerability characteristics. Vulnerability Assessment should deal with the socio-economic vulnerability, housing vulnerability and environmental vulnerability. HRV analysis should also include resource inventory/capacity analysis, preparedness analysis in terms of network of communication systems, public distribution systems, storage facilities, transportation facilities, medical facilities, fire stations, cyclone shelters with their capacity, presence of NGOs and other volunteers etc so as to enable quick response. The vulnerability atlas of BMTPC may be referred for this purpose. Further assistance can be obtained from NDM cells of your state ATIs or NIDM.

5. Institutional Mechanism

This chapter should focus on

- The structure of disaster management mechanism at the district level

- District Disaster Management Committee
- Disaster management teams
- Crisis management group/Incident Command System
- Emergency operation centers and its operation
- Site Operation Centers
- Modalities (role, inter-institutional communication mechanisms, linkages etc) for involvement of army, NGOs and other non-governmental agencies (e.g. stand alone institutions)
- Linkages (with exact coupling points¹) with the sub-plans (block plans, plans of major industrial establishments, departments (police, fire, agriculture, institutions such as NGOs etc).

6. Mitigation Plan

- This chapter should mainly focus on various ways and means of reducing the impacts of disasters on the communities through damage prevention.
- Major focus may be given to disaster mitigation owing to its importance in reducing the losses.
- The mitigation plans should be specific for different kinds of hazards identified in the HRV analysis section.
- Mitigation plans should also be specific for specific sectors
 - Mitigation plans should deal with both aspects: structural and non-structural
- This session should essentially include the strategy rather than the technical listing/description of various methods of resistant construction technologies etc.
 - Identification of various departments including PRI and ULBs for implementing the mitigation strategies is important.
 - Community mitigation measures should be identified and implementation modalities formulated.
 - A Training Strategy should be formulated for training major government and non-governmental cadres in the state who can aid in disaster management.
 - The mitigation plan should also include a chapter/section on preparedness planning. Some indicative components may include:
 - Operational readiness of facilities, equipment & stores
 - Setting up of EOC, Staffing, infrastructure, communication etc
 - Updation of resource inventory, before the flood/cyclone season
 - Management/skills/simulation training
 - Community Awareness

7. Response Plan

The onset of an emergency creates the need for time sensitive actions to save life and property reduce hardships and suffering, restore essential life support and community systems, to mitigate further damage or loss and provide the foundation for subsequent recovery. Effective response planning requires realistic identification of likely response functions, assignment of specific tasks to individual response agencies, identification of equipment, supplies and personnel required by the response agencies for performing the assigned tasks. A Response plan essentially outlines the strategy and resources needed for search and rescue, evacuation etc. A Response Plan should be backed by SOPs.

¹ Points where the both plans/administrative structure meets/joins

A District Response Plan will essentially focus on: (list indicative, not exhaustive)

- Operational Direction & Coordination
- Emergency Warning & Dissemination
- Rapid Damage Assessment & reporting
- Incident Command System
- Search & Rescue
- Medical Response
- Logistic Arrangements
- Communications
- Temporary Shelter management
 - Free Kitchen/ Food Management
- Law & Order
- Public Grievances/Missing Persons Search/Media Management
- Animal Care
- Management of deceased
- NGOs & Voluntary organizations

Management of Relief and Logistic arrangements is an area that requires extensive planning and may still fall short of expectations. A separate **Relief Management Plan** can be prepared as a part of the Response plan to identify the projected relief needs, relief mobilization points, transportation routes, coordination mechanism with local police, coordination with national and international relief teams, relief transport vehicles, alternative communication like HAM radios (in case of communication failures) etc.

The Relief Management Plan with all important contact nos and checklists can be designed as a pullout from the DDMP, to facilitate easy functioning and coordination of relief officials.

8. Recovery & Reconstruction Plan

Essentially discusses the strategy to restore normalcy to the lives and livelihoods of the affected population. Short-term recovery returns vital life support systems to minimum operating standards while long-term rehabilitation continues till complete redevelopment of the area takes place. Recovery and Reconstruction Plan should take into account the following components:

- Restoration of basic infrastructure
- Reconstruction/repair of lifeline buildings/social infrastructure
- Reconstruction/repair of damaged buildings
 - Insurance
 - Short-term Loans
 - Assistance
- Restoration of livelihoods
 - Loans
 - Assistance/Aid
 - Grants
- Medical Rehabilitation
 - Physiological
 - Psycho-social interventions
 -

9. Standard Operating Procedures

Each SOP should clearly mention the roles and responsibilities during various stages of disaster management cycle (i.e. during disaster and post disaster including response, relief, rehabilitation, prevention and preparedness).

- District Disaster Management Committee, Information management team, Search and rescue team, Emergency health management team, Relief (food, feed, fodder and civil supplies) team, Transportation management team, Infrastructure management team, and Animal resource management team
- Checklist for District Collector
- Checklist for various DMTs
- Checklists and SOPs for district Emergency Operations Center
- Irrigation dept, electricity dept, agriculture dept, police, chief district medical officer, Public works dept, telecommunication dept, rural water supply & sanitation dept, and chief district veterinary officer, fire service, food & civil Supplies Dept.
- Checklist for ULBs (Municipal Corporation etc)

10. Linking with the Developmental Plan

Linkages with the developmental plan is established by sensitizing the developmental plans (and its designers) about the vulnerability aspects of the location and necessary changes needed in building the capacity of the government and other structures and institutions in dealing with such disasters. Incorporation/integration of mitigation components within the development plan facilitates implementation of both DDMP and District Development plan and aids in long-term risk reduction process. It is germane that the developmental plan is being more sensitive to disasters and its management rather than the disaster management plan getting more towards developmental plan. In fact, the developmental plan should use the disaster management plan as a resource in planning for future.

Mention in this section on how the developmental plans are linked/sensitized about the disaster vulnerabilities of the region and how they are taken care of in terms of building capacities at various levels and various outlays provided for the same.

11. Budget and other Financial Allocations

This chapter should focus on the budget and other financial allocations made at district level in preparing and executing the disaster management plan. All relevant Government Orders (GOs) issued from time to time should find a reference here with important ones attached in Annexure.

12. Monitoring and Evaluation

This chapter should lay down the rules and regulations for

- Proper monitoring and evaluation of the DM plan
- Post-disaster evaluation mechanism
- Its regular updation
- Periodic uploading of updated plans at IDKN and resources on IDRN
- Conducting periodic mock drills
- Checking whether all the personnel involved in execution of DDMP are trained and updated on the latest skills necessary in line with the updated plans

13. Annexure

The following Annexure must be included along with the plan. Additional Annexure may also be attached according to the specific need.

13.1. District profile

2.11 Latest data on geography, demography, agricultural, climate and weather, roads, railways etc that describes the district may be provided. However, care must be taken to summarize the data so as to not to make the plan document bulky.

13.2. Resources

- Hazard specific infrastructure and manpower should be mentioned here
- Usage of IDRN, IDKN etc (updating them, latest update available etc)

13.3. Checklists

The following checklists are necessary to be included in the plan. Additional checklists may be attached depending on the necessity.

Checklists to be included are for district collector/magistrate, ZP President, Executive Engineer, district agricultural officer (Joint Director), and other important officers representing the emergency support functions at the district level.

13.4. Media and information management

Provide strategy for managing mass media such as newspapers and television in terms of dissemination of information at the wake of disasters. Clear guidelines would help the administration in avoiding communication of wrong information and creating panic.

13.5. Process of development of DDMP

Here, discuss in short the process adopted for developing the DM plan. Also mention the year in which it was developed and when the next update is pending etc.

13.6. Contact numbers

Latest important contact numbers of EOC, DMTs, fire, irrigation and flood control, police etc must be provided.

13.7. Do's and don'ts all possible hazards

A comprehensive list of do's and don'ts for district administration in handling the disasters and at various other phases of disaster management should be provided. Remember, this list is not same as that of do's and don'ts necessary for common man in managing disasters.

13.8. Important GOs

You may wish to attach most important GOs issued in smooth implementation of the DM plan.

Annexure I

Observations Made on Individual DDMPs

The following specific observations were made by the resource persons on the district disaster management plans reviewed in the Consultation Workshop conducted at NIDM on 29th November 2004. The consolidated report has been provided in the first section of this document.

1. CUDDALORE

1.1. *Strengths*

- Well linked (in the document) with the other plans of the district (industrial, power etc) (how is it linked in operation...no idea!)
- Resources such as boats, electric generators etc
- Data support on cyclones, floods etc is good
- Good chapters: 'DM structure', 'damage assessment'

1.2. *Weaknesses*

- Difficult to find the answer to the question 'When was it prepared'
- Sequence:
 - Hazard analysis first and risk analysis while the risk analysis encompasses hazard analysis
 - The planning process (again mentions how it should be done rather than how it was done...leaving it to our imagination) and other info to go to Annexure
- Too much of theoretical information (different kinds of cyclones, construction techniques etc) **makes it a more a 'Resource Book' rather than a plan**

Technicality

- Assumes floods and cyclones as most important and then derives the data support to it with less comparative analysis on other disasters
- Gives country scale maps and talks at district level
- Old maps (old seismic zones)
- Poor analysis on the preparedness front and capacity fronts (whether the existing resources are sufficient or not?)
- SOPs not mentioned according to the phase of disaster (mitigation, prevention, peacetime etc etc)

Presentation

- Too much wordy...One has to dig out to find out the real thing...
- Data is scattered i.e. Annexure in and outside the main text/chapters and at the end of the book. Some data is repetitive (same data in tables and figures)
-

Functionality

- The functionality of the plan can be assessed by asking some questions and finding answers in the plan. The plan provided small or no answers to the following sample questions
- Q: What is the first step I should take in the event of cyclone warning?
- A: Leaving it to your logical skills or plan assumes that you know your role...
- Q: What is the next decision making step?

- A: read a full SOPs or I am trained so I should know it...

1.3. Some other recommendations

- 2/3 pager plan should be provided up-front of the document such as help understand the plan quickly (series of tasks to be achieved) in gist/ nutshell
 - Major hazard vulnerability
 - Response and other mechanisms (flow diagrams)
 - Important data on resources (infrastructure and personnel etc)
 - Update version number and whether linked to IDRN or not (cross checked for facts and figures)

2. DHANBAD

2.1. Risk Assessment & Vulnerability Analysis

Strong points

- Clear identified the vulnerable areas towards natural (11) & manmade disasters (8)
- Earthquake is a massive disaster as come under earthquake Vulnerable zone III as like Ahmedabad of Gujarat

Weak points

- How much areas of Dhanbad is vulnerable to different natural disasters (%age).

2.2. Disaster Response System in Dhanbad

Strong points

- Three tier DRS in Jharkhand to operate IMT, QRT, ESF and DCR.
- DCR-Vital linkage among EOCs of State, District & Block (on site) levels.

Weak points

- Four tier DRS i.e. Panchayat Raj System (village level) to be adopted.
- At on site, local people to be involved in IMT

2.3. ESF of Dhanbad District

Strong points

- An effective operational system of 14 identified ESFs (Table-5.1) covering all aspects of DM

Weak points

- Gender issue is not discussed

2.4. DCR System in Dhanbad

Strong points

- Information Flow Chart of DCR including BCR (Block Control Room)
- Coordination Structure at District level Control Room
- Activity wise flow of Information among Revenue Control Room, DCR and Site Operation Centre.
- Early Warning Dissemination

Weak points

- Role of CWC & IMD in Early Warning Dissemination
- Coordination between Govt. agencies towards victims at Short term & Long term basis

2.5. CRO At Block level

Strong points

- Functions of CRO at different stages i.e. pre, during & post disaster.
- Reference materials in block control room

Weak points

- Socio-economic aspects of the affected areas to be studied along with the old people of these areas
- Documentation work (Lesson learnt) to be carried out with the Research Units

2.6. SOPs at Block Level

Strong Points

- BDO as Officer in charge of Emergency Control Room during disaster
- Functional distribution of work
- Press briefings through a well designed format
- Check lists at various levels apart from BDO, Panchayat Samiti, MO, CHC, JE/SDO, etc.

Weak points

- Panchayat Samiti & other institutions like education to be more active

2.7. Crisis Response Structure Designs/ Layouts

Strong points

- Control Room Operation – Early warning dissemination
- Evacuation Response
- Search & Rescue Operation
- Health services
- Shelter Management, Relief Operation, Water & Sanitation Response & Infra structure Restoration
- Coordination & Linkage with G.P. and Village

Recommendations

- Clear identification of safe places for Evacuation
- Mention the role of Army in search & rescue & relief operations to be involved
- Coordination and linkage of DCR with GP and Village to be enhanced
- DM Plan be more oriented on disaster Preparedness & Mitigation measures

3. EAST NIMAR

3.1. Strengths

- The plan is comprehensive, detailed

- Gives good resource inventory
- Well focused on coordination
- Mentions about the participation of volunteers/Home Guards
- Specifications for retrofitting
- Suggested information dissemination format
- Media management chapter, guidelines/Format
- Detailed and Comprehensive Annexures:
 - Guidelines for requisition of Armed Forces, maintenance of Accounts, Functioning of Control Room, Search & rescue Operations, Evacuation planning & Relief Camp management, triage & transport at site.
 - Detailed Resource Inventory including manpower
 - Checklists for Search & Rescue, Medical Relief, Shelter Management, Preparedness checklist, response checklist
 - Operational Responsibilities of major line departments

3.2. *Lacunae*

- Detailed District Vulnerability map to be prepared.
- Stand alone plan, not linked to Dev plan
- Monitoring & evaluation
- Updates for plan, resources, volunteers not mentioned
- Dos & Don'ts: cursory mention
- Preparedness plan could be more detailed.
- Rehearsals, exercises could be added
- Community participation minimal
- Not linked to lower level plans at the tehsil, block or village level.

4. JAMNAGAR

4.1. *Introduction*

- Sufficient details given – no revision suggested

4.2. *Risk and Vulnerability Analysis*

- Gives a table indicating probability and likely areas to be affected
- No Analysis – vulnerability is rating is too general, Hazard specific vulnerability required

4.3. *Contingency Plan for early warning, relief and recovery*

- Linked to ICS (10 Units)- not sure of conformity with LBSNAA system
- Emergency Operations Task-force 16 listed (could add Debris clearance)
- EOCs - DCR, operations Room, Taluka CR listed with facilities available and broad functional responsibilities-Flow chart gives succinct cross cutting linkages

4.4. *Annexure 1*

- District Profile gives area and administration, climate, river system, post, salt works, live stock, industries, roads and railway, health.
- Could add more info on agriculture, demography

4.5. *Annexure 2*

- District Incident Command system – Officers and contact details

- Repetition of page 28

4.6. Annexure 3

- Control Room Contact numbers
- Taskforces mentioned, numbers not given
- It also lists a number of additional attachments-detailed, but doesn't include the facilities For e.g., its list down the hospital, Government and Private, but no information on the number of beds, doctors or facilities.
- Sector specific plans are included in the list

4.7. Annexure 4

- Guidance on Risk and Vulnerability Ranking
- This mentions the importance of listing probability and impact rating- too broad to understand hazard specific vulnerability

4.8. Annexure 5

- A note on District level Mitigation, prevention and preparedness (ADB Consultant)
- Mentions the importance of mitigation and prevention analysis at sub-district level to form a part of the plan, Public Private partnership, Education and Capacity Building

5. KENDRAPARA

5.1. Overview of the district

- Detailed information given
- Some of the large tables could be shifted as Annexure

5.2. Recommendations

- Very comprehensive, needs structuring
- Several details can be shifted to annex
- SOPs can be in a separate document
- Mitigation part is weak. Could pull out from sub-district level documents
- Capacity building requirements not listed

5.3. Annex

- 18 Annex giving actions to be taken by various Government Departments and details of the facilities available
- Another set of annex giving sectoral action
- Mitigation measures suggested are preparatory in nature, not structural measures.

6. KHAGARIA

6.1. Strengths

- Almost model
- Flood specific-comprehensive
- Roles –clear well defined
- Pre, during & post disaster work/job chart
- Seasonality of hazard & roles
- Tasks well defined
- Task forces entrusted

- Stress on preparedness
- Brief and interesting- a good document

6.2. Weaknesses

- Vulnerable areas should be clearly demarcated
- Hazards –area vulnerable should be indicated
- Maps are not there
- Route chart to reach should be included
- Route chart to rescue should be included
- Assignment of areas for rescue, relief & relocation for individual departments/persons should be there
- Department wise check lists should be provided along with monthly duties/roles
- District level committee- electricity department is missing
- Information on block level committees should be provided
- Gram Panchayat information is not provided
- Information on involvement of civil society should be provided
- Infrastructure- requirement and gaps if any needs to be identified
- Outsourcing of help should be made clear

7. LATUR

7.1. Merits

- Adopted a multi-hazard approach
- Objectives have been detailed out
- Underline Policy statement to mitigate disasters and protect life
- Geographic and socioeconomic profile of the district

7.2. Lacunae

- RA&VA is not done
- Educational, occupational, social and economic
- Building codes and implementation-poor content
- Disaster vulnerability- floods, earthquakes, and fires, industrial and chemical accidents
- Table on disaster probability is inapt
- Social and psycho impact only in earthquakes
- No damage to infrastructure and govt. systems in disasters
- Table on vulnerability of systems and services to disaster events -inapt
- Rail network-not vulnerable to any disaster
- Disaster probability is not included
- Earthquake, flood, epidemics, road accidents and fires not clearly mentioned
- Industrial and chemical hazard not identified but still detailed out in Annexure 1&2
- Context of Annexure 4: Minor irrigation projects completed which is out of relevance to the plan.

7.3. Recommendations

- Content page should be included
- Restructuring of the contents has to be done

- Repetition of contents should be avoided
- Detailed plan has to be made.
- Inapt and inadequate tables should be removed
- Irrelevant data to be done away with

8. MAHARAJGANJ

8.1. Strengths

- District Overview is concise
- Hazard Identification done – Flood & earthquake
- Risk & Vulnerability Assessment good
- Mitigation aspects specifically covered esp. relating to floods– can be of help in integrating with development plans
- Plan review protocol & periodicity well enunciated
- Departmental Checklists/SOP's well covered – preparedness phase

8.2. Strengths

- Departmental Responsibilities clearly laid out – Response phase
- Needs well identified esp. of vulnerable sections with regard to floods
- Emergency relief kit for flood affected well thought out
- Reporting Formats included
- Database of contact nos. included

8.3. Recommendations & issues

- District Map to be incorporated in greater detail
- List of villages likely to be affected can be illustrated
- Earthquake response needs & intervention assessment can be detailed further.
- Resource inventory can be incorporated specific to the hazards identified
- Organizational structure needs to be reworked in the light of the ICS
- Communication flowcharts to be incorporated
- Many of the mitigation measures suggested especially regarding earthquake are policy decisions which can be excluded from the DDMP
- DDMP needs to be backed by agency specific action plans & reporting protocols
- Do's & Don'ts for specific events, affected population & even responders can be incorporated
- Sample survey forms to be included.
- Set of activities to be done by various line departments can be classified in a user friendly manner –matrix type
- Earmarking a portion of development funds for mitigation activities

8.4. Other issues

- Strengthening fail safe communications networks
- Upgrading critical Infrastructural Facilities
- Integrating VDMP & Off site Emergency plans with DDMP
- Pre arranged contracts for critical supplies & equipment
- Developing Field Operational guide for Responders

9. MUZAFFARPUR

9.1. **Strong points**

- Detailed information about district administration has been provided.
- Identification of types of disasters
- Identification of types of resources
- Human resources
- Resources available with dist. administration like fire fighting, medical & health etc.
- Material resources through IDRN (update?)
- List of telephone numbers of certain categories present like NGOs, govt. depts. press & media
- Contains formats for sending w/less and for conducting quick surveys for relief operations.
- Mentions the role of various district level functionaries and of various departments
- Stresses on IEC mentions the role of community in prevention of certain types of disasters
- Mentions the time table for updating certain records and inventories

9.2. **Recommendations**

- Disaster specific response and role of various agencies for each type be prescribed.
- Framework for involvement of public representatives be created.
- Directory of resources for various expected disasters be created.
- Role of army and sop for requisitioning their services be incorporated.
- Good road maps be incorporated
- Mapping of disasters would be a good idea.
- Plan be prepared in a manner that response to any disaster can be initiated by personal staff SHO etc without loss of time and should be such that lower level functionaries are able to act as per the plan.
- Plan for mitigation and rehabilitation be given due weightage.
- Plan should incorporate the role of DLOs and other agencies so far as preparation of their own contingency plans for various identifiable and foreseeable disasters are concerned.
- Administrative and command structure of various departments/agencies must be highlighted.

9.3. **Some issues**

- Proper legal framework be prepared so that govt./semi-govt./private agencies can be made legally accountable for providing services in times of disasters.
- Issue circulars/orders directing army to share their SOPs, inventory of resources(men, material and machinery)with civil authorities
- Provide district collectors with foolproof communication system so that relief and rescue operations can be started w/out delay.
- Prepare a disaster management code on the lines of famine code which gives details of scale of finances to be made available to a district so as to bring greater transparency.
- Explore the possibility of setting apart certain % of css funds/sfcs/state plan funds in the 'district disaster management society' so as to encourage local level innovations, IEC, documentation, regular w/shops, starting temporary relief works immediately.
- Create a structure for a very good advanced forecasting and warning system for various types of disasters likely to strike the district.
- Prepare legal framework requiring approval by a high powered district level team of certain activities of local bodies such as approval of building plans of certain types of buildings etc.

- Giving more teeth to the factories and boiler inspector / change in the act to ensure adherence to fire control standards, better on site and offsite emergency plan
- Create a system for regular training of manpower.

10. NORTH 24 PARGANAS

10.1. *Comments*

- This plan includes both annual action plan and long term plan of four years. This need to be separated.
- Annual action plan should be prepared basing on the dire necessities of the field realities taking together of all the concerned departments.
- The provision of funds for this annual action plan need to be made in the budget for which preparedness can be implemented.
- There is no rehabilitation part in this plan. Specific provision should be made to rehabilitate the encroachers who setteled on the Government land and canal embankments.
- There no provision for assessment of damage made to the victims of the calamity – both private & Government.
- No procedure has been enunciated for deployment Armed personnel and their management during the calamity, and fund required for this purpose.
- There is no provision to deal with the unlawful migrants who had migrated from the neighbouring countries and not accepted as citizens of India but became victims to calamities
- Provision should be made to handle the assistance coming from different organisations (both Govt./ Non Govt.) during the time of calamities.
- Deployment of civil defence volunteers and NCC cadets during the calamities should be categorically mentioned in the plan.
- A separate Chapter should be provided to fix up reasonabilites with the NGOs dealing with rehabilitation of victims after calamity is over, in case of their non performance and cheating.
- Provision should be made to impress upon state government to give logistic and financial support to the plan for the disaster management (both short term & long term).

11. RUDRAPRAYAG

11.1. *Strengths*

- Sufficient data is given
- Data on compilation of individuals posted at different locations is useful
- Hazard profiling was done well
- List of NGOs is handy
- Tehsil wise DM committee has been sufficiently mentioned

11.2. *Weaknesses*

- Hazard database was not good
- No HRV analysis done
- Much of the information might not be important for the DDMP
- No maps on geographical and vulnerability of the tehsils are given
- No information about the district level key functionaries given
- Plan is silent on many fronts – mapping of state and private resources

- Implementation arrangements are not clear
- Mitigation and response got mixed together
- No linkages with any of the initiatives taken under the national plan
- History of disasters is not provided to assess the vulnerability of the district

11.3. Recommendations

- District officials should be facilitated with the trained hands on DDMP
District officials should also be exposed to half a day workshop on DM planning national initiatives

Annexure II

Resource Persons who reviewed the DDMPs

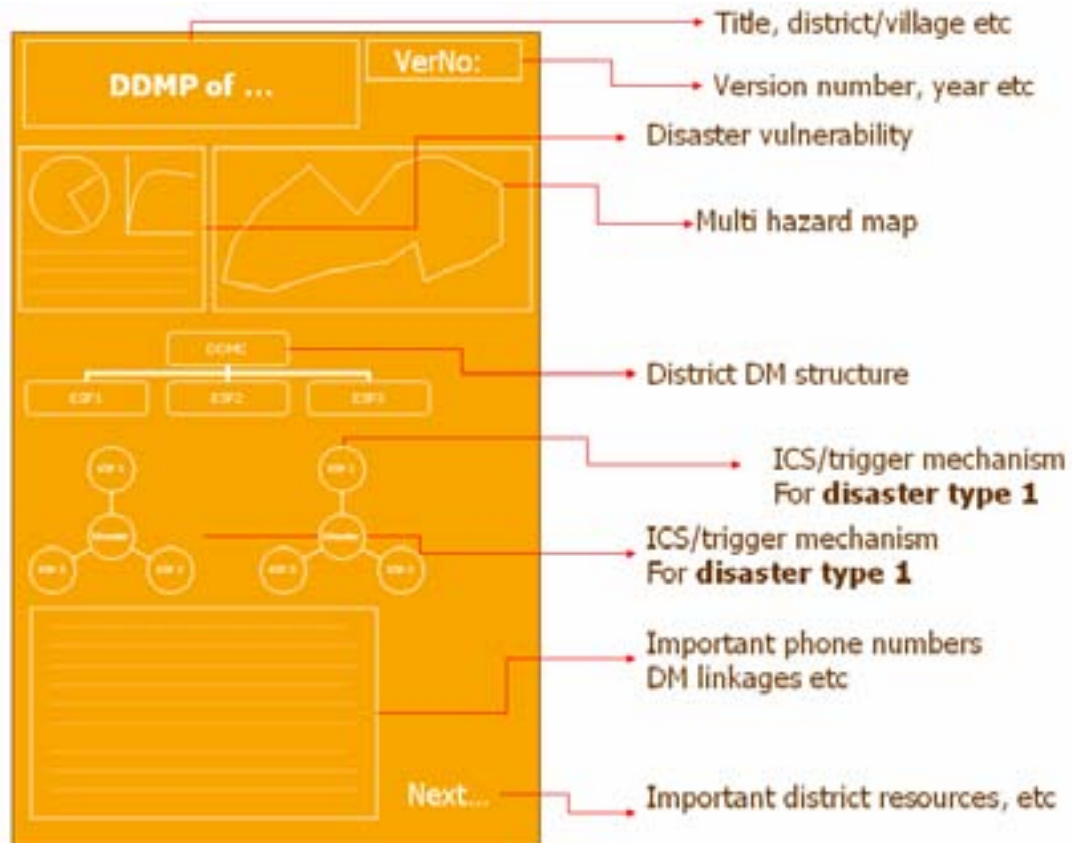
S No	Name	Address	Plan Reviewed	Score²
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6	Kaushik, A. D.	NIDM IIPA Campus, IP Estate, New Delhi-02 011-23702432, 011-23702443, 011-23702442 (F), kaushik@nidm.net	Dhanbad	3
7	Padmanabhan G	UNDP, C-23, Defence Colony New Delhi	Jamnagar	2.5

² The plans were scored in the scale of 1-5 by each participant based on the content and technicality of the analysis and sequencing of the chapters.

S No	Name	Address	Plan Reviewed	Score²
		24332388, 24331425 (O), 9810402937 (M), g.padmanabhan@undp.org	Kendrapara	3
8	Prabhakar SVRK	Project Associate UNDP_GOI Programme NIDM, IIPA Ring Road, New Delhi-02 0-9811299711, sivapuram.prabhakar@undp.org	Cuddalore	3
9	Rajiv Topno	District Collector Bharuch, Gujarat 02642-240600 (O), 02642- 240703 ®, 02642-240602 (Fax), 9825049123 (M) Collector_bha@gujarat.gov.in	Khagaria	3.5
10	Santosh Kumar	Professor Planning and Community Issues NIDM, IIPA Campus, IP Estate New Delhi-02 011-23702432, 011-23702443, 011-23702442 (F), Santosh@nidm.net	Rudraprayag	2
11	Tanmay Kumar	District Collector Kota, Rajasthan 0744-2451200 (O), 0744- 2451100 ®, 2450165 (Fax), 9414181018 (M), tanmay@rajasthan.gov.in, dio- kot@raj.nic.in	Muzaffarpur	3

Annexure III

Indicative layout of the first chapter of DDMP



District - Latur

Introduction

As a part of overall preparedness of the state, the GOM has a State disaster management action plan to support and strengthen the efforts of district administration. In this context every district has evolved its own district disaster management action plan (DDMAP). It is expected that these multi-hazard response plans would increase the effectiveness of administrative intervention.

Multi-disaster Response Plan

The DDMAP addresses the districts' response to disaster situations such as earthquakes, floods, cyclones, epidemics, off-site industrial disasters and roads accidents and fires. Some of these disasters such as floods and earthquakes affect large areas causing extensive damage to life, property and environment while others such as epidemics only affect large populations. In any case, the management of these disasters requires extensive resources and manpower for containment by remedial action.

The present plan is a multiresponse plan for the disasters and outlines the institutional framework required for managing such situations. However, the plan assumes a disaster specific form in terms of the actions to be taken by the various agencies involved in the disaster. The front-end or local level of any disaster response organisation will differ depending upon the type of disaster, but at the level of the back-end i.e., at the controlling level at the district it will almost remain same for all types of disasters.

Objectives

The objectives of District Action Plan are:

- To improve preparedness at the district level, through risk and vulnerability analysis, to disasters and to minimise the impact of disasters in terms of human, physical and material loss
- To ascertain the status of existing resources and facilities available with the various agencies involved in the management of disasters in the district and make it an exercise in capability-building of district administration. This enables the district to face a disaster in a more effective way and builds confidence across different segments of society.. It will be a positive factor for long-term development of the district
- To utilise different aspects of disaster mitigation for development planning as a tool for location and area specific planning for development in the district
- To use scientific and technological advances in Remote Sensing, GIS etc in preparation of this plan with a view to ensure their continuous use for development planning
- To develop a framework for proper documentation of future disasters in the district, to have an update on critical information essential to a plan, to critically analyse and appraise responses and to recommend appropriate strategies
- To evolve DDMAP as an effective managerial tool within the overall policy framework of GOM.

Response to disasters, in the absence of a defined plan, would be arbitrary leading to overemphasis of some actions and absence of other actions which could be critical. The objectives of any disaster management plan should be to localise a disaster and to the maximum extent possible contain it so as to minimise the impact on life, the environment and property. A formal plan for managing disasters is therefore necessary. This would include

- a. pre-planning a proper sequence of response actions
- b. allocation of responsibilities to the participating agencies
- c. developing codes and standard operating procedures for various departments and relief agencies involved
- d. inventory of existing facilities and resources
- e. mechanisms for effective management of resources
- f. co-ordination of all relief activities including those of NGOs to ensure a coordinated and effective response.
- g. co-ordination with the State response machinery for appropriate support.
- h. Monitoring and Evaluation of actions taken during Relief and Rehabilitation

"Outline for Vulnerability Assessment", prepared by CSSD/EMC has been used as the basic instrument to collate district level information to meet the database requirements for the preparation of DDMAP.

Policy Statement

The underlying policy of the DDMAP is to protect life, environment and property while ensuring mitigation of the disaster to the maximum extent possible, relief to those affected and restoration of normalcy at the earliest.

Essentially, communities draw their support from the social institutions, administrative structure, and values and aspirations they cherish. Disasters may temporarily disorganise the social units and the administrative system and disrupt their lives built around these values and aspirations. A systematic effort to put back the social life on its normal course with necessary technology support and resources will contribute significantly to the resilience of the community and nation.

This policy forms the basis of the DDMAP. It aims at capacity building and prompt utilisation of resources in a disaster situation through a partnership of the GOM, NGOs, Private initiatives and the community. In pursuance with this policy, DDMAP addresses itself to strengthening the pre-disaster and post-disaster responses of various actors and stakeholders including the “victims” of the disaster.

Overview of Latur district

Location

- Geographically, Maharashtra is located 16.40 N to 22.10 N and 72.60 E to 80.9 E
- Latur district is located between 17°45' N to 18°45' N and 76°15' E to 77°15' E which essentially indicates that Latur district is located in the Deccan Plateau.
- The adjoining districts are Nanded on the east, Osmanabad on the south-west, Beed on the north-west and in the north Parbhani. It also shares the boundary with Andhra Pradesh on the south-east.

Area and Administrative divisions

- The state of Maharashtra, consisting of 31 districts, is divided in six administrative divisions, namely Konkan, Nashik, Pune, Aurangabad, Amravati, and Nagpur. The divisional headquarters for Latur district is located at Aurangabad.
- The district is divided into 7 talukas (administrative units) and two sub-divisions as per details given below
- Latur district covers an area of 7,372 Sq. Kmtr.

Sub-Divisions	Taluka within the sub-division
Latur	Latur, Ausa and Renapur
Udgir	Udgir, Nilanga, Ahmedpur and Chakur

Physical Features and Land Use Patterns

Soil

The predominant soil cover in the district is medium black to deep black calcareous formed with varying depth and texture.

Land Use

Inhabited area :-	320 sq. km (4.3 %)
Agricultural area :-	6674 sq. km (90 %)
Industrial area :-	17.78 sq. km (0.2 %)
Forest Cover :-	37.42 sq. km (0.5 %)
Wastelands :-	233 sq. km (3.1 %)
Drought Prone areas :-	Whole District

Geology and Geomorphology

Geology

This entire Latur district is covered by the Deccan Trap lava flows of upper cretaceous to eocene age. The traps are overlain by thin alluvial deposits along the major rivers. The geological succession of the area is given below:

Formation	Age	Lithology
Alluvium	Recent	Sandy, clay in nature
Deccan Trap	Upper Cretaceous to Eocene	Amygdular vesicular zeolitic basalt often separated by red bole.

Deccan Trap : The basaltic lava flows belonging to the Deccan Trap is the only major geological formation occurring in the district. The lava flows are horizontal and each flow has distinct two units. The upper layers consists of vesicular and amygdular zeolitic basalt while the bottom layer consists of massive basalt. The flow

thickness ranges between 15-20 mts. And in all 10 flows have been demarcated which are lying between 510-740 m msl. The flows are generally separated by a red clay bed commonly called as 'Red bole'.

Alluvium : The major rivers of the district viz., Manjara, Tirna and Manar have deposited thin alluvium along their course. The alluvium consists of clay and sand. The thickness of alluvium ranges between 10-15 mtrs. The extension of alluvial belt is confined to 0.5-1 km. Across the river.

Lineaments : Number of lineaments which are fracture zones have been identified on the satellite imagery due to linear pattern, exhibited by darker tone and straight drainage course.

These lineaments are favourable for occurrence of groundwater. The major lineament trends in the district are NW-SE, NE-SW and E-W.

Geomorphology

The Deccan Trap lava flow and alluvium occurring along the major rivers are the only major geological formations in the area. The Deccan Traps have given rise to trappean landforms. While the alluvium is forming the alluvial plain of fluvial origin.

Since the Deccan Trap occupies very large part of the district, the trappean landforms occurring in the district have been divided in two groups according to their origin viz., structural and denudational origin. The plateaus are covering the large area of the district which are subdivided in three groups depending upon the degree of dissection.

The different landforms which have been identified on the satellite imagery are described below.

Highly Dissected Plateau (HDP):

The higher elevations with steep to moderate slopes often exposed with hard rocks form the highly dissected plateau (HDP) with high drainage density. As per the image characteristics, the western and southern part of the district covering Latur, Ausa, Nilanga and Ahmadpur talukas are forming the highly dissected plateau. The areas covered HDP are mostly scrub land with or without vegetation.

Moderately Dissected Plateau (MDP):

The areas having moderate slopes with moderate drainage density form the moderately dissected plateau. The large part of the district has this characteristic and thus the moderately dissected plateau is the prominent landform of the district. The soil cover also in this zone is generally moderate with moderately thick weathered zone. The major land use of this landforms is Kharaif or Rabi cropping

Slightly Dissected Plateau (SDP):

The narrow valley along the river Manjara covering small part of Latur and Nilanga taluka is covered by Deccan Trap and has a very gentle slope with low drainage density. Thus these valleys have been classified as slightly dissected plateau.

The area has a good soil cover and thick weathered mantle. The agriculture is the principal land use of the area. The major part of the area has double crop, thus showing intensive agricultural activity.

Denudational Origin

Denudational and Residual Hills : The small isolated hills which are occurring in the district have steep slope and often exposed with hard rock and thus have been classified as denudational hills. The denudational hills are often occupied by scrubs.

Fluvial Origin :

Alluvial Plains : The narrow alluvial belt occurring along the major rivers has been classified as alluvial plains. These plains have a very gentle slope with long drainage density. The agriculture is a principal land use of the area and are mostly double cropped.

Climate and Rainfall

Climate

- Latur faces extreme variations in temperature with very hot summers and very cold winters and a low relative humidity.
- The average maximum temperature is 39.6 degree Celsius
- The average minimum temperature is 13.9 degree Celsius

Rainfall

- Latur district receives rainfall from the South-westerly monsoons mainly in the months of June, July, August and September.
- July, August and September are the months during which the maximum rainfall as well as maximum continuous rainfall occurs.
- The table below shows the average rainfall data

Rainfall	969.8 mm.802.4 mm.124 mm. (Latur taluka on 29.08.96)
Total Annual Rainfall (for 1996)	
Average Rainfall (over the years)	
Maximum Rainfall	

Socio-Economic Features

Demographic Features

According to the 1991 census, the demographic features observed in Latur district are as follows:

Total number of households	:	2,84,000
Total Population	:	16,77,000
Total Male Population	:	8,63,000
Total Female Population	:	8,13,000
Sex Ratio	:	942
Urban Population	:	3,42,000
Rural Population	:	13,35,000
Percentage of Urban population to total population	:	23.31 %
Population density	:	234 per sq. km
Literacy Rate	:	55.57 %
Male Literacy rate	:	70.47 %
Female Literacy rate	:	39.74 %

SC/ST

[Scheduled Castes/Scheduled Tribes are socially handicapped groups listed in the Schedule of the Indian Constitution]

SC percentage : 19.06%

ST percentage : 2.24%

Literacy rate in SC : 34.15 %

Literacy rate in ST : 33.56 %

Slum Population percentage : 16.72 %

Population below poverty line : 69.11 %

Urban and Rural Locations

The main urban and rural centres along with their population are given in the tables below

Urban Centres :- (distinct urban characteristics)

Sr No	Name of the Urban Centre	Population	Population Density	Major Occupational Patterns		
				Agri Labors	Trade & Commerce	Other Services
1.	AHAMADPUR	25878	1426	7.75 %	4.98 %	4.47 %
2.	AUSA	23246	4144	8.58 %	4.97 %	5.72 %
3.	LATUR	197408	9400	1.81 %	7.09 %	6.68 %
4.	NILANGA	24883	993	8.75 %	5.19 %	5.06 %
5.	UDGIR	70453	3438	2.91 %	5.41 %	6.57 %

Major Rural Centres (populations more than (10,00 0)

Sr.No	Name of the Rural Centre	Population	Population Density	Major Occupational Patterns		
				Cultivators	Agri Labors	Other Services
1.	AHAMADPUR TAHASIL NALEGAON (125)	11480	337	12.21 %	17.53 %	2.41 %
2.	AUSA TAHASIL KILLARI (132)	13208	612	7.12 %	21.73 %	4.17 %
3.	CHAKUR TAHASIL CHAKUR (205)	12637	496	8.36 %	16.80 %	6.41 %
4.	LATUR TAHASIL MURUD (167)	15260	509	6.65 %	11.24 %	7.56 %
5.	NILANGA TAHASIL AURAD (SHA) (198)	11065	826	3.55 %	14.93 %	6.76 %
6.	RENAPUR TAHASIL RENAPUR (79)	10132	239	9.77 %	17.22 %	3.13 %

Major Rural Centers (populations BETWEEN (7,000 to 10,00 0)

Sr.No	Name of the Rural Centre	Population	Population Density	Major Occupational Patterns		
				Cultivators	Agri Labours	Other Services
1.	AHAMADPUR TAHASIL KINGAON (13)	7061	262	12.22 %	16.73 %	3.52 %
2.	NILANGA TAHASIL HIRUR ANANTPAL	7302	197	10.57 %	17.93 %	3.62 %
3.	RENAPUR AHASIL PANGAON (62)	8415		9.88 %	17.77 %	3.07 %
4.	UDGIR	9564	260	9.24 %	14.29 %	6.47%
I.	TAHASIL DEVANI (BK)					
.II.	WADWANA (BK) (16)	7181	366	9.76 %	16.88 %	3.61%

Historical and Religious centres

Information on historical and religious centres is compiled to assess the possible influx of large populations on specific occasions and the service demands generated. This is important specifically with respect to administration's response for management of transport, health services, law and order, facilities for food and sanitation in order to control epidemics, road accidents and fires.

Name of the Historical and Religious centre and nearest Urban or Major Rural Centre listed above	Periods of Festive Occasions, Months	Estimated tourist or visiting population
AUSA TQ. 1. AUSA FORT 2. Nilkatheshwer Mandir (Killari)	October August	5,000 10,000 To 15,000
CHAKUR TQ. 1. Hakani Baba yatra (Chakur)	July-August	20,000
LATUR TQ. 1. Shidheshwar Mandir (Latur)	Feb (Seven Days)	1,00,000
NILANGA TQ. 1. Pirpasha Utsav Nilanga	March-April	10,000
RENAPUR TQ. 1. Renukadevi Mandir (Renapur)	Oct-Nov (15 days)	15,000
UDGIR TQ. 1.Dongarshelki (Dhondu tatya) 2. Hawagiswami (Udhir) 3. Udaygiri Fort (Udgir)	July (One Day) January (3 Days) Gudhi Padawa	20,000 10,000 10,000

Seasonal Migration

The pattern of migration in the district along with the main reasons for migration is given below.

Purpose	Area (specify Talukas)	Period (calendar months)	Estimated population in migration
Seasonal Labour Work	Chakur	Nov To May	3000-3500
Seasonal Labour Work	Ausa	Nov to May	1000 -1500
Seasonal Labour Work	Latur	Nov to May	3500-4000

Agriculture and Crop Pattern in the District

Types	Names	Cropping Period in Months	Market (District, State, Export)
Major Crops (Irrigated)	1. Sugarcane	Jan, Feb To Nov, Dec	District
	2. Sun-flower	July To March	"
	3. Wheat	Oct. To March	"
	4. Ground Nut	Jan To May & Jun. To Oct.	"
Major Crops (Non - Irrigated)	1. Jawar	June To Sept.	District
	2. Tur	June To Dec.	"
	3. Mug & Udid	June To Sept.	"
	4. Sunflower	June To Sept.	"
	5. Gram	Oct. To March	"
Major Cash Crops	Cotton	May To Dec.	District
Major Plantations	1. Grapes	Feb To June	District, State & Export
	2. Mango	April To July	District
	3. Ber	Oct To Jan	District & state
	4. Papya	June To March	"

River Systems and Dams Rivers

The main rivers in Latur district are

- Manjra
- Terna
- Rena
- Manar
- Tawarja
- Tiru
- Gharni

Dams and Irrigation Projects

There is at present Manjara dam, a major irrigation project on Manjara river with the catchment area of 2371 sq. km and the target command area is 13625 ha.

Apart from this, the following are the 6 medium projects

Sr No	Location of the project(s)	Taluka	Catchment area, sq. km	Target command area in Ha
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1.	Whati	Ahamadpur	74.17	1356
2.	Tawarja	Latur	248.6	4040
3.	Aurad	Nilanga	31.45	880
4.	Gharni	Nilanga	243.45	2834
5.	Girakchal	Nilanga	40.50	2140
6.	Tiru	Udgir	269.67	3964

**Details on 47 minor projects is given in Annexure IV.
Power Stations and Electricity Installations**

There is no power plant in the district. The distribution of power is managed through 220 KV, 132 KV, 110 KV and 33 KV sub-stations.

Industries

The extent of industrialisation gets reflected by the number of industrial estate and industrial activity and in terms of movement of cargo.

Extent of Industrialisation

- Number of Industrial Estates : 7
- Number of chemical industries/ tank farms : 40
- Total work force in industries : 10025
- Number of pipelines carrying chemicals : 7.
- Number of potentially hazardous locations : Nil
- Number of vehicles carrying hazardous raw materials for industries (during a month) : Nil
- Number of vehicles carrying hazardous products from industries (during a month) : Nil
- Number of vehicles passing through the district carrying hazardous materials for industries (during a month) : Nil
- Number of container terminals : Nil
- Types of Industries : Agrobased, Engineering, Chemical, Sugar factories, Textiles, Food Processing Etc.

The details on each industrial estate and fact sheet on each industry have been attached in Annexure I and Annexure II.

Transport and Communication Network

Road network, Waterways, Railways

- Number of National Highways --
- Length (in Kms) of National Highways --
- State highways (in Kms) 830.85
- ZP roads (in Kms) 3982.26
- Number of bridges on rivers 27
- Number of ST depots 5
- Numbers of villages not accessible by ST 30
- Number of Ports or jetties --
- Number of boats
- Number of railway stations with mail / express halts 6
- Number of railway bridges 116
- Non-electrified railway routes (in Kms) 117.40
- Electrified railway routes (in Kms) --
- Number of unmanned railway crossings 42
- Number of airports/air strips 1

Proposed Development

- New Afforestation : 26.60 sq. Kms area covered
- New area declared as reserved forest/sanctuary : 0.4 (Ausa) sq. Kms area covered

New Industrial Estates Proposed

Name of the industrial estate	Addl. MIDC, Latur	Udgir MIDC
Location of the industrial estate	Latur-Barshi road,latur	Udgir-nanded Road, Udgir

Nearest Urban / Major rural centre	Latur City	Udgir
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Large industries proposed and set-up
Industries Set-up

Name of the industries	Location of the industries	Type of Industries
1.Govt. Milk Scheme	Udgir	Milk Chilling Pant
2. Killari sahakari Sakhar Karkhana Ltd.	Killari Tq. Ausa	Sugar factory
3. Jai jawan jai Kisan sahakari sakhar karkhana Ltd.	Nalegaon tq. Chakur	-do-
4. Manjara shetkari Sah. Sakhar Karkhana Ltd.	Vilasnagar Chincholiwadi,Latur	-do-
5. Mahatma Phule Sah. Soot girni	Coop. Indl. estate, Udgir	Textile Mill
6. Manjara Shetkari Sah. Sakhar karkhana Ltd, Distillary	Vilasnagar Chincholiwadi,Latur	Indl. Alcohol
7. Jawahar Coop. Spg. Mill	Signal camp, Latur	textile Mill
8. Tina Oil & chemicals	G-86 MIDC, Latur	Oil refinery
9. Indira soot girni	MIDC Latur	Textile Mill

Industries Proposed

Name of the industries	Location of the industries	Type of Industries
1.Balaghat Sah. Sakhar Karkhana Ltd.	Charwak Nagar, Ahamadpur	Sugar factory
2. Gore Metal Re-rolling Mill Pvt.Ltd.	MIDC Area , Latur	Steel re-rolling Mill
3. Jai jawan jai Kisan sahakari sakhar karkhana Ltd. Distillary	Lal bahadur Shastr nagar Nalegaon tq. Chakur	Indl. Alcohol
4.Priyadarshani shetkari Sah.Sakhar Karkhana Ltd.	Tondar Tq. Udgir	Sugar factiry
5.S.M.Dye Chem.	MIDC Ausa	
6.Veronica laboratories ltd.	Mahalangra Tq. chakur	Medicinal Formulation
7.Gopal Agro tech.Pvt. Ltd.	S.No. 151 Ausa	Agrotech
8.Central Railway Line	Latur-Miraj	Railway Line

Proposed Irrigation Projects
I. Major Project

Sr No	Name(s) of the dam(s)	Location of the dam(s)	Capacity of the dam(s) in cusecs.	River(s) on which the dam(s) are proposed	Estimated time of completion
1	Lower	Makni Tq.	101.5	Terna	upto

	terna	Omarga			June 1998
--	-------	--------	--	--	-----------

II. Medium Projects

Sr No	Name(s) of the dam(s)	Location of the dam(s) VillageTaluka	Capacity of the dam(s) in Mcusecs.	River(s) on which the dam(s) are proposed	Estimated time of completion
1.	Upper Manar L.I.S.	Sangvi Ahamadpur	-----	Manar	June 2000
2.	Masalaga	Masalaga Nilanga	13.52	local	June 1997
3.	Renapur	Kamkheda Renapur	20.55	Rena	June 2000
4.	sakol	tipral Udgir	10.95	Local	June 1997
5.	Deverjan	devejan Udgir	18.53	Local	june 1997

III. Minor Projects (Future Schemes)

Sr No	Name(s) of the dam(s)	Location of the dam(s) Village Taluka	Capacity of the dam(s) in Mcusecs.	River(s) on which the dam(s) are proposed	Estimated time of completion
1.	Ahamadpur	Ahamadpur Ahamadpur	2.300	Local	June 2000
2.	Anadwadi	Anadwadi Ahamadpur	1.760	Local	June 2000
3.	Chera	Chera Ahamadpur	2.350	Local	June 2000
4.	Guttewadi	Guttewadi Ahamadpur	2.290	Local	June 2000
5.	Jadhala	Jadhala Ahamadpur	2.290	Local	June 2000
6.	kaudgaon	Kaudgaon Ahamadpur	2.420	Local	June 2000
7.	kawalwadi	Kawalwadi Ahamadpur	2.260	Local	June 2000
8.	Kharabwadi	kharabwadi Ahamadpur	2.320	Local	June 2000
9.	wanjarwadi	wanjarwadi Ahamadpur	1.640	Local	June 2000
10.	Yeldari	Yeldari Ahamadpur	2.410	Local	June 2000
11.	Yestar	Yestar Ahamadpur	2.340	Local	June 2000
12.	Chincholi	Chincholi AUSA	3.560	Local	June 2000
13.	Shivali	Shivali AUSA	2.110	Local	June 2000
14.	Chakur	Chakur Chakur	2.390	Local	June 2000
15.	Aurad wanjarkheda	Aurad Nilanga	1.810	Terna	June 2000

16.	Dhondwadi	Dhondwadi	Udgir	2.290	Local	June 2000
17.	Dongraj	Dongraj	Udgir	2.210	Local	June 2000
18.	Sindhi kamath	Sindhi Kamath	Udgir	3.300	Manjara	June 2000

RISK ASSESSMENT AND VULNERABILITY ANALYSIS

Economic, Occupational, Social and Educational Profile of the Population

Economy

- Latur is one of the smaller districts in the state.
- Physical features and land use pattern of the district indicates that agriculture is the main activity of the district. The total agricultural area is approximately 6,674 sq. Km, that is, 90 % of the total area of the district. Latur comes under the low rainfall area with possibilities of drought.
- At the district level major crops consist of cereals (48 %), oilseeds account for 20 %, pulses 12 % and other crops 20 %.
- Grapes are exported whereas other fruits like ber and papaya are sold for district as well as state consumption
- 0.5 % of the total area is under forest cover.
- The distribution of urban and rural population shows that 23.31 % of the population is urban.
- SCs and STs (socially handicapped) account for 19.06 and 2.24 per cent respectively of the total population.
- The overall area for industrial use accounts for only 17. 78 sq. km, that is, 0.2 per cent of the total area.
- The number of main urban centres are 5.
- In these urban centres, the main employment activity is in trade and commerce and services. On an average it accounts for 8-10 per cent of the total population of the centre. The urban population consists of mainly the retired, government employees, students, servicing sector and slum dwellers.
- 16.7 % of the urban population is in the slums and 69.11% of the population is below poverty line.
- The total work force in seven industrial estates is just 10,025 clearly indicating that the industries aren't a major employment avenue. However, in recent years there have been two new industrial estates and eight large industries proposed.
- In terms of population density, Latur is the most densely populated area with a density of 9400 per Km².
- In-migration in the district is essentially for manual or skilled labour for agriculture during the harvest
- There are six historical and religious centres.
- There is a continuous influx of tourist population in the range of one lakh in Latur city in February to Siddheshwar temple. All other places receive around 10,000-20,000 visitors.
- The overall literacy per cent of the district is 55.57 % whereas among the SCs and STs, it is around 34 per cent indicating the vulnerability of the group.

Building Codes Implementation

- In urban areas, only for new constructions, the building codes are being implemented.
- Care is being taken to construct earthquake proof buildings particularly in civic and industrial zone so as to avoid further damage.
- In rural areas building codes are not being implemented since there is no effective controlling authority. However, in the post-Latur earthquake phase, constructions undertaken by the government as well as the NGOs have adopted earthquake resistant technologies in villages wherever resettlement was required. Efforts to promote retrofitting and replacements are being made.
- Gram Panchayats have no technical staff for ensuring implementation of building codes.

Disaster specific proneness.

Floods

Latur district receives very low rainfall and lies in a drought prone area. The frequency of flooding in this district is therefore very low. However, there are two dams Manjara, Terna which have reported flooding in the past through the probability of future occurrence is low. These dams rarely get filled to their storage capacity. In respect to these two dams, Manjara Action Plan and Terna Action Plan have been prepared by the minor irrigation Department. The Villages under the blue zone and red zone have been identified, safe sites for evacuation in case of flooding have been marked and indicated in these plans. Both these plans are in the form of a worst-case Scenario of dam- burst. The action plan is attached to this document. A list of villages close to the banks of rivers is given below. Latur also does not experience any flash flood.

List of villages situated at the bank of rivers in Latur District.

Sr.No	Name of Taluka	Name of River	Name of villages
1.	Latur	1) Terna	-
		2) Manjara	1) Kanadi Borgaon
			2) Sarsa
			3) Wanjarkheda
			4) Ganjur
			5) Karsa
			6) Takli(B)
			7)Jewali
			8) Nagzari
			9) Borwat
			10) Sonwati
			11) Ramjanpur
			12) Dhanegaon
			13) Umbadaga
			14) Shivani(K)
		3) Tawarja	1) Dhakani
			2) Bopali
			3) Ankoli
			4) Dhanori
			5) Shiur
			6) Peth
			7) Chandehwar
			8) Kavha
			9) Sirsi
			10) Selu
			11) Shivani(B)
2.	Ausa	1) Manjra	1) Selu
			2)Shivani(B)
			3) Tondwali
			4) Lodga
			5) Holi
		2) Terna	1) Killari
			2) Mangrul
			3) Sarni
			4) Lohta
			5) Masala(B)
			6) Matola
			7) Kamalpur
			8) Ujani
		3) Tawarja	1) Kavtha
			2) Kalmatha
			3) Uti(B)

			4) Almala
			5) Budhoda
			6) Umbadga
			7) Hasala
			8) Sinadala
			9) Jamalpur
			10) Hipparsoga
			11) Dhanora
			12) Tondwali
			13) Lodga
			14)Holi
			15) Kavtha
3.	Nilanga	1) Manjara	1) Kavtha
			2)Bindgi Hal
			3) Anandwadi
			4)Phakranpur
			5) Wanjarwada
			6) Halki
			7) Dongargaon
			8) Hisamabad
			9) Bibral
			10)Bakli
			11) Baspur
			12) Kolgaon
			13) Sangvi
			14) Ghugi
			15) Shirol
			16) Shiur
			17) Nadiwad
			18) Takli
			19) Chincholi
		2) Terna	1) Aurad (s)
			2) Manejawlga
			3) Sawari
			4) Sonkhed
			5) Chincholi
			6) Jamga
			7) Dadgi
			8) Dhanora
			9) Yelamwadi
			10) Bamni
			11) Pimpal
			12) Ramtirth
			13) Sangvi
			14) Nadihattarga
		3) Gharni	1) Dhamangaon
			2) Lakadjawlga
			3)Shirur(A)
			4) Honmal
			5) Talegaon
			6) Ajani
			7) Sakol
			8) Ghuggi
			9) Sangvi
4.	Udgir	1) Manjara	1) Hisamnagar
			2) Helamb
			3)Dhamngaon
			4) Hanchnal

			5) Takli Bombli
			6) Bolegaon
			7) Anandwadi
			8) Lasona
			9) Batanpur
			10) Gaudgaon
			11) Kumdal
			12) Sindi
			13)Gurnal
			14) Borol
		2) Devarjan	1) Tipral
			2) Sarmapur
			3) Chawan Hipparga
			4) Nagtirthwadi
			5) Kamroddinpur
			6)Nideban
			7) Devani(B)
			8) Sangam
			9) Anchnal
			10)Ajani
			11) Wangdhari
		3) Teru	1) Hali-Handarguli
			2) Tiruka
			3) Shelgaon
			4) Dongraj
			5) Atnoor
5.	Ahmedpur	1) Manyad	1) Khanapur
			2)Kopra
			3) Sonkhed
			4)Mankhed
			5)Wilegaon
			6)Tambat Sangvi
			7) Mawalgaon
			8) Sora
			9) Borgaon
			10) Chisala
			11) Shenkud
			12) Yesta
			13) Takalgaon
			14) Shembi
			15) Shendri
			16) Sonegaon
			17) Ruddha
			18) Rui
			19) Gugdal
			20) Nagdal
			21) Thodga
			22) Tembhurni
			23) Malegaon
			24) Jawalga
		2) Waki	1) Halhani
			2) Nandurga(B)
			3) Kelgaon
			4) Kangavwadi
		3) Gharani	1) Ajansonda
			2) Nalegaon

Earthquakes

According to the MERI report, Latur is proposed in Zone IV, which indicates a very high probability of earthquake proneness. However, the rezoning proposal is yet to be approved. In the meantime, with the assumption that Latur will be in Zone IV and with the experience of 1993 earthquake, building codes and land use and zoning regulations have been actively pursued.

In Latur district, Ausa and Nilanga talukas which have witnessed a major earthquake of the intensity of 6.3 in 1993 are more at risk than the other talukas primarily because of the active faults and the soil structure.

All new constructions in Latur district since 1993 therefore are according to Zone IV norms. Around 1,00,000 houses in the district have been retrofitted. Around a lakh of houses however are old and still at risk. All Government structures and installations have been retrofitted.

[Case study on Latur earthquake is given in Annexure III]

Fires

Only three of the five Municipal Councils in Latur have fire-brigade Services. There has been no study to indicate the main areas prone to fires.

In Latur city, the prone areas are Green market, Gandhi market and the slum areas, the main causes being human negligence and short-circuiting.

The table below gives the number of calls attended by Latur fire brigade since 1994 within and beyond municipal limits.

Year	Calls Attended.
1994	136
1995	126
1996	180
1997	110

Majority of the occurrences are during summer season. Rural areas also report incidences of fire which are attended by the municipal fire brigade. Many a times fire brigade has experienced shortage of water in these areas.

Road Accidents

Due to low traffic volume and absence of heavy chemical tanker traffic (except fuel), road accidents in Latur District are not seen as a major problem. However, the number of recorded road accidents (as given in the table below) with casualties and injuries in the district over the last three years indicate that definite steps will have to be taken to bring down the casualties and the losses.

Year	Casualties	Injured.
1995	141	440
1996	126	588
1997	146	408

The main roads on which these accidents occur along with the accident prone spot have been identified and are given below.

Sr.No	Road	Accident prone area	No. of casualties in 1996
1	Latur-Nanded Road	Ashta near Chakur(river bridge)	23
2	Latur-Umarga Road		16
3	Latur-Nilanga Road	Near Lamjana Near Jau Phata	11
4.	Latur- Barshi Road	Near Ramegaon village Near Manjara Sugar Factory	11
5	Latur-Ambejogai Road	Near Pimpal phata	7
6	Ahmedpur-Udgir Road	Rudha Phata	11
7.	Ausa-Tuljapur Road		8
8	Chakur-Ahmedpur Road		13
9	Nilanga-Ausa Road		8

The main reasons for the accidents have been identified as over-speeding. Majority of accidents have been due to head-on collisions involving jeeps or tourist buses. The PWD has identified road surfaces with improper gradients, roads which need widening and bridges which need strengthening and/or widening.

Road side settlements exist at the following places :

Ahmedpur, Shirur-Tajband, Chakur, Latur, Murud, Nilanga, Killari, Udgir. These areas can be considered as prone due to accidents involving petrol or diesel tankers.

There is also one unmanned railway crossing near Dayanand College in Latur city which is an accident prone spot.

Epidemics

According to the Maharashtra health directory, Latur district is

- Low endemic for cholera
- High endemic for diarrhea diseases. Latur faces diarrheal epidemics every year with 263 deaths in the last ten years.
- Moderately endemic for infective hepatitis.
- The API for Malaria is below 2.

The high-risk villages for epidemics have been identified according to following criteria.

1) Endemic villages, 2) Riverside villages, 3) Remote(Non approachable) villages

The main Epidemic that occurs in Latur are water-borne diseases – mainly attacks of Gastro. This occurs due to improper use of bleaching powder for disinfection of water source as well as due to leakages in distribution system. The water samples tested at the District Health Laboratory, Latur city show a high rate of bacterial as well as faecal contamination. There have been as many as 2000-3000 sporadic cases of Gastro every year. The high-risk villages in the district have been identified and given below. Food poisoning cases have also been reported in Latur city.

Epidemic	Taluka	High-risk villages
1. Gastro.	Latur	Kharola ; Chincholi (B) ; Renapur ; Harwadi ;
	Ausa	Ausa town
	Nilanga	Kelgaon ; Ambulga BK. ; Mane Jawalga ; Mudgad Ekoji ; Aundha ; Kasarsirshi ;
	Udgir	Udgir (Town) ; Dewani (BK.) ; Kodali ; Dongarshelki ;
	Ahmadpur	Wadarwadi ; Sugaon.
2. Infective Hepatitis	Nilanga	Wadhona (BK)

The Taluka wise list of High Risk Villages (non approachable for S.T. Buses) in Latur District are given below.

Latur : 39 villages

Bramwadi ; Hake Tanda ; Basvant Tanda; Sangavi ; Wagholi Wadi ; Andhalgaon ; Indrthana ; Digol Deshpande ; Motegaon ; Lakhamapur ; Davngaon ; Garsuli ; Fardpur ; Tatapur ; Kumbharwadi ; Raywadi; Anandwadi ; Chukarwadi ; Bhandarwadi ; Javilga ; Selu ; Harwadi ; Hanmantwadi ; Pandhari ; Javalga Tanda ; Ramwadi ; Narvatwadi ; Favdewadi ; Bavchi; Bitargaon ; Pimpri; Yeli ; Chikalthana ; Bamni ; Dagadwadi; Ramjanpur ; Aadgaon ; Khopegaon ; Shirshi.

Ausa : 23 villages

Maslga ; Ladwadi ; Utka Tonda ; Jau ; Anandwadi ; Shivani ; Chincholi ; Chalburga ; Krjgaon ; Ramegaon ; Umbdga (B) ; Almala ; Satdharwadi ; Kavtha ; Korngla ; Limbla Tanda ; Yekambi ; Ashiv Tanda; Dhanora ; Jamalpur ; Hasala ; Shindala ; Masurdi ;

Nilanga : 38 villages

Sirsi ; Aoundha ; Mirgali ; Dongargaon ; Hattрга ; Takli ; Kalmugli ; Tgarkheda ; Shedolwadi; Bhoslewadi ; Sunegaonsangvi ; Ambegaon ; Hanmantwadi ; Bujrugwadi ; Gurhal ; Jainur ; Dapka ; Savngira ; Chinchili (Bhar.) ; Bamni ; Shindala ; Anandwadi ; Sumthana ; Dongargaon; Girakchal ; Channachiwadi ; Lahuwadi ; Reddiwadi ; Honmal ; Umardara ; Dagadwadi; Mamdapur ; Tambalwadi ; Haliali ; Chandori ; Tirupatwadi.

Udgir : 47 villages

Dongrwadi ; Waghdi ; Kamalwadi ; Ravangaon ; Neknal ; Shindhi Kumtha ; Batanpur ; Gurnal ; Yenki ; Manki ; Novani ; Honali ; Guttewadi Tanda ; Borgaon ; Nagalgaon ; Tondchir Tanda ; Chilgli ; Bhakaskheda ; Dhotrawadi ; Pendewadi ; Arsnal ; Kumtha ; Shekhapur ; Gangapur ; Dhythna ; Jaknal ; Belskarga ; Nideban ; Netragaon ;

Marsangvi ; Meghapur ; Dhondiwadi ; Waghmaritanda ; Kunnali ; Karanji ; Dhangarwadi ; Panhipparga ; Kavkhed ; Wadhona (Khu) ; Wadgaon ; Chidrewadi ; Hanmnatwadi ; Rohina ; Sendol ; Mandol.

Ahmedpur : 52 villages

Tivghyal ; Tivtghyal ; Mahurwadi ; Kedmuli ; Pimpalwadi ; Takalgaon ; Bhaskarwadi ; Dalwewadi ; Salunkewadi ; Hipparga ; Bramhpuri ; Limbalwadi ; Maharwadi ; Anandwadi ; Bansavargaon ; Ukachiwadi ; Govindwadi ; Nageshwadi ; Hatkarwadi ; Guttewadi ; Kavalewadi ; Narvatwadi ; Borgaon ; Lendegaon ; Vayragad ; Bavalgaon ; Chilka ; Sunegaon ; Bebdewadi ; Kolwadi ; Molvnwadi ; Sirsatwadi ; Hungewadi ; Devkara ; Whatala ; Kalegaon ; Sonkhed ; Mankhed ; Vilegaon ; Makhegaon ; Shindhgi (Bk) ; Mogha ; Ruai ; Sorga ; Vadgaon ; Shindhgi ; Chatewadi ; Sayyadpur ; Kodgaon ; Dongaon ; Hawarga ; Dhorsangavi.

The Talukawise list of High Risk Villages (River Side) in Latur District are given below.

Latur : 25 villages

Kanadiborgaon ; Sarsa ; Wanjarkheda ; Ganjur ; Karsa ; Takali ; Jewali ; Nagazari ; Borwati ; Sonvati ; Ramjanpur ; Dhanegaon ; Umbadga ; Shiwani (Kh) ; Dhakani ; Bopala ; Ankoli ; Dhanuri ; Shiur ; Peth ; Chandeshwar ; Kawa ; Sirshi ; Selu ; Shivani (Bk).

Ausa : 28 villages

Selu ; Shiwani (Kh) ; Todali ; Lodaga ; Hali ; Killari ; Mangrul ; Sarni ; Lohata ; Masala ; Matola ; Kamalpur ; Ujani ; Kawatha ; Kalmatha ; Utti (Bk) ; Almala ; Budhoda ; Umbadga ; Hasala ; Sindala ; Jamalpur ; Hipparsoga ; Dhanora ; Tondewali ; Lodaga ; Hali ; Kawatha.

Nilanga : 39 villages

Bindgihal ; Anandwadi ; Fakranpur ; Wanjarkheda ; Halki ; Dongargaon ; Hisamabad ; Bibril ; Bakali ; Baspur ; Kalga ; Sangwi ; Ghugi ; Shiral ; Shiur ; Nadiwadi ; Takali ; Chinchali ; Aurad ; Mane Jawalga ; Sawari ; Sonkhed ; Jamga ; Dadgi ; Danora ; Yalamwadi ; Bamani ; Pimpala ; Ramtirth ; Nadihattarga ; Shirur Ant. ; Honmal ; Talegaon ; Ajani ; Sakol ; Ghugi ; Sangwi.

Udgir : 29 villages

Hisamnagar ; Helamb ; Dhamangaon ; Hanchanal ; Takali Bombali ; Bolegaon ; Anandwadi ; Lasona ; Batanpur ; Gaudgaon ; Kumtha ; Shindi ; Gurunal ; Borul ; Tipral ; Chawanhipparga ; Nagtirthawadi ; Nideban ; Kamrodhinpur ; Deoni (Bk) ; Songaon ; Anchanal ; Ajani ; Wendari ; Tiruka ; Hali Handurguli ; Shelgaon ; Dongaraj ; Atnoor.

Ahmedpur : 29 villages

Khanapur ; Kopara ; sonkhed ; Mankhed ; Wilegaon ; Tambatsangavi ; Sora ; Mawalgaon ; Borgaon (Kh) ; Shenkur ; Yestar I ; Takalgaon ; Shembi ; Shendri ; Sunegaon ; Sudha ; Gugadal ; Ruai ; Nagadal ; Thodga ; Temburni ; Malegaon ; Jawalga ; Halani ; Nandurga ; Kalegaon ; Kongalwadi ; Anjansoda ; Nalegaon.

The Taluka wise List of High Risk Villages (River Side) in Latur District is given below.

Latur : 25 villages

Kanadiborgaon ; Sarsa ; Wanjarkheda ; Ganjur ; Karsa ; Takali ; Jewali ; Nagazari ; Borwati ; Sonvati ; Ramjanpur ; Dhanegaon ; Umbadga ; Shiwani (Kh) ; Dhakani ; Bopala ; Ankoli ; Dhanuri ; Shiur ; Peth ; Chandeshwar ; Kawa ; Sirshi ; Selu ; Shivani (Bk).

Ausa : 28 villages

Selu ; Shiwani (Kh) ; Todali ; Lodaga ; Hali ; Killari ; Mangrul ; Sarni ; Lohata ; Masala ; Matola ; Kamalpur ; Ujani ; Kawatha ; Kalmatha ; Utti (Bk) ; Almala ; Budhoda ; Umbadga ; Hasala ; Sindala ; Jamalpur ; Hipparsoga ; Dhanora ; Tondewali ; Lodaga ; Hali ; Kawatha.

Nilanga : 39 villages

Bindgihal ; Anandwadi ; Fakranpur ; Wanjarkheda ; Halki ; Dongargaon ; Hisamabad ; Bibril ; Bakali ; Baspur ; Kalga ; Sangwi ; Ghugi ; Shiral ; Shiur ; Nadiwadi ; Takali ; Chinchali ; Aurad ; Mane Jawalga ; Sawari ; Sonkhed ; Jamga ; Dadgi ; Danora ; Yalamwadi ; Bamani ; Pimpala ; Ramtirth ; Nadihattarga ; Shirur Ant. ; Honmal ; Talegaon ; Ajani ; Sakol ; Ghugi ; Sangwi.

Udgir : 29 villages

Hisamnagar ; Helamb ; Dhamangaon ; Hanchanal ; Takali Bombali ; Bolegaon ; Anandwadi ; Lasona ; Batanpur ; Gaudgaon ; Kumtha ; Shindi ; Gurunal ; Borul ; Tipral ; Chawanhipparga ; Nagtirthawadi ; Nideban ; Kamrodhinpur ; Deoni (Bk) ; Songaon ; Anchanal ; Ajani ; Wendari ; Tiruka ; Hali Handurguli ; Shelgaon ; Dongaraj ; Atnoor.

Ahmedpur : 29 villages

Khanapur ; Kopara ; sonkhed ; Mankhed ; Wilegaon ; Tambatsangavi ; Sora ; Mawalgaon ; Borgaon (Kh) ; Shenkur ; Yestar I ; Takalgaon ; Shembi ; Shendri ; Sunegaon ; Sudha ; Gugadal ; Ruai ; Nagadal ; Thodga ; Temburni ; Malegaon ; Jawalga ; Halani ; Nandurga ; Kalegaon ; Kongalwadi ; Anjansoda ; Nalegaon.

In these villages, all types of preventive and curative services are provided with special attention towards disinfection of drinking water sources and checking of water samples.

Industrial and Chemical Accidents

Only one industrial accident has been reported during the last ten years involving only one casualty.

Latur isn't a highly industrialised district. There aren't any hazardous industries present. Only one industry, Tina Oil mill which is an extraction unit having a boiler plant could have an explosion, but since it is in the MIDC industrial estate, no off-site accident can occur.

Even in Udgir, the Maharashtra Dairy Development Board has a huge plant but this is also isolated from residential areas.

There are cotton mills at Latur and Ahmedpur which could lead to fires since the storage is in barracks and therefore a fire could immediately spread. These units in non-industrial estates therefore need to be regulated.

Initially Manjara Sugar Factory did cause some water pollution but a treatment plant has been established now.

1100 ha of land is taken for MIDC area in Barshi which may have chemical and pharmaceutical units.

Most of the industries in Latur are trading units and not much of production activity is taken up. The future growth is expected only of low-polluting plants.

Disaster Probability

According to district administration, the probability of disaster occurrence and the possible intensity of disasters, based on the earlier history is given below.

The possible effects (intensity) of each of the above disaster event on a scale of High/Medium/Low are:

Damage	Earthquake	Floods	Cyclones	Epidemics	Industrial and Chemical Accidents	Fires	Road Accidents
Loss of Lives	Yes	--	--	Yes	--	--	Yes
Injuries	Yes	--	--	--	--	--	Yes
Damage to and Destruction of Property	Yes	Yes	--	--	--	Yes	--
Damage to cattle and livestock	---	--	--	---	---	--	--
Damage to subsistence and crops	--	Yes	--	--	--	--	--
Disruption of life style	Yes	--	--	--	--	--	--
Disruption of community life	Yes	--	--	--	--	--	--
Loss of Livelihood	Yes	--	--	--	--	yes	--
Disruption of services	Yes	Yes	--	--	--	--	--
Damage to infrastructure and/or disruption of government systems	--		--	--	--	--	--
Impact on National Economy	Yes	--	--	--	--	yes	--
Social and Psychological after-effects	Yes	--	--	--	--	--	--

Specific Vulnerability of Systems and Services to Disaster Events

Specific Vulnerability of	Vulnerable to						
	Earthquakes	Floods	Cyclones	Epidemics	Fires	Road Accidents	Industrial & Chemical Accidents
Transport systems (road network)	Yes	--	--	--	--	--	--
Transport systems (rail network)	--	--	--	--	--	--	--
Power supply	Yes	Yes	Yes	--	--	--	--
Water supply	yes	Yes	--	yes	--	--	--
Sewage	Yes	--	--	--	--	--	--
Hospitals	--	---	--	Yes	--	--	--
Food stocks and supplies	--	--	--	--	--	--	--
Communication systems (telecommunication)	Yes	Yes	Yes	--	--	Yes	--

Ranking and Probability of Disaster Episodes in the District

Event	Ranking of events in terms of past occurrence		Probability of future occurrence	
		High	Medium	Low
Earthquake	First	Yes	--	--
Floods	Second		Yes	--
Cyclones	--	--	--	--
Epidemics	Third	--	Yes	--
Industrial and Chemical Accidents	--	--	--	--
Fires	Fifth	--	Yes	--
Road Accidents	Fourth	Yes	--	--

Annexure I

Information on Industrial estates

Name of the Industrial Estate	Location in the form of an address	No. of industries in the estate	No. of Major Hazardous and Polluting Industries	Total Work Force in Industries
1. Latur MIDC	Latur - barshi Road Latur	210	--	1540
2. AUSA MIDC	Latur-Ausa road, AUSA	--	--	--
3. Nilanga mini MIDC	Nilanga	--	--	--
4. Ahamadpur Mini MIDC	Ahamadpur-nanded Road, Ahamadpur	--	--	--
5. Latur coop. Indl. Estate Latur	Signal Camp Latur	46	--	323
6. Udaygiri coop. Indl. Estate, Udgir	Loni, Udgir	40	--	281
7. Chakur coop. Indl. Estate Chakur	Chakur	7	--	47

Annexure II Information on major hazardous industries for each industry

1.

- | | | |
|--|----|--|
| I. Factory identity | :- | Veronica Laboratories Ltd. |
| II. Address | :- | W-3 & 4 M.I.D.C. Latur |
| III. Location (mention the industrial estate if applicable) | :- | MIDC LATUR |
| IV. Contact Persons | :- | Shri Harshad Seth Chapsi, M.D.
Chapsi Lane, H.No. 24/52 Latur ph. no. 45715 |
| V. Principle activity(ies) for each plant | :- | Mfg of Medicinal formulation. |
| VI. Inventory of the hazardous chemicals (raw materials, intermediate products, final products and wastes) | | |

Name of the Chemical	Quantity stored	Storage method and mode	Quantity of chemical in the processing system
Paracetamol	1.5 Ton	RCC Room	15 K.L.
Trymethoprim	100 Kg	"	
Sulfa methoxazole	500 Kg	"	50 Kg
Gentamicine Sulphide	100 Kg	"	
Protine Hydrocycete	2 Ton	"	

VII. Consequences of major hazards from storage for each chemical

NO HAZARDOUS

VIII. Consequences of major hazards from processing

NO HAZARDOUS

IX. Physical range of consequences

Storage	Manufacturing
The area of influence (in sq.km) as well as the names of villages within that area for each chemical should be clearly indicated.	The area of influence (in sq.km) as well as the names of villages within that area for each chemical should be clearly indicated.

NIL NIL

X. An inventory of personal protective equipment in the factory premises Used the fire fighting equipments and medical first aid.

XI. Action required

- Fire brigade - action required to be taken by the fire brigade including the names and telephone numbers of contact persons.
- Shri A.K. Sutar Latur Ph. No. 43101
- Police service - action required to be taken by the police including the names and telephone numbers of contact persons.
- Shri Shivajirao Kamble, PSI MIDC Latur Ph. No. 43199
- Medical Services - action required to be taken by the medical services including the names and telephone numbers of contact persons and hospitals.
- Dr. M.L. Sathe ,C.S. ,Civil Hospital,Latur Ph No. 42199
- Communication services - action required to be taken by the railways, airports and bus services including the names and telephone numbers of contact persons in each case.
- Shri Deshmukh, Stand Incharge Latur Ph. No. 43015

XII. Estimated Response time

Within 15 Minutes

XIII. Layouts of the plants (to be updated as and when expansions/modernization occur)

Layout enclosed

XIV. Chemical pipe line

I. Foodgrain hexane 50 Mtrs. length width 2.5 inch

XV. Transportation : by approved transport- One truck

XVI. Parking :- Open space

3.

I. Factory identity :- TINA OIL & CHEMICALS

II. Address :- G-75 to 85 MIDC Latur Ph. No. 42206

III. Location (mention the industrial estate if applicable) :- MIDC Latur

IV. Contact Persons

Shri B.M.Nayar, Factory manager, New Adarsh colony, Latur ph. 45768

V. Principle activity(ies) for each plant

Mfg. of Edible oil & D-oiled cake

VI. Inventory of the hazardous chemicals (raw materials, intermediate products, final products and wastes)

Name of the Chemical	Quantity stored	Storage method and mode	Quantity of chemical in the processing system
Hexane	80 MT	MS Tank Undergrounnd	30 Tons

VII. Consequences of major hazards from storage for each chemical

NO HAZARDOUS

VIII. Consequences of major hazards from processing

NO HAZARDOUS

IX. Physical range of consequences

Storage	Manufacturing
The area of influence (in sq.km) as well as the names of villages within that area for each chemical should be clearly indicated.	The area of influence (in sq.km) as well as the names of villages within that area for each chemical should be clearly indicated.

NIL

NIL

X. An inventory of personal protective equipment in the factory premises Used the fire fighting equipments and medical first aid.XI. Action required

- Fire brigade - action required to be taken by the fire brigade including the names and telephone numbers of contact persons.
- Shri A.K. Sutar Latur Ph. No. 43101
- Police service - action required to be taken by the police including the names and telephone numbers of contact persons.
- Shri Shivajirao Kamble,PSI MIDC Latur Ph. No. 43199
- Medical Services - action required to be taken by the medical services including the names and telephone numbers of contact persons and hospitals.
- Dr. M.L. Sathe ,C.S. ,Civil Hospital,Latur Ph No. 42199
- Communication services - action required to be taken by the railways, airports and bus services including the names and telephone numbers of contact persons in each case.
- Shri Deshmukh,Stand Incharge Latur Ph. No. 43015

XII. Estimated Response time

Within 20 Minutes

XIII. Layouts of the plants (to be updated as and when expansions/modernization occur)

Layout enclosed

XIV. Chemical pipe line

I. Hexane 100 Mtrs. length width 0.75 inch

XV. Trasportation : by authorised transporter (8 Trucks)

XVI. Parking :- Open space

4.

I. Factory identity :- MARUTI FERTOCEM FACTORY LTD.

II. Address :- A-71/1 MIDC Latur Ph. 44611

III. Location (mention the industrial estate if applicable) :- MIDC Latur

IV. Contact Persons

Shri Birajdar Ramesh,M.D.New Adarsh Coleny, Latur Ph. 42511

V. Principle activity(ies) for each plant

Mfg. of Fertilizers

VI. Inventory of the hazardous chemicals (raw materials, intermediate products, final products and wastes)

Name of the Chemical	Quantity stored	Storage method and mode	Quantity of chemical in the processing system
MOP	500 Ton	RCC room	600 Kg
Dia amonium			
Phospet	1000 Ton	-do-	1200 Kg
Urea	1000 Ton	-do-	1200 Kg
Single Super			
Phospet	500 Ton	-do-	600 Kg
Nimcake	50 Ton	-do-	60 Kg

VII. Consequences of major hazards from storage for each chemical

NO HAZARDOUS

VIII. Consequences of major hazards from processing

NO HAZARDOUS

IX. Physical range of consequences

Storage	Manufacturing
The area of influence (in sq.km) as well as the names of villages within that area for each chemical should be clearly indicated.	The area of influence (in sq.km) as well as the names of villages within that area for each chemical should be clearly indicated.

NIL

NIL

X. An inventory of personal protective equipment in the factory premises Used the fire fighting equipments and medical first aid.

XI. Action required

- Fire brigade - action required to be taken by the fire brigade including the names and telephone numbers of contact persons.
- Shri A.K. Sutar Latur Ph. No. 43101
- Police service - action required to be taken by the police including the names and telephone numbers of contact persons.
- Shri Shivajirao Kamble, PSI MIDC Latur Ph. No. 43199
- Medical Services - action required to be taken by the medical services including the names and telephone numbers of contact persons and hospitals.
- Dr. M.L. Sathe ,C.S. ,Civil Hospital,Latur Ph No. 42199
- Communication services - action required to be taken by the railways, airports and bus services including the names and telephone numbers of contact persons in each case.
- Shri Deshmukh, Stand Incharge Latur Ph. No. 43015

XII. Estimated Response time

Within 15 Minutes

XIII. Layouts of the plants (to be updated as and when expansions/modernization occur)

Layout enclosed

XIV. Transportation : by authorised transporter (305 Trucks)

XVI. Parking :- Open space

5.

I. Factory identity :- SHRI CHEM INDUSTRIES

II. Address :- A-4, MIDC Latur

II. Location (mention the industrial estate if applicable) :- MIDC Latur

IV. Contact Persons

Shri Ashok Namdeo badade A-4, MIDC, Latur

V. Principle activity(ies) for each plant

Mfg. of Paints & Varnish

VI. Inventory of the hazardous chemicals (raw materials, intermediate products, final products and wastes)

Name of the Chemical	Quantity stored	Storage method and mode	Quantity of chemical in the processing system
Rosine	12000 Kg	RCC Room	100 Kg
Turpentine	12000 Kg	-do-	100 Kg
Color Pigment	600 Kg	-do-	5 Kg
(all)	7200 Kg	-do-	100 Kg
Alkyed Resine	600 Kg	-do-	100 Kg
Titanium Dioxide			

VII. Consequences of major hazards from storage for each chemical

NO HAZARDOUS

VIII. Consequences of major hazards from processing

NO HAZARDOUS

IX. Physical range of consequences

Storage	Manufacturing
The area of influence (in sq.km) as well as the names of villages within that area for each chemical should be clearly indicated.	The area of influence (in sq.km) as well as the names of villages within that area for each chemical should be clearly indicated.

NIL NIL

X. An inventory of personal protective equipment in the factory premises Used the fire fighting equipments and medical first aid.

XI Action required

- Fire brigade - action required to be taken by the fire brigade including the names and telephone numbers of contact persons.
- Shri A.K. Sutar Latur Ph. No. 43101
- Police service - action required to be taken by the police including the names and telephone numbers of contact persons.
- Shri Shivajirao Kamble, PSI MIDC Latur Ph. No. 43199
- Medical Services - action required to be taken by the medical services including the names and telephone numbers of contact persons and hospitals.
- Dr. M.L. Sathe ,C.S. ,Civil Hospital,Latur Ph No. 42199
- Communication services - action required to be taken by the railways, airports and bus services including the names and telephone numbers of contact persons in each case. Shri Deshmukh, Stand Incharge Latur Ph. No. 43015

XII. Estimated Response time

Within 15 Minutes

XIII. Layouts of the plants (to be updated as and when expansions/modernization occur)

Layout enclosed

XIV. Chemical pipe line

NIL

XV. Transportation : by Truck (22)

XVI. Parking :- Open space

6.

I. Factory identity :- Issulal Panchabhyi Daruwala

II. Address :- S.No. 169 Baroda road AUSA dist Latur

III. Location (mention the industrial estate if applicable) :-

IV. Contact Persons

Shri I.P. Daruwala At. po. AUSA dist Latur

V. Principle activity(ies) for each plant

Mfg. of Autom Bombs, laxmi Tota etc.

VI. Inventory of the hazardous chemicals (raw materials, intermediate products, final products and wastes)

Name of the Chemical	Quantity stored	Storage method and mode	Quantity of chemical in the processing system
Sodium	1 Ton	Tin Shed	20 Kg
Berium Nitrate	0.75 Ton	-do-	20 Kg
Sulphur	0.50 Ton	-do-	15 Kg
Paro powder	10 Drum	-do-	5 kg
Dicting	150 Kg	-do-	2.5 kg
Iron powder	0.50 Ton	-do-	10 Kg

VII. Consequences of major hazards from storage for each chemical

FIRE HAZARDOUS

VIII. Consequences of major hazards from processing

FIRE HAZARDOUS

IX. Physical range of consequences

Storage	Manufacturing
The area of influence (in sq.km) as well as the names of villages within that area for each chemical should be clearly indicated.	The area of influence (in sq.km) as well as the names of villages within that area for each chemical should be clearly indicated.
10 M. Radius	10 M. Radius

X. An inventory of personal protective equipment factory premises Used the fire fighting equipments and medical first aid.

XI. Action required

- Fire brigade - action required to be taken by the fire brigade including the names and telephone numbers of contact persons.
- Shri A.K. Sutar Latur Ph. No. 43101
- Police service - action required to be taken by the police including the names and telephone numbers of contact persons.
- Shri A.D. shirsagar,PSI, AUSA Ph. No. 22036
- Medical Services - action required to be taken by the medical services including the names and telephone numbers of contact persons and hospitals.
- Dr. Dudhale ,medical supdt. ,Gramin Rugnalaya AUSA Ph No. 22046
- Communication services - action required to be taken by the railways, airports and bus services including the names and telephone numbers of contact persons in each case.
- Shri Lakal patil,Depo Manager,AUSA Ph. 22049

XII. Estimated Response time

Within 20 Minutes

XIII. Layouts of the plants (to be updated as and when expansions/modernization occur)

Layout enclosed

XIV. Chemical pipe line

NIL

XV. Transportation : by Trucks (1)

XVI. Parking :- Open space

7.

I. Factory identity :- Manjara Shetkari Sahakari Sakhar karkhana Ltd.

II. Address :- Vilas nagar,Chincholiraowadi tq & dist. Latur

III. Location (mention the industrial estate if applicable) :- IV. Contact Persons

Shri B.B. Thombre,M.D. Ph. 43292

V. Principle activity(ies) for each plant

Mfg. of Sugar

VI. Inventory of the hazardous chemicals (raw materials, intermediate products, final products and wastes)

Name of the Chemical	Quantity stored	Storage method and mode	Quantity of chemical in the processing system
Lime	50 Ton	AC Shed	5 Ton
Sulphur	50 Ton	-do-	1.5 Ton
Biocide	1 Ton	-do-	25 Ton

VII. Consequences of major hazards from storage for each chemical

NO HAZARDOUS

VIII. Consequences of major hazards from processing

NO HAZARDOUS

IX. Physical range of consequences

Storage	Manufacturing
The area of influence (in sq.km) as well as the names of villages within that area for each chemical should be clearly indicated.	The area of influence (in sq.km) as well as the names of villages within that area for each chemical should be clearly indicated.

NIL

NIL

X. An inventory of personal protective equipment factory premises Used the fire fighting equipments and medical first aid.

Gum Boots,Hand Gloves,mask,Fire fighting equipments,water fire fighting,fire Brigade And ambulance are available with factory.

XI. Action required

- Fire brigade - action required to be taken by the fire brigade including the names and telephone numbers of contact persons.

Shri A.K. Sutar Latur Ph. No. 43101

- Police service - action required to be taken by the police including the names and telephone numbers of contact persons.
- Shri Shivajirao Kamble, PSI MIDC Latur Ph. No. 43199
- Medical Services - action required to be taken by the medical services including the names and telephone numbers of contact persons and hospitals.
- Dr. M.L. Sathe, C.S., Civil Hospital, Latur Ph No. 42199
- Communication services - action required to be taken by the railways, airports and bus services including the names and telephone numbers of contact persons in each case.

Shri Deshmukh, Stand Incharge Latur Ph. No. 43015

XII. Estimated Response time

Within 20 Minutes

XIII. Layouts of the plants (to be updated as and when expansions/modernization occur)

Layout enclosed

XIV. Chemical pipe line

Lime 40 Mtrs length width 2 inch

sulphur gas 20 Mtrs length width 6 inch

XV. Transportation : by Authorised Transporters (11 Trucks)

XVI. Parking :- Open space

8.

I. Factory identity :- Manjara Shetkari Sahakari Sakhar karkhana Ltd.

II. Address :- Vilas nagar, Chincholiraowadi tq & dist. Latur

III. Location (mention the industrial estate if applicable) :-

IV. Contact Persons

Shri S.J. PAWAR, Distilary Incharge, at. Po. Karkhana site Ph. 43292

V. Principle activity(ies) for each plant

Mfg. of Industrial Alcohol

VI. Inventory of the hazardous chemicals (raw materials, intermediate products, final products and wastes)

Name of the Chemical	Quantity stored	Storage method and mode	Quantity of chemical in the processing system
Sodium meta Bisulphate	1 Ton	AC Shed	50 Kg
Dia amonium Phosphet	1 Ton	-do-	15 Kg
Terkey red oil	2 Ton	-do-	180 Kg

VII. Consequences of major hazards from storage for each chemical

NO HAZARDOUS

VIII. Consequences of major hazards from processing

IX. Physical range of consequences

Storage	Manufacturing
The area of influence (in sq.km) as well as the names of villages within that area for each chemical should be clearly indicated.	The area of influence (in sq.km) as well as the names of villages within that area for each chemical should be clearly indicated.

1) If the alcohol tax fires it covers one square Kilo Meter Area.

2) If explosion of gas takes place it covers minimum 2-3 sq mtrs area.

An inventory of personal protective equipment factory premises Used the fire fighting equipments and medical first aid.

Gum Boots, Hand Gloves, mask, Fire fighting equipments, water fire fighting, fire Brigade And ambulance are available with factory.

XI. Action required

- Fire brigade - action required to be taken by the fire brigade including the names and telephone numbers of contact persons.
- Shri A.K. Sutar Latur Ph. No. 43101

- Police service - action required to be taken by the police including the names and telephone numbers of contact persons.
- Shri Shivajirao Kamble, PSI MIDC Latur Ph. No. 43199
- Medical Services - action required to be taken by the medical services including the names and telephone numbers of contact persons and hospitals.
- Dr. M.L. Sathe ,C.S. ,Civil Hospital,Latur Ph No. 42199
- Communication services - action required to be taken by the railways, airports and bus services including the names and telephone numbers of contact persons in each case.

Shri Deshmukh, Stand Incharge Latur Ph. No. 43015

XII. Estimated Response time

Within 20 Minutes

XIII. Layouts of the plants (to be updated as and when expansions/modernization occur)

Layout enclosed

9.

I. Factory identity :- Killari Shetkari Sahakari Sakhar karkhana Ltd.

II. Address :- Ramanand tirth Nagar, killari ,Tq. ausa dist. Latur Ph. 3525

III. Location (mention the industrial estate if applicable) :-

IV. Contact Persons

Shri A.S. Kadam ,M.D., at. Po. factory Site

V. Principle activity(ies) for each plant

Mfg. of Sugar

VI. Inventory of the hazardous chemicals (raw materials, intermediate products, final products and wastes)

Name of the Chemical	Quantity stored	Storage method and mode	Quantity of chemical in the processing system
Sulphur	200 Ton	RCC Room	500 Kg
Lime	600 Ton	-do-	2 Ton
Eartho Phosferic	10 Ton	-do-	50 Kg
Hydrosulphic Of soda	1 Ton	-do-	5 Kg

VII. Consequences of major hazards from storage for each chemical

NO Hazadous

VIII. Consequences of major hazards from processing

NO HAZARDOUS

IX. Physical range of consequences

Storage	Manufacturing
The area of influence (in sq.km) as well as the names of villages within that area for each chemical should be clearly indicated.	The area of influence (in sq.km) as well as the names of villages within that area for each chemical should be clearly indicated.
NIL	NIL

X. An inventory of personal protective equipment factory premises Used the fire fighting equipments and medical first aid.

Gum Boots, Hand Gloves, mask, Fire fighting equipments, water fire fighting, fire Brigade And ambulance are available with factory.

XI. Action required

- Fire brigade - action required to be taken by the fire brigade including the names and telephone numbers of contact persons.
- Shri A.K. Sutar Latur Ph. No. 43101
- Police service - action required to be taken by the police including the names and telephone numbers of contact persons.
- Shri B.G. Ingewad, PSI Killari ,Ph. 3573
- Medical Services - action required to be taken by the medical services including the names and telephone numbers of contact persons and hospitals.
- Dr. V.R. Patil ,medical Supdt., Gramin Rugnalaya, Killari ,Ph. 3507

- Communication services - action required to be taken by the railways, airports and bus services including the names and telephone numbers of contact persons in each case.

Shri lakal Patil, Depo Manager, AUSA, Ph. No. 22049

XII. Estimated Response time

Within 20 Minutes

XIII. Layouts of the plants (to be updated as and when expansions/modernization occur)

Layout enclosed

XIV. Chemical pipe line

Lime 40 ft length, width 4 inch

sulphur gas 20 ft length, width 6 inch

XV. Transportation : by Authorised Transporters (85 Trucks)

XVI. Parking :- Open space

10.

I. Factory identity :- Jay Jawan Jay Kisan Shetkari Sahakari Sakhar karkhana Ltd.

II. Address :- S.No. 24 to 26 Lal bahadur Shastri Nagar, Nalegaon

tq. Chakur, dist. Latur Ph. 6526

III. Location (mention the industrial estate if applicable) :-

IV. Contact Persons

Shri S.M. Pulate, Chief Chemist, At.Po. factory Site

V. Principle activity(ies) for each plant

Mfg. of Sugar

VI. Inventory of the hazardous chemicals (raw materials, intermediate products, final products and wastes)

Name of the Chemical	Quantity stored	Storage method and mode	Quantity of chemical in the processing system
Lime	500 Ton	AC Shed	500 Kg
Sulphur	150 Ton	-do-	50 Kg
Phosphoric Acid	10 Ton	RCC	5 Kg
Anti scalant	4 Ton	Room	5 Kg
Hydrosulphate of soda	1 Ton	-do-	1 Kg
		-do-	

VII. Consequences of major hazards from storage for each chemical

NO HAZARDOUS

VIII. Consequences of major hazards from processing

NO HAZARDOUS

IX. Physical range of consequences

Storage	Manufacturing
The area of influence (in sq.km) as well as the names of villages within that area for each chemical should be clearly indicated.	The area of influence (in sq.km) as well as the names of villages within that area for each chemical should be clearly indicated.

NIL

NIL

X. An inventory of personal protective equipment factory premises Used the fire fighting equipments and medical first aid.

Gum Boots, Hand Gloves, mask, Fire fighting equipments, water fire fighting, fire Brigade And ambulance are available with factory.

XI. Action required

- Fire brigade - action required to be taken by the fire brigade including the names and telephone numbers of contact persons.
- Shri A.K. Sutar Latur Ph. No. 43101
- Police service - action required to be taken by the police including the names and telephone numbers of contact persons.
- Shri G.D. Kolekar, PSI Chakur, Ph. No. 52040

- Medical Services - action required to be taken by the medical services including the names and telephone numbers of contact persons and hospitals.
- Dr. Nelage, PHC nalegaon, Ph No. 6542
- Communication services - action required to be taken by the railways, airports and bus services including the names and telephone numbers of contact persons in each case.
Shri Deshmukh, Stand Incharge Latur Ph. No. 43015

XII. Estimated Response time

Within 20 Minutes

XIII. Layouts of the plants (to be updated as and when expansions/modernization occur)

Layout enclosed

XIV. Chemical pipe line

Lime 20 fts length, width 4 inch

sulphur gas 15 fts length, width 4 inch

XV. Transportation : by Authorised Transporters (70 Trucks)

XVI. Parking :- Open space

11.

I. Factory identity :- latur Zilla Sah. Doodh Utpadak & Purvatha Sangh Maryadit, Udgir

II. Address :- P.no. 142/B2 CO-OP.INDL.Estate Loni ,tq. Udgir

III. Location (mention the industrial estate if applicable) :-

IV. Contact Persons

Shri V.R.Patil ,M.D., Coop. Indl. Estate, Loni , Tq. Udgir

V. Principle activity(ies) for each plant

Milk Chilling

VI. Inventory of the hazardous chemicals (raw materials, intermediate products, final products and wastes)

Name of the Chemical	Quantity stored	Storage method and mode	Quantity of chemical in the processing system
Amonia Liquid	300 Kg	MS Tank RCC Room	1 Kg
Sulphuric Acid	1000 kg	RCC Room	3.2 Kg
Any Alcohol	50 Ltrs	-do-	0.32 Kg
Absolute Alcohol	5 ltrs	-do-	
Rosalic Acid	1 Ltrs	-do-	
Resorsinal Powder	2 Ltrs		

VII. Consequences of major hazards from storage for each chemical

HAZARDOUS

VIII. Consequences of major hazards from processing

HAZARDOUS

IX. Physical range of consequences

Storage	Manufacturing
The area of influence (in sq.km) as well as the names of villages within that area for each chemical should be clearly indicated.	The area of influence (in sq.km) as well as the names of villages within that area for each chemical should be clearly indicated.

Gas Leakage hazardous Udaygiri

C.I.E. Udgir

Gas Leakage hazardous Udaygiri

C.I.E. Udgir

X. An inventory of personal protective equipment factory premises Used the fire fighting equipments and medical first aid.

NIL

XI. Action required

- Fire brigade - action required to be taken by the fire brigade including the names and telephone numbers of contact persons.
- Shri A.K. Sutar Latur Ph. No. 43101
- Police service - action required to be taken by the police including the names and telephone numbers of contact persons.
- Shri S.M. Gute, police Inespector, Udgir Ph. No. 52003

- Medical Services - action required to be taken by the medical services including the names and telephone numbers of contact persons and hospitals.
- Dr. Swami , Medical Supdt. udgir. , Ph No. 52336
- Communication services - action required to be taken by the railways, airports and bus services including the names and telephone numbers of contact persons in each case.
- Shri Mane , depo Manager , Udgir Ph. 52156

XII. Estimated Response time

Within 20 Minutes

XIII. Layouts of the plants (to be updated as and when expansions/modernization occur)

Layout enclosed

XIV. Chemical pipe line

Amonia gas 400 Ft length width 1/2 inch

XV. Transportation : by Transport dealer (11 Tempos)

XVI. Parking :- Open space

Annexure III Case study of Major disaster episodes in the district

Annexure III: Case Study of Major disaster: Earthquake in the district									
Type of Episode	:	Earthquake							
Location	:	The centre of Earthquake was near Village Killari in Ausa Taluka About 45 Kms from district Headquarters.							
Date	:	30-09-1993							
Reasons assigned for the event	:	Sliding of Rocks of linearments.							
Warning Systems used	:	The incident was not predicted, hence Warning system could not be used.							
Assessment of administrative preparednes:	The Administrative machinery.Machinery was put on the job only after the incidence.								
Area Affected (number of villages)	:	1] Fully -- 27 2] Partly -- 728 Total -- 755							
Extent of Damage –									
1. Houses damaged	:	1,26,701							
2. Loss in Rupees	:	111.40 crores							
Number of lives lost	:	Male	:	600					
		Female	:	1092					
Loss of Cattle	:	Ox	Cow	buffaloes	Goat	Sheep	Ass	Total	
		408	607	844	3840	270	4	5973	

Damage to Infrastructure (specify infrastructure)

Roads admeasuring 16455 Kms length was damaged. In addition to this 802 public Buildings like schools, Gram panchayats, Samaj Mandirs Etc. suffered damage.

Procedures followed for assessing various types of damages and the compensation norms used

Detailed panchnama's specifying damages on various counts were drawn with the help of Revenue machinery.

Department wise break-up of the expenditure incurred on relief and rehabilitation

Name of Department	Type of Relief/Compensation and rehabilitation	Expenditure
1. Revenue Department	1. land Acquisition	346.41
	2. temp.water supply	262.47
	3. Repairs & Strenthening of Houses	3175.93
	4. recon. of Houses	340.49
	5. Constructon of Houses	3026.38
	6. Civic amenities	68.04
	7. C.M. Relief fund	1327.55
	8. Misc Expenditure	988.09
2. Zilla parishad	Repairs of wells ued for irrigation	27.77
	Pilot strenthening	11.394
3.Social forestry Dept.	Block plantation	35.70
	Courtyard plantation	2.82
	Roadside plantation	1.18
	Smritiven	1.75
4. Animal husbandry Dept.	Distibution of cattles	206.35
5. M.S.E.B.	Electrification	271.67
6. Env.Engg.dept.	Permanent water supply sc	1627.21
7. Agri Dept.	Distri. of agri. Equipments	518.36
8. Industries Dept.	Distri. of equipments to Artisans & Businessman	73.45
9. P.W.D.	Rep. & Recon. or build-ings	1064.82
	Rep. & Recon of Roads	1179.50
10. Horticulture Dept.	Holticulture developements	10.78
11. Archological Dept.	Rep. of Horti. monuments	11.46
12. Irrigation Dept.	Rep. To the Project &	

Organizational Structure evolved to manage the emergency – specify the key departments involved

Revenue machinary was pressed into service for drawing panchnamas of damage on various counts. The armed forces ,the police,the Homegurds, etc were Summoned to remove the debris & rescue those who were burried and injured.The health Dept. & various Social organisations volunteetred to take care of thoe injured & needed medical help , officials from agril.industry Dept. were asked to asses 7 record the damage to standing crops,small scale industries and implements used by the farmers,rural artisans Etc.Cattles & treat cattles injured in the earthquake. the staff of PWD.ENE,irrigation Dept. took up the work of restoring electric supply, water supply providing temprary sheds for essential services and infrastructure.

Nature of support from the State and Central authorities,

From State Government : the state goverment has provided all technical,financial personnel suport for temporarily setting the people immediately after the earthquake at safer place. now the state goverment has taken up hudge programme of relocation of Villages within were situated on the earthquake prone areas and also repairs & strenthening of houses damaged in the earthquake dated 30-09-1993.

Methods used for mobilizing resources, NGO/Community Response,

During the relief and rescue operations various social organisations ,Associations,citizens,forein agencies provide help in term of personel foodgrains,vehicles,daily belongigs,money material for temporey settlements etc. Various donar organisations have built & donated houses in consultation with state Govt. for permenent resettlement of the earthquake affected villages. the state Govt. has mobilised loan from various international organisations like world Bank,ODA Etc for the same purpose.

Legal or Procedural bottlenecks experienced in managing the situation,

Initially it was difficult to evolve uniform criterion for classifying the villages so as to proceed with the permanent resettlement. But in due course after taking guidance from technical experts and after giving serious thought a uniform criterion was evolved. The finalisation of criterion number of villages were selected for consideration. The people in villages which were deleted after verification have approached various courts and was a massive job to defend all those cases in various courts. Actual work had one time look to stand still due to these cases. Then the Honorable Supreme Court was requested to stay all these proceedings till 6/97. Honorable Supreme Court was convinced and the problem was solved, temporarily at least to 6/96. Now the work is in progress.

The decision about the type, design and implementation. Various alternatives were considered and uniform type needs of the local people was evolved. As regards the liability of grants of houses the criterion was evolved after considering the testing various options. There were no set patterns available on this count.

Lessons learnt by officials and communities in dealing with disaster along with specific suggestions for improving procedures

Lessons Learnt : The earthquake cannot be predicted, there is no area which can be identified as earthquake proof. This natural calamity is not specific in occurrence i.e. no specific time can be given. The earthquake takes place at mid night when people have no chance to defend themselves. The earthquake destroys all infrastructure, houses etc., As the supply of electricity with the water are out of order. It is very difficult to carry out relief operations in these areas.

Suggestions : There is a general and earnest need to create awareness about precautions to be taken before during the earthquake, all the areas where people and cattle live. It is necessary to have relief and rescue machinery always at all levels including Village tahasil and Dist. level. Machinery, equipment and trained personnel are necessary for removing debris and rescuing people in earthquake. In the absence of this one cannot save many lives in earthquake loss to infrastructure, houses can be avoided by building them quake proof.

Annexure IV Minor Irrigation Projects Completed

Sr No	Location of the project(s) Taluka	Taluka	Catchment area, sq. km	Target command area in Ha
1.	Bhutekarwadi	Ahamadpur	35.74	809
2.	Dhanora Bandra	Ahamadpur	--	253
3.	Dhorsangvi	Ahamadpur	19.04	474
4.	Gotala	Ahamadpur	17.61	701
5.	Mogha	Ahamadpur	70.00	1255
6.	Nagthana	Ahamadpur	69.00	1578
7.	Sonkhed	Ahamadpur	14.17	476
8.	Sukani	Ahamadpur	13.70	793
9.	Apachunda	Ausa	43.65	594
10.	Belkund	Ausa	28.16	486
11.	Chincholi (J)	Ausa	23.75	523
12.	Chincholi (T)	Ausa	75.06	689
13.	Karla	Ausa	11.81	255
14.	Malkondji	Ausa	12.43	378
15.	Nanand	Ausa	16.04	598
16.	Sarola	Ausa	33.79	664
17.	Shivani K.T.W.	Ausa	---	465
18.	Somdurga	Ausa	18.17	388
19.	Tungi	Ausa	62.31	526
20.	Wanwada	Ausa	14.58	289
21.	Bothi	Chakur	---	429
22.	Devangarwadi	Chakur	---	486
23.	Ganjur	Chakur	12.56	350
24.	Shivankhed	Chakur	---	468
25.	Zari	Chakur	10.88	455
26.	Chikurda	Latur	13.30	351
27.	Garsuli	Latur	23.56	489
28.	Gondegaon	Latur	27.65	708
29.	Kasarkheda K.T.W.	Latur	46.45	373

30	Nivali	Latur	---	379
31	Wasangaon	Latur	18.20	445
32	Hadga	Nilanga	9.83	359
33	kasarbalkunda	Nilanga	20.09	668
34	Kedarpur	Nilanga	18.41	364
35	Madansuri K.T.W.	Nilanga	---	289
36	Malegaon	Nilanga	26.94	668
37	Pandharwadi	Nilanga	14.68	385
38	Shedol	Nilanga	16.18	607
39	Sonkhed	Nilanga	---	259
40	Arasanal	Udgir	8.29	365
41	Deoni bandra	Udgir	---	486
42	Ekurka	Udgir	9.84	422
43	Kallur	Udgir	8.42	277
44	Keshkarwadi	Udgir	8.13	268
45	Nagalgaon	Udgir	10.47	303
46	Pimpari	Udgir	18.10	767
47	Takali K.T.W.	Udgir	65.71	337



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