WEST BENGAL
CRISIS MANAGEMENT PLAN
2014
Part-I

Department of Disaster Management,

<u>INDEX</u>

CHAPTER I:
INTRODUCTION

This plan will be known as "West Bengal State Crisis Management plan" and will be applicable in state of West Bengal.

Different parts of West Bengal are vulnerable to the natural calamities like Flood, Cyclone including hailstorm & kalbaishakhi, Earthquake, Landslide, Drought and Erosion. In fact, the Multi Hazard coupled with High Risk zones exist across the State.

Apart from these natural hazards there are chances of man-made crisis like major fire, industrial accidents, terrorist attacks etc.

West Bengal has 19 Districts covering 66 Sub-divisions, 341 Blocks, 127 Municipalities, 3354 Gram Panchayats, 40782 Mauzas, 37945 inhabited villages, 375 towns and 463 Police Stations (includes 42 G.R.P. for Sealdah, Howrah and Siliguri). The total area of the state is 88,752 sq Km having a dense population of more than 80 million people of which about 72% live in the Rural areas covering 85427.26 sq Km, i.e., 96% of the total geographical area and the population density is 1209 per square kilometer.

This plan is being formulated in the context of both natural and man-made crisis to tackle the multi-hazard vulnerabilities and is based on the factors like ever-growing population, the vast disparities of income, rapid urbanization, increasing industrialization, development within high risk zones, environmental degradation, climate change, state and national security, economy and sustainable development.

Policy: Saving of human lives will be at the highest priority, however this plan will also address minimum loss of property and environment.

Theme:
The central themes of this State Crisis Management Plan are as follows:
- To study the vulnerability of different parts of the state to different kinds of crisiss
- The measures to be adopted for prevention and mitigation of crisiss.
- The manner in which mitigation measures shall be integrated with development plans and projects, i.e., mainstreaming of Crisis Management.
- The capacity building and preparedness measures to be taken.
- The roles and responsibilities of each department of the government of the state in relation to the measures specified above.
- The roles and responsibilities of different departments of the government of the state in responding to any threatening crisis situation or crisis.
- Methodologies for the annual review and updating of the state plan.
- Appropriate provisions for financing the measures to be carried out under the

state government.
- Availability to the departments of the government of the state and provision and methodology of such departments to draw up their own plans in accordance with the state plan.

1.2 Objectives of the Plan:

Crisis Management Plan shall include Hazard Risk and Vulnerability Analysis (HRVA), response plan and procedures. An indicative list with possible plan objectives is given below:

- To identify the areas vulnerable to major types of the hazards in the State.
- To adopt proactive measures at State level by all the govt. departments to prevent crisis and mitigate its effects.
- To define and assign the different tasks and responsibilities to stakeholders during the pre-crisis and post-crisis phases of the crisis.
- To enhance crisis resilience of the people in the State by way of capacity building.
- Reduce the loss of public and private property, especially critical facilities and infrastructure, through proper planning.
- Manage future development to mitigate the effect of natural hazards in the State.
- To strengthen an Emergency Operations Centre at the State level to function effectively in search, rescue, response.
- To develop the standardized mechanism to respond to crisis situation to manage the crisis efficiently.
- To set up the early warning system so as to prepare the community to deal with the crisis and responsive communication system based upon fail-proof proven technology.
- To prepare the response plan based upon the guidelines issued by NDMA so as to provide prompt relief, rescue and search support in the crisis affected areas.
- To adopt crisis resilient mechanism in the State by way of using Information, Education and Communication for making the community aware of the need of crisis resilient development.
- To make the use of media in crisis management.

1.3 Scope of the Plan:

The State Crisis Management Plan provides a consistent, statewide framework to enable state, local, governments, Central government and the private sector to work together to respond at the time any emergencies regardless of cause, size, location, or complexity. In accordance with the NDMA / SDM Act (if any), this plan is in effect at all times and applies to all levels of state government and its administrative subdivisions district/Blocks/Local Bodies. The plan incorporates and complies with the principles and requirements found in National and state laws, regulations and guidelines.
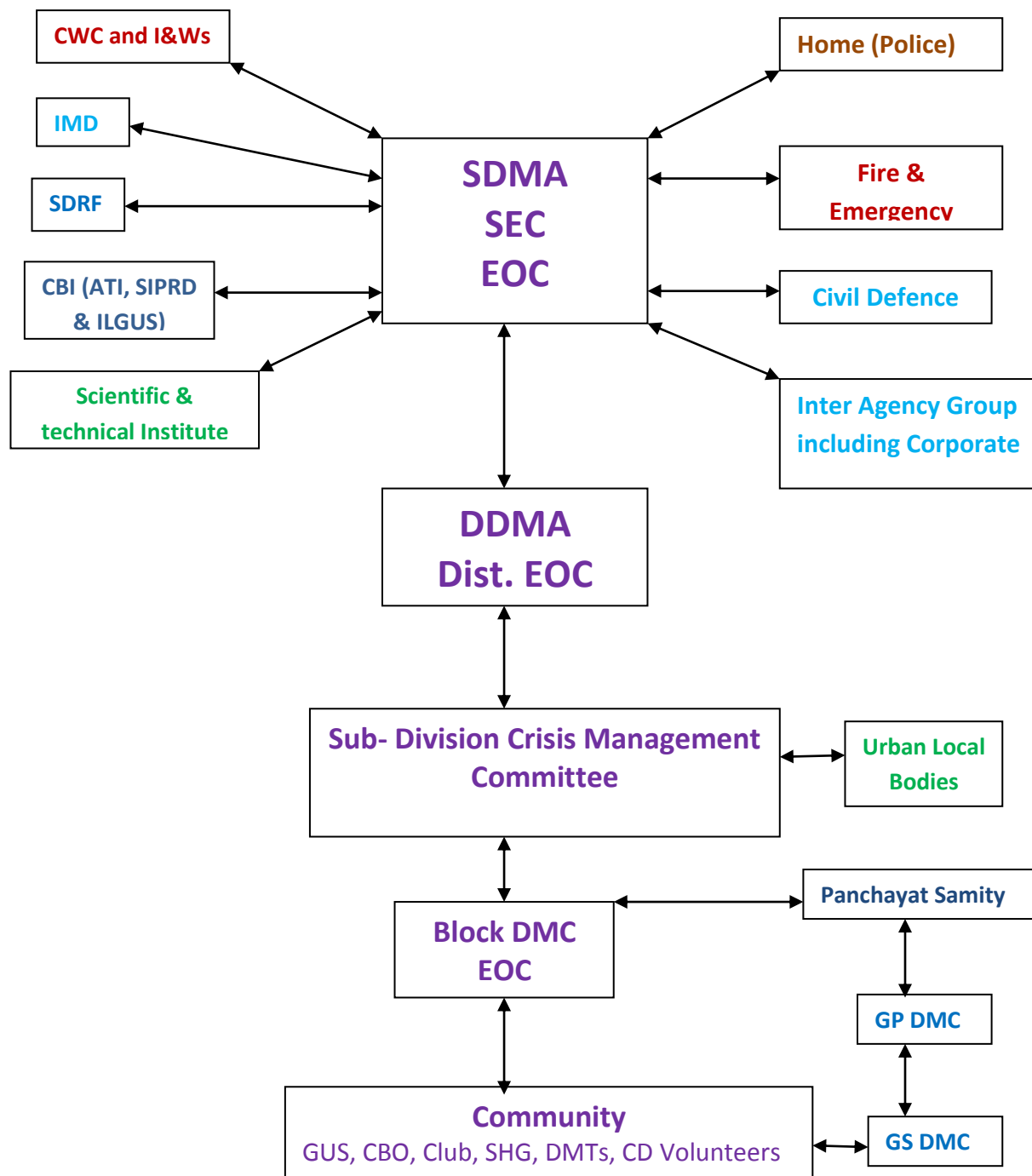
The scope is applicable to the whole Geographical Jurisdiction of West Bengal and it includes Corporation, Municipality, Sub Division, Block including three tier Panchayati Raj System upto Gram Sansad level. The Plan comprises all concerned Department's crisis management plan and is applicable to all the Departments of West Bengal.

1.4 Institutional Arrangements, Roles and Responsibilities

The Crisis Management Act 2005 provides the legal and institutional framework for crisis management in India at the national, state and district levels. In the National polity of India the primary responsibility of crisis management vests with the State Governments. The Central Government lays down policies and guidelines and provides technical, financial and logistic support while the district administration carries out most of the operations in collaboration with central and state level agencies.

1.4.1 West Bengal Disaster Management Structure

West Bengal DM Structure

CWC and I&Ws

IMD

SDRF

CBI (ATI, SIPRD & ILGUS)

Scientific & technical Institute

SDMA SEC EOC

Home (Police)

Fire & Emergency

Civil Defence

Inter Agency Group including Corporate

DDMA Dist. EOC

Sub- Division Crisis Management Committee

Urban Local Bodies

Block DMC EOC

Panchayat Samity

GP DMC

Community
GUS, CBO, Club, SHG, DMTs, CD Volunteers

GS DMC

1.4.2 State Disaster Response Force (SDRF):

Seven Companies from West Bengal SAP Battalion (State Armed Police) and three from Kolkata Police have been working as State Crisis Response Force (SDRF). These companies of SAP Bns. are currently located at Raiganj, Barrackpore, Krishnagar, Siliguri and Barjora (Bankura). Three Company strength of Crisis Management Group (DMG) of Kolkata Police has been operating in Kolkata with full equipments. Both State and Kolkata Police Search and Rescue teams have been equipped. Further fund is being provided for strengthening the teams and equipping more teams. The following table depicts the aspects of SDRF and DMG, Kolkata.

Date of Constitution	No. of Companies	No. of personnel	Location
SDRF from West Bengal State Armed Police (SAP)			
Police Order No. 16/2009 & 01/2013 dated 18.01.2013	07	Each company comprises 81 police personnel i.e. **Total: 567**	1. SAP 4th Bn. Kasba, Raiganj 2. SAP 6th Bns. Barrrackpore 3. SAP 8th Bn. Barrackpore 4. SAP 7th Bn. Asansol 5. SAP 9th Bn. Sandhya, Krishnagar 6. SAP 10th & 12th Bns. Siliguri 7. SAP 13th Bn. Barjora, Bankura
Crisis Management Group under Kolkata Police			
14.05.2002	1. Water Wing 2. CSSSR & MFR Wing 3. Tree Cutting Team	Inspector – 01, Subedar – 02, ASI – 03, Sepoy – 78, HG – 65, GP – 27 **Total - 176**	Police Training School (PTS) 247 AJC Bose Road, Kolkata - 7000278

1.4.3 State Emergency Operation Centre (EOC): EOC is an off-site facility functioning from State / District HQ. The EOC will take stock of the emerging situation and assist the incident managers in mobilising the respective line department's resources, manpower and expertise along with appropriate delegated authorities for the on-scene actions / response. State EOC will keep the DEOC and field EOC informed of the changing situation and support extended. Emergency communication, alert and warning system, decision support system, and resources management system are few of critical components inbuilt into State EOC

infrastructures. The basic functions of EOC, derived on the basis of functional framework of crisis management would be to:

- Receive, monitor, and assess crisis information.
- Keep track of available resources.
- Monitor, assess, and track response units and resource requests.
- Manage resource deployment for optimal usage.
- Make policy decisions and proclaim local emergencies as needed.
- Provide direction and management for EOC operations through Standard Operations Guide (SOG), set priorities and establish strategies.
- Coordinate operations of all responding units, including law enforcement, fire, medical, logistics etc.
- Augment comprehensive emergency communication from EOC to any field operation when needed or appropriate.
- Maintain EOC security and access control.
- Provide recovery assistance in response to the situations and available resources
- Keep senior, subordinate and tenant officials informed.
- Keep local area (Village/town/City, district and State) informed.
- Operate a message centre to log and post all key crisis information.
- Develop and disseminate public information warnings and instructions.
- Provide information to the news media.
- Manage donation / aids.

State EOC is seamlessly connected with National EOC on up-stream and with all District EOC on downstream.

1.4.4 District Disaster Management Authority (DDMA): Each DDMA will be headed by the respective District Magistrate, District Collector (DC), Dy. Commissioner as the case may be, with the elected representative of the Local Authority as the Co-Chairperson. DDMA will act as the planning, coordinating and implementing body for Crisis Management at District level and take all necessary measures for the purposes of Crisis Management in accordance with the Guidelines laid down by the NDMA and SDMA. It will, inter alia, prepare the District plan for the District and monitor the implementation of the National Policy, the State Policy, the National Plan, and the State Plan concerning its own District and prepare the District Plan. The DDMA will also ensure that the Guidelines for prevention, mitigation, preparedness and response measures lay down by NDMA and SDMA are followed by all Departments of the State Government, at the District level and the Local Authorities in the District.

1.4.5 Local Authorities:
Local Authorities would include Panchayati Raj Institutions (PRIs), Municipal Corporations, Municipalities, District and Cantonment Boards and Town Planning Authorities which control and manage civic services. These bodies will prepare Crisis Management Plans in consonance with the Guidelines of NDMA, SDMAs and DDMAs and will ensure capacity building of their officers and employees for managing crisis, carry out relief, rehabilitation

and reconstruction activities in the affected areas.

1.4.6   Trust / Organisations managing Places of Worships & Congregation

Each establishment / organization identified as "critical infrastructure and key resource", including places of congregation in the state of West Bengal prepare and implement "on-site" and "off-site" Crisis management plan in consultation with respective DDMA. Carry out mitigation, response, relief, rehabilitation and Reconstruction activities.

1.4.7 Private Sector:

- The private sector is being encouraged to ensure their active participation in the pre-crisis activities in alignment with the overall plan developed by the SDMA
- They adhere to the relevant rules regarding prevention of crisis, as may be stipulated by relevant authorities in the State.
- As a part of CSR undertakes Response projects in consultation with State / District Authority for enhancing State's resilience.

1.4.8 Community Groups and Volunteer Agencies:

- Local community groups and voluntary agencies including NGOs normally have active role in prevention and mitigation activities under the overall direction and supervision of the SDMA or DDMA.
- They should be encouraged to participate in all training activities as may be organized and should familiarize themselves with their role in State crisis management.

1.4.9 Citizens:

It is the duty of every citizen to assist the State agency engaged in crisis management whenever demanded generally for the purpose of crisis management.

Chapter 2
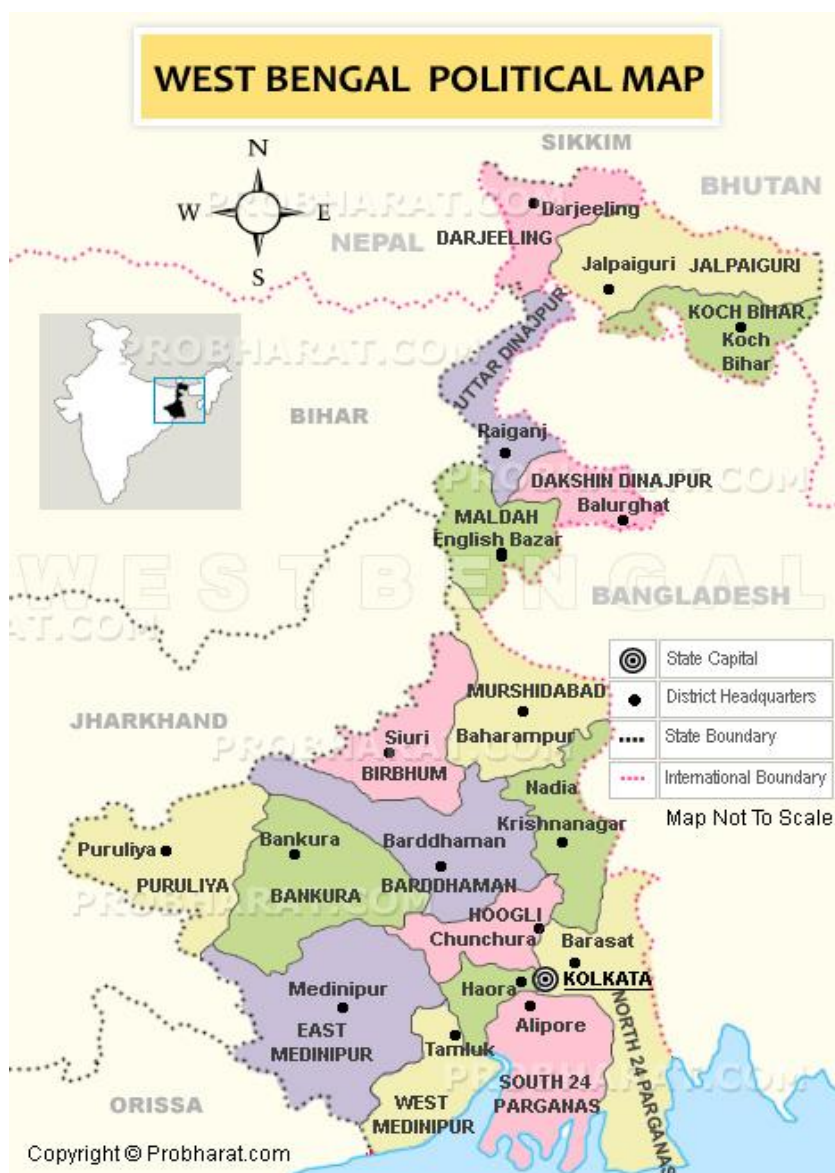**Hazard, Risk and Vulnerability profile of West Bengal**

2.1   **State Profile**
Date of formation of West Bengal   15th August 1947

2.1.1   Geography:

The state is located on the eastern part of India

Area	88,752 sq Km
Latitude	21°30' N & 27° 30' N
Longitude	85° 30' E & 89°45'E
Geographical Regions	• The hill region in the north • The Terai and Teesta alluvial region of North Bengal • The lateretic, red and gravely undulating region in the west • The coastal alluvial region in the south • The gangetic alluvial region in the west • The Vindhya alluvial region in the centre
Connected States/ UTs	• Jharkhand, Bihar, Orissa, in the west • Assam in the east • Sikkim in the north
Major Rivers	• Torsa, Mahananda, Teesta, Fulahar, Mechi-Balasan, Tangon, Jaldhaka, Raidak, (North Bengal) • Churni, Jalangi, Ichhamati, Bhagirathi, Pagla-basloi, Bhrammani-Dwarka, Mayurakshi, Punarbhaba, Attrayee, Damodor, Subarnarekha (South Bengal)
Mountains	North-Western side of the state of West Bengal is covered by the Himalayan mountain range.
Forest	• Recorded forest area in the state is 11,879 km^2 which is 13.38% of the state's geographical area. • Reserves, protected and unclassed forests constitute 59.4%, 31.8% and 8.9%, respectively, of the forest area. • Part of the world's largest mangrove forest, the Sundarbans, is located in southern West Bengal. • West Bengal has 3.26% of its geographical area under protected areas comprising 15 wildlife sanctuaries and 5 national parks[51] — Sundarban National Park, Buxa Tiger Reserve, Gorumara National Park, Neora Valley National Park and Singalila National Park.
Coastlines	350 km

2.1.2 Demography

Population	91347736
Male population	46927389
Female population	44420347
Sex Ratio	947 females per 1000 males
Population Density	1029/KM^2
Rural Population	About 68.13% of the population
Urban Population	About 31.87% of the population
Decadal Growth Rate	13.93%
Birth Rate (Rural)	19.00 per 1000 population
Birth Rate (Urban)	12.1 per 1000 population
Death Rate (Rural)	6.1 per 1000 population
Death Rate (Urban)	6.4 per 1000 population
Infant Mortality Rate(IMR)	31 per 1000 population
Growth Rate	11.1 per 1000 population
Effective Literacy Rate	77.08%

2.1.3 Administrative Profile

No. of Districts	19
No. of Zilla Parisads	18
No. of Sub Divisions	66
No. of Blocks	341
No. of Panchayat Samity	333

No. of Municipalities	126
No. of Corporations	06
No. of Gram Panchayats	3239
No. of Mouzas	40782
No. of Villages	4782
No. of Towns	375
No. of Police Stations	502(including 42 G.R.P.s)

2.1.4 Languages:

Official Primary Language	Bengali
Other languages spoken	English, Hindi, Nepali, Urdu, santhali.

2.1.5 Agriculture: Agriculture is the leading occupation in West Bengal. Rice is the state's principal food crop. Rice, jute, sugarcane and wheat are the top crops of the state. Tea of Darjeeling and Duars is also an important crop.

Area under principal Crops in West Bengal (In thousand hectares)

Sl. No.	Type of Crops	Area
1	Cereals	5365
2	Pulses	197
3	Fibres	576
4	Spices	75
5	Vegetables & Misc. Crops	14

Source : Directorate of Agriculture (Estimation Wing) GoWB -2010-2011

2.1.6   Animal Husbandry & Livestock

Sl. No.	Particulars	No. in thousand
1	Cattle	20607
2	Buffalo	666
3	Others	21820
4	Poultry	97463

Source : Directorate of Live Stock, GoWB, 2010-2011

A) Milk production: 4660 (000 tonnes)
B) Fish production: 13746 lakh tonnes
C) Egg production :4001 Million
D) Fishing boats: 29733 (13622 Mechanised)

2.2. History of Vulnerability
Followings are the records of large FLOODS in West Bengal:

Period	Description
1978	Major flood, affected 13 districts, 1370 human lives were lost, damaged about 14 lakh houses.
1986	Flooding due to heavy rains in some areas of Kolkata, Hooghly, Howrah, 24-Parganas and Midnapore
1988	Monsoonal rains caused flooding in areas of Balurghat and Dinajpur lying under the purview of the Ganges and Churani rivers.
1991	Flash floods caused damage 35,000 houses
1995	Flooding triggered by heavy rains caused erosion, severe agricultural damage and outbreak of diseases
1998	Monsoon rains caused flooding of the Ganges river
1999	Tropical cyclones caused destruction of an estimated number of 1500 villages. Floods due to brief torrential rains affected areas of Kolkata, Burdwan and Birbhum
2000	Besides flash floods triggered by incessant torrential rains, crisis is also accredited to the opening of sluice gates of dams. The fatalities counted to the tune of 1262, besides affecting millions of people.
2002	Flooding in Jalpaiguri, Cooch Behar and Jalpaiguri in north Bengal due to monsoonal rains. Flash floods swamped ten villages, causing four deaths and 11,000 displacements
2003	Monsoonal rains caused floods affecting the regions of Darjeeling, Jalpaiguri, Malda and Murshidabad
	Heavy monsoonal rains affected several districts
2005	Heavy rains caused floods in many areas. About 3000 coastal villages were inundated and 60,000 huts and many roads washed away.
2005	Heavy monsoon rains triggered flash floods and landslides
2006	The regions of Birbhum, Burdwan and Murshidabad were affected mainly from continuous monsoonal downpour
2006	Monsoonal rains and tropical cyclone-driven storms in the Bay of Bengal hit India and Bangladesh. West Bengal recorded 50 deaths, 300 were injured and 30,000 mud houses destroyed. Heavy rains left large parts of Kolkata city under water; subsequently 2000 people were evacuated from the city.
2007	The hazard affected Kolkata and several other districts. 83 deaths were reported, and millions of people were marooned in 3000 villages in coastal areas of the state
2007	Heavy rain from tropical depression in the Bay of Bengal caused flooding leading to 51 deaths, and affecting 3.2 million people
2013	Moderate flood occurred in 4 districts, affected 21 lakhs population, 84720 houses were damaged

Following Table provides the information for damaging cyclones in West Bengal from 1900 A.D.

Period	Description
18–29/09/1916	Extensive damage reported; however, no estimation of
14–16/10/1942	About 5 m high surge reported at Midnapur (64 km upstream in Hooghly River). Overall 15,000 deaths reported.
29/05/1956–01/06/1956	Caused flooding in Midnapur District, and also damage to agriculture due to saline water intrusion
13–20/08/1974	Cyclonic storm over land with maximum wind speed of 139 kmph caused floods in several districts. Seven deaths reported.
12–11/09/1976	About 2.5 m high surge along with 1.4 m tide caused 40 deaths.
27/09/1971–01/10/1971	Sixty people died and thousands of houses collapsed.
24–28/09/1981	Caused loss of five launches in the Bay and damage to many houses in Midnapur District.
09–14/10/1984	Caused damage in Midnapur district.
23–27/05/1989	Sixty-one persons died and thousands of cattle perished.
12/11/2002	Caused 78 deaths along with the destruction of agricultural crops and property.
25/05/2009	Cyclone AILA , caused huge damage to the North 24 Pargans, South 24-Parganas, Purba Midnapur and Kolkata . Death tolled to 146
12/10/2013	Cyclone caused by Phailin. Death of 17 persons in the District Purba Midnapur, Paschim Midnapur and Burdwan.

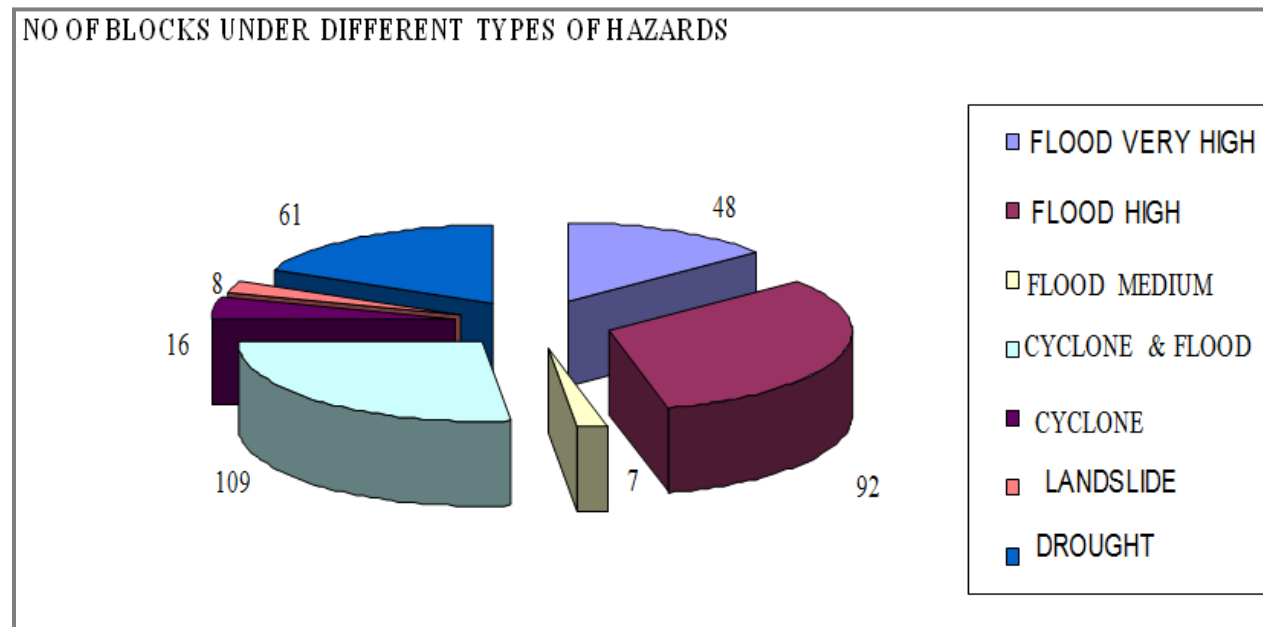| History of fatal Fire Accidents in West Bengal :	
12.10.10	Stephen Court fire death-43
12.10.11	AMRI fire death-92

Interaction of hazards & people's vulnerability

Vulnerability analysis is developed from a range of socio-economic approaches to hazards. Vulnerability analysis begins with the acceptance that it is often part of normal, becoming apparent and obvious to some only with the impact of hazard. It is vital to recognise that vulnerability should be treated as a condition of people that derives from their political-economic position.

The initial development of vulnerability analysis is rooted in social science and has constituted a political economy of crisis. The focus of vulnerability analysis should be on its political determinants and their effects in differentiating people into groups that are differentially exposed to risk and not simply structures that happen to be in places where a particular hazard (or various hazards) is likely to strike. This means that vulnerability analysis is complex and dependent on large data sets, and on qualitative analysis that requires the involvement of people connected in the evaluation of their vulnerability.

NO OF BLOCKS UNDER DIFFERENT TYPES OF HAZARDS:

NO OF BLOCKS UNDER DIFFERENT TYPES OF HAZARDS

Legend:
- FLOOD VERY HIGH
- FLOOD HIGH
- FLOOD MEDIUM
- CYCLONE & FLOOD
- CYCLONE
- LANDSLIDE
- DROUGHT

Values shown: 61, 8, 16, 109, 48, 7, 92

2.3. Assessment of Vulnerability and Risk Analysis due to Natural Hazards in West Bengal

2.3.1 : <u>GEOLOGICAL VULNERABILITY</u>

<u>EARTHQUAKE</u>

Seismic Profile of West Bengal: The seismic zonation map (2002) as prepared by Bureau of Indian Standard shows:

- Eastern section of northern districts of Jalpaiguri and Coochbehar lie in Zone –V
- The remaining part of these two districts, along with the districts of Darjeeling, Uttar Dinajpur, Dakshin Dinajpur, Malda, 24 Paraganas (south & north) lie in Zone – IV
- The rest of the state along with Kolkata lies in Zone – III expect some portions of Purulia, Bankura and Paschim Medinipur.
- Small part of Purulia, Bankura and Medinipur lies in Zone – II.

It is also found from seismic map that two fault lines run through the state.
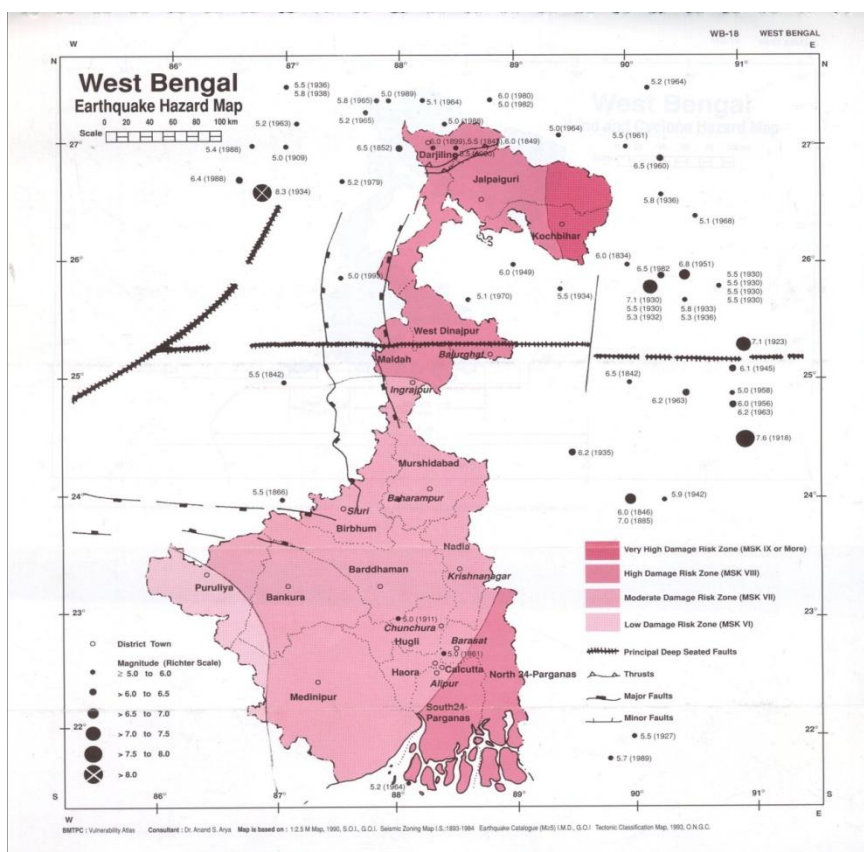
Element at Risk –

Several key factors that contribute to vulnerability of human populations to earthquakes:

- Location of settlements in an earthquake prone area, especially on soft ground, on area prone to landslides or along fault lines.
- Dense collection of weak buildings with high occupancy.
- Non-engineered building constructed by earth, rubble, buildings with heavy roofs (more vulnerable than light weight structures), poor quality and maintenance of buildings.
- Weak or flexible storey intending for parking purposes.

Temblor measured 6.3 on the Richter scale, occurred 10 km depth and settled in **India 2:23 (0853 GMT)**, the U.S. Geological Survey on 27-04-2009.

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20 June 2002 - Jayachari-Rajshahi, Bangladesh, Mw 5.1

25.868 N, 88.874 E, D=037.8 kms, OT=05:40:43 UTC

A moderate earthquake struck northern Bangladesh, on 25 June 2002 at 11:40 AM local time, causing several injuries in the Rajshahi division, Bangladesh. It had a magnitude of Mw=5.1 and was felt for close to 45-seconds.

28 November 2005 - Ganga Canyon, South of the Sunderbans, Mb 4.7

21.015 N, 89.158 E, D=010.0 kms, OT=16:57:13 UTC

A light earthquake occurred in the Ganga Canyon in the northern Bay of Bengal, off the Sunderbans on 28 November 2005 at 22:27 PM local time in India. The earthquake had a magnitude of Mb=4.7 and was felt in southern parts of West Bengal.

18 September 2011 – Earthquake originating at Sikkim, affected the whole of Bengal. Richter Scale 6.9

LANDSLIDES AND EROSION

Landslides -These are slippery masses of rock, earth or debris which move by force of their own weight down mountain slopes or river banks. Landslides are common crisis phenomena in Darjeeling district.

Landslide is primarily nature's way of adjustment to slope stability. Here the process has been intensified by human interference mainly through rapid deforestation, incorrect construction procedure and unplanned tapping of natural resources. The nature of landslides varies in proportion in various localities in Darjeeling depending on the intensity of rainfall coupled with extent of deforestation and the vulnerable geological structures.

  The most common occurrence in different parts of Darjeeling is:

a) Along the springs which invariably cut across the roads,
b) At coal mining sites,
c) In tea gardens and

d) At urban agglomeration.

Soil Erosion - The removal of soil by the action of water or wind, compounded by poor agricultural practices, deforestation, overgrazing, and desertification. Mainly three types of erosion make this State vulnerable:

1. Erosion in hill areas of North Bengal;
2. Erosion in banks of Ganga at Malda;
3. Erosion in coastal region.

Elements at Risk

The most common elements at risk are the settlements built on the steep slopes, built at the toe and those built at the mouth of the streams emerging from the mountain valley. All those buildings constructed without appropriate foundation for a given soil and in sloppy areas are also at risk. Roads, communication line and buried utilities and vulnerable.

Subsidence:

Subsidence hazard has been exhibited in underground coal mining areas of the state, such as Raniganj and Asansol. During 19th century, the Raniganj coalfield was the most important producer of coal in India.

In the past when the surface was not densely populated the operators had extracted as much coal as possible without sowing or supporting.

The surface rights were generally acquired. In course of time when these holdings were abandoned habitation started growing over the old abandoned workings first slowly and subsequently at a rapid pace. This was further accelerated after nationalization of coal mines in 1973.

Unplanned and unsystematic coal mining activity, spread over decades past in shallow deposits up to about 60m depth poses serious problem of subsidence. In and around Ranigunj Coalfield, about 8.0 sq.km of the inhabited area is under the threat of subsidence.

Drought

General : Drought is an insidious natural hazard that results from a departure of precipitation from expected or normal that, when extended over a season or longer period of time, is insufficient to meet the demands of human, plant and animal activities.
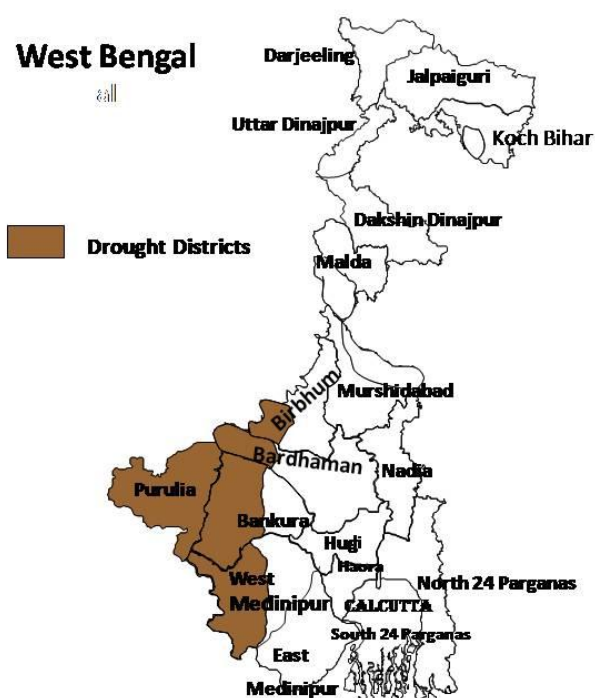
Elements at risk: Drought impacts mostly rainfed crops to start with and subsequently the irrigated crops. Areas with minimum of alternative water sources to rainfall (ground and canal water supplies), areas subjected to drastic environmental degradation such as denuded forest lands and altered ecosystems, and areas where livelihoods alternative to agriculture are least developed are most vulnerable to drought. The herdsman, landless laborers, subsistence farmers, the women, children, and farm animals are the most vulnerable groups affected by the drought conditions.

Typical Effects: Drought, different from other natural crisis, do not cause any structural damages. The typical effects include loss of crop, dairy, timber (forest fires), and fishery production; increase in energy demand for pumping water; reduced energy production; increased unemployment, loss of biodiversity, reduced water, air and landscape quality; groundwater depletion, food shortage, health reduction and loss of life, increased poverty, reduced quality of life, and social unrest leading to migration.

2.3.2. CLIMATIC VULNERABILITY

It is now undeniably evident that the global climate is changing as a result of human induced greenhouse gas (GHG) emissions. With a rural population of over 60 million directly dependent on climate-sensitive sectors (agriculture, forests and fisheries) and natural resources (water, biodiversity, mangroves, coastal zones, grasslands) for their subsistence and livelihoods, climate change will increasingly contribute to their growing vulnerability. Simulation models show an increase in the frequency of tropical cyclones in the Bay of Bengal and sea level rise in coastal zones displacing populations, increasing flooding in low-lying areas, and reducing crop yields due to inundation and Stalinization. A further increasingly worrying repercussion of climate change is future water security.

Rainfall in West Bengal –

The main rainfall season in the state is from June to September, i.e., the monsoon rain. 75% of the total rainfall in a year takes place due to the impact of south-western monsoonal wind-flow.

According to State Agro-meteorological department of West Bengal, 78% of the total rainfall takes place within June to September and that also varies in different places throughout the state resulting variation in surface discharge.

Excessive rainfall

Rainfall sufficiently in excess of the normal is a predominant factor for occurrence of floods, particularly in high rainfall regions. Even with a coefficient of variation of rainfall of 20% or less, regions are prone to frequent floods. Since the coefficient of variation of annual rainfall is less than 25% in the state, the state is prone to floods. For the purpose of the present description annual rainfall of 125% or more of the normal is considered as excessive rain.

Floods:

General : It is a temporary inundation of large regions as a result of an increase in reservoir, or of rivers flooding their banks because of heavy rains, high winds, cyclones storm surge along coast, tsunami, melting snow or dam bursts.

Types of Flood:

Flash floods:- It is defined as floods which <u>occurs within six hours</u> of the beginning of heavy rainfall, and are usually associated with cloud bursts, storms and cyclones requiring rapid localized warning and immediate response if damage is to be mitigated. In case of flash floods, warning for timely evacuation may not always be possible.

River floods :- Such floods are caused by precipitation over large catchment's areas. These floods normally build up slowly or seasonally and may <u>continue for days or weeks</u> as compared to flash floods.

Coastal floods :- Some floods are associated with the cyclonic activities like Hurricanes, tropical cyclone etc. Catastrophic flooding is often aggravated by wind-induced strom surges along the coast.
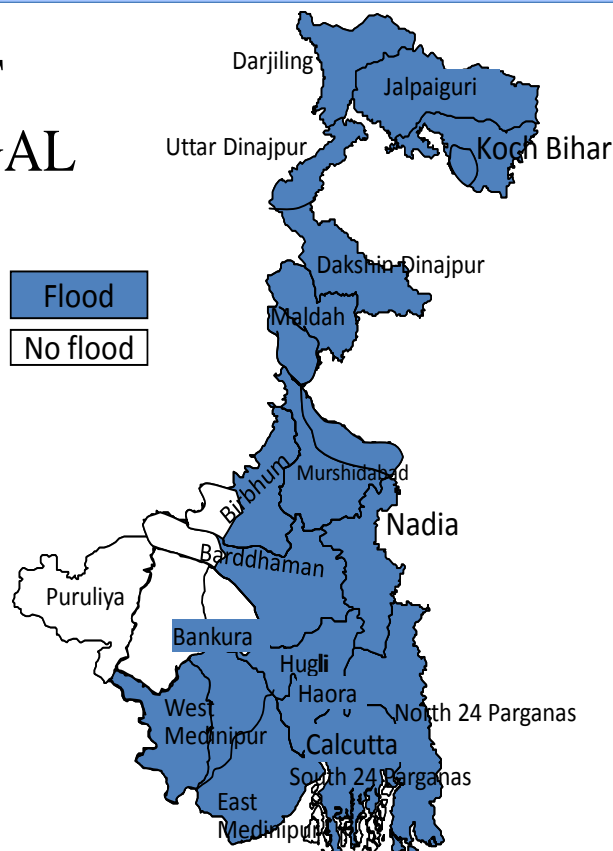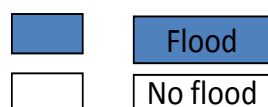
River Systems of West Bengal at a glance

Rivers	Origin	Outfall	Travels through
Torsa	Chumbivalley (Tibet)	Brahmaputra (B)	Bhutan,Jalpaiguri, Coochbehar
Mahananda	Mahaldirang near Kurseong	Padma (B)	Darjeeling, Bihar, S. Dinajpur, Malda
Teesta	Kangse Glaciers	Brahmaputra (B)	Dargeeling,Jalpaiguri, Coochbehar
Fulahar	Bagdob	Ganga	Malda
Mechi-Balasan	Singhalia Range of Himalayas	Mahananda	Darjeeling, Jalpaiguri
Tangon	Panchagar (B)	Mahananda	N. & S. Dinajpur, Malda
Jaldhaka	Bitana lake, Sikkim	Brahmaputra (B)	Sikkim,Bhutan,Darjeeling, Jalpaiguri, Coochbehar
Raidak	Mt. Chamolhari (Tibet)	Torsa	Bhutan, Jalpaiguri, Coochbehar
Churni	Mathabhanga in nadia	Bhagirathi	Nadia
Jalangi	Padma in Murshidabad	Bhagirathi	Murshidabad, Nadia
Ichhamati	Mathabhanga in Nadia district	Bay of Bengal	Nadia, N. 24 Parganas,S. 24 Parganas
Bhagirathi	Ganga in Murshidabad	Bay of Bengal	Murshidabad, Nadia, Hooghly, Bardhaman, Howrah, S. 24 Parganas, N. 24 Parganas

Pagla-basloi	Chotonagpur Plateau in Bihar	Bhagirathi	Birhum, Murshidabad
Bhrammani-Dwarka	Chotonagpur Plateau in Jharkhand	Bhagirathi	Birbhum, Murshidabad
Mayurakshi	Do in Jharkhand	Bhagirathi	Birbhum, Murshidabad
Punarbhaba	East Dinajpur at Bangladesh	Mahananda	South Dinajpur & Malda at West Bengal; East Dinajpur, Bangladesh
Attrayee	East Dinajpur at Bangladesh	Boral River (B)	Barind tract at Bangladesh
Damodor	Chotonagpur Plateau in Jharkhand	Hooghly	Bankura, Bardhaman, Hooghly, Howrah, Ps. & Pb. Medinipur
Subarnarekha		Bay of Bengal	Pb. Medinipur

FLOOD SCENARIO

WEST
BENGAL

Flood

No flood

Darjiling

Jalpaiguri

Koch Bihar

Uttar Dinajpur

Dakshin Dinajpur

Maldah

Birbhum

Murshidabad

Nadia

Barddhaman

Puruliya

Bankura

Hugli

Haora

West
Medinipur

North 24 Parganas

Calcutta

South 24 Parganas

East
Medinipur

According to the Irrigation Department, 37.6 lakhs Ha of West Bengal (42.4% of the total geographical area and 69% of its net cropped area) has been identified as flood prone area; of this 29.8 lakh Ha (i.e., 58% of the flood prone area) is Protected Area. Strong monsoon, rivers and floods are an integral part of Bengal's characteristic ecology that shaped its civilization and culture and at the same time, cause of flood hazard and crisis for the society as a whole.

Pattern of rainfall and discharge of water through the drainage basins are the two main parameters generally studied for assessing the flood vulnerability in the state. Cyclonic flood and storm surge generated flood are given separately in Cyclone Hazard sub-heading.

Cyclone:

The coastal stretch of West Bengal is necessarily highly vulnerable to cyclone. The phenomenal storm surge in coastal West Bengal is due to its peculiar bathymetry and nature of coastal belt. The northern part of the Bay of Bengal is very shallow. The coast is also landlocked on three sides. As a result when a very severe cyclonic storm or a hurricane approaches the coast, the enormous storm surge generated by the wind pressure submerges the coastal belt at the time of the storm crossing the belt. The frequency of storms crossing this belt is also high. Another peculiar characteristic of this coast is that it is crisis crossed by innumerable rivers and rivulets, with the elevation of the islands about 4 to 5 meters. The sea dykes and embankment are not strong enough to resist strong wind-driven waves and naturally cave in during depression / cyclonic storm situation.
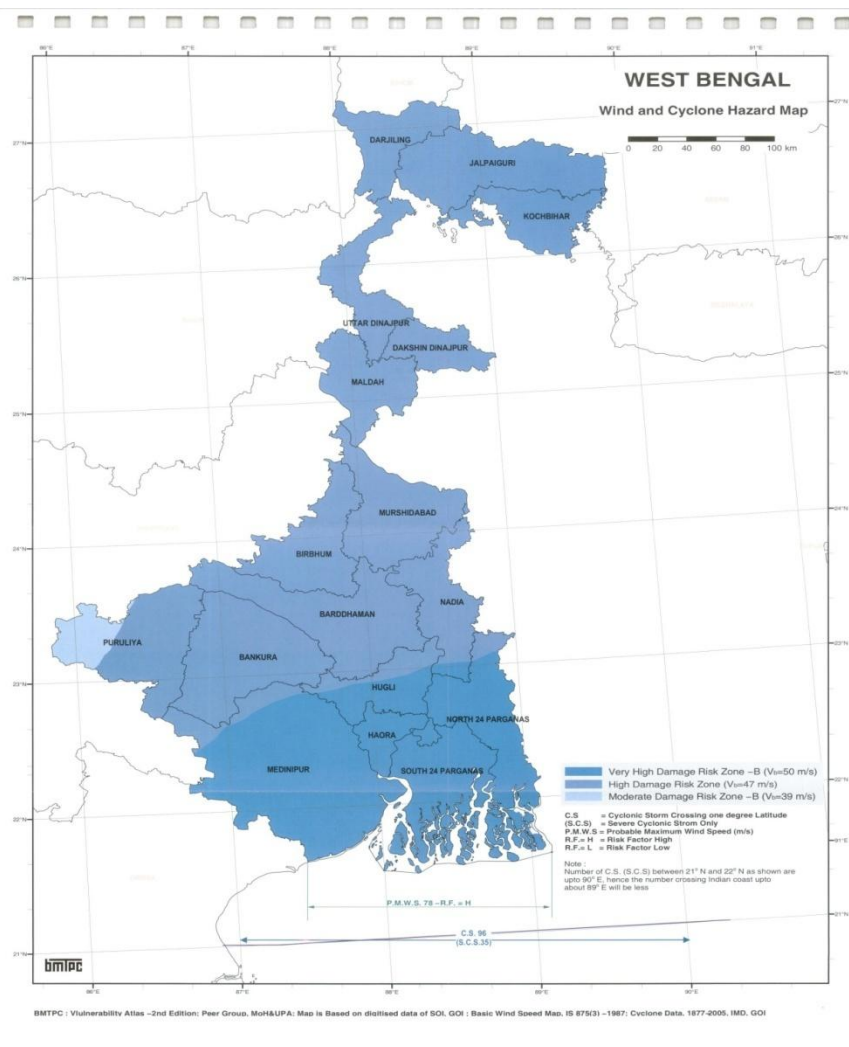
In peninsular India, cyclone occurs frequently on both the coasts i.e. The West Coast (Arabian Sea) and East Coast (Bay of Bengal) but the east coast is considered to be one of the most cyclone prone areas of the world.

About 80 tropical cyclones (with wind speeds equal to or greater than 35 knots) form in the world's waters every year. Of these about 6.5% develop in the Bay of Bengal and Arabian Sea. Since the frequency of cyclones in the Bay of Bengal is about 5 to 6 times the frequency of those in the Arabian Sea, the Bay of Bengal's share comes out to be about 5.5%.

The regions of West Bengal that may suffer the possible impact of tropical cyclones come belong to the following districts:

1. Purba Medinipur (blocks – Ramnagar I, Ramnagar II, Contai I, Contai II, Khejuri II, Nanadigram I, Sutahata)
2. 24 Parganas-South (blocks – Kultali, Canning I, Canning II, Gosaba, Basanti, Kakdwip, Namkhana, Sagar, Patharpratima)
3. 24 Parganas-North (blocks – Hingalganj, Sandeshkhali I, Sandeshkhali II, Hasnabad, Gaighata, Bongaon, Bagdah).
4. Howrah (blocks – Uluberia I, Shyampur II)
5. Paschim Medinipore (Danton)

The State capital Kolkata also falls in the cyclone prone region, as stated before.

2.4: Technological Vulnerability:

Technological Hazards:

Technological hazards include hazardous materials incidents and nuclear power plant failures. Usually, little or no warning precedes incidents involving technological hazards. In many cases, victims may not know they have been affected until many years later.

The number of technological incidents is escalating, mainly as a result of the increased number of new substances and the opportunities for human error inherent in the use of these materials.

Chemicals are found everywhere. They purify drinking water, increase crop production, and simplify household chores. But chemicals also can be hazardous to humans or the environment if used or released improperly. Hazards can occur during production, storage, transportation, use, or disposal. Our community are at risk if a chemical is used unsafely or released in harmful amounts into the environment where you live, work, or play.

Chemical manufacturers are one source of hazardous materials, but there are many others, including service stations, hospitals, and hazardous materials waste sites.

2.5: Biological Crisis

Biological crisis of natural origin are largely the result of the entry of a virulent organism into a congregation of susceptible people living in a manner suited to spread the infection. In crowded areas anthrax spreads by spore dispersal in the air, small pox spread by aerosols, typhus and plague through lice, fleece, rodents, etc. Crisiss occur when environmental factors are conducive.

2.6: Epidemics:

The introduction of a pathogen capable of establishing a transmission chain into a susceptible population will result in an epidemic. Experience with the highly pathogenic avian influenza virus (H5N1) in West Bengal in January 2008 is a good example of the economic and health issues, and actions needed to control epidemics and epizootics.

Institutional Mechanism: There are various national health programmes run by the Director General Health Services, Ministry of Health & Family Welfare, either as a central sector scheme or in partnership with the state government. Some of these programmes, such as the National TB Programme, National Vector Borne Disease Control Programme, National Programme for Control of Iodine Deficiency Disorders and National AIDS Control Programme which have their networks throughout the country, run as vertical programmes, merging horizontally with service delivery at the grass-root level and have focused strategic approach with inbuilt components for surveillance and monitoring. Many of these programmes were successful in achieving their objective to control/prevent major biological crisis—malaria, smallpox and AIDS are prime examples.

2.7: Problems of Urbanization

At present the state has 375 towns and the area and population is increasing. Census data for 1991 revealed that eastern India was the least urbanized. West Bengal was the third most urbanized state with 27.48% (27.97% in 2001 census) of urban population. During 1961-91, urban population increased more rapidly than rural population in West Bengal. Fast growing districts included Midnapur, Howrah, Murshidabad, and Maldah. Burdwan and West-Dinajpur districts after 1971 had the highest rates of urbanization. During 1981-91, Maldah had a very high rate of urbanization. The proportions of male and female migrants were the same for all districts, with the exception of Midnapur where male migrants outnumbered female migrants. Rural-to-urban migrants settled primarily in the districts of Calcutta, 24-Parganas, Burdwan, Howrah, and Jalpaiguri. The proportions of female urban-to-rural migrants were higher than their male counterparts for most districts. Females tended to migrate towards districts of 24-Parganas, Burdwan, and Hadia. A large migrant population shifted from Maldah to West Dinajpur. Problems include proper place and area for waste disposal systems, sewage systems, infrastructural facilities etc., all of which are heading towards man-made crisis right from health related diseases to loss of natural drainage basin areas, which further increase the flood vulnerability in the urban areas.

Population Explosion:

On account of the Partition of the Indian subcontinent in 1947, refugees moved from Pakistan, without much interruption, to various parts of India, especially to West Bengal, till 1971, when political boundaries in South Asia were redrawn. Even after the emergence of Bangladesh as an independent country in 1971, however, the march of refugees to West Bengal appeared to be ceaseless.

Table 1.1: Population in West Bengal 1941-2011

Year	Population (100,000)	Increase of population in the previous decade (100,000)	Percentage rate of growth in the current decade
(1)	(2)	(3)	(4)
1941	232	43	22.9
1951	263	31	13.2
1961	349	86	32.8
1971	443	94	26.9
1981	546	103	23.2
1991	680	134	24.6
2001	801	121	17.77
2011	913	112	13.93

Natural Population Increase in 1991-2011:

Every year the Registrar General of India conducts sample surveys, and estimates the annual rates of birth and death. Table 1.2 communicates these rates for West Bengal during 1991-2011.

Table 1.2: Birth and Death Rates in West Bengal 1991-2011

Year	Birth	Death	Natural increase of per thousand Population per Year
(1)	(2)	(3)	(4) = (2) - (3)
1981	32.2	11.0	22.2
1982	32.3	10.4	21.9
1983	32.0	10.3	21.7
1984	30.4	10.7	19.7

1985	29.4	9.6	19.8
1986	29.7	8.8	20.9
1987	30.7	8.8	21.9
1988	28.1	8.3	19.8
1989	27.2	8.8	18.4
1990	27.3	8.1	19.2

Source: **Sample Registration Survey Reports by the Registrar General of India.**

Chapter – 3

Crisis Response

3.1 Response Strategy:

During the Response Phase, emergency managers set goals, prioritize actions and outline operational strategies. This plan provides a broad overview of those goals, priorities and strategies and describes what should occur during each step, when and at whose direction.

3.2 Operational Goals: During the response phase, the agencies that are charged with responsibilities in this plan should focus on the following goals:
   a)   Mitigate Hazards.
   b)   Meet Basic Human Needs.
   c)   Address Needs of People with Disabilities and Older Adults.
   d)   Restore Essential Services.
   e)   Support Community and Economic Recovery.

3.3 Operational Priorities: Operational priorities govern resource allocation and the response strategies for the State of California and its political subdivisions during an emergency. Below are operational priorities addressed in this plan

Save Lives – The preservation of life is the top priority of emergency managers and first responders and takes precedence over all other considerations.
   a) **Protect Health and Safety** – Measures should be taken to mitigate the emergency's impact on public health and safety.
   b) **Protect Property** – All feasible efforts must be made to protect public and private property and resources, including critical infrastructure, from damage during and after an emergency.
   c) **Preserve the Environment** – All possible efforts must be made to preserve California's environment and protect it from damage during an emergency.

3.4 Operational Strategies: - To meet the operational goals, emergency responders should consider the following strategies:

- **Mitigate Hazards** – As soon as practical, suppress, reduce or eliminate hazards and/or risks to persons and property during the crisis response. Lessen the actual or potential effects or consequences of future emergencies.
- **Meet Basic Human Needs** – All possible efforts must be made to supply resources to meet basic human needs, including food, water, shelter, medical treatment and security

during the emergency. Afterwards provisions will be made for temporary housing, food stamps and support for re-establishing employment after the emergency passes.

- **Address Needs of People with Disabilities and Older Adults** – People with disabilities and older adults are more vulnerable to harm during and after an emergency. The needs of people with disabilities and the elderly must be considered and addressed.
- **Restore Essential Services** – Power, water, sanitation, transportation and other essential services must be restored as rapidly as possible to assist communities in returning to normal daily activities.
- **Support Community and Economic Recovery** – All members of the community must collaborate to ensure that recovery operations are conducted efficiently, effectively and equitably, promoting expeditious recovery of the affected areas.

3.5 Response Structure and Organisation

Incident Response System (IRS) is a system of Management by Objectives through IAP (Incident Action Plan). It takes care of any expanding incident through an organizational structure of Command Staff, Sections, Branches, Divisions, Groups, Units, resources and span of control. Through Unified Command (UC) it allows all agencies having jurisdictional or functional responsibilities to jointly develop incident objectives and strategies.

3.5.1. IRS requires that every emergency response involving multiple area or multiple agencies include the four functions.

Command/Management: Command is responsible for the directing, ordering, and/or controlling of resources at the field response level. Management is responsible for overall emergency policy and coordination at the IRS EOC levels.

- **Command:** A key concept in all emergency planning is to establish command and tactical control at the lowest level that can perform that role effectively in the organization.
- **Management:** The EOC serves as a central location from which multiple agencies or organizations coordinate information collection and evaluation, priority setting and resource management.

Operations: Responsible for coordinating and supporting operations in support of the response to the emergency through implementation of the organizational level's Action Plans (AP). At the Field Level, the Operations Section is responsible for the coordinated tactical response directly applicable to, or in support of the objectives in accordance with the Incident Action Plan (IAP). In the EOC, the Operations Section Coordinator manages functional coordinators who share information and decisions about discipline-specific operations.
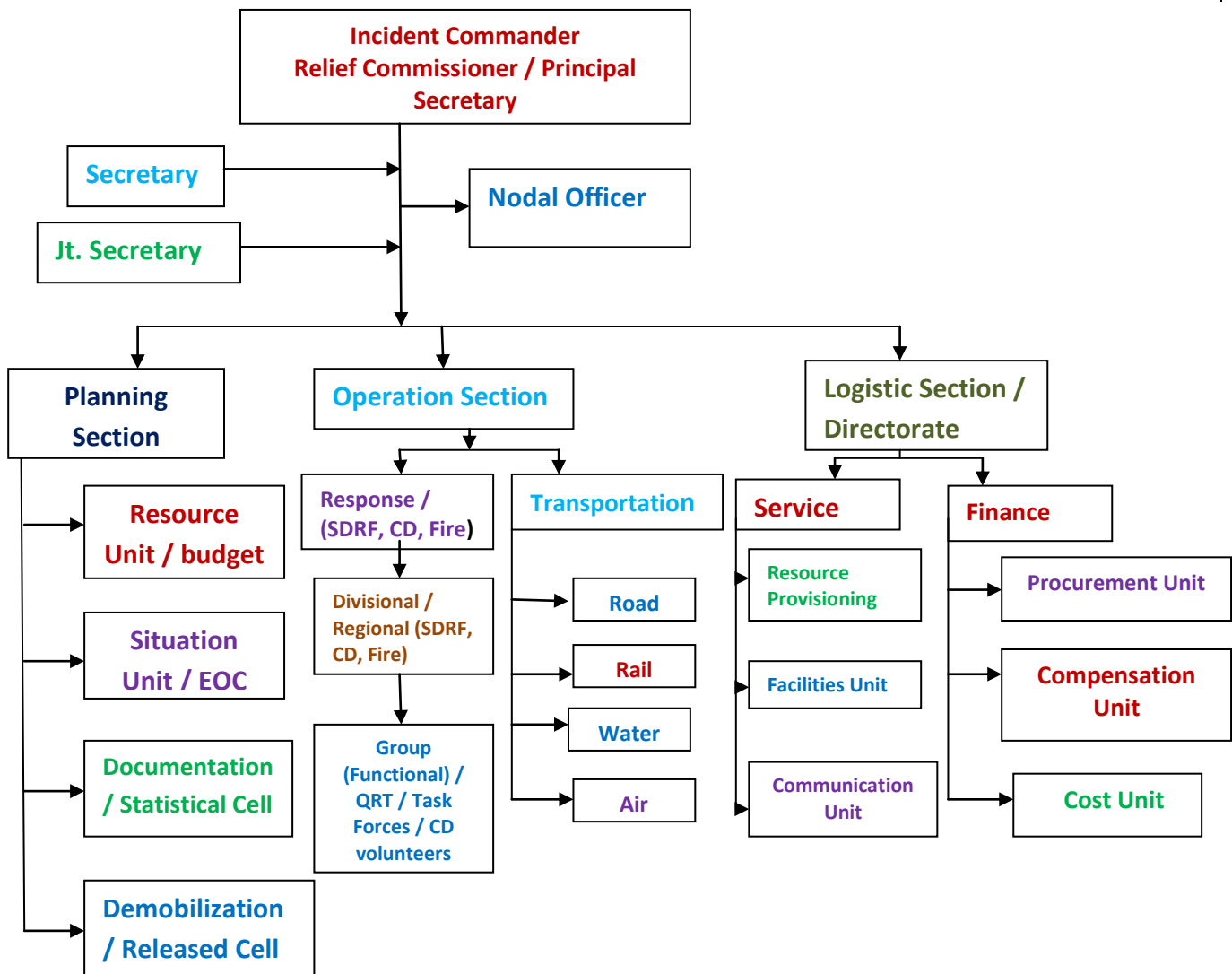
Planning: Responsible for the collection, evaluation and dissemination of operational information related to the incident for the preparation and documentation of the IAP at the Field Level or the AP at an EOC. Planning/Intelligence also maintains information on the current and forecasted situation and on the status of resources assigned to the emergency or the EOC. As needed, Unit Coordinators are appointed to collect and analyse data, prepare situation reports, develop action plans, set Geographic Information Systems (GIS) priorities, compile and maintain documentation, conduct advance planning, manage technical specialists and coordinate demobilization.

Logistics: Responsible for providing facilities, services, personnel, equipment and materials in support of the emergency. Unified ordering takes place through the Logistics Section Ordering Managers to ensure controls and accountability over resource requests. As needed, Unit Coordinators are appointed to address the needs for communications, food, medical, supplies, facilities and ground support.

Responsible for all financial and cost analysis aspects of the emergency and for any administrative aspects not handled by the other functions. As needed, Unit Leaders are appointed to record time for incident or EOC personnel and hired equipment, coordinate procurement activities, process claims and track costs.

3.5.2 Incident Response Team (IRT)

No single agency or department can handle a crisis situation of any scale alone. Different departments have to work together to manage the crisis. For proper coordination and effective use of all available resources, the different departments and agencies need a formalised response management structure that lends consistency, fosters efficiency and provides appropriate direction during response. The **IRS envisages** and lays down various tasks that may need to be performed by the existing administrative machinery at various levels.

Incident Commander
Relief Commissioner / Principal Secretary

Secretary

Jt. Secretary

Nodal Officer

Planning Section

Operation Section

Logistic Section / Directorate

Resource Unit / budget

Situation Unit / EOC

Documentation / Statistical Cell

Demobilization / Released Cell

Response / (SDRF, CD, Fire)

Divisional / Regional (SDRF, CD, Fire)

Group (Functional) / QRT / Task Forces / CD volunteers

Transportation

Road

Rail

Water

Air

Service

Resource Provisioning

Facilities Unit

Communication Unit

Finance

Procurement Unit

Compensation Unit

Cost Unit

The IRS organisation functions through Incident Response Teams (IRTs) in the field which are pre-designated at all levels; State, District, Sub-Division and Block. On receipt of Early Warning, the response officer (RO) will activate them. In case a crisis occurs without any warning, the District IRT will respond and contact RO for further support, if required. Accountability of personnel and resources are ensured through procedures and use of various forms prescribed.
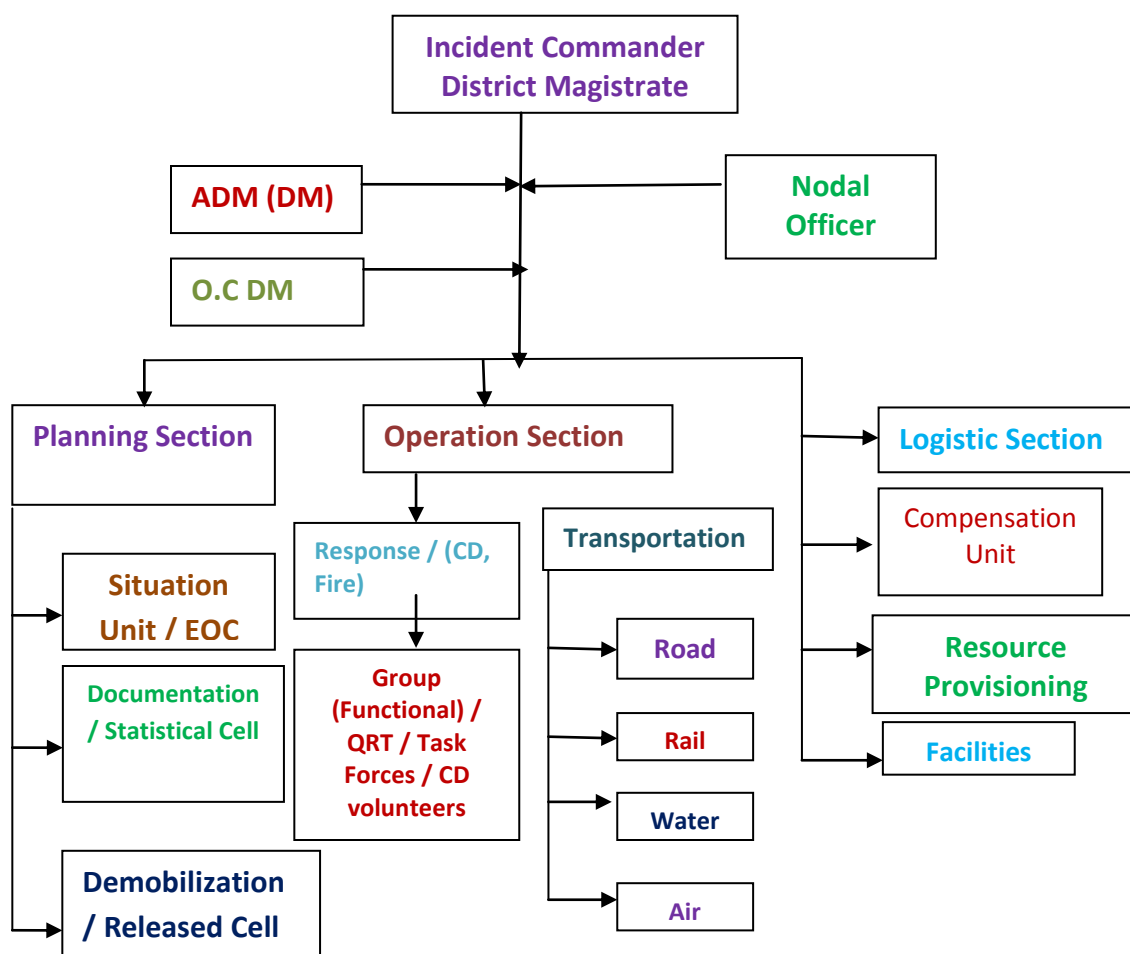
3.5.2.1 State Level IRT:

The state level of IRT prioritizes tasks and coordinates state resources in response to the requests from the Regional level and coordinates mutual aid among the mutual aid regions and between the Regional Level and State Level. The state level also serves as the coordination and communication link between the state and the National emergency response system. The state level operates out of the State Emergency Operations Centre (SEOC). The hierarchical representation of RO with State EOC, Headquarters IRT and its lower level of IRTs at District levels are shown in Fig.
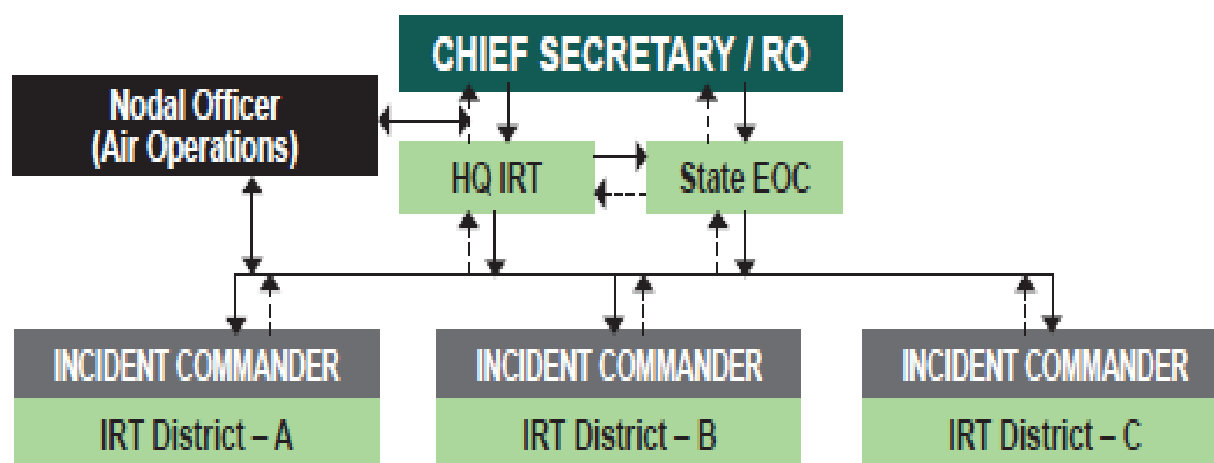
The IRT is a team comprising of all positions of IRS organisation headed by IC. The OS helps to prepare different tactical operations as required. The PS helps in obtaining different information's and preparing plans as required.

3.5.2.2 District Level IRT:

The District level includes District, Blocks. Municipalities, Panchayats manage and coordinate the overall emergency response and recovery activities within their jurisdiction. District Administrations are required to use IRT when their Emergency Operation Centres (EOC) is activated or a District emergency is declared. The District Magistrate / RO will issue a Standing Order for formation of IRT at District headquarters / Sub-Division and Block levels. He will ensure that appropriate and experienced officers are selected for IRTs. The complete IRS organizational structure at District level is given below.

Incident Commander District Magistrate

ADM (DM)

Nodal Officer

O.C DM

Planning Section

Operation Section

Logistic Section

Situation Unit / EOC

Response / (CD, Fire)

Transportation

Compensation Unit

Documentation / Statistical Cell

Group (Functional) / QRT / Task Forces / CD volunteers

Road

Resource Provisioning

Rail

Facilities

Demobilization / Released Cell

Water

Air

3.5.2.4 Field Level IRT – The Field Level is where emergency response personnel and resources, under the command of responsible officials, carry out tactical decisions and activities in direct response to an incident or threat.

3.5.3 Coordinating Structure:

Coordinating structures aid preparedness and response at all levels of government and within the private sector, communities, and nongovernmental entities. The structures help organize and measure the whole community's capabilities in order to address the requirements of the Response mission area, facilitate problem solving, improve access to response resources, and foster coordination prior to and following an incident.

Scalable, flexible, and adaptable coordinating structures are essential in aligning the key roles and responsibilities to deliver the Response mission area's core capabilities. The flexibility of such structures helps ensure that communities across the country can organize response efforts to address a variety of risks based on their unique needs, capabilities, demographics, governing structures, and non-traditional partners.

3.5.3.1 State Coordinating Structures

States also leverage the capabilities and resources of line departments and other stakeholders across the state when identifying needs and building capabilities. The coordinating structures at the state level also vary depending on factors such as geography, population, industry, and the capabilities of the districts and local agencies within the state. These structures are also designed to leverage appropriate representatives from across the whole community—some of whom may also participate in local or regional coordinating structures.

3.5.3.2 Line Departments / Emergency Support Function (ESFs) Agencies:

State governments organize their response resources and capabilities through line departments / emergency support agencies. Specific agencies / line departments have proven to be an effective way to bundle and manage resources to deliver core capabilities. The State emergency support agencies are the primary coordinating structures for building, sustaining, and delivering the response core capabilities. Most State agencies support a number of the response core capabilities. In addition, there are responsibilities and actions associated with State departments / agencies that extend beyond the core capabilities and support other response activities, as well as department and agency responsibilities.

The State Disaster Management Plan (SDMP) brings together the capabilities of State departments/ agencies and other State-level assets. State departments / agencies are grouped to work together to deliver core capabilities and support an effective response. Departments and agencies identified for emergency support function may be selectively activated by SEOC/ SDMA or as directed by the SEC to support response activities in the State or elsewhere.

3.5.3.3 Lead / Support Agency:

Different crisis require different types of expertise for response and major natural and human made crisis **require Lead and Support agencies** to deal specific tasks. For example - in case of rescue and relief in natural crisis, it will generally be the local Police and the SDRF/ NDRF, in case of Fire it will be the Fire department, in case of drought it will be the Agriculture department, in case of Epidemics and other Biological crisis it will be the Health department that will have to play the lead role and the remaining departments will have to play the supporting role as per requirement and their core competencies.

Table given below summarises response core capabilities each emergency support agency will directly coordinate and supports. All emergency support agencies support the common core capabilities planning, Public Information and Warning, and Operational Coordination– and many agencies support more than those that are listed.

Task	Activity	Lead / Support Agency
Transportation	Assists in the management of transportation systems and infrastructure during any emergency or in response to incidents.	• Transport Dept. • DM Dept. • RC • Dist. Level RTOs • Home Dept. • Private Sector • Local Bodies
Communications	Provides resources, support and restoration of government emergency telecommunications, including voice and data.	• DM Dept. • RC • District NIC • Home Dept. • Telecom.Deptt
Construction and Engineering	Organizes the capabilities and resources of the state government to facilitate the delivery of services, technical assistance, engineering expertise, construction management and other support to local area	• PWD Dept. • DM Dept. • RC • Home Dept. • Private Sector • NGOs
Fire and Rescue	Monitors the status of fire mutual aid activities. Coordinates support activities related to the detection and suppression of urban, rural and wild land fires and emergency	• F&ES Dept. • DM Dept. • RC • Local authority • Private Sector

	incident scene rescue activities and provides personnel, equipment and supplies to support local area.	• NGOs
Management	Coordinates and resolves issues in the four phases of emergency management to ensure consistency in the development and maintenance and management. During emergencies, serves in an advisory capacity to the EOC Director	• DM Dept. • RC • F&S Dept. • CD Dept. • F&ES • Home Dept. • Transport. • And all related line Departments
Care and Shelter	Coordinates actions to assist responsible area to meet the needs of victims displaced during an incident including food assistance, clothing, non-medical care and sheltering, family reunification and victim recovery.	• DM Dept. • RC • F&S Dept. • CD Dept. • F&ES • Home Dept. • Transport. • And all related line Departments
Resources	Coordinates plans and activities to locate, procure and pre-position resources to support emergency operations.	• DM Dept. • RC • F&S Dept. • CD Dept. • F&ES • Home Dept. • Transport. • And all related line Departments
Public Health and Medical	Coordinates Public Health and Medical activities and services state-wide in support of local jurisdiction resource needs for preparedness, response, and recovery from emergencies and crisis	• Health Dept. • DM Dept. • RC • P&RD • Private Sector • NGOs
Search and Rescue	Supports and coordinates response of personnel and equipment to	• SDRF • DMG

	search for and rescue missing or trapped persons. State Fire and Rescue supports and coordinates responses to search for locate and rescue victims of structure collapse, construction cave-ins, trench, confined space, high angle structure rope rescue and similar emergencies and crisis and water rescues	• CD Dept. (Dist.-QRT) • F&ES • DM Dept. • RC • Home Dept. • NGOs
Hazardous Materials	Coordinates state resources and supports the responsible area to prepare for, prevent, minimize, assess, mitigate, respond to and recover from a threat to the public or environment by actual or potential hazardous materials releases.	• DM Dept. • RC • Municipal Affair Dept. • PWD Dept. • Home Dept. • Private Sector • NGOs
Food and Agriculture	Supports the responsible area and coordinates activities during emergencies impacting the agriculture and food industry and supports the recovery of impacted industries and resources after incidents	• F&Es Dept. • Agriculture Dept. • DM Dept. • RC • P&RD • Home Dept. • NGOs
Utilities	Provides resources and support to responsible area and in partnership with private sector to restore gas, electric, water, waste water and telecommunications.	• PWD Dept. • WBPDCL • PHE Dept. • Telecom Dept. • DM Dept. • RC • Private Sector
Law Enforcement / Police department	Coordinates state law enforcement personnel and equipment to support responsible law enforcement agencies, coroner activities and public safety in accordance with Law Enforcement	• Home Dept. • P&RD Dept.. • DM Dept. • RC
Long-Term Recovery	Supports and enables economic recovery of communities and State	• PWD Dept. • DM Dept.

	from the long-term consequences of extraordinary emergencies and crisis.	- RC - Agricultue Dept. - Private Sector - NGOs
Public Information	Supports the accurate, coordinated, timely and accessible information to affected audiences, including governments, media, the private sector and the local populace, including the special needs population.	- I&C Dept. - DM Dept. - RC - P&RD Dept. - Home Dept. - Private Sector - NGOs
Evacuation	Supports responsible area in the safe evacuation of persons, domestic animals and livestock from hazardous areas.	- CD Dept. - P&RD Dept. - DM Dept. - RC - F&ES Dept. - Home Dept. - Private Sector - NGOs
Volunteer and Donations Management	Supports responsible area in ensuring the most efficient and effective use of affiliated and unaffiliated volunteers and organizations and monetary and in-kind donated resources to support incidents requiring a state response.	- Home Dept. - DM Dept. - RC - CMO

3.5.3.4 Local Coordinating Structures

Local agencies and states employ a variety of coordinating structures to help identify risks, establish relationships, organize, and build capabilities. Due to the unique partnerships, geographic conditions, threats, and established capabilities each jurisdiction faces, the coordinating structures at these levels vary. Examples of local response coordinating structures include IRT at local level supported by DEOC / DDMA. These structures organize and integrate their capabilities and resources with neighbouring area, the state, the private sector, and NGOs.

3.5.3.5 Private Sector Coordinating Structures

Business EOC or mutual aid centres, industry trade groups, and private sector information serve as coordinating structures for the private sector. These organizations, composed of multiple businesses and entities brought together by shared geography or common function (e.g., banking, supply chain management, transportation, venue management), support the collaboration, communication, and sharing of information within the private sector. Such organizations can coordinate with and support NGOs, and in many cases they serve as a conduit to local and state government coordinating structures.

3.5.4 State Wide Network of EOC:

EOC is an offsite facility which will be functioning from the State / District headquarters and which is actually an augmented control room having communication facilities and space to accommodate the various ESFs. During sever incident - an EOC is also established and activated to support field operations and resource coordination. Field Incident Commanders (IC) and EOCs will establish communications with the district / state EOCs.

Basic functions of an EOC includes, but not limited to –

- Receive, monitor, and assess crisis information.
- Keep track of available resources.
- Monitor, assess, and track response units and resource requests.
- Manage resource deployment for optimal usage.
- Make policy decisions and proclaim local emergencies as needed.
- Provide direction and management for EOC operations through Standard Operations Guide (SOG), set priorities and establish strategies.
- Coordinate operations of all responding units, including law enforcement, fire, medical, logistics etc.
- Augment comprehensive emergency communication from EOC to any field operation when needed or appropriate.
- Maintain EOC security and access control.
- Provide recovery assistance in response to the situations and available resources
- Keep senior, subordinate and tenant officials informed.
- Keep local jurisdictions (Village/town/City, district and State) informed.
- Operate a message centre to log and post all key crisis information.
- Develop and disseminate public information warnings and instructions.
- Provide information to the news media.
- Manage donation / aids.

3.5.4.2 EOC ACTIVATION CRITERIA

Emergency Operations Centres (EOCs) should be activated in accordance to the standardized Emergency Management procedure and protocols established in the State. Some of the natural hazards have a well-established early warning system. On receipt of information regarding the impending crisis, the EOC will inform the RO / District Magistrate, who in turn will activate the required IRT and mobilise resources. The scale of their deployment will depend on the magnitude of the incident.

At times the information about an incident may be received only on its occurrence without any warning. In such cases the local IRT (District, Sub-Division, Tehsil / Block) as the case may be, will respond and inform the higher authority and if required seek reinforcement and guidance. The measures decided to be taken for response will be jotted down by the Command Staff and later handed over to PS. It will thus form the initial IAP.

Based on the HPC report – levels of emergency (L1, L2, and L3) and activation guidelines are as given below:

L1 EOC Activation: Level 1 is a minimum activation. This level may be used for situations which initially only require a few people, e.g., a short term earthquake prediction at condition one or two level; alerts of storms, tsunamis; or monitoring of a low risk planned event. At a minimum, Level zero staffing consists of the EOC Head / Director. Section Coordinators and a situation assessment activity in the Planning Section may be included in this level. Other members of the organization could also be part of this level of activation e.g., the Communications Unit, from the Logistics Section, or an Information Officer.

Level 2 EOC Activation: Level 2 activation is normally achieved as an increase from Level 1 or a decrease from Level 3. This activation level is used for emergencies or planned events that would require more than a minimum staff but would not call for a full activation of all organization elements, or less than full staffing. One person may fulfil more than one IRS function. The EOC Head / Director, in conjunction with the General Staff, will determine the required level of continued activation under Level 2, and demobilize functions or add additional staff to functions as necessary based upon event considerations. Representatives to the EOC from other agencies or area may be required under Level 2 to support functional area activations.

Level 3 EOC Activation: Level 3 activation involves a complete and full activation with all organizational elements at full staffing. Level 3 would normally be the initial activation during any major emergency.

3.5.4.3 IRS for Nuclear and Biological Crisis:

All nuclear facilities have specialised Crisis Management Groups (CMGs) for on-site response under the aegis of Department of Atomic Energy (DAE). For the offsite incident response at those locations, the RO / District Magistrate will act as the Incident Commander (IC) and ensure that the stakeholders and communities are properly sensitised in advance through regular mock exercises. Support from local experts for such purpose may be obtained wherever available. The State Government should train and equip its own SDRF for this purpose. The help of NDRF may be taken for immediate response and for training the SDRF. The location of NDRF equipped and trained to handle CBRN emergencies has been parked with them.

3.5.4.4 For Radiological Emergencies in Metropolitan and larger cities having population of 20 lakhs and above with high vulnerability, the State RO / District Magistrate will identify a Nodal Officer for Radiological Emergency to act as an IC. He should have designated experts to assist him in the discharge of his duties. Specially trained and equipped task forces will be earmarked which would be readily available with decontamination facilities. The details of response actions to be taken by the IC in such emergencies are given in the NDMA Guidelines on the Nuclear and Radiological emergencies, which is kept for ready reference as a separate document.

3.6 Alert and Warning:

Each district within the state is responsible for preparing for a crisis including establishing methods for alerting and warning the public, mobilizing resources and initiating protective actions. At the state level, SEOC will have a State alert and Warning centre (SAWC), which is staffed 24 hours a day, 365 days a year to serve as the official state level point of contact for emergency notifications. From this centre, Warning Centre personnel maintain contact with district warning points, state agencies, central agencies and the National EOC.

3.6.1 Notifications Received by the State Alert &Warning Centre: District / authority/ EOC notify the SAWC of emergencies in accordance with existing procedures and protocols, or when state assistance is requested or anticipated. In some specific natural crisis – the notification are received from the designated national agencies as listed below.

Crisis	Agency
Earthquake	IMD
Flood	IMD, Irrigation Department, CWC
Tsunami	IMD, INCOIS
Draught	Agriculture Department
Epidemics	Ministry / Department of Health & Family Welfare
Industrial and Chemical Accidents	Industry, Labour & Employment Department, DISH
Fire	Fire & Emergency Services / State/ District/ Local agencies

Severe Weather	IMD

3.6.2 Communications, Alert and Warning System:

The SEOC/SAWC is responsible for informing, communicating, alerting and notifying state / district officials and the central Government of natural or human caused emergencies. To meet this responsibility, the SEOC is equipped with a number of telephone, data and radio systems, managed siren system, satellite communication, mass messaging and automated Notification System. Most of these systems are used on a day-to-day basis; others are available for use in an emergency, as conditions require.

3.6.3 Alerting and warning State / District/ Local agencies:

Multiple communication channels will be used to maintain constant communication with local, state and federal communications centres and to ensure the State can quickly respond to any developing emergencies. The SEOC provides local and state agencies with a broad range of information, including, but not limited to:
- Local emergencies.
- Earthquakes.
- Tsunamis (seismic sea waves).
- Floods.
- Cyclone
- Dam and failures.
- Major fires.
- Hazardous material spills.
- Radiological and nuclear incidents.
- Radioactive fallout wind data.
- Energy emergencies.
- Foreign animal disease.
- Weather watches and warnings.
- Severe weather emergencies.
- Search and rescue incidents.

3.6.4 Notification of Emergency Personnel:
The SEOC maintains a list of agencies and personnel that are critical to emergency operations. The SEOC will utilize cell phone, telephone, email, smart phones and Automatic Notification System to notify State personnel of an emergency and help guide response teams across the state.

3.6.5 Public Information:
Public information consists of the processes, procedures and systems to communicate timely and accurate information by accessible means and in accessible formats on the

incident's cause, size and current situation to the public, responders and additional stakeholders (both directly affected and indirectly affected).

Public information must be coordinated and integrated as part of the emergency management System across the State/ central agencies and organizations, and with the private sector and NGOs. Public information includes processes, procedures and organizational structures required to gather, verify, coordinate and disseminate information.

During an emergency, responsible district disseminate information about the emergency to keep the public informed about what has happened, the actions of emergency response agencies and to summarize the expected outcomes of the emergency actions.

State authority will coordinate the state's emergency public information efforts and provides support to other state agencies to ensure that the state government issues a timely, clear, concise, consistent message.

3.6.5.1 Media Canters: State authority may establish a Media Centre that serves as a central location for media briefings, conferences and information distribution.

3.6.5.2 Inquiry / Call Canters: State authority Agencies may activate an inquiry centre to centralize information sharing between the public, the media and government. Inquiry centres should be directly linked to media centres. Inquiry / call Canters will:
- Establishment of Public Information Hotlines
- Monitoring of radio and television stations and informing the IMO (Information and media officer) Coordination Team of inaccuracies.
- Sharing of information about the emergency or the government's response.

3.7 Sequence of Events during Crisis:

Two sequences of events are typically associated with crisis: One involves the response and the other involves local / district or State emergency declaration. The response sequence generally describes the emergency response activities to save lives, protect property and preserve the environment. This sequence describes deployment of response teams, activation of emergency management organizations and coordination among the various levels of government. The emergency proclamation sequence outlines the steps to gain expanded emergency authorities needed to mitigate the problem. It also summarizes the steps for requesting state and federal crisis assistance.

3.7.1 Before Impact:
3.7.1.1 Routine Monitoring for Alerts, Watches and Warnings: Emergency officials constantly monitor events and the environment to identify specific threats that may affect

their jurisdiction and increase awareness level of emergency personnel and the community when a threat is approaching or imminent.

3.7.1.2 Increased Readiness: Sufficient warning provides the opportunity for response agencies to increase readiness, which are actions designed to increase an agency's ability to effectively respond once the emergency occurs. This includes, but is not limited to:

- Briefing government officials.
- Reviewing plans and procedures.
- Preparing and disseminating information to the community.
- Updating resource lists.
- Testing systems such as warning and communications systems.
- Precautionary activation Emergency Operations Centers.

3.7.1.3 Pre-Impact: When a crisis is foreseen as highly likely, action is taken to save lives and protect property. During this phase, warning systems are activated, evacuation begins and resources are mobilized.

The IRS organisation functions through Incident Response Teams (IRTs) in the field which are pre-designated at all levels; State, District, Sub-Division and Block. On receipt of Early Warning, the response officer (RO) will activate them. Accountability of personnel and resources are ensured through procedures and use of various forms prescribed.

3.7.2 Immediate Impact:

IRTs at various levels are activated by RO based on the situation. The state level of IRT prioritizes tasks and coordinates state resources in response to the requests from the Regional level and coordinates mutual aid among the mutual aid regions and between the Regional Level and State Level. The state level also serves as the coordination and communication link between the state and the National emergency response system.

During this phase, emphasis is placed on control of the situation, saving lives and minimizing the effects of the crisis.

3.7.2.1 Alert and Notification: Response agencies are alerted about an incident by the public through emergency communication at State EOC and other established methods. First responders are then notified of the incident. Upon an alert, response agencies notify response personnel.

3.7.2.2 Resource Mobilization: Response agencies activate personnel and mobilize to support the incident response. As the event escalates and expands, additional resources are activated and mobilized to support the response. Activation and mobilization continue for the duration of the emergency as additional resources are needed to support the response.

This includes resources from within the affected area, or, when resources are exhausted, from unaffected area / districts / States.

3.7.2.3 Incident Response: Immediate response is accomplished within the affected area by local area and segments of the private sector. First responders arrive at the incident and function within their established field level plans and procedures. The responding agencies will manage all incidents in accordance with IRS organizational structures, doctrine and procedures.

3.7.2.4 Establishing Incident Command: Incident Command is established to direct, order, or control resources by virtue of some explicit legal, agency or delegated authority. Initial actions are coordinated through the on-scene Incident Commander (IC). The Incident Commander develops an initial Incident Action Plan (IAP), which sets priorities for the incidents, assigns resources and includes a common communications plan. If multiple area or agencies are involved, the first responders will establish a Unified Incident Command Post (ICP) to facilitate multijurisdictional and multiagency policy decisions. The Incident Commander may implement an Area Command to oversee multiple incidents that are handled by separate IRS organizations or to oversee the management of a very large or evolving incident that has multiple incident management teams engaged.

3.7.2.5 **Activation of the Multiagency Coordination or Unified Command**: Responding agencies will coordinate and support emergency management and incident response objectives through the development and use of integrated Multiagency Coordination Systems. UC is a framework headed by the Governor / LG / Administrator / CM and assisted by the CS that allows all agencies with jurisdictional responsibilities for an incident, either geographical or functional, to participate in the management of the incident.

3.7.2.6 **Local EOC Activation:** Local area activates their local EOC based on the magnitude or need for more coordinated management of the emergency. When activated, Local EOCs help form a common operating picture of the incident by collecting, analyzing and disseminating emergency information. The local EOC can also improve the effectiveness of the response by reducing the amount of external coordination of resources by the Incident Commander by providing a single point of contact to support multiagency coordination. When activated the local EOC notifies the OA lead that the local EOC has been activated.

3.7.2.7 Communications between Field and the EOC: When a jurisdiction EOC is activated, communications and coordination are established between the IC and the DEOC / SEOC.

3.7.2.8 Operational Area (OA) EOC Activation: If one or more Local EOCs are activated, or if the event requires resources outside the affected jurisdiction, the OA EOC activates. The OAEOC also activates if a Local Emergency is proclaimed by the affected local government. The OA EOC then coordinates resource requests from the affected jurisdiction to an

unaffected jurisdiction, or if resources are not available within the Operational Area, forwards the resource request to the SEOC.

3.7.2.9 State Level Field Teams: The state may deploy Field On-Site Observation Teams to provide situation reports on the crisis in coordination with the responsible Unified Command.

3.7.2.10 State Emergency Operations Center (SEOC) Activation: The SEOC is activated when in order to:
- Continuously monitor the situation and provide situation reports to brief state officials as appropriate.
- Process resource requests between the affected regions, unaffected regions and state agency Department Operation Centers.
- Process requests for central assistance and coordinate with central CMG.
- Provide Decision support backup to DEOC and filed EOC / IC.

3.7.3 After Impact is over:

As the initial and sustained operational priorities are met, emergency management officials consider the recovery phase needs. Short-term recovery activities include returning vital life support systems to minimum operating standards. Long-term activity is designed to return to normal activities. Recovery planning should include reviews of ways to avert or mitigate future emergencies. During the recovery phase, damage is assessed, local assistance centers and crisis recovery centers are opened and hazard mitigation surveys are performed.

Demobilization: As resources are no longer needed to support the response, or the response activities cease, resources are demobilized. Demobilization includes provisions to address and validate the safe return of resources to their original location and include processes for resource tracking and ensuring applicable reimbursement. Where applicable, the demobilization should include compliance with mutual aid and assistance provisions.

3.8 Funds generation: The GoWB allocates funds in the State Budget for relief activities. In addition, funds may be available through the State Crisis Response Fund (Detail regarding funding of SDRF is described in chapter 1). However, these funds may not be adequate to meet crisis management requirements in the aftermath of large-scale crisis like the September' 2000 flood in the State. In such circumstances, the GoWB shall explore additional sources of funding through aid, grants, loans etc., as identified in the pre-crisis phase.

3.9 Finalizing relief pay-outs and packages: Relief packages would include details relating to collection, allocation and disbursal of funds to the affected people. Relief would be provided all the affected families without any discrimination of caste, creed, religion, community or sex

whatsoever. GoWB also start to provide Crisis Management Kits to the affected families in the year 2013. Each such kit contains all sorts of foods and utensils to survive a family at least 3-4 days without any help of others.

3.10 Post-relief assessment: The Department of Disaster Management, with assistance from Government departments, district administration and local authorities will document learning from the relief experience, which can be inputs into further mitigation, relief or rehabilitation and reconstruction plans.

CRISIS MANAGEMENT

Important Functionaries telephone Numbers- State level

Sl. No.	Designation	Name	Contact Number	
			Office	Mobile
1	Minister-in-Charge, Disaster Management Dept.	Janab Javed Ahmed Khan	(033) 22144052 033) 22144026	9830977758
2	Chief Secretary	Sanjay Mitra,IAS	(033) 22145858	9433024700 9163103000
3	Home Secretary	Basudeb Banerjee,IAS	(033) 22145656	9831180157 9903100000
4	Principal Secretary, Disaster Management Dept.	Indevar Pandey,IAS	(033) 22143674	9007154222
5	State Relief Commissioner	Indevar Pandey,IAS	(033) 22143674	9007154222
6	Principal Secretary, Finance Dept.	H.K. Dwivedi,IAS	(033) 22143695	9830125000
7	Secretary, Irrigation & waterways Dept.	Tusar Kanti Ghosh	(033) 23216980	9830042457
8	Secretary, Civil Defence Dept.	P.d. Bandyopadhyay, IAS	(033) 22141130	9674343054
9	Principal Secretary, PHE Dept.	Saurabh Kr. Das,IAS	(033) 22486769	9903931373
10	Principal Secretary, PWD Dept.	Indevar Pandey,IAS	(033) 22143674	9007154222
11	Principal Secretary, Health & F.W. Dept.	Satish Tewari,IAS	(033) 23575899	9830277319
12	Secretary, Agriculture Dept.	Subrata Biswas,IAS	(033) 22145506	9433253984
13	Addl. Chief Secretary, ARD Dept.	A.K.Singh,IAS	(033) 22143690	9433022440
14	Principal Secretary, FPI&H Dept.	C.M. Bachhawat,IAS	(033) 23374244	9674385002
15	Addl. Chief Secretary, Fisheries Dept.	Subesh Kumar Das	(033) 23570077	9830033362
16	Director of Disaster Management	Ikhlaque Islam	(033) 22275820	9830196328
17	Director, Civil Defence Dept.	Gangeswar Singh,IPS	(033) 22252179	9836402121
18	Deputy Marine Fisheries	Sandip Mondal	(033) 23576416	9051434056
19	Director General of Police	Surojit Kar Purakayasta,IPS	(033) 22145400	
20	Commissioner of Police	Surojit Kar Purakayasta,IPS	(033) 22145060	9831591268

21	IG(Admn) as Nodal Officer for DMG, West Bengal Police	Sanjoy Mukherjee,IPS	(033) 22144498	98300051111
22	Addl. C. P. Nodal of KP, DMG	Debasish Roy,IPS	(033) 22505361	9836777722
23	DG , Fire &Emergency Services	D. P. Tarania, IPS	(033) 22527172	9831056497
24	Commissioner, KMC	Khalil Ahmed,IAS	(033) 22861234	
25	OSD(Superintending enginieer)	Tanay Das	(033) 22846036	9433242129

Disaster Management Department

1	Control Room		1070 (Toll free) (033) 22143526 (033) 22544478	(033)22141378 (Fax)
2	Secretary, Disaster Management Dept.	Subrata Mukherjee, ITS	(033) 22146447	9433000202
3	Jt. Secretary, Disaster Management Dept.	Ikhlaque Islam, WBCS(Exe)	(033) 22143526	9830196328
4	Director, IMD	G.C. Debnath,	(033) 24790596 (033) 24793167 (033) 24793782	9433836994

LIST OF DISTRICT MAGISTRATES AND SUPERINTENDENTS OF POLICE

DISTRICT	DESIGNATION	NAME	STD	TEL (O)	TEL (R)	FAX	MOBILE
COOCH BEHAR	D.M.	SHRI P. ULAGANATHAN	03582	227101	227201	227000 225000	9434027101
	S.P.	SHRI ANOOP JAISWAL	03582	227755	227632	227745	09775802301
DARJEELING G.T.A- DONBOXO LEPCHA-7602359729	D.M.	SHRI PUNEET YADAV	0354	2254233 2256201	2256182	2254338	9434054233
	S.P.	SHRI AKHILESH KR. CHATURVEDI	0354	2254270	2254278	2254203 2254204	09733008001
JALPAIGURI	D.M.	SMT. PRITHA SARKAR	03561	230127	227333 228133	224811	9800025000
	S.P.	SHRI KUNAL AGGARWAL	03561	230492	232024	231237 223237	9434016610 8170040001

MALDA	D.M.	DR. SHARAD KR. DWIVEDI	03512	252381	253092 252415	253092 253049	9775844844
	S.P.	SHRI PRASUN BANDAPADHAYA	03512	252520	255699	253345 266223	9775802302
UTTAR DINAJPUR	D.M.	SMT. SMITA PANDEY	03523	252925	252441 250005	252250	9434049215
	S.P.	SHRI RAJESH KUMAR YADAV	03523	252461	252527	253033	9674735351
DAKSHIN DINAJPUR	D.M.	SHRI TAPAS CHAUDHURY	03522	255201	255202	255488	9434055201
	S.P.	SHRI SHEESH RAM JHAJHARIA	03522	255321	255689	255323	9474519607
MURSHIDABAD	D.M.	SHRI Y. RATNAKARA RAO	03482	251650	250002	277546 250145	9434770000
	S.P.	DR. HUMAYUN KABIR	03482	250751	252003	251850 250511	9434222000
NADIA	D.M.	SHRI P. B. SALIM	03472	251001	252052	252294 253030	9434340101
	S.P.	SHRI SABYA SACHI RAMAN MISHRA	03472	252229	252303	253154 253121	9732522222
PURULIA	D.M.	SHRI TANMAY CHAKRABORTY	03252	222302	222301	222490 222511	9434001122
	S.P.	SHRI SUDHEER KUMAR NEELAKANTA	03252	222304	222303	224379	9434001500 8145500325
BANKURA	D.M.	SHRI VIJAY BHARTI	03242	250304	250303	251076 254807	9434037744
	S.P.	SHRI MUKESH	03242	250305	250306	250727 250601	9434000328 9564100100
BIRBHUM	D.M.	SHRI P.M.K GANDHI	03462	255222	255223	256222 (O) 255646 (R)	9434009861
	S.P.	SHRI ALOK RAJORIA	03462	255353	2525219	250806	9051217042

BURDWAN	D.M.	SHRI SUMITRA MOHAN	0342	2662428	2625700 2625702	2625703 2561899	9734750500 Sr. D.C.-0342-2662347
	S.P.	SHRI SYED MD. HUSSAIN MEERZA	0342	2662495	262 4400	266 3808	9830489770
HOWRAH	D.M.	SMT. SUBHANJAN DAS	033	26412024	26412961	26413367	9831076865
	S.P. (Rural)	SHRI BHARAT LAL MEENA	033	2641 2626	2638 2086	2641 2386	8017577777 9674100400
HOOGHLY	D.M.	SMT. MANMEET NANDA	033	26802044	26802040	2680 2048	9432013662
	S.P.	SHRI SUNIL KR. CHAUDHURY	033	2680 4827	2680 2325	2680 4739	7407006666
NORTH 24 -PARGANAS	D.M.	SHRI SANJAY BANSAL	033	25523662	25523474	25626177 25523535	9051022000
	S.P.	SHRI TANMAY RAY CHAUDHURY	033	2542 3055 2538 9202	2562 1282	2552 2247	9830522253
SOUTH 24-PARGANAS	D.M.	SHRI SANTANU BASU	033	24791469	24793713	24793456 24791694	9874706555
	S.P.	SHRI PRAVIN KR. TRIPATHI	033	2479 3333	2488 3626	2479 3333 2479 1261	98367-59227
PASCHIM MEDINIPUR SDO, GHATAL,ADIB RAY- 9434744670/ 03225255145	D.M.	SHRI MD. G. A. ANSARI	03222	275571	275570	275427	9434750400
	S.P.	SMT. BHARATI GHOSH	03222	275609	275608 263769	274298	9836832777
JHARGRAM POLICE DIST.	S.P.	SMT. BHARATI GHOSH	03221	263529		257042	9836832777
PURBA MEDINIPUR	D.M.	SMT. ANTARA ACHARYA	03228	263098	263120	263500	9434000700
	S.P.	SHRI SUKESH KUMAR JAIN	03228	263580	263602	269763 266038	7797219090 9874020008

Field Organisations

Designation	Organisation	Officer	Contact Numbers		
			Office	**Mobile**	**Fax**
Disaster Management Department	Control Room		1070 2214 3526 2254 4478	89020 01070	2214 1378
	Principal Secretary	Indevar Pandey, IAS	2214 3674	90071 54222	2214 4005
	Secretary	Shri Subrata Mukherjee, ITS	2214 1938 6447	**8334900094** 94330 00202	2214-1989
	Joint Secretary	Ikhlaque Islam, WBCS (Exe.)	2214 3526 98301 96328	89020 01070 94341 02091	2214 1378
ADG (L&O)	Control Room		2214 5486 2214 4031		2214 4031 2214 4031
	A.D.G.E	Shri Sanjay Mukherjee	2214 4041	9830005111	2214 4031
CP	Control Room		2250 5000 2250 5090		2250 5000 2250 5090
	Nodal Officer	Debashish Roy, IPS	2214 1515 2409 5273 (r)	98367 77722	2250 5000 2250 5090
	Alternative Officer	Satyajit Banerjee, IPS	2409 9096	97359 00501	2250 5000 2250 5090
HQ Bengal Area Pin: 908752 c/o 99 APO	G.S.O. 1 (ops) Control Room	D.N Rai 86979 72073	2248 7195	9051165478	2248 7195
DG, F&ES	Control Room		2252 1165		2252 2223 (F)
	Nodal Officer	Shri D. P. Tarenia, IPS, Director, Fire Services	2252 7172	98310 56497	2359 8866 (R)
	Alternative Officer	Debapriya Biswas, IPS [Retd.] OSD to Deptt. F & ES		98300 68025	

KMC	Control Room		2286 1212 2286 1313		2286 1334 2286 1434 2286 1444
	Nodal Officer	Mr. P.K Dhuya D.G	2286 1271	9830324329	2286 1334 2286 1434
	Alternative Officer	Sajhzad Shibli Jt. Municipal Commr.	2286 1126	9830158232	2252 2678
NDRF 2nd Bn. Haringhata, Nadia	Control Room		2587 3601 2526 4394		2587 5032
	DG, NDRF	Dr. Mehboob Alam, IPS	011 2671 2851	09911357888	
	Nodal Officer	Sukhdev Raj, Commandant, 2nd Bn.	8017166658	94347 42836	2587 5032
	Alternative Officer	Mr. Mukesh, Deputy Commandant	8017166657	94347 42866	2587 5032
IAF Advance HQ Eastern Air Command, IAF, Fort William PIN-938562			2248 2152 Extn. 305		2262 5336
		K. Mukherjee	2248 2152 Extn. 305	8697322453	
Disaster Management Cell at HQ EAC, Upper Shillong	Nodal Officer	OC-in-Charge	0364 2560978		0364 2560978
Coast Guard Haldia					
	Director General of Police, Coastal Security, W.B.	Shri Raj Kanojia, IPS	2337 1428	9830940682	2337 1482
	Inspector	Aloke Ghosh	2479 4050	9830326383	2479 4050
	Army	Vikram Singh, GOC Bengal Area	2248 9351		
	Air Force	Joseph Suares, Group Captain	2248 5287	8420956606	2248 0208

	Navy	Ravi Ahluwalia	2242 0446 2242 0119 (r)	9051553111	
IG BSF	South Bengal Frontier	Rajnikanta Mishra, IPS	2282 6690	94347 62685 9434738827	2282 6690
	North Bengal Frontier	S.K. Sood	0353 2580155	94347 57007	(0353) 2580155
Director, Civil Defence		Gangeswar Singh, IPS Control Room	2225 2179 2237 4033/ 2236 3594	98364 02121	2237 4438
Irrigation & Waterways Department		Gopal Krishna, IAS, Addl. Chief Secretary Dhiman Mukherjee, Secretary Control Room	2321-5616 2321 6980 2321 8341 23340117(Toll Free)	77978 49941	99032 54000 98300 42457 2321 5604
AIR Duty Room 24X7	Program Officer	Duty Officer ----------- Control Room --------- Dr. D. C. Poddar News Room	2248 6064 2248 5938 2248 9364	94330 99340	2231 3469 2248 9364
DD News Room		Snehashish Sur Head of News	2423 5757 **2423 5343** 2423 5757	**98300 28644**	2423 5858 2231 3469 2423 5454

Howrah Police Commissioner ,	Ajay Mukund, IAS 8017311111	26415614	26400400/Police Control Room- 26415614
Howrah Railway Station Control Room	2641-4217/26410667 PLAT Form Enquary - 26506886		

Telephone Numbers of ADM (Disaster Management)

Districts	Mobile Nos. Of ADM (Disaster Management)	S.T.D. Code	Telephone Nos. (Office)	Fax Nos. (Office)
Cooch Behar	Debjani Bhattacharjee 9434027303	03582	227-102/227-114	227-002

Darjeeling	Kausik Bhattacharjee 9434058101	0354	2254-313	2256-202
Jalpaiguri	Amyas Tshering 7797860200	03561	231-101	224-811
Malda		03512	253-049	253-049 223-775
U. Dinajpur	P.D. Pradhan 9434155218	03523	252-347	252-347
D. Dinajpur	Sajal Kanti Tikadar 9434055612	03522	255-248	255-121
Murshidabad	Enaur Rahman 9434770005	03482	250-389	261-800 250-693
Nadia	Utpal Bhadra 9434111515	03472	252-293	252-893/253-030
Purulia	Sabuj Baran Sarkar 9434246605	03252	223-120	223-120
Bankura	Aditi Das Gupta 9434754806	03242	250-355/250-757	250-751
Birbhum	Nibil Iswarary 9434748890	03462	255-272	255-422
Burdwan	Utpal Biswas 9734484699	0342	2662-443	2662-443
Howrah	Arshad Hasan Warsi 9830570982	033	2638-3529/ 2641-4721	2638-0756
Hooghly	Abid Hussain 9836422998	033	2680-2043/2680-2317	2680-2217
North 24-Pgs.	Bijit Kr. Dhar 8017043888	033	2552-3878	2552-3355 2552-3878
South 24-Pgs.	Abhijit Kr. Latua 8334972555	033	2479-1233	2479-1552
W. Midnapore	R. Arjun 8900359767	03222	275-455	275-785
E. Midnapore	Abhijit Maitra 8373063001	03228	263-667	263-994/263-500

WEST BENGAL
CRISIS MANAGEMENT PLAN
2014

Part - II

Contents

Action Plan for Earthquake

1.1 Introduction :

The seismic zonation map (2002) as prepared by Bureau of Indian Standard shows:
- Eastern section of northern districts of Jalpaiguri and Coochbehar lie in Zone –V

- The remaining part of these two districts, along with the districts of Darjeeling, Uttar Dinajpur, Dakshin Dinajpur, Malda, 24 Paraganas (south & north) lie in Zone – IV

- The rest of the state along with Kolkata lies in Zone – III expect some portions of Purulia, Bankura and Paschim Medinipur.

- Small part of Purulia, Bankura and Medinipur lies in Zone – II.
It is also found from seismic map that two fault lines run through the state.

With a view to minimize the adverse impacts of earthquakes in the future, the Government of West Bengal has taken various initiatives to combat the effects of earthquake. This Chapter will mainly focus on the Action Plan of the State Government to manage earthquake Crisis after its occurrence. The Action Plan will consist of the following activities:
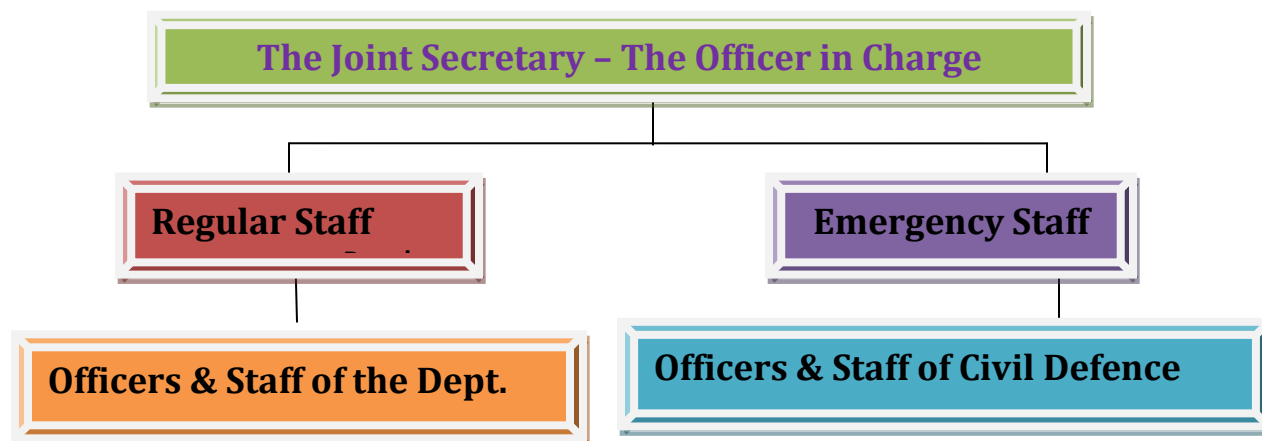
i) Institutional mechanism of the State Government to respond to earthquake Crisis

ii) Trigger mechanism on receiving the report of occurrence of an earthquake

iii) Response mechanism of the concerned line departments along with the roles and responsibilities of each one of them and

iv) Immediate relief to be provided to the affected population

1.2 Institutional mechanism of the State Government to respond to earthquake Crisis:

Until 2004, no organized effort was made to build the capacity for earthquake preparedness, mitigation and risk and vulnerability reduction in the West Bengal. However, in the aftermath of 2004 Tsunami & the earthquake of 18th September 2011 initiated the State government to undertake long term capacity building initiatives to deal with future earthquakes. The focus of the government has now broadened to include earthquake risk reduction, mitigation and preparedness also, along with response & relief.

West Bengal has its Disaster Management Department which is primarily responsible for emergency response and relief in the State, while the West Bengal State Disaster Management Authority (WBSDMA) along with the Department of Disaster Management works for formulation of policies, long term planning, coordination and monitoring body for mitigation, reduction and preparedness for Emergency in the State.

The structure of the EOC in the state is as follows:

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          ┌─────────────────────────────────────────────┐
          │   The Joint Secretary – The Officer in Charge │
          └─────────────────────────────────────────────┘
                    │                         │
          ┌──────────────────┐      ┌──────────────────┐
          │   Regular Staff   │      │  Emergency Staff │
          └──────────────────┘      └──────────────────┘
                    │                         │
   ┌──────────────────────────┐   ┌──────────────────────────────┐
   │ Officers & Staff of the Dept. │ │ Officers & Staff of Civil Defence │
   └──────────────────────────┘   └──────────────────────────────┘
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1.3 Trigger mechanism on receiving the report of occurrence of an earthquake:

An earthquake of magnitude 5 or more is likely to cause deaths and injuries to human beings and damage to all kinds of property, both private and public. Unfortunately there is very little warning available before the earthquake. Therefore planning should cater for a quick response at all levels to reduce the effects of the earthquake to the minimum.

1.4 Response mechanism of the concerned line departments along with the roles and responsibilities of each one of them

1.4.1 Information and reporting:
The agency who provides information to the SEOC about the occurrence of an earthquake in the State is the

- IMD, Kolkata

- The SEOC should be activated for emergency response on the occurrence of any major earthquake. The SEOC should initiate following activities:

i) State EOC should report the occurrence of a major earthquake to the following:

- Relief Commissioner & the Principal Secretary (Disaster Management)
- Chief Secretary of the State
- Joint Secretary & Officer in Charge SEOC

- Members of Crisis Management Committee
- Hon'ble Chief Minister
- Hon'ble Minister-in- Charge, Department of Disaster Management
- National Crisis Management EOC at MHA, GoI
- Vice Chairman, National Disaster Management Authority (NDMA)
- Secretary, MHA

ii) State EOC to alert the Quick Response Team for emergency response as also fire brigade personnel.

iii) State EOC to verify the authenticity of the information from authorized scientific agencies as well as district and block control rooms.

iv) State EOC to contact its regular and emergency staff to report immediately.

v) All Secretaries of the State Departments to be contacted to be available in the EOC immediately.

vi) State EOC to remain in constant touch with control rooms at national district and Block level.

vii) Overall management of state EOC shall be taken over by the Relief Commissioner.

On receipt of information, RC to:
- Contact all member of Crisis Management Group to inform them about the venue and time of first meeting (chaired by Chief Secretary) to assess the situation and decide the course of action to be adopted by the State government.
- Issue instructions to all departments to ensure that all state government employees to report for duty immediately in order to execute their responsibilities.
- Instruct all line departments to ensure their duty officers to remain available round the clock in state EOC with full updated information of the activities of their departments.
- Prepare and submit daily situation report to Government of India, Chief Secretary, Principal Secretary (Disaster management), etc.
- If necessary depute Senior state level officers to worst affected blocks for effective implementation and supervision of Relief Operation.
- Mobilize additional manpower from the departments to the affected district / blocks for supporting the Relief Operation. They should be provided task force action Plans of the concerned blocks / district prepared earlier.
- Management of Media (Press/TV Channels/Government Press Notes) to be carried out by the Secretary (Information & Broadcasting) with special emphasis on rumor control. He shall maintain constant liaison with Disaster Management Department.

1.4.2 Restoration of lines of communications and essential services to facilitate emergency response:
- Establishment of Emergency Communication
- Restoration of Communication Links (Rail, Road & Air)
- Restoration of power and electricity

- Supply of safe drinking water
- Restoration of essential lifeline infrastructure

1.4.3 Search, rescue and medical assistance:
- Identification of areas where Quick Response Teams (SDRF/QRTs) to be deployed for search & rescue
- Coordination of SDRF/QRTs for their quick deployment in allotted areas
- Provision of quick transport of SDRF/QRTs to affected areas with the well equipped vehicles containing all the necessary arrangements for search & rescue and medical assistance.
- The department of PWD (Roads) to evolve a mechanism for clearing access routes and debris in order to facilitate search and rescue operations.
- Mobilization of specialized equipments and machinery to affected areas.
- Cordoning of affected areas with control of entry and exit.
- Traffic Management by establishment of traffic points and check-posts.
- The Home Department to evolve a mechanism for providing security of properties of government and public in the affected areas.
- Setting up of field hospitals in the affected areas and deployment of mobile hospitals.
- Providing logistical support to the health sectors round the clock
- Arrangements to be made for quick transportation of injured victims to the hospitals.
- Principal Secretary (Health) to evolve a mechanism for speedy treatment of casualties.

1.4.4 Emergency relief (shelter, food, clothing, etc.)
(a) Establishment of Temporary shelters for evacuees.
(b) Ensuring provision of essential services as under:
- Arrangement for food, clothing, blanket/bedding, drinking water, sanitation and hygiene, lighting arrangements and essential medicines.
- Deployment of mobile hospitals in affected areas for treatment of victims.
- Providing counseling services to the earthquake victims and their relatives.

(c) Arrangement for providing transport facility to send dead bodies of non-locals to their natives. The administration should also ensure Law and Order during shifting of the dead bodies.

(d) Ensure establishment of communication link between the affected people and their relatives outside.

A Task and Responsibility Matrix for Emergency Response Phase (first 72 Hours of the incident) is given below;

Time Frame	Sl. No.	Task	Responsibility
0 + 15 Minutes	1	Report the occurrence of earthquake to the RC, PS (DM), Heads of all line departments, Chief Secretary and Chief	Joint Secretary,

		Minister's Office and NDMA	DMD
0 + 30 Minutes			
	2	Establish communication link by activating alternate communication equipment i.e. satellite phone, HF / VHF set, VSAT etc. in State / District EOCs and block control rooms	SEOC
	3	Verify the authenticity of the incident from agencies like IMD and also from District/block control rooms, Police and Fire Brigade control rooms	Joint Secretary, DMD
	4	Instruct duty officers of line departments to report in SEOC	RC
	5	Hold first meeting with duty officers	
	8	Contact the Heads of all line departments including the Information Department to reach SEOC	
	9	Alert SDRF / SDRF/QRTs for quick mobilization to affected areas	Joint Secretary, DMD
	10	Request for the services of NDRF/ SDRF and Armed forces, if required through designated representative	RC
0 + 1 Hour			
	11	Instruct both regular and emergency staff of EOC to report for duty	Joint Secretary, DMD
	12	Dispatch of SDRF/QRTs to the affected areas with necessary equipments and vehicles	
	13	Instruct Quick Response Team to submit preliminary need and loss assessment report of the affected areas	Joint Secretary, DMD
	14	Alert Quick Medical Response Teams to the affected areas	
	15	Make arrangements for aerial survey of the affected areas	RC
	16	Instruct local administration to evacuate victims to safer sites	
	17	Contact Chief Secretary for deciding on time and venue for holding Crisis Management Group (CMG) meeting at the earliest	
	18	Inform all CMG members to attend CMG meeting in designated venue to assess situation and review emergency measures	
	19	Instruct concerned authorities or Agencies to shut down critical operations	
	20	Contact ISRO and Ministry of Defence for aerial / satellite imageries of the affected areas	
0 + 2 Hour			
	21	Ensure all State Government employees report for emergency duties as soon as possible	RC
	22	CMG to assess situation, delegate responsibilities for organizing rescue and relief operations	

	23	Senior State level officers to be deputed to the affected areas	
	24	Activate Operations Section of IRS for Emergency Response Operation	
	25	Assess the conditions of road, rail and air communication link for quick mobilization of Emergency Teams and resources to affected areas and take follow up actions	
	26	Director, Information and Broadcasting - (I & B) to establish media management / information cell for public information, guidance and rumor control	Secretary, I & B
	27	Request may be made for assistance from Central Government (MHA and MOD) if required	RC
	28	Request the nearest headquarters of the Armed Forces to render assistance in emergency search, rescue and relief operations	
	29	Contact private / public sector agencies in the State to assist in emergency rescue and relief operations	
	30	Inform Secretaries of the departments to provide necessary logistics support to emergency operation task forces	
	31	If necessary, assistance may be asked from neighbouring states and outside agencies	
	32	Set up separate desks for each operation task force and NGO coordination desk in the SEOC for coordinating emergency operations	
	33	Provide security in affected areas and maintain law and order situation	Secretary, Home
	34	Mobilize Medical First Response Teams to affected areas	Secretary, Health
	35	Instruct district information officers to establish information centre near affected areas to provide guidance to volunteers and aid agencies	RC / Director - Information
0 + 3 Hour			
	37	Instruct district information officers to establish information centre near affected areas to provide guidance to volunteers and aid agencies	RC / Director - Information
	38	Maintain constant touch with the National / District and Block EOCs	RC and SEOC
	39	Establish Press / Media Centre for media management and information dissemination	Director, Information
	40	Arrange for press / media release for rumour control and public information and guidance	Director, Information
	41	Arrange for press / media release for rumour control and public information and guidance	Director, Information and RC

0+6 hrs			
	42	Establish relief coordination centre at the airport, railway station, etc. for arrival of Search @ Rescue and Medical Teams coming for humanitarian aid	RC
	43	Establish central relief coordination centre nearer to State Head Quarter	
	44	Instruct to cordon affected areas and setting up of check posts to control entry and exit	Secretary, Home
	45	Open access routes and manage traffic for mobilization of equipment, machinery and volunteers to the affected areas	Secretary, Home & Secretary Transport
	46	Conduct aerial survey and also mobilize quick assessment teams to affected areas	RC & Secretary Transport
	47	Establish information centres at the arrival and departure points especially at the airports, railway stations and interstate bus terminus	RC / DMD / Line Departments
0+12 hrs			
	48	Mobilize relief materials i.e. tents, food materials, water, essential medicines, blankets, etc. to the affected districts and Blocks	RC / DMD / Line Departments
	49	Arrange to shift evacuated persons to temporary shelters and ensure provision of food, water facilities, blankets and storage of relief materials	RC
	50	Arrange road, rail and air transport at State / District headquarters for dispatch of relief materials to the affected areas	Secretary, Transport
	51	Set up field hospitals near the affected areas	Secretary, Health
	52	Arrange to shift injured persons to field hospitals	Secretary, Health

1.5 Immediate relief to be provided to the affected population

1.5.1 Short-Term Relief Measures

(1) Provide temporary shelter to affected people

(2) Evacuation site should be safe, and easily accessible.

(3) Continue to provide essential services to the affected people i.e. food, water, clothing, sanitation and medical assistance

The RC to ensure the following in the relief camps:
- Special emphasis on Hygiene and sanitation aspects should be given in relief camp sites.

- Separate area should be earmarked within the relief camp for storage of relief materials.
- Adequate manpower and transport facilities for the camp site.
- Arrangements to be made for trauma management.
- Mobile medical units to be sent to remote areas with a view to provide medical assistance to the victims/injured.
- Information centre should be established by the administration.

1.5.2 Interim Relief Measures

- Arrangements to be made for identification and maintenance of the records of disposal of dead bodies in the affected areas.
- Arrangements to be made to record the complaints of all persons reported missing. Follow up action in terms of verification of the report also needs to be made.
- Sub-Divisional magistrates to be empowered to exempt the requirement of post-mortem in case of mass casualties.
- Unclaimed/unidentified dead bodies to be disposed off at the earliest after keeping their records.
- Additional manpower to be deployed in the affected areas for supplementing the efforts of the local administration.
- Separate Cell to be established at state/district/Blocks level to coordinate with the NGOs and outside donor/aid agencies.
- Regular meetings of the different stakeholders/departments should be organized at state level for sharing of information, developing strategies for relief operations.
- Information & Broadcasting Dept to coordinate with the media to play a positive role in disseminating appropriate information to public and the government in order to facilitate the speedy recovery.

1.5.3 Assessment of Damage / Loss and Relief needs

- The RC to issue instructions to the District Magistrates provide "the need and loss assessment".
- Adequate manpower, vehicles, stationery etc should be provided to supplement the efforts for need/loss assessment.
- Identification and demolition of dangerous structures in the affected areas to minimize further loss of life and injuries.
- Arrangements for debris removal and its appropriate disposal.
- Arrangements for distribution of gratuitous relief and cash doles.
- Arrangements to be made for survey of human loss and distribution of exgratia relief to the families of deceased persons.
- Teams to be formed and dispatched to the affected areas for detailed assessment of houses and property assessment.

- As reconstruction of houses will take a long period, arrangements to be made to provide interim shelters to the affected
- Providing essential services at the interim shelter sites such as water, power, drainage / sanitation, PDS shops, etc.
- Distribution of shelter materials to individual families

Action Plan for Cyclone

2. Action Plan for Cyclone

2.1 Introduction:

West Bengal has two cyclone seasons – pre-monsoon and post-monsoon cyclone during April-May and Nov-Dec, respectively. Pre-monsoon cyclone, which causes wide spread hailstorm and it is traditionally called n the state as Kalbaishaki. Paschim Medinipur, Purba Medinipur, South 24 Parganas, North 24 Parganas, Howrah, Hooghly, part of Nadia, Burdwan and Bankura are located in very high damage risk zone (V=50m/s) with respect to Cyclone; whereas a major part of Nadia, Burdwan, Bankura, Murshidabad, Malda, Uttar and Dakshin Dinajpur, Jalpaiguri, Cooch Behar, Darjeeling, part of Purulia encounter with high damage risk zone (V=47m/s). Major portion of Purulia falls under moderate damage risk zone (V=29m/s) with respect to cyclone.

About 80 tropical cyclones (with wind speeds equal to or greater than 35 knots) form in the world's waters every year. Of these about 6.5% develop in the Bay of Bengal and Arabian Sea. Since the frequency of cyclones in the Bay of Bengal is about 5 to 6 times the frequency of those in the Arabian Sea, the Bay of Bengal's share comes out to be about 5.5%.

The regions of West Bengal that may suffer the possible impact of tropical cyclones come belong to the following district wise blocks:

Sr	Name of the District	Name of the Block
01	Purba Medinipur	1. Ramnagar I, 2. Ramnagar II, 3. Contai I, 4. Contai II, 5. Khejuri II, 6. Nanadigram I, 7. Sutahata
02	24 Parganas-South	8. Kultali, 9. Canning I, 10. Canning II, 11. Gosaba, 12. Basanti, 13. Kakdwip, 14. Namkhana, 15. Sagar, 16. Patharpratima
03	24 Parganas-North	17. Hingalganj, 18. Sandeshkhali I, 19. Sandeshkhali II, 18. Hasnabad, 19. Gaighata, 20. Bongaon, 21. Bagdah
04	25. Howrah	22. Uluberia I, 23. Shyampur II
05	Paschim Medinipore	23. Danton
06	The State capital Kolkata Areas	

2.2 Associated Authority

The Nodal Department for controlling, monitoring and directing measures for organizing rescue, relief and rehabilitation is the Crisis Management Department of the State/WBSDMA. All other concerned Departments should extend full cooperation in all matters pertaining to the management of the Cyclone Crisis whenever it occurs. The State Departments like Agriculture, Home including Transport, Ports & Fisheries, Power, Finance, Information and Broadcasting etc. shall have a major role in emergency response during occurrence of Cyclone.

2.3 Crisis Declaration

The purpose of declaration of Crisis is to organize effective response and mitigating the Cyclone effects. Such a declaration provides wide powers and responsibilities to the State Relief Commissioner and the District Magistrates in order to handle the incident effectively.

2.4 Four - stage warning system for Tropical Cyclones

1.) **Pre-Cyclone Watch**
It is issued when a depression forms over the Bay of Bengal irrespective of its distance from the coast and is likely to affect Indian coast in future. The pre-cyclone watch is issued by the name of Director General of Meteorology and is issued at least 72 hours in advance of the commencement of adverse weather. It is issued at least once a day.

2.) **Cyclone Alert**
It is issued at least 48 hours before the commencement of the bad weather when the cyclone is located beyond 500 Km from the coast. It is issued every three hours.

3.) **Cyclone Warning**
It is issued at least 24 hours before the commencement of the bad weather when the cyclone is located within 500 Km from the coast. Information about time /place of landfall are indicated in the bulletin. Confidence in estimation increases as the cyclone comes closer to the coast.

4.) **Post landfall outlook :**
It is issued 12 hours before the cyclone landfall, when the cyclone is located within 200 Km from the coast. More accurate & specific information about time /place of landfall and associated bad weather indicated in the bulletin. In addition, the interior distraction is likely to be affected due to the cyclone are warned in this bulletin.

2.5 Warning Dissemination process

1. Cyclone/flood forecasting is generally the responsibility of the Indian Meteorological Department (IMD). IMD is the nodal agency for providing cyclone warning services. IMD‟s INSAT satellite based Cyclone Warning Dissemination System (CWDS) is one of the best currently in use in India to

communicate cyclone warnings from IMD to community and important officials in areas likely to be affected directly and quickly. There are 6 CWDS stations in West Bengal.

2. After getting information from IMD, warning dissemination is a responsibility of State Government (RC). The RC under the Crisis Management Department is responsible for disseminating cyclone warnings to the public and Line Departments.

3. On receiving an initial warning, the office of the RC disseminates the warning to all Line Departments, the District administration and DG Police. Warning messages are transmitted though wireless to all districts and Blocks. District Magistrates are provided with all sorts of equipments to maintain effective communication, even if terrestrial and cell-phone communication fails.

4. The state EOC and control rooms of the other line departments at the State level as well as district level also get the warnings. The control rooms are activated on receiving the warnings.

2.6 Plan Activation

The cyclone response structure will be activated on the receipt of cyclone warning by the Indian Meteorological Department (IMD). The occurrence of a cyclone may be reported by the IMD to the Relief Commissioner/WBSDMA by the fastest means. The Relief Commissioner (RC) will activate all the Departments for emergency response including the State EOC, District EOC and ERCs. He will issue instructions to include the following details:

- Specify exact resources (in terms of manpower, equipments and essential items from key dept. /stakeholders) required.

- The type of assistance to be provided

- The time limit within which assistance is needed

- Details of other Task/Response Forces through which coordination should take place

The State EOC, ERCs and other control rooms at the state level as well as district control rooms should be activated with full strength. The state Government may publish a notification in the official gazette, declaring such area to be Crisis-affected area.

2.7 Roles and Responsibility

Time Frame	Sr. No	Task	Responsibility	Activity

| Time = 0 – 72 hrs | 1 | Warning receipt and dissemination | IMD, RC | Report the generation of Cyclone in Bay of Bengal/ Indian Ocean after getting information from IMD to following officials;
- RC
- Principal Secretary (DM)
- Chief Executive Officer, WBSDMA
- Chief Secretary of the State
- Members of Crisis Management Group
- Hon. Chief Minister
- Hon. Minister – Crisis Management
- National Crisis Management Authority, GoI.
- All concerned District Magistrates as well as Control Rooms of the district/s likely to be affected as per preliminary warning of IMD.
- Ministers and Secretaries of all line departments

• Instruct all District Magistrates (of the districts likely to be affected) to activate District Control Room at full strength.
• Alert all response teams in the State for deployment.
• Remain in constant touch with control rooms at National & State Level.
• Instruct and alert all heads of departments of the key line departments to activate their departmental plan and SOPs for Cyclone response. |
| | | Establishment of lines of Communication | RC | Activate alternative communication equipments i.e. satellite phones, HF/VHF sets, Ham radio, VSAT in State EOC and ERCs, District and Blocks control rooms.

• Establish communication links with ERCs and Search & Rescue Teams in all Municipal Corporations and alert them to |

				Activity
				be in stage of readiness.
				• Establish communication links with villages likely to be affected as per the contact details available in SDRN.

Time Frame	Sr. No	Task	Responsibility	Activity
Time = 0 – 48 hrs	1	Review of situation and reporting	RC	• Establish contact with IMD, CWC, ACWC, ISRO and the defense ministry of GoI for aerial / satellites imageries of the latest Cyclone threat. • Get the latest weather report from IMD/other international Web Sites to know the exact location of Cyclone and the likely area where landfall will take place. • After reviewing the weather report and satellite images issue instructions and orders for emergency response to areas likely to be affected.
	2	Management of EOC, ERCs and Cyclone Response	DM Dept./RC	• Take over full command of State EOC and ERCs. • Instruct line departments to depute representatives at the State and District EOCs. • Hold a meeting with leaders of task forces and entrust them their tasks. • Ensure that Cyclone information is disseminated to all who are at danger • Arrange emergency meeting with State Crisis Management Group to device a plan of action.

			RC	Arrange dissemination of information through various means of communication such as Radio, TV, Cable Network, SMS about Cyclone warning to districts/areas which are likely to be hit by Cyclonic Storm.
			Secretary Transport	Impose restriction on all transport activities heading towards coastal areas that are likely to be affected by Cyclone. .
			RC	- Alert following teams to remain in readiness: - Evacuation - Emergency Medical Services - Search and Rescue - Alert following emergency response forces to remain in readiness: - Fire & Emergency Services - NDRF - Village Crisis Management Teams - Police, Home Guards - State Reserve Police Force - Army (if required) - Air Force (if required)

Time = 0 – 48 hrs	3	Cyclone response to coastal areas (likely to be affected)	DM Dept., Transport Dept. and Dist. District Magistrates, Municipal Commissioner	- Based on the warning issued by IMD, pin point the districts and villages likely to be affected by Cyclone and start the procedure for identifying safe places/shelters for evacuation in those villages. - Village wise data of safe sheltering for evacuation available on SDRN should be referred and the dist. District Magistrates/Village level officers should be contacted to know

				- the status of the shelters with the capacity of the shelter and other available facilities at the site. - Make transport arrangement for mobilization of all emergency response teams.
			Ports & Fisheries Dept., DM Dept.	Ensure arrangements are in place to evacuate fishermen and salt workers if needed.
			Tourism Dept.	Ensure safety of tourists visiting beaches along the coastline.
			Home Dept., Dist. District Magistrates	- Cordoning off coastal areas for restricting entries of rail or road traffic. - Ensure law and order is maintained in areas likely to be affected.
			Line Depts.	Ensure that all critical activities (mainly industrial production) in areas likely to be affected are shutdown
			Education Dept.	Ensure that the schools and colleges are closed in areas likely to be affected by Cyclone and associated hazards.
			Dist. District Magistrates, Municipal Commissioner, Information Dept.	- Ensure dissemination of information to remote areas by local means. - Ensure that local help lines are opened and effectively managed for public information, guidance and rumor control. - Ensure that the information to public and media about the progress of Cyclone at periodic intervals is released.

| | | | Dist. District Magistrates, Municipal Commissioner, Line Dept. | Make arrangements for logistic support to all emergency response teams. |
| | | | Health Dept. | Health Department to activate their Departmental Cyclone Crisis Management Plan and Departmental SOPs for Management of casualties |

Time Frame	Sr. No	Task	Responsibility	Activity
Time = 0 - 24 hrs	1.	Review of situation and reporting	DMD	- Establish contact with IMD, CWC, ACWC, ISRO and the defense ministry of GoI for aerial / satellites imageries of the latest Cyclone threat. - After reviewing the weather report and satellite images issue instructions and orders for emergency response to areas likely to be affected areas.
			DMD, Information Dept.	- Review and monitor following activities: - Evacuation of people from coastal areas likely to be affected - Positioning of Search and Rescue Teams - Positioning of mobile communication units - Positioning of quick medical response teams - Mobilization of restoration teams of respective departments - Requirement of armed forces in rescue and relief operations - Dissemination of information to the vulnerable areas

				• All preparedness measures to be taken by various authorities • Keep in touch with National, District and Blocks Control Rooms • Release information at appropriate time to media and public regarding response measures organized by the Government
			RC, Dist District Magistrates	• If reports regarding striking of Cyclone are confirmed by IMD and other sources, start the emergency response and relief operations.
			RC, Dist District Magistrates	• Divert the emergency services to areas likely to be affected as per the warning issued by IMD.
			RC, Dist District Magistrates Municipal Commissioner, Home Dept.	• Inform the public residing in areas likely to be affected to evacuate through various means such as SMS, AIR, FM Radio, Doordarshan, etc. • Start evacuation from the likely affected areas through Police support, if necessary
			Coast Guard, RC	To account for the exact number of fishermen in the sea and fishermen that have already reached the shore
			DMD	Ensure that the Relief Management work planned in the areas likely to be affected by the Cyclone are well organized.
			DMD, Civil Supply Dept., Revenue Dept. & Dist. District Magistrates, Municipal Commissioner Water Supply	Ensure that the arrangement for basic amenities(shown below) at evacuation/relief centres are made by the respective departments: • Drinking water • Food • Clothing • Sanitation and hygiene,

			Dept., GEB, Health Dept.	• Lighting • Medicines and other Health Care
			DMD	• Inform following agencies to be in a state of readiness for assisting in the Cyclone response measures (if required): • Public sector agencies • Private sector agencies • NGOs • CBOs • Volunteer Organizations • Request for help (if needed) to MHA/National Crisis Management Authority
			Information Dept.	• Make necessary arrangements for public information/guidance, public opinion and rumor control.
			Transport Dept. and Dist. District Magistrates, Municipal Commissioner	• Restriction may be imposed for transportation in threatened areas.
Time=0 hrs	1	Crisis Declaration	DMD, Dist District Magistrates	• When Cyclone makes a landfall, Cyclone affected Dist. District Magistrates should send a communication to the State Govt. to declare the area as Crisis affected, if necessary, (depending upon the nature and intensity of impact)
	2	Preliminary assessment, deployment of emergency response teams and information dissemination	Dist. District Magistrates, Municipal Commissioner	• Dist. District Magistrates should send teams to the affected areas to take stalk of the effects of Cyclone and associated rain. • District District Magistrates should send sector wise situation reports to: • State EOC/RC

		Preliminary assessment, deployment of emergency response teams and information dissemination	RC, Dist. District Magistrates, Municipal Commissioner	Deployment of following teams to Cyclone affected areas: • Emergency Communication Teams • Emergency Medical Services Teams • Search and Rescue Teams (With Equipments) • Preliminary damage Assessment Teams • Need Assessment Teams
		Preliminary assessment, deployment of emergency response teams and information dissemination	DMD, Dist. District Magistrates, Information Dept.	• Establish communication link with affected districts by activating alternate communication equipments such as Satellite Phones, HF/VHF Sets, Ham Radio, V Set etc., in State/District EOCs and Taluka Control Rooms. • Arrange dissemination of information about occurrence of Cyclone and areas that are affected by it to Media & Public.
Time = 0+24 hrs	1	Mobilization and Deployment	DMD, Dist. District Magistrates, Municipal Commissioner, Key line Dept	Remain in constant touch with IMD for updates on weather forecast for the coming hours and plan accordingly. • Immediate mobilization of following units/teams to areas affected by Cyclone and associated rains. • S & R Teams of Fire and Emergency Services • SDRF/QRT for medical assistance, damage & loss assessment, Dead Body disposal & Carcasses disposal, debris clearance, etc.
	2	Measures for quick and organized response	DMD, Dist. District Magistrates, Municipal Commissioner, Key line Dept	• State EOC, ERCs, the District Magistrates of the affected District/s Should ensure that the following response activities are carried out immediately

	a.	Clearance of access roads to reach at the sites of affected areas	Transport Dept., Railways, DMD	• To survey the access roads/routes leading to the affected areas and manage traffic for mobilization of equipments, machinery and volunteers. • Identify alternate roads/routes for evacuation. • Undertake repairing/restoration of damaged roads leading to the affected areas. • Identify and declare unsafe buildings/structures in Cyclone affected areas. • Evacuate people from unsafe buildings/structures and shift them to relief camps/sites. • Divert/stop transport activities (Rail + Road) heading towards Cyclone affected areas.
	b.	Necessary Arrangements at evacuation/ relief centres	Revenue Dept., Civil Supply Dept., District Magistrates, Municipal Commissioner, Water Supply Dept., Health Dept., WBSEB, Power & Energy Dept., & Local Authorities, Home Dept.	• To ensure that necessary arrangements at evacuation/relief centers is made with sufficient availability of: - Food, - Water, - Blankets/Clothing - Medicines - Lighting - Sanitation and hygiene etc • To ensure necessary security arrangements for the personals (Emergency responders/relief teams) who are working at Relief Centers and involved in distribution of Relief Materials. • To ensure that law and order is maintained at evacuation / relief centers and in the affected areas as well.

	c	Safety of fishermen	• RC, Port • And Fisheries Dept., • Tourism Dept., • Industrial Dept.	• Immediate actions to be taken for safety of fishermen, salt workers and visitors at Cyclone affected coastal areas. • Ensure that all the fishermen and salt workers have returned from the sea or those who are in the sea are rescued and evacuated to safer places
	d	Ensure immediate health and minimization of outbreak of disease	Health Dept., Transport Dept.	• To establish camp hospitals near the affected areas. • To make transportation arrangements to shift seriously injured persons to nearest- a. Camp Hospitals, b. Block and District Hospitals, c. Regional and State Hospitals • Ensure that the Hospitals are well prepared to deal with seriously injured persons. • To ensure that the required medical assistance/aid and medicines are provided to the affected people at site as well as at evacuation/relief centers in the affected area and necessary records are maintained. • Take sanitation and epidemic control measures for preventing any water borne disease. • Keep adequate stock of essential medicines, first-aid etc. at block/district hospitals • Take steps to purify drinking water sources If required, take the help of doctors/paramedics from the list of doctors/paramedics available at the block/district level for immediate medical assistance.
		Ensure immediate health and minimization of	Animal Husbandry Dept.	Assess need for fodder if required. Keep ready teams for carcass disposal (if required).

		outbreak of disease		
	e	Information to public and media	Information Dept., COR	Establish Media/Press Centre for media management and information dissemination • Ensure that the information to media /general public about the response of the State Government is released in an organized manner. • Organize media briefing twice a day at pre - determined intervals.
	f	Other important work related to immediate response	DMD	• Prepare quick need assessment report for planning of relief operation. • Additional assistance may be asked for emergency response/relief from GoI-NDMA (If needed). • Maintain constant touch with National, District and Block EOCs and other control rooms. • Conduct Arial survey of affected areas for taking a stalk of the situation.

Time=0+24 to 48 hrs	1	Restoration of critical infrastructure/ essential services	DMD, Line Depts., Dist. District Magistrates, Municipal Commissioner	• Ensure that the essential services/critical infrastructure of the affected areas have been restored or alternative arrangement is made for ensuring safety of people and smooth management of emergency response.
				• Ensure that key administrative and lifeline buildings are brought back to operation quickly.
				• Ensure following primary necessities are restored
				   o Power
				   o Water
				   o Telecommunication
				   o Roads
				   o Bridges

Time=0+24 to 48 hrs	2	Disposal of	Revenue Dept.,	• Ensure following procedure is

		Dead bodies	District Magistrates, Municipal Commissioner, Home Dept., Health Dept., Local Authorities	followed before disposal/handing over of dead bodies: o Photographs of the dead bodies are taken, o Identification of the dead bodies is done, o Post Mortem where ever necessary and possible is carried out, o Handing over dead bodies of persons known/identified to their relatives, o Disposal of unclaimed and unidentified dead bodies.
			Animal Husbandry Dept, Local Authorities, health dept	- Animal Husbandry Department to ensure medical aid to cattle who are injured. - Disposal of animal carcasses with the help of local bodies/health dept.
	3	Public Information and Media Management	DMD, Information Dept. and Dist. District Magistrates, Municipal Commissioner	- Ensure that the information about progress of rescue and relief is provided to media/public in an organized manner at least twice a day. - Establish help lines for facilitating communication between the victims and their relatives residing outside the affected area/s. - Establish Information Centers at strategic locations for providing information about persons evacuated to the relief centres/hospitals.
	4	Miscellaneous rescue and relief works	DMD, Districts District Magistrates, Municipal Commissioner,	- Assess the situation and take appropriate action to accelerate the Search & Rescue Operations. - Depute additional officers and supporting staff to cyclone affected areas from non-affected areas (if required) to accelerate the rescue and relief operations.
Time=0+48 to 96 hrs	1		DMD, Dist.	- Remain in constant touch with

			District Magistrates, Food Supply Dept.	IMD for updates on weather forecast for the coming days and plan accordingly. - Arrange for procurement of additional relief material required for relief operations (on the basis of need assessment). - Mobilize additional relief material required for relief operations. - Maintain constant touch with State & Districts EOCs.
Time=0+48 to 96 hrs	2		DMD Health Dept. and Transport Dept	- Arrangement for transportation of injured from field hospital to base hospital - Arrangement for transport of dead bodies to their native places.
	3		Line Depts., Dist. District Magistrates, RC	- Ensure maintenance of record, timely reporting and information management. - Ensure maintenance of record and information database.
Time = 0 + 96 to 168 Hrs	1		DMD	- Remain in constant touch with IMD for updates on weather forecast for the coming days and plan accordingly. - Review the restoration of all the public and essential in Cyclone affected areas. - Review and follow-up all necessary arrangements for emergency response & relief in the affected area/s.
	2		DMD, IMD	On receiving the message from IMD about degradation of Cyclone, inform the concern dist. District Magistrates.
	3		DMD, Dist. District Magistrates, Municipal Commissioner,	Organize a quick rapid visual survey of the affected areas (through a technical team of engineers) to ascertain the safety of the structures decide on giving the go-ahead to people to move back to their respective houses.

	4		DMD, District Magistrates, DSP	After receiving the massage of de-warning, ensure that people are moved back safely to their houses.
	5		DMD	Ensure relief disbursement, allotment of funds and grants to line department and District Magistrates for organizing emergency response, relief and evacuation arrangements.

2.8   Immediate relief to be provided to the affected population

2.8.1   Short-term Relief Measures

Search, rescue and medical assistance

- Identification of areas where SDRF/QRTs to be deployed

- Coordination of SDRF/QRTs for their quick deployment in allotted areas
- Provision of quick transport of SAR teams to affected areas.

- The department of Roads and Buildings to evolve a mechanism for clearing access routes in order to facilitate search and rescue operations.

- Mobilization of specialized equipments and machinery to affected areas.
- Cordoning of affected areas with control of entry and exit.

- Traffic Management by establishment of traffic points and check-posts.

- The Home Department to evolve a mechanism for providing security of properties of government and public in the affected areas.
- Emergency relief (shelter, food, clothing, etc.)

- Establishment of Temporary shelters for evacuees.
- Ensuring provision of essential services as under:
- Arrangement for food, clothing, blanket/bedding, drinking water, sanitation and hygiene, lighting arrangements and essential medicines.

- Deployment of mobile hospitals in affected areas for treatment of victims.

- Providing counseling services to the cyclone victims and their relatives.
- Ensure establishment of communication link between the affected people and their relatives outside.
- The RC to ensure the following in the relief camps:

- Special emphasis on Hygiene and sanitation aspects should be given in relief camp sites.

- Separate area should be earmarked within the relief camp for storage of relief materials.

- Adequate manpower and transport facilities for the camp site.
- Arrangements to be made for trauma management.

- Mobile medical units to be sent to remote areas with a view to provide medical assistance to the victims/injured.
- Information centre should be established by the administration.

2.8.2 Interim Relief Measures

- Arrangements to be made for quick identification and maintenance of the records of disposal of dead bodies in the affected areas (Home, Revenue, Health Dept., Local Authorities).

- Arrangements to be made to record the complaints of all persons reported missing. Follow up action in terms of verification of the report also needs to be made. (Home Dept.)

- District Magistrates and sub-divisional magistrates to be empowered to exempt the requirement of identification and post-mortem in case of mass casualties. DMD may depute additional executive magistrates to expedite disposal of the dead bodies.

- Unclaimed/unidentified dead bodies to be disposed off with the help of pre identified voluntary Agencies at the earliest after keeping their records. (DMD, Health Dept. & Local Bodies)

- Additional manpower to be deployed in the affected areas for supplementing the efforts of the local administration.

- Separate Cell to be established at state/district/Block level to coordinate with the NGOs and outside donor/aid agencies. (DMD)

- Regular meetings of the different stakeholders/departments should be organized at state level for sharing of information, developing strategies for relief operations. (DMD, RC & District Magistrates at District Level).

- Information & Public Relation Dept to coordinate with the media to play a positive role in disseminating appropriate information to public and the government in order to facilitate the speedy recovery.

2.8.3 Assessment of Damage/Loss and Relief needs

- Form CA II should be filled up by the affected districts/blocks in the prescribed format where all the details of damage and death are to given.
- The Relief Commissioner to consolidate the same and to prepare **"state's damage and loss assessment report"** which will be useful in planning and implementing the relief operation after the Crisis for the victims of the Crisis.
- Adequate manpower, vehicles, stationery etc should be provided to supplement the efforts for need/loss assessment. (DMD.)
- The relief need assessment report should be provided by the District Magistrates. (Relief Commissioner & District Magistrates)
- Identification and demolition of dangerous structures in the affected areas to minimize

further loss of life and injuries. (Agricul. Dept., DM Dept and Local Bodies)

- Arrangements for distribution of gratuitous relief and cash doles. (DM Dept., Panchayat Dept., and District Magistrates)

- Arrangements to be made for survey of human loss and distribution of ex-gratia relief to the families of deceased persons. (DM Dept.)

- Teams to be formed and dispatched to the affected areas for detailed assessment of houses and property damage assessment. (DM Dept and Local authorities)

- As reconstruction of houses will take a long period, arrangements to be made to provide interim shelters to the affected. (DMD and Line Departments like PHE., PWD Dept. etc)

    - Identification of the site for interim shelter
    - Allocation of areas to affected families
    - Providing appropriate shelters to the affected families
    - Providing essential services as under in the interim shelter sites.

- Water
- Transportation
- Power
- Road
- Drainage/Sanitation
- School
- PDS Shops
- Health
- Protection
- Distribution of shelter materials to individual families.

Action Plan for Flood

3.   Action Plan for Flood

3.1   Introduction

According to the Irrigation Department, 37.6 lakhs Ha of West Bengal (42.4% of the total geographical area and 69% of its net cropped area) has been identified as flood prone area; of this 29.8 lakh Ha (i.e., 58% of the flood prone area) is Protected Area. Strong monsoon, rivers and floods are an integral part of Bengal's characteristic ecology that shaped its civilization and culture and at the same time, cause of flood hazard and Crisiss for the society as a whole. West Bengal, mostly being a deltaic plain, has to face flood situation almost every year. Also it is a densely populated sate and has developed a very effective flood SOP. SOP for proper management of flood comprises of three phases:
A) Pre-flood phase,
B) During flood phase and
C) Post-flood phase.

A. PRE-FLOOD PHASE:-
Activities during pre-flood phase are essentially aimed towards 1. **Preparedness** and 2. **Mitigation.**
1. PREPARATORY MEASURES:
1.1 Vulnerability Assessment
1.2 Database Preparation
1.3 Early Warning Dissemination system:
1.4 Stocking of Essential Commodities
1.4.1 Relief Materials
1.4.2 Kerosene Oil
1.4.3Medicine
1.4.4 Animal feed
1.4.5 Drinking Water
1.4.6 A list of locations where essential commodities are stored for emergency use during and or after flood should be prepared, updated and maintained. It is also important that such sites are adequately secured against plundering during crisis
1.5 CO-ORDINATION
1.6ACTIVATING CONTROL ROOMS
1.7 MAINTENANCE OF ESSENTIAL SERVICES
1.8 RESPONSIBILITY AND ACCOUNTABILITY: As far as possible, responsibility for every level of authority during flood should be fixed. Every such official should be accountable for his action/discretion during Crisis.
1.9 PREPARDNESS FOR EMERGENCY RESPONSE
1.9.1 Evacuation Plan
1.9.2 Search & Rescue
1.9.3 Relief Shelters
1.9.4 Arrangement of boats & other equipments

1.10 STRUCTURAL VERIFICATION AND CHANGES
2. MITIGATION MEASURES
2.1 Planning & Capacity Building
B) DURING FLOOD PHASE
3.1 Role of local govt. representatives
3.2 Local Coping Mechanisms
3.3 Operationalisation of the control room
3.4 Co-ordination
3.5 Disposal of Caracas & dead bodies
C.) POST FLOOD PHASE
4. Assessment of damages
5. Verification of loss of life
6. Rehabilitation of the affected people
7. Animal care
8. Physical, Economic & Social Rehabilitation
9. Documentation

The Action Plan will consist of the following activities:

1. Declaration of Flood Crisis
2. Flood Forecasting and Warning
3. Trigger mechanism
4. Response mechanism of the concerned line departments along with the roles and responsibilities
5. Relief

3.2   Declaration of Flood Crisis

The Crisis Management Department of the State Government declares any area where flood have occurred or likely to occur as Crisis affected area on the recommendations of the State Relief Commissioner or the District Magistrates. The purpose of the declaration is to organize effective response in mitigating the flood effects. Such a declaration provides wide powers and responsibilities to the State Relief Commissioner and the District Magistrates in order to handle the incident effectively.

3.3   Flood Forecasting and Warning

Flood forecasting is a process whereby the authorities are alerted to impending conditions where floods may be likely. Flood forecasting requires understanding of meteorological and hydrological conditions, and is therefore the responsibility of the appropriate government agencies. National organisation is required, but information needs to be made available at a river basin scale. This allows forecasting to integrate with flood warning arrangements.
The main components of a national flood forecasting and warning system are as follows:

- Collection of real-time data and prediction of flood severity and time of onset of particular levels of flooding
- Preparation of warning messages, describing what is happening, predictions of what will happen and expected impact.
- The communication and dissemination of such messages
- Interpretation of the predictions and other flood information to determine flood impacts on communities
- Response to the warnings by the agencies involved and communities
- Review of the warning system and improvement in the system after flood event
- If predictions fail, the reasons of prediction failure should be communicated to communities in order to establish trust.

For a flood warning system to work effectively, all these components must be present and they must be integrated with each other rather than operating in isolation.

3.3.1 Community based flood forecasting and warning systems :

It is important that the people in each community receive information as early as possible about the possibility of flooding in their area. In addition to the valuable information from the official flood warning system, communities should attempt to develop their own warning systems. At community level, it is important that warnings are received by all individuals. The way in which messages are disseminated in communities will depend on local conditions, but may include some or all of the following:

- Media warnings (print and electronic)
- General warning indicators, for example sirens
- Warnings delivered to areas by community leaders or emergency services
- Dedicated automatic telephone warnings to at-risk properties
- Information about flooding and flood conditions in communities upstream. One approach to disseminating messages is to pass warning messages from village to village as the flood moves downstream
- Keep watch and be regularly informed about the river level and embankment conditions in the local area. The monitoring of the river and embankment should be increased as the water level increases and crosses the critical danger level
- A community-based warning system to pass any information about an approaching flood to every family.

3.3.1 Involvement of communities in data collection and local flood warning systems

If communities become involved in data collection for flood forecasting, and the importance of their role is understood, a sense of ownership is developed. Individuals can be appointed for the following tasks:

- Taking care of installations/ equipments
- Trained as gauge readers for manual instruments (rain gauges, water level recorders)
- Radio operators to report real-time observations

Trained individuals within the community should be able to gather and update

information to:
- Know the depth of past severe floods in the local area
- Know the causes of flooding in the local area
- Know how quickly the waters might rise
- Know how long the floodwaters might remain in the locality
- Know the direction of movement of the floodwaters

The involvement of members of the community also helps to prevent vandalism and damage to installations going unreported.

3.3.3 Procedure for disseminating warnings to remote areas

Communities in remote areas may not be able to receive the types of warnings described in the previous section. Responsibilities need to be defined clearly for lower tiers of administration and the emergency services to have predefined links with communities in remote areas.

This should include;
- Local radio, which should be supplied with clear and accurate information
- Use of appointed community wardens with direct two-way radio or mobile telephone access to warning agencies and emergency authorities
- Local means of raising alarms, for example church bells, sirens, loud hailers, loudspeakers etc. The latter could be the responsibility of selected individuals or wardens, who need to be provided with equipment and transport, for example motor cycles or bicycles;
- 'Sky Shout' from emergency service helicopters.
- High Priority Telegram
- Doordarshan and the local cable channels (TV channels & radio Channels including FM radio)
- Bulletins in the Press
- Satellite Based Crisis Warning Systems
- Fax
- Telephone

3.3 Trigger Mechanism: Plan Activation

The flood response system will be activated on the occurrence of a heavy rain. The Joint Secretary, Department of Crisis Management will activate all the Departments for emergency response including the State EOC. He will issue instructions to include the following details:
- Specify exact resources required
- The type of assistance to be provided
- The time limit within which assistance is needed
- The state, district or other contact persons/agencies for the provision of the assistance
- Other Task Forces with which coordination should take place

The state EOC and other control rooms at the state level as well as district control rooms should be activated with full strength. The state Government may publish a notification in the official gazette, declaring such area to be Crisis-affected area.

Once the situation is totally controlled and normalcy is restored, the COR declares End of

Emergency Response and issues instructions to withdraw the staff deployed in emergency duties.

3.5   Roles and Responsibilities

Sl. No.	Action To be Taken	Responsible Department
1.	Reporting the occurrence of flood to RC, Heads of line departments, Chief Secretary and Chief Minister's Office and National Crisis Management EOC, GoI.	West Bengal State Emergency Operation Centre (WBSEOC)
2.	Establish communication links by communication equipments like phone, fax etc. in state/district EOC and Sub- Division & Block Control Rooms.	State Emergency Operation Centre (SEOC)
3.	Verifying authenticity of flood from agencies like IMD	SEOC
4.	Hold meetings with Officers of Line Departments (especially Irrigation & Water Supplies Department)	DMD
5.	Dispatch of SDRF/QRTs to the affected areas.	DMD
6.	Make arrangements for the aerial survey of affected areas	RC
7.	Instruct local administration to evacuate victims to safer sites	RC
8.	Assess the condition of road and rail network for quick mobilization of Emergency teams and resources to affected areas and take follow up steps.	RC
9.	Maintain constant touch with National/District EOCs and Sub-Division & Block Control Rooms	DMD

Distribution of activities among various State Departments in West Bengal during flood

SL. No.	Response To be Taken	Responsible Department
1.	Providing temporary shelters to evacuated persons	Local Administration & DMD
2.	Providing food materials to the victims	Food & Supply
3.	Providing safe drinking water to the victims	Public Health Engineering Dept.
4.	Provision of hygienic sanitation facilities	Public Health Engineering Dept.
5.	Provision of health assistance	Health Department
6.	Clothing and Relief Articles	Local Administration & DMD
7.	Relief camps	Local Administration & DMD

3.6 Relief :

3.3.2 *Short-term relief measures*

• Food & nutrition :

In an extreme flood situation, people lose standing crops and stored food grains. In such cases, free distribution of foods are made to avoid hunger and malnutrition to the affected. Wherever possible, dry rations should be distributed for home cooking.

• Water :

Water supply is invariably affected in natural Crisiss. Availability of safe drinking water is very challenging particularly during floods. It must be ensured that affected people have adequate facilities and supplies to collect, store and use clear and safe water for drinking, cooking and personal hygiene. The Public Health Engineering (PHE) takes every possible initiative in this respect.

• Health :

During post Crisis phase many factors increase the risk of diseases and epidemics because of overcrowding, inadequate quantity and quality of water, poor environmental and sanitary conditions, decaying biological matter, water stagnation, inadequate shelter and food supplies. There should be adequate supply of medicines, disinfectants, fumigants etc. to check outbreak of epidemics. It should be ensured that the medicines have not reached expiry date.

• Clothing & Utensils (Crisis Management Kit):

The people affected by the Crisis shall be provided with sufficient clothing, blankets etc. to ensure their safety and well-being. Each Crisis-affected household shall be provided with DM Kits that include cooking and eating utensils.

• Shelter :

In case of flood, a large number of people are rendered homeless. In such situations shelter becomes a critical factor for survival and safety of the affected population. In view of this,

flood affected people who have lost their houses, are provided sufficient covered space for shelter. Crisis-affected households are provided with House Building Grant as per NDRF/SDRF norms.

- Relief camp:

  Relief camps also provide **temporary arrangements** for people affected by flood. Adequate numbers of buildings or open space are identified where relief camps can be set up during emergency. The use of premises of educational institutions for setting up relief camps are encouraged. The requirements for operation of rescue camps are worked out in detail in advance. The temporary relief camps should have adequate provision of drinking water and bathing, sanitation and essential health-care facilities.

- Sanitation and Hygiene

  Sanitation services are crucial to prevent an outbreak of epidemics in post Crisis phase. Therefore a constant monitoring of any such possibilities needs to be carried out. It should be ensured that Crisis-affected households have access to sufficient hygiene measures.

3.6.2 *Interim Relief Measures*

- Arrangements to be made for quick identification and maintenance of the records of disposal of dead bodies in the affected areas (DMD, Health Dept. and Local Authorities).
- Arrangements to be made to record the complaints of all persons reported missing. Follow up action in terms of verification of the report also needs to be made. (Home Dept., DMD)
- District Magistrates and sub-divisional magistrates to be empowered to exempt the requirement of identification and post-mortem in case of mass casualties.
- Unclaimed/unidentified dead bodies to be disposed off with the help of pre identified voluntary Agencies at the earliest after keeping their records. (Home Dept., DMD, Health Dept. & Local Bodies)
- Additional manpower to be deployed in the affected areas for supplementing the efforts of the local administration. (DMD).
- Separate Cell to be established at state/district/sub-division/block level to coordinate with the NGOs and outside donor/aid agencies. (DMD)
- Regular meetings of the different stakeholders/departments should be organized at state level for sharing information, developing strategies for relief operations. (Relief Commissioner & District Magistrates at District Level).
- Information & Public Relation Dept to coordinate with the media to play a positive role in disseminating appropriate information to public and the government in order to facilitate the speedy recovery. (I. & C. Dept.)

3.6.3 *Assessment of Damage/Loss and Relief needs*

- The Relief Commissioner issues instructions to the District Magistrates to provide the CA-II/ "Need Assessment Report". The Relief Commissioner consolidates the same and to prepare "State's Need Assessment Report".

- The relief need assessment report should be provided by the District Magistratess to

the RC and DMD.

- Identification and demolition of dangerous structures in the affected areas to minimize further loss of life and injuries. (DMD and Local Bodies)

- Arrangements for distribution of gratuitous relief and cash doles. (DMD and District Magistrates)

- Arrangements to be made for survey of human loss and distribution of ex-gratia relief to the families of deceased persons. (DMD.)

- Teams to be formed and dispatched to the affected areas for detailed assessment of houses and property damage assessment. (DMD. and Local authorities).

<u>Action Plan for Tsunami</u>

4   Action Plan for Tsunami

4.1   Introduction

The purpose of a Tsunami action plan is to assist the delivery of the right people, to the right location with the right equipments to complete the tasks required during a tsunami Crisis.

4.2   Associated Authority

The Nodal Department for controlling, monitoring and directing measures for organizing rescue, relief and rehabilitation is the Crisis Management Department of the State. All other concerned Departments should extend full cooperation in all matters pertaining to the management of the Tsunami Crisis whenever it occurs. The state departments like Transport, Ports & Fisheries, Home, Power, Finance, Information and Culture, Health etc. shall have a major role in emergency response during occurrence of Tsunami generating earthquake and Tsunami hitting the shore.

4.3   Early Warning

Public may be able to protect themselves from the Tsunami emergency if they are informed and educated before an emergency. Most of the time tsunami hazard is predictable so warning to public is important part of Action Plan.

Decision Support system is the set of rules to be followed for issue of tsunami bulletins. These rules are appropriately coded in the form of software that automatically generates bulletins by accessing the real-time data from the observing network as well as the model scenario database. The Action Plan is the set of routine activities to be followed by the staff at the tsunami warning centre for observation, evaluation, confirmation, and dissemination of bulletins.

Warning/ Alert / Watch:

Based on earthquake parameters, region's proximity to the earthquake zone (Travel Times) and expected run-up from pre-run model scenarios Warnings to Far Source Regions: Issued only after confirmation of tsunami triggering based on real-time water-level observations and correction of scenarios. This will reduce possibility of false warnings.

Category of tsunami advisory bulletins, time-line for generation, content of the alert and dissemination contact information is detailed below:

Types of TWC Tsunami Bulletin Messages:

Earthquake Information Bulletin (T+20 Min) contains information about origin time, latitude and longitude of the epicenter, name of geographical area, magnitude and depth of an earthquake. This message also contains preliminary evaluation of tsunami potential based on the magnitude. (e.g. earthquake occurring on land or earthquake with < M6.5 or earthquake occurring > 100 Km depth or earthquake occurring in very shallow water column, etc. No tsunami is expected; for larger magnitude earthquakes in the ocean, a qualitative statement on the tsunamigenic potential may be given). No immediate action is required. Bulletins provided to Ministry of Home Affairs (MHA).

Tsunami Warning (T+30 Min) (RED) contains information about the earthquake and a tsunami evaluation message indicating that tsunami is expected. (e.g. For earthquakes with M6.5 occurring in the Ocean within a depth of < 100 Km, a tsunami warning will be issued for those areas falling within 60 minutes travel time from the earthquake source and if expected run up is > 2 m). This is the highest level wherein immediate actions are required to move public to higher grounds. Message also contains information on the travel times and tsunami grade (based on run-up estimates) at various coastal locations from pre-run model outputs. Information provided to Ministry of Home Affairs (MHA) and public.

Tsunami Alert (T+30 Min) (ORANGE) contains information about the earthquake and a tsunami evaluation message indicating that tsunami is expected. (e.g. For earthquakes with > M6.5 occurring in the Ocean within a depth of < 100 Km, a tsunami alert will be issued for those areas falling within 60 minutes travel time from the earthquake source and if expected run up is between 0.5 to 2 m as well as for those areas falling above 60 minutes travel time from the earthquake source and if expected run up is >2 m). This is the second highest level wherein immediate public evacuation is not required. Public should avoid beaches since strong current are expected. Local officials should be prepared for evacuation if it is upgraded to warning status. Message also contains information on the travel times and tsunami grade (based on run-up estimates) at various coastal locations from Pre-run model outputs. Information provided to Ministry of Home Affairs (MHA) and public.

Tsunami Watch (T+30 Min) (YELLOW) contains information about the earthquake and a tsunami evaluation message indicating that tsunami is expected. (e. g. For earthquakes with > M6.5 occurring in the Ocean within a depth of < 100 Km, a tsunami watch will be issued for those areas falling within 60 minutes travel time from the earthquake source and if expected run up is < 0.5 m and for those areas falling above 60 minutes travel time from the earthquake source and if expected run up is 0.5 to 2 m). This is the third highest level wherein immediate public evacuation is not required, Local officials should be prepared for evacuation if it is upgraded to warning status. Message also contains information on the travel times and tsunami grade (based on run-up estimates) at various coastal locations from Pre-run model outputs. Information provided to Ministry of Home Affairs (MHA).

Tsunami cancellation (GREEN) will be issued if the tsunami warning was issued on the basis of erroneous data or if the warning center determines from subsequent information that only an insignificant wave has been generated. In addition, tsunami warning may be canceled on a selective basis when a significant wave that has been generated clearly poses no threat to one or more of the areas the warning center warns, either because of intervening continents or islands which screen them or because the orientation of the generating area causes the tsunami to be directed away from these areas. To maintain credibility the warning center will use the terminology **"non-destructive tsunami"** in the cancellation message whenever applicable.

Tsunami All Clear (GREEN) bulletin indicates that the '**Tsunami Threat'** is passed and no more dangerous waves are expected.

4.4 Plan Activation

The tsunami response structure will be activated on the occurrence of a major tsunami. The Relief Commissioner (RC) will activate all the Departments for emergency response including the State EOC. He will issue instructions to include the following details:

- Specify exact resources required.
- The type of assistance to be provided
- The time limit within which assistance is needed
- The state, district or other contact persons/agencies for the provision of the assistance
- Other Task Forces with which coordination should take place

The state EOC and other control rooms at the state level as well as district control rooms should be activated with full strength.

Once the situation is totally controlled and normalcy is restored, the RC should declare End of Emergency Response and issues instructions to withdraw the staff deployed in emergency duties.

INFORMATION FLOW CHART

OTHERS

NEOC / NDMA

IMD

CWC

IRRIGATION

WBSDMA (SEOC)

DDMA (DEOC)

SUB-DIVISION (CONTROL ROOM)

BDMC/ULBDMC (BLOCK/MUNICIPALITY CONTROL ROOM)

GPDMC/WDMC (GP/WARD CONTROL

VDMC (VILLAGE/SANSAD)

VDMT/WDMT

COMMUNITY