

GUJARAT STATE DISASTER MANAGEMENT PLAN

VOLUME 1



2020-21

GUJARAT STATE DISASTER MANAGEMENT AUTHORITY
Block No. 11, 5th Floor, Udyog Bhavan, Gandhinagar

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Abbreviations

AAI	Airport Authority of India
ACWC	Area Cyclone Warning Centre
Addl. DGP	Addl. Director General of Police
AERB	Atomic Energy Regulatory Board
AIR	All India Radio.
AMCDRR	Asian Ministerial Conference on Disaster Risk Reduction
ANSS	Advanced National Seismic System
ASC	Amateur Seismic Center
AWS	Automatic Weather Stations
AYUSH	Ayurveda, Yoga and Naturopathy, Unani, Sidha, Homeopathy
BARC	Bhabha Atomic Research Centre
BASE	Building Assessment And Structural Surveillance
BIS	Bureau of Indian Standard
BISAG	Bhaskaracharya Institute for Space Applications and Geo-Informatics
BMTPC	Building Materials and Technology Promotion Council
BPL	Below Poverty Line
BPR	Bottom Pressure Recorder
BRO	Border Road organization
CAPF	Central Armed Police Forces
CBO	Community Based Organizations
CBRI	Central Building Research Institute
CBRN	Chemical, Biological, Radiological and Nuclear
CCA	Climate Change Adaptation
CCD	Climate Change Department
CCG	Central Crisis Management Group
CDEF	Civil Defense Emergency Force
CDHO	Chief District Health Officer
CDMA	Code Division Multiple Access
CDO	Central Design Organization
CEO	Chief Executive Officer
CFO	Chief Fire Officer
CHC	Community Health Center
CMG	Crisis Management Group
CoH	Commissioner of Health
COR	Commissioner of Relief
CP	Commissioner of Police
CRZ	Coastal Regulation Zone
CSO	Civil Society Organisation
CSR	Corporate Social Responsibility
CWC	Central Water Commission
CWCs	Cyclone Warning Centres
CWDS	Cyclone Warning Dissemination System
DAE	Department of Atomic Energy
DC	District Collector
DCF	Deputy Conservator of Forest

DCG	District Crisis Management Group
DCR	District Control Room
DDO	District Development Officer
DEOC	District Emergency Operation Centre
DEOC	District Emergency Operation Centre
DFO	District Forest Officer
DG	Director General
DGHS	Directorate General of the Health Services
DGP	Director General of Police
DIG	Deputy Inspector General
DISH	Director Industrial Safety & Health
DM	District Magistrate
DM	Disaster Management
DMP	Disaster Management Plan
DoR	Director of Relief
DP&S	Directorate of Purchase and Stores
DPIIT	Department of Promotion of Industry and Internal Trade
DPO	District Project Officer
DPR	Detailed Project Report
DRM	Disaster Risk Management
DRMP	Disaster Risk Management Programme
DRR	Disaster Risk Reduction
DST	Department of Science & Technology
EFC	Expenditure Finance Committee
EHRA	Earthquake Hazard and Risk Assessment
EMS	Emergency Medical Services
EMSA	Emergency Medical Services Authority
EOC	Emergency Operation Centre
ERC	Emergency Response Center
ERTs	Emergency Response Teams
ESF	Emergency Support Function
F&E Dept.	Forest and Environment Department
F&ES	Fire and Emergency Services
GACC	Global Anthropogenic Climate Change
GACC	Global Adaptation Climate Change
GAD	General Administration Department
GDCR	General Development Control Regulations
GDP	Gross Domestic Product
GEB	Gujarat Electricity Board
GERI	Gujarat Engineering Research Institute
GIDC	Gujarat Industrial Development Corporation
GIDM	Gujarat Institute of Disaster Management
GIS	Geographic Information System
GMB	Gujarat Maritime Board
GMCSL	Gujarat Medical Corporation Services Limited
GoG	Government of Gujarat
GoI	Government of India

GPCB	Gujarat Pollution Control Board
GSDMA	Gujarat State Disaster Management Authority
GSI	Geological Survey of India
GSM	Global System for Mobile Communications
GSRTC	Gujarat State Roads Transport Corporation
GSWAN	Gujarat state Wide Area Network
GUVNL	Gujarat Urja Vikas Nigam Limited
GWSSB	Gujarat Water Supply & Sewerage board
HAZCHEM	Hazardous Chemicals
HBJ	Hazira-Bijapur-Jagdishpur
HF/VHF	High Frequency/Very High Frequency
HoD	Head of Department
HQ	Headquarter
HRVA	Hazard Risk and Vulnerability Assessment
HRVCA	Hazard Risk Vulnerability and Capacity Assessment
HWB	Heavy Water Board
ICG	Indian Coast Guard
ICMR	Indian Council of Medical Research
IDRN	India Disaster Resource Network
IEC	Information, Education and Communication
IIPH	Indian Institute of Public Health
IMD	India Meteorological Department
INCOIS	Indian National Centre for Ocean Information Services
IND	Improvised Nuclear Device
INSAT	Indian National Satellite System
IOC	Indian Oil Corporation
IRCS	Indian Red Cross Society
IRIS	Incorporated Research Institute for Seismology
IRS	Incident Response System
IRT	Incident Response Team
ISR	Institute of Seismological Research
ISRO	Indian Space Research Organization
ICT	Information and Communication Technology
ITCS	Information Communications Technology System
JSSK	Janani Shishu Suraksha Karyakram
KAPS	Kakrapar Atomic Power Station
LCG	Local Crisis Management Group
LPA	Long Period Averages
MAFW	Ministry of Agriculture and Farmers Welfare
MAH	Major Accident Hazard
MCA	Ministry of Corporate Affairs
MoEF&CC	Ministry of Environment, Forests and Climate Change
MFIN	Microfinance Institutions Network
MFRs	Medical First Responders
MHA	Ministry of Home Affairs
MHFW	Ministry of Health and Family Welfare
MHIPE	Ministry of heavy Industries and Public Enterprises

MHUA	Ministry of Housing and Urban Affairs
MLA	Member of Legislative Assembly
MoA	Ministry of Agriculture
MoC & F	Ministry of Chemicals and Fertilizers
MoC & I	Ministry of Commerce and Industry
MOCA	Ministry of Civil Aviation
MoD	Ministry of Defence
MOES	Ministry of Earth Sciences
MoF	Ministry of Finance
MoLE	Ministry of Labour and Employment
MOM	Ministry of Mines
MoP & NG	Ministry of Petroleum and Natural Gas
MOR	Ministry of Railways
MOSPI	Ministry of Statistics and Program Implementation
MoSRT & H	Ministry of Shipping, Road Transport and Highways
MP	Member of Parliament
MRTH	Ministry of Road Transport & Highways
MSDS	Material Safety Data Sheet
MSK	Medvedev–Sponheuer–Karnik scale
MSZ	Makran Subduction Zone
NBC	National Building Codes
NCC	National Cadet Corps.
NCCR	National Centre for Coastal Research
NCMC	National Crisis Management Committee
NDMA	National Disaster Management Authority
NDMF	National Disaster Mitigation Fund
NDRF	National Disaster Response Force
NDRF	National Disaster Response Fund
NDRMF	National Disaster Risk Mitigation Fund
NEC	National Executive Committee
NEIC	National Earthquake Information Center
NFHS	National Family Health Survey
NGO	Non Government Organization
NGRI	National Geophysical Research Institute
NHAI	National Highway Authority of India
NIC	National Information Center
NIDM	National institute of Disaster Management
NIO	North Indian Ocean
NIOT	National Institute of Ocean Technology
NPCIL	Nuclear Power Corporation of India Ltd
NSRA	Nevada Seismic Research Affiliates
NSS	National Service Scheme
NSSP	National School Safety Programme
NWRWS	Narmada Water Resources Water Supply
NYK	Nehru Yuva Kendra
ONS	Observational Network Stations
PCR	Police Control Room

PESO	Petroleum and Explosive Safety Organization
PFZ	Potential Fishing Zones
PGA	Peak Ground Acceleration
PHC	Primary Health Center
PMNRF	Prime Minister's National Relief Fund
PMO	Prime Minister's Office
PMS	Probable Maximum Surge
PPP	Public private Partnership
PRI	Panchayati Raj Institutions
PS	Principal Secretary
QCI	Quality Council of India
QRMT	Quick Reaction Medical Team
R & B Dept.	Roads & buildings Department
R & R	Rehabilitation & Reconstruction
RD	Revenue Department
RDD	Radiological Dispersal Device
RED	Radiation Exposure Device
RGN	Rain-Gauge Network
RMSA	Rastriya Madhyamik Shiksha Abhiyan
RMSC	Regional Specialised Meteorological Centre
RSBY	Rashtriya Swasthya Bima Yojana
RSO	Radiological Safety Officer
RTA	Road Transport Authority
RTSMN	Real Time Seismic Monitoring Network
RWA	Resident Welfare Associations
SAR	Search and Rescue
SCG	State Crisis Management Group
SCMC	State Crisis Management Committee
SDG	Sustainable Development Goals
SDMA	State Disaster Management Authority
SDMF	State Disaster Mitigation Fund
SDMP	State Disaster Management Plan
SDRF	State Disaster Response Force
SDRF	State Disaster Response Fund
SDRMF	State Disaster Risk Mitigation Fund
SDRN	State Disaster Response Network
SED	Site Emergency Director
SEOC	State Emergency Operation Centre
SFAC	Standing Fire Advisory Committee
SIRD	State Institute of Rural Development
SJ&ED	Social Justice and Empowerment Department
SMS	Short Messaging Service
SOG	Standard Operations Guide
SOP	Standard Operating Procedure
SPIPA	Sardar Patel Institute of Public Administration
SRPF	State Reserve Police Force
SSNNL	Sardar Sarovar Narmada Nigam Limited

SST	Sea Surface Temperature
SWP	Single Wire Protocol
TEOC	Taluka Emergency Operation Centre
UD & UHD	Urban Development & Urban Housing Department
UDA	Urban Development Authority
UDD	Urban Development Department
UFDM	Urban Flood Disaster Management
UHC	Urban Heath Centers
UNDP	United Nations Development Programme
UNICEF	United Nations International Children's Emergency Fund
UNDRR	United Nations Office for Disaster Risk Reduction
UNOEIWG	UN General Assembly Open-Ended Intergovernmental Working Group
UTs	Union Territories
VSAT	Very Small Aperture Terminal
WALMI	Water and Land Management Institute
WAN	Wide Area Network
WASMO	Water and Sanitation Management Organization
WE&CDD	Women and Child Department
WHO	World Health Organization
WRD	Water Resource Department

Chapter 1:Introduction

1.1 Background

The National Disaster Management Act, 2005 (NDM Act 2005) lay down institutional and coordination mechanism for effective Disaster Management (DM) at the national, state, district and local levels. Government of Gujarat has also enacted Gujarat State Disaster Management Act, 2003 (GSDM Act 2003) which preceded the NDM Act 2005 and created a multi-layered institutional system consisting of Gujarat State Disaster Management Authority (GSDMA) headed by the Hon. Chief Ministers and suitable mechanism at below levels i.e. at District, Municipal Corporation, Taluka, City/Town and village level. The institutional arrangements have been set up consistent with the paradigm shift from the relief-centric approach of the past to a proactive, holistic and integrated approach for Disaster Risk Reduction (DRR) by way of strengthening disaster, mitigation, preparedness and response.

The NDM Act 2005 defines disaster as;

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

The losses and impacts that characterise disasters usually have much to do with the exposure, vulnerability and coping capacity of people and places as they do with the severity of the hazard event. Therefore, there is no such thing as a natural disaster, but disasters often follow natural hazards.

1.2 Need for the Plan

As per Section 15 (3) of The Gujarat State Disaster Management Act, 2003, “The Authority shall prepare, or cause to be prepared and maintain a master plan for the State”. Section 23 (1) of The Disaster Management Act, 2005 also reads “There shall be a plan for disaster management for every State to be called State Disaster Management Plan”. Apart from these statutory requirements, the hazard profile and disaster history of the state demands for a comprehensive state disaster management plan to be in place for coordinated and streamlined management of disaster in the state.

1.3 Disaster Risk Reduction Post-2015

Post 2015, there has been a significant shift from the approach of Managing Disasters to Managing Risk. The three landmark global agreements viz. – the Sendai Framework for Disaster Risk Reduction 2015-30 (SFDRR), Sustainable Development Goals (SDG) and the Paris Agreement (CoP 21) set the stage for future global action on Disaster Risk Reduction (DRR), sustainable development and climate change.

1.3.1 Sendai Framework of Actions for Disaster Risk Reduction 2015-2030

The Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR) was adopted at the Third United Nations World Conference on Disaster Risk Reduction held in Sendai, Japan in March 2015. The SFDRR is document which outlines four priorities for action to achieve 7 targets, which in turn would lead to one outcome that is- substantial reduction of disaster risk and losses in lives, livelihoods, health, economy of persons, businesses, communities and countries. India is a signatory to the Sendai Framework for a 15-year, voluntary, non-binding agreement which recognizes that the State has the primary role to reduce disaster risk, but that responsibility should be shared with other stakeholders including local government, the private sector and other stakeholders.

The Four priorities of actions are:-

1. Understanding Disaster Risk
2. Strengthening Disaster Risk Governance to Manage Disaster Risk
3. Investing in Disaster Risk Reduction for Resilience
4. Enhancing Disaster Preparedness for Effective Response and to 'Build Back Better' in Recovery, Rehabilitation and Reconstruction

The seven global targets are:-

- A. Substantially reduce global disaster mortality by 2030, aiming to lower the average per 100,000 global mortality rate in the decade 2020-2030 compared to the period 2005-2015
- B. Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 in the decade 2020-2030 compared to the period 2005-2015
- C. Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030
- D. Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030
- E. Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020
- F. Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this Framework by 2030
- G. Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to the people by 2030

1.3.2 Sustainable Developmental Goals

The Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted by all United Nations Member States in September 2015 as a universal call to action to end

poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030. The 17 SDGs are integrated—that is, they recognize that action in one area will affect outcomes in others, and that development must balance social, economic and environmental sustainability. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests. In order to make the 2030 Agenda a reality, broad ownership of the SDGs must translate into a strong commitment by all stakeholders to implement the global goals.

1.3.3 Paris Agreement on Climate Change Action and Disaster Risk Reduction (CoP 21)

The CoP 21 or the Paris Climate Conference held in December, 2015 led to a new international climate agreement, applicable to all countries, aiming at “holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change”. The Paris Agreement recognized the need to address loss and damage associated with the effects of climate change. The agreement identified areas of cooperation central to DRR and called for investments to address the underlying risk drivers associated with rising greenhouse gas (GHG) emission levels and to inspire innovation and low-carbon growth.

The State Disaster Management Plan (SDMP) has tried to envisage coherence across the state’s efforts for DRR, sustainable development, and the actions in response to climate change.

1.4 Prime Minister’s 10 Point Agenda towards Disaster Risk Reduction

The Prime Minister, Shri Narendra Modi, listed a Ten -Point Agenda in his inaugural speech at the Asian Ministerial Conference on Disaster Risk Reduction 2016, held in New Delhi during November 2016 (AMCDRR), which has also been incorporated in the SDMP.

The ten key elements consist of the following:

1. All development sectors to imbibe principles of Disaster Risk Management
2. Work towards risk coverage for all—starting from poor households to small and medium enterprises to multi-national corporations to nation states.
3. Encourage greater involvement and leadership of women in disaster risk management
4. Invest in risk mapping globally related to hazards such as earthquakes based on widely accepted standards and parameters.
5. Leverage technology to enhance the efficiency of disaster risk management efforts.
6. Develop a network of universities to work on disaster issues.
7. Utilise the opportunities provided by social media and mobile technologies.

8. Build on local capacity and initiative. Response agencies need to interact with the communities and make them familiar with the essential drill of disaster response.
9. Ensuring that disaster learning is well documented.
10. Bring about greater cohesion in international response to disasters.

1.5 Vision

Making disaster resilient Gujarat by enhancing the capacity of all stakeholders to respond to disasters in a planned way to minimize loss of lives, livelihoods and economic loss in different forms including critical infrastructure, basic services including health and educational facilities along with social, cultural & environmental loss.

1.6 Objectives of the Plan

- i) To assess various hazard, vulnerability, capacity and risk associated with the state.
- ii) To lay down various measures and guidelines for prevention and mitigation.
- iii) To lay down preparedness measures for all stakeholders.
- iv) To build the capacity of all stakeholders in the state to cope with the disasters and promote community based disaster management.
- v) To provide clarity on roles and responsibilities for all stakeholders concerned with various phases of disaster management.
- vi) To ensure co-ordination and promote productive partnership with all other agencies related to disaster management.
- vii) To mainstream disaster management concerns into the developmental planning process.
- viii) Ensuring DRM is socially inclusive, gender sensitive and empowering.
- ix) Strengthen efforts to mainstream DRR into water management and reduce the likely impacts of water-related hazards.
- x) To develop efficient, streamlined and rapid disaster response and relief mechanism in the state.
- xi) Prevent disasters and achieve substantial reduction of disaster risk and losses in lives, livelihoods, health, and assets (economic, physical, social, cultural and environmental).
- xii) Invest in disaster risk reduction for resilience through structural, non-structural and financial measures, as well as comprehensive capacity development.
- xiii) To commence recovery programme as an opportunity to build back better in case of a future disaster by incorporating community in the programme.
- xiv) Promote the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures to prevent and reduce hazard exposure and vulnerabilities to disaster.
- xv) Strengthen disaster risk modeling, assessment, mapping, monitoring and multi-hazard early warning systems.
- xvi) Effective use of science, technology and traditional knowledge in all aspects of DRM.

1.7 Plan Activation

The disaster response structure will be activated on the receipt of disaster warning/on the occurrence of the disaster. The occurrence of disaster may be reported by the concern monitoring authority to the Commissioner of ReliefGSDMA by the fastest means. The Commissioner of Relief (COR) will activate all departments for emergency response including the State EOC, District EOCs and Regional ERCs. Also, they will issue instructions to include the following details:

- Exact quantum of resources (in terms of manpower, equipments and essential items from key departments/stakeholders) that is 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 areas to be disaster-affected area under GSDMA Act (Section 32 (2) (a)).

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.

1.8 Plan Implementation

Both the DM Act 2005 and GSDM Act 2003 enjoins state governments to make provisions for the implementation of the disaster management plans. The Section 15 of GSDM Act 2003 states that every Department of the Government of Gujarat shall make provisions, in its annual budget, for funds for the purposes of carrying out the activities and programmes set out in its disaster management plan. The Act also mandates that every Department of the Government must prepare a departmental Disaster Management Plan in accordance with the SDMP.



Chapter 2 : State Profile: Understanding the Context

The State of Gujarat was formed on 1st May 1960. It is located on the western most part of India and shares border with Pakistan and Rajasthan in the north east, Madhya Pradesh in the east, and Maharashtra and the Union territories of Diu, Daman, Dadra and Nagar Haveli in the south. The Arabian Sea borders the state both to the west and the south west. As per 2011 census, the population of the State comes to nearly 6.03 crores, which is around 5 % of the population India¹. Literacy rate in Gujarat has seen upward trend and is 79.31% as per 2011 population census. Of that, male literacy stands at 87.23% while female literacy is at 70.73%. Urban Population of the State is 42.6%, which used to be at 37.4% in 2001. Rural population in the state in 2011 fell to 57.4% from 62.6% in 2001. Ahmedabad is the most populated District in the State, with 7.20 million people.

Gujarat has the longest coastline of about 1,600 Km in India which makes it vulnerable to numerous hydro-meteorological hazards viz. Cyclone, storm surge, Gusty winds, Heavy rainfall etc. Gandhinagar, is the capital city of Gujarat and is located close to Ahmedabad, the commercial capital of Gujarat.

The State of Gujarat can be divided into four major parts Central Gujarat, North Gujarat, Saurashtra & Kutch, and South Gujarat.

2.1 Administrative Profile

Administrative Unit	Number
Districts	33
Talukas	252
Municipal Corporation	8 (Ahmadabad, Surat, Vadodara, Rajkot, Bhavnagar, Jamnagar, Junagadh and Gandhinagar)
Municipalities	159
Villages	18584

Table 2.1: Administrative Profile of Gujarat

2.2 Geographical Profile

The total geographical area of the state is 196,024 km². It stretches from 20-6' N to 24-42' N latitude and from 68-10'E to 74-28' E longitude.

Geographical Regions	<ul style="list-style-type: none"> • Peninsula of Saurashtra - Hilly track sprinkled with low mountains • Kutch – Barren and rocky in north-west • Mainland (from Aravalli hills in north to Damanganga river in south) – a level plain of alluvial soil
Connected States/UTs	<ul style="list-style-type: none"> • Rajasthan in north east • Madhya Pradesh in east • Maharashtra and the Union Territories of Daman, Diu and Nagar Haveli in south
Major Rivers	<ul style="list-style-type: none"> • Sabarmati and Mahi (Central & North Gujarat) • Mithi, Khari, Bhadar, Shetrunji and Bhogavo (Saurashtra)

¹<https://gujaratindia.gov.in/state-profile/demography.htm>

2.3 Demography

Population	604.40 lakhs	
	Male – 314.91 lakhs	Female – 289.48 lakhs
• Rural Population	346.95 lakhs (57.40 %)	
	Male – 177.99 lakhs	Female – 168.95 lakhs
• Urban Population	257.45 lakhs (42.60%)	
	Male – 136.92 lakhs	Female – 120.53 lakhs
• Child Population (0-6 yrs)	77.77 lakhs (12.87%)	
	Male – 41.15 lakhs	Female – 36.62 lakhs
	Rural – 48.25 lakhs	Urban- 29.52 lakhs
Population Density	308 per km ²	
Decadal Growth Rate	19.3% (2001-2011)	
• Rural	9.3% (2001- 2011)	
• Urban	36.0 % (2001-2011)	
Sex Ratio	919 females per 1,000 males	
• Rural	949	
• Urban	880	
• Child (0-6)	890	
Literacy Rate	78 %	
	Male – 85.8 %	Female – 69.7 %
• Rural	71.7 %	
	Male – 81.6 %	Female – 77.2%
• Urban	86.3%	
	Male – 91.0 %	Female – 81.0 %
Effective Literacy Rate	67.99	
Crude Birth Rate	20.8 per ‘000 population (SRS 2013)	
Crude Death Rate	6.5 per ‘000 population (SRS 2013)	
Infant Mortality Rate (IMR)	36 per ‘000 live birth (SRS 2013)	
Maternal Mortality Rate (MMR)	122 per 1 lakh live births (SRS 2010-12)	
Natural Growth Rate	14.3 per ‘000 population (SRS 2013)	

Table 2.3: Demography of Gujarat; (Source: Census of India)

2.4 Social Profile

2.4.1 Religion

Majority of the population in the state practices Hinduism. Religion wise population of the state is mentioned in Table 2.4.

Religion	Percent of Total Population (2001)
Hindu	89.09 %
Muslim	9.06 %
Jains	1.04%
Christian	0.56 %
Sikhs	0.09 %
Buddhists	0.04 %
Others	0.06 %

Table2.4: Religion wise Population

2.4.2 Caste and Tribes

As per Census 2011, the population of Scheduled Castes and Scheduled Tribes in the state is 40.74 lakh (6.7 %) and 89.17 lakh (14.8 %) respectively. The tribal population is concentrated in the 14 eastern districts, from Mt. Abu on the Rajasthan border in the north to Dahanu district on the Maharashtra border in the south. The tribal sub plan (TSP) area constitutes 18% of the state's geographical area. There are 11 major tribes in Gujarat; the largest Bhil constituting 47.89% of the state's tribal population. The 5 Particularly Vulnerable Tribal Groups number about 1,44,593 (as per Census 2011).

Social Indicators	Scheduled Castes		Scheduled Tribes	
Population (Lakhs)	Male- 21.10	Female- 19.64	Male- 45.01	Female- 44.16
	Rural- 22.82	Urban- 17.93	Rural- 80.22	Urban- 8.95
Literacy Rate	79.18 %		62.48%	
	Male- 87.87%	Female- 69.87%	Male- 71.68%	Female- 53.16%
Sex Ratio	931		981	

Table 2.5: Social Indicators of SC and ST Population

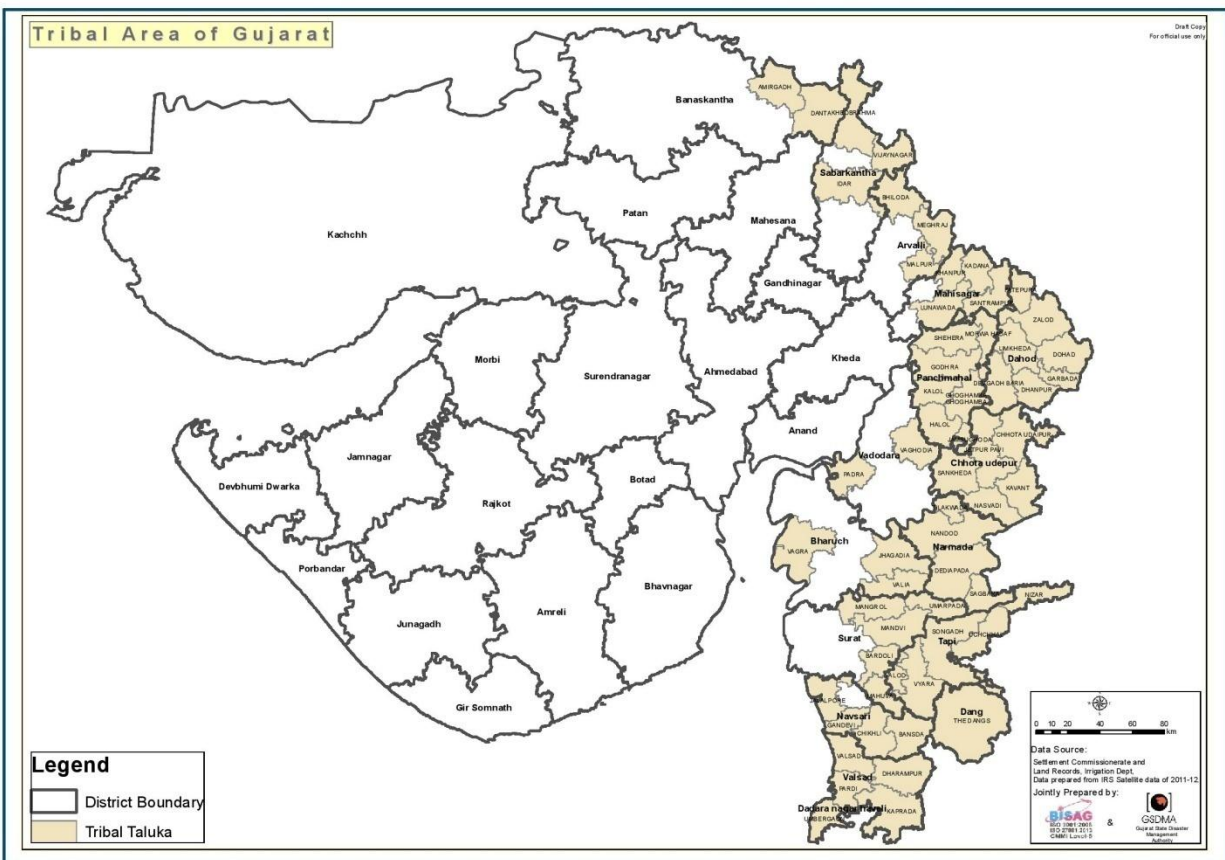


Figure 2.2: Tribal Population in Gujarat³

2.5 Economic Profile

Gujarat is one of the most industrially developed states having, the highest geographical area under SEZ development in India. Gujarat government has taken effective steps to grant permits, licenses and environment clearance speedily, as a result more and more new factories are being setup. Agricultural growth is highly influenced by cash crops such as cotton, oilseeds and tobacco and increased crop productivity. Due to decisive steps taken by Gujarat government in agriculture sector, noticeable growth has been achieved despite water scarcity in the state. Continuously rising milk production and significant exports of fish have dominated the growth in Animal husbandry sector.

Gujarat accounts for 7.9% share to national GDP. According to the Department of Promotion of Industry and Internal Trade (DPIIT), Gujarat attract US \$ 3.461 billion (Rs. 24012 crore) FDI in 2019-20 (April-September) as against US \$ 1.803 billion (Rs. 12618 crore) FDI in 2018-19.

³<https://tribal.gujarat.gov.in/tribal-demography-of-gujarat#>

Total FDI in the state of Gujarat reached US\$ 24.006 billion during April 2000 to September, 2019. Gujarat accounted for about 5.4% share in the overall FDI inflows in India.⁴

Gujarat is 5th largest state in milk production in India. 7.7% of milk production of the country is from Gujarat in the year 2018-19. Gujarat enjoys the status of industrially developed state of India with its 16.8 per cent share to Country's industrial output, the 1st largest among the states of India. Gujarat is a leader in exports with more than 20 percent share to India's aggregate exports. In which, the ports are most important contributor. The cargo handled by minor & intermediate ports in Gujarat has nobaly increased from 27.8 lakh tones in 1980-81 to 3991.97 lakh tonne in 2018-19. Gujarat has been a leading state on the front of harnessing renewable energy sources with its 10.56 per cent share in Country's total Grid Interactive Renewable power installed capacity as on 2018. Out of this, there is 16.94 per cent share in total wind power capacity of India.⁵

2.5.1 Main occupation

The occupation in the state is business, agriculture and industries workers. As per Population Census 2011, the total number of workers (who have worked for at least one day during the reference year) is 247.68 lakhs. Of this, 180.01 lakh workers are males and 67.67 lakhs are females. The workers have registered a growth of 16.5 per cent during the decade. 155.7 lakh workers are in the rural areas and 92.0 lakh workers are in the urban areas. The female workers in rural and urban areas are 54.0 lakhs and 13.7 lakhs respectively.

2.5.2 Income Pattern

The Per Capita Income at current prices has been estimated at Rs. 96,976/- in 2012-13 as against Rs. 87,175/- in 2011-12, showing an increase of 11.2% during the year.

2.5.3 Sectors of Economy

The key sectors in the economy of the state and the respective production are:

Sector of Economy	Detail of Sector	Production/ Quantity (Annually)
Agriculture	Food grains production	80.72 lakh tones
	Cotton production	87.08 lakh bales (170 kgs. each)
	Oil seeds production	74.23 lakh tones
	Fruits	92.26 lakh tones
	Major vegetables grown	Onion, Brinjal, Tomato, Okra and Cucurbits 125.40 lakh tones
	Spices	Cumin, Fennel and Garlic 8.24 lakh tones
	Flowers	1.96 lakh tones
Animal Husbandry	Livestock population	282.41 lakhs
	Milk production	144.92 lakh tones
	Fish production	8.42 lakh tones (6.99 lakh tones marine and 1.43 lakh tones inland)

⁴<https://invest-india-revamp-static-files.s3.ap-south-1.amazonaws.com/s3fs-public/2020-03/Gujarat%20Socio%20Economic%20review.pdf>

⁵ Socio Economic review of Gujarat 2019-2020

Water Resources	Irrigation potential surface and ground water	71.27 lakh hectare
Industries	No of registered factories	28556
	No. of MAH Factories	402
	Employment in factories	18.26 lakh
Mining	Agate, Steatite (soap stone) , Gypsum, Limestone, Lignite, Bauxite, Laterite, Dolomite, China and other clay, Bent mite, Quartz, Silica and sand, Chalk, Crude, and Natural Gas	
Electricity	Installed capacity	27509 MW
	Total generation of electricity	121939 million units (2018-19)
	Total consumption	92520 million units (2018-19)
	Per capita consumption	2208 units

Table 2.6: Sectors of Economy⁶

2.6 Climate

The maximum temperature ranges between 26°C and 45°C while the minimum temperature varies between 10.8°C and 27.4°C. Gujarat's agro climate is very heterogeneous and constitutes about 20 per cent of arid and 9 per cent semi-arid areas of the country. Vast area of Saurashtra Kutch and North Gujarat falls under Arid to Semi-arid. It comprises low and erratic rainfall. The winter is mild cold, whereas summer is hot.

Agro climate of the state divided in to eight sub regions in respect of rainfall, temperature, humidity and geographical situation.

Sub Region	District	Rainfall (mm)	Types of Soil
Southern Hills	Dang, Valsad, Navsari	1500 and above	Deep black with patches of costal alkali Lateritic and medium black soil
South Gujarat	Surat, Bhrauch, Narmada	1000 to 1500	Deep black clayey soils
Middle Gujarat	Panchmahal, Dahod, Vadodara, Kheda, Anand	800 to 1000	Deep black to loamy sand (Goradu)
North Gujarat	Ahemdabad, Gandhinagar, Sabarkantha, Bansantha, Patan, Mehsana	625 to 875	Sandy loan to sandy soils
North Arid Zone	Kutch	250 to 500	Sandy and saline saols
North Saurashtra	Bhavnagar, Jamnagar, Surendranagar, Amreli, Rajkot	400 to 700	Shallow medium black
South Saurashtra	Junagadh, Porbandar	645 to 700	Shallow medium black & Calcareous soil
Bhal& Coastal Areas	Khambhat, Bhal Coastal Area of Surat & BhrauchOlpad, Vagra, Hansot, Alater, Dholka, Dhanduka, Vallbhipur, Bhavnagar & Limbadi Talukas	625 to 1000	Medium black poorly drained and saline soil

Table 2.7: Climatic Sub Regions of Gujarat

⁶ Socio Economic Survey of Gujarat 2019-20

2.7 Cultural Profile

Gujarat is a melting pot of varied cultures, traditions and religions. Gujarat's long coastline had attracted sea-farers through the ages, lured by the rich prospects of trade. The Arabs, Portuguese, Dutch, Mughals, British and Parsis have also left their marks on Gujarat's culture. Gujarati people celebrate all regional and national fairs and festivals with equal fervour. Gujarat's vibrant culture is also evident in the various dance forms, music, art and crafts and cuisine.

2.7.1 Languages

Gujarati is both the official and local language of the State. Surti, Charotari, Kathiawai, Kutchi, Marathi, Sindhi, Punjabi, etc. are also spoken in the State.

2.7.2 Costumes

Depending on rural or urban area, varied outfits are worn by people of Gujarat. Generally, men wear trousers and shirts or t-shirts and younger women wear normal western outfits like skirts, dresses, jeans, etc. Older women usually wear saris or *salwar kamiz*. In rural parts, people usually wear dhotis and *kurtas* or *bandis*. Even traditional outfits like *chania choli* for women and *kediyu* dress for men are worn in rural areas or during cultural festivals.

2.7.3 Food

Majority of the Gujaratis are vegetarian. The diet mainly consists of cereals, pulses, green vegetables, fruits, milk, ghee, butter-milk, etc. A variety of cuisine sub-ordinates like pickles, chutney, papad, yoghurt, etc serve as fillings on main menu.

2.7.4 Housing

Gujarati urban living offer sophisticated living lifestyles. Well ventilated, furnished, glazed tiled or marbled homes and flats are found in Gujarat. Rural living is flourishing with development. However, the traditional hut dwellings and wooden houses still exist with a rich heritage feel and ethnic living. Wood carved houses with the '*Chabutras*' for bird feeding are the beauty of many traditional homes in Gujarat.

2.7.5 Fairs and Festivals

Festivals in Gujarat signify socio-cultural-religious and even economic aspirations of the people of Gujarat. Gujarat- the 'Land of the Festivals' celebrates more than 3500 fairs and festivals round the year. Among the most popular festivals celebrated are Navratri, Deepavali, Kite Festival, Shivratri, Holi, Janmashtmi, Ganesh Chaturthi and Mohorram-Ramzan. Some of the popular fairs include BhavnathMahadev Fair, Chitra- Vichitra Fair, Dangs Durbar Fair, Dhrang Fair, Tarnetar Fair, Shamlaji Fair, Vautha Fair, Modhera Dance Festival, KutchhUtsav, Ambaji Purnima Fair, etc.



Chapter 3: Hazard, Vulnerability, Capacity and Risk Analysis

3.1 Hazards Analysis

Owing to its geo-climatic, geological and physical features, Gujarat is vulnerable to all major natural hazards namely, drought, flood, cyclone, earthquake, tsunami, Heat wave, etc. The State is also under constant threat of various human made hazards like that of Industrial chemical hazards, fire, transportation accidents, epidemic, accidents, etc.

Gujarat State Disaster Management Authority (GSDMA) developed Gujarat Hazard Risk & Vulnerability Atlas. As per the same, following are the major hazards in the State:

3.1.1. Earthquake

As per Indian Seismic Zone Map, Gujarat region lies in three zones- Zone III, IV and V. Kachchh region (about 300km x 300km) lies in zone V where earthquakes of magnitude 8 can be expected. A belt of about 60-70km width around this zone covering areas of North Saurashtra and areas bordering Eastern part of Kachchh lie in zone IV where intensity VIII can be expected mainly due to earthquakes in Kachchh and some local earthquakes along North Kathiawar Fault in Northern Saurashtra. The rest of Gujarat lies in zone III where intensity VII earthquakes can be expected due to moderate local earthquakes or strong Kachchh earthquakes.

The estimated mean taluka earthquake peak ground acceleration (PGA) zonation for a 100-year return period is presented in the [figure 3.1](#). All of Kachchh, almost the entire coastline of northern Saurashtra that adjoins Kachchh and a small area in Patan district fall into the very severe intensity zone over a 100-year return period. The cities of Ahmedabad, Bharuch, Rajkot, and Bhavnagar fall into the severe intensity zone, while Bhuj and Jamnagar fall in the very severe intensity zone over this time frame.

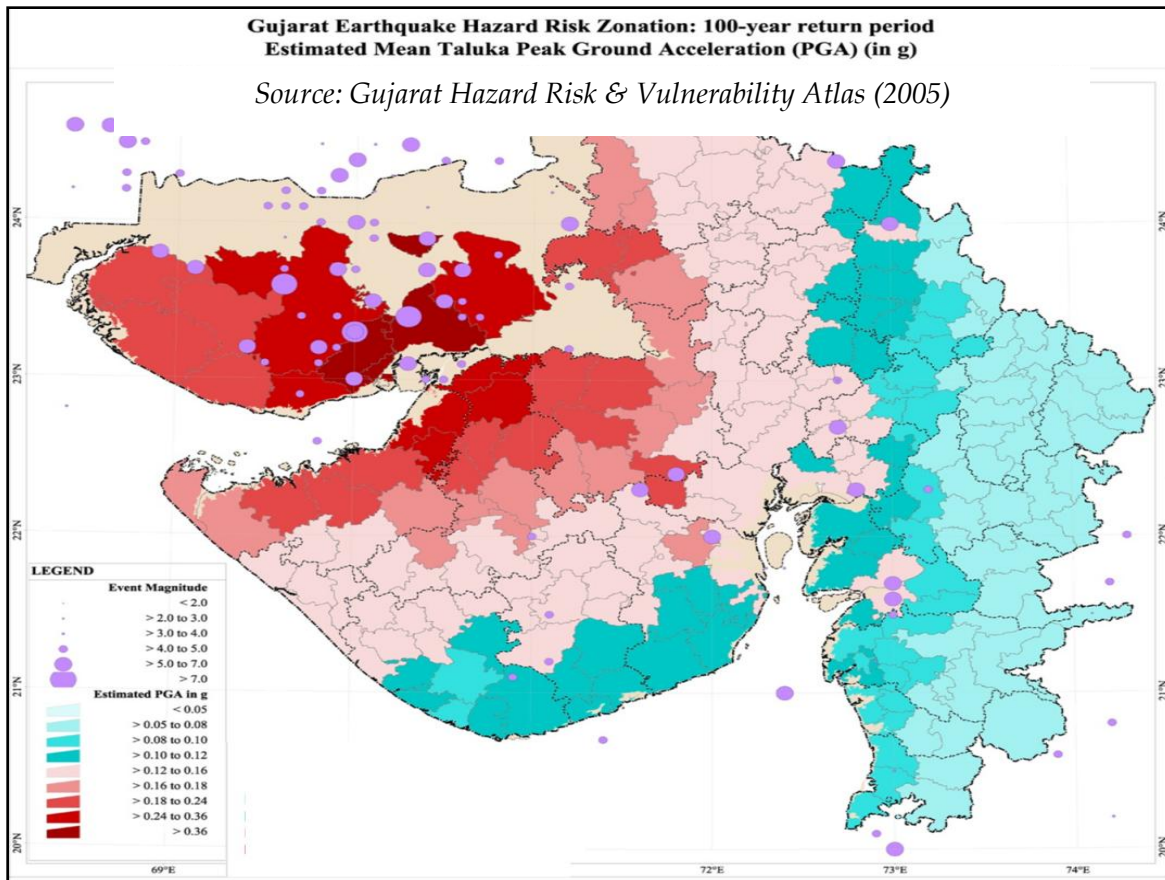


Figure 3.1: Gujarat Earthquake Hazard Risk Zonation Map

3.1.2 Cyclone

Gujarat falls in the region of tropical cyclone. With the longest coast line of 1600 km in the country, it is highly vulnerable to cyclone and its associated hazards such as floods, storm surges, etc. Most of the cyclones affecting the state are generated in the Arabian Sea. They move North-East and hit the coast particularly the Southern Kutch and Southern Saurashtra and the Western part of Gujarat.

Two cyclonic storm seasons are experienced in Gujarat: May to June (advancing southwest monsoon) and September to November (retreating monsoon).

Over 120 cyclones originating in the Arabian Sea had passed through Gujarat over a period of 100 years. **Figure 3.2** shows a maximum wind speed class of more than 55 m/sec along the Saurashtra coast, specifically in Amreli, Gir Somnath, Junagadh, Porbandar, Devbhoomi Dwarka, Jamnagar, Morbi, and Kutch districts, which are exposed to high intensity cyclonic and storm impact.

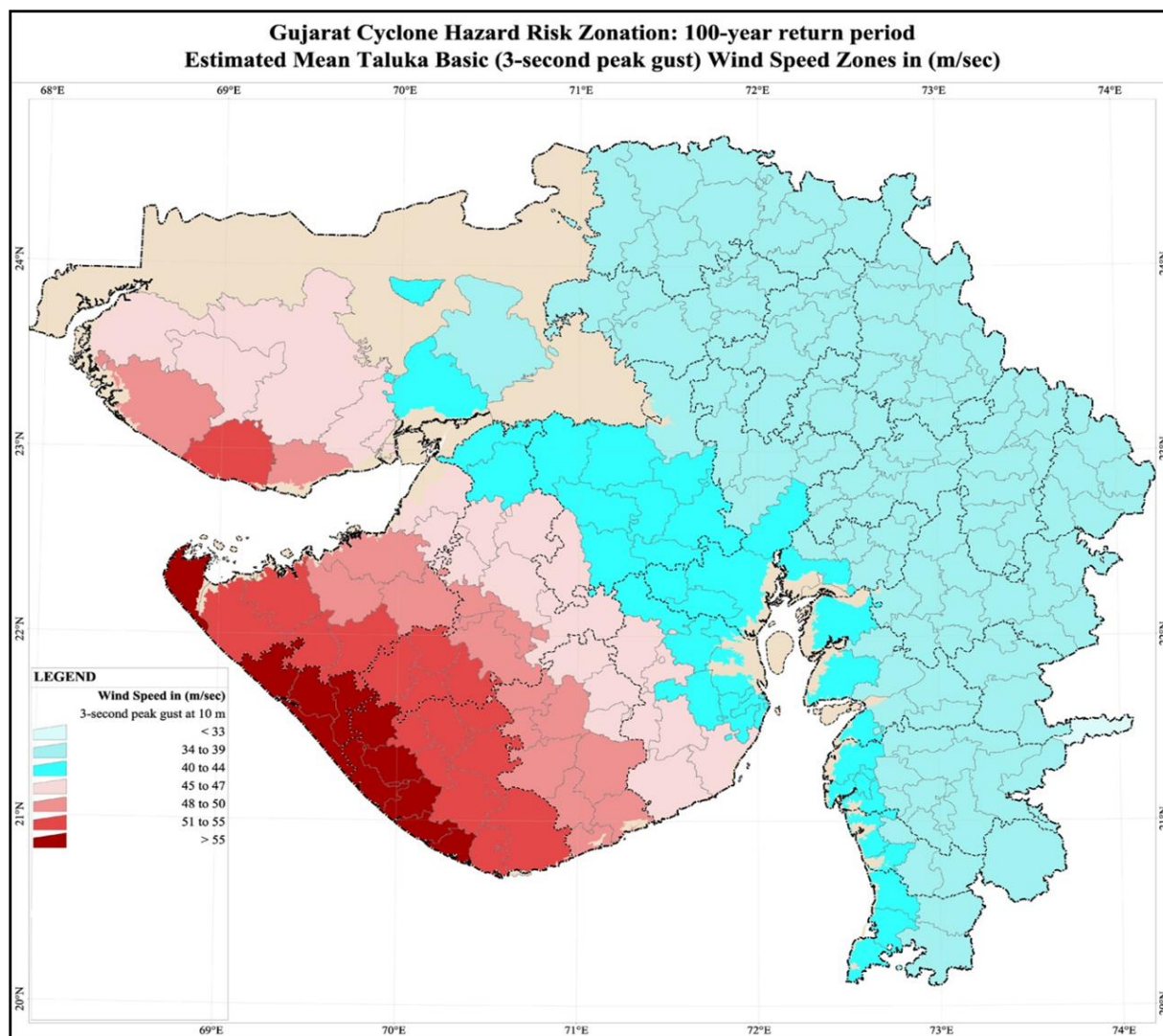


Figure 3.2: Gujarat Cyclone Hazard Risk Zonation Map

The 51 to 55 m/sec class extends further inland to cover much of Jamnagar, part of Rajkot, Morbi and Kutch districts. The 48 to 50 m/sec class extends to most of Rajkot, part of Amreli and Jamnagar districts including Jamnagar, Rajkot cities and parts of Kutch. The 45 to 47 m/sec class covers much of Saurashtra and all of Kutch. This is followed by the 40 to 44 m/sec class that gets its swathe from Kutch through northern Saurashtra all the way to the coast of Gulf of Khambhat and southern Gujarat. The rest of the State falls into the 34 to 39 m/sec class.

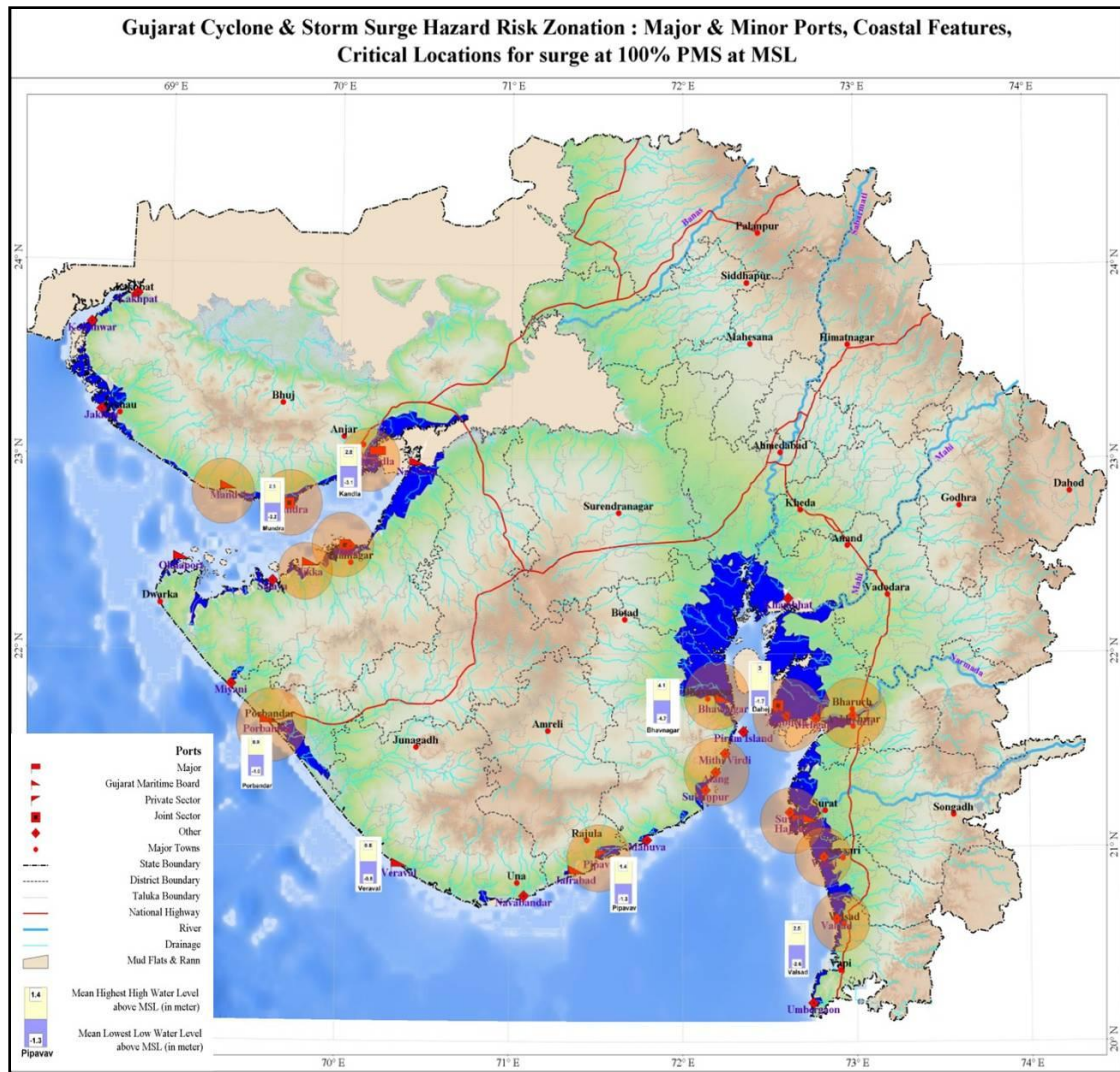


Figure 3.3: Gujarat Storm Surge Hazard Risk Zonation Map

3.1.3. Drought

Daily temperature of the State ranges from a minimum 13°C to 27°C in January to 27°C to 45°C in the summer during May. The South-West winds mostly bring rain between June to September and approximately 90 to 95% of precipitation is registered in these three months. From the North-West areas to South Gujarat areas, the rainfall varies from 300 mm to 2000 mm per annum. In Gujarat, 60% of rainfall is uncertain, unprecedented and unequal and the regions of Saurashtra, Kutch and North Gujarat face famine every third year. Since 1900, the state has faced scarcity of water and food almost 30 times.

Gujarat is one the chronic drought prone state of India, with an average annual rainfall about 816 mm with more than half of the Talukas of Gujarat receiving rainfall within the range of 200-400 mm.

Substantial portions of the State are arid to semiarid. With large parts of North Gujarat and Saurashtra having no source of alternate irrigation, groundwater exploitation is leading increased threats of droughts. Falling water tables have added stress on crops and water supplies.

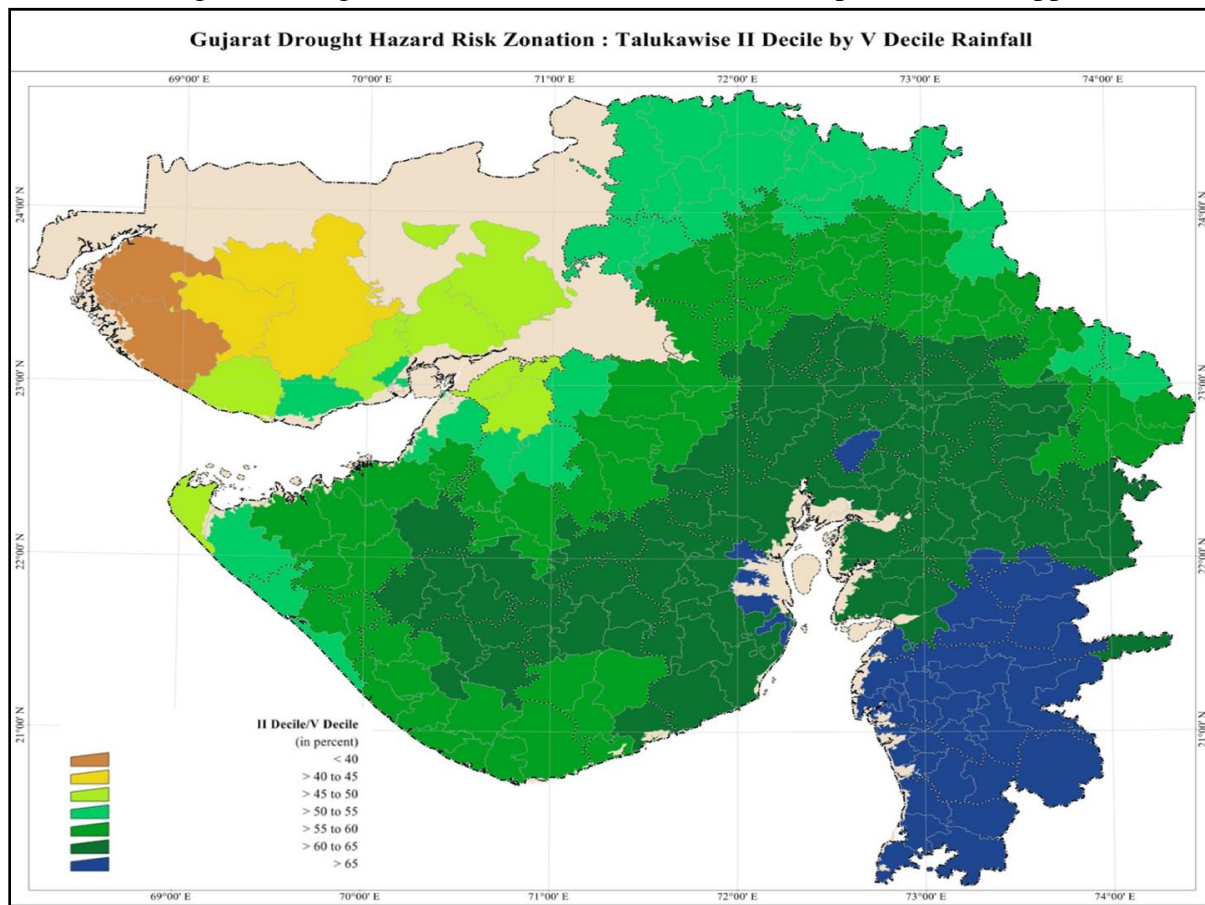


Figure 3.4 : Gujarat Drought Hazard Risk Zonation Map

3.1.4 Flood

The climatology of Gujarat is influenced by the Arabian Sea in the West and three hill ranges along its Eastern border. A long coastline makes parts of arid Saurashtra and Kutch occasionally experience very high rainfall. These occasional heavy rainstorms are responsible for most of the floods in the State. While the Northern part of the State is mostly arid and semi-arid, the Southern part is humid to sub-humid. Extremes of climate, be it rainfall or temperatures are quite common in this region. All major rivers in the State pass through a wide stretch of the very flat terrain before reaching the sea. These flat lowlands of lower river basins are prone to flooding. Cities like Ahmedabad, Surat, and Bharuch are located on the flat alluvial plains of large rivers.

Concentrated runoff resulted by heavy rainfall cause flash floods in the small river basin of Saurashtra and Kutch because of their fairly impervious catchments (rocky or black cotton soils) and steep sloping upper catchments.

The flood prone river sections were identified from settlement level analysis. Flood prone river sections in Saurashtra extend to the upper basins due to the presence of dams which have to resort to emergency discharge during heavy rainstorms. Even small valleys in Saurashtra are used for agriculture. Hence flooding in these zones impacts both residents and settlements.

Figure 3.5 shows the majority of the area of Gujarat is flood prone, irrespective of the size of the catchment. The flood risk in Saurashtra is lower than that of the South Gujarat plains. The relatively flat plains in the lower basin areas with hilly catchments in upper parts of South Gujarat accentuate flood risks. Few villages in the North Gujarat are flood prone too.

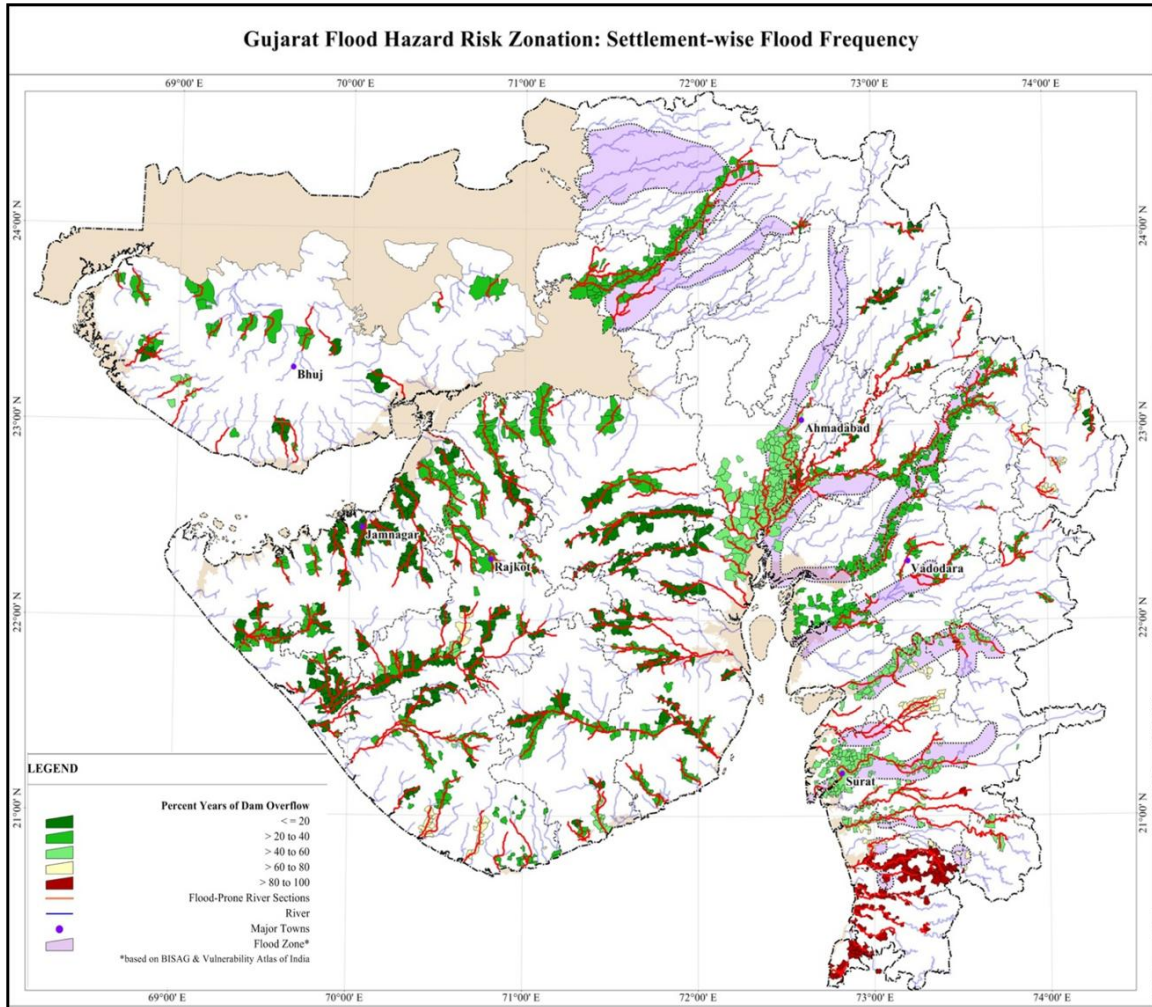


Figure 3.5: Gujarat Flood Hazard Risk Zonation

3.1.5 Tsunami

Gujarat is prone to tsunami risk due to its long coastline and probability of occurrence of near and offshore submarine earthquakes in the Arabian Sea. Makran Subduction Zone (MSZ) -South West of Karachi is an active fault area which may cause a high magnitude earthquake under the sea leading to a tsunami.

In past, Kandla coast was hit by a Tsunami of 12 mtrs height in 1945, due to an earthquake in the Makran fault line. Tsunami prone areas in the State include coastal villages of Kutch, Jamnagar, Rajkot, Porbandar, Bhavnagar, Anand, Ahmedabad, Bharuch, Surat, Navsari and Valsad districts.

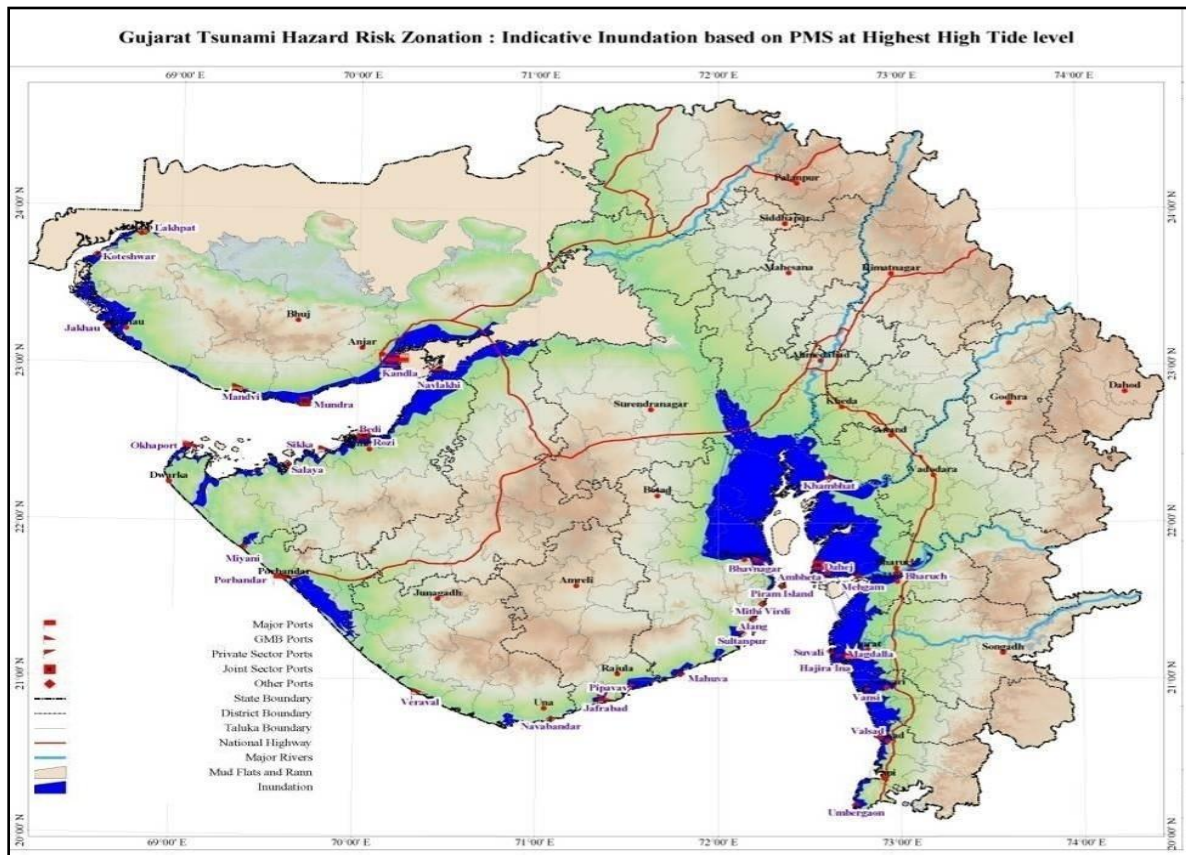


Figure 3.6: Gujarat Tsunami Hazard Risk Zonation

The Hazard Risk and Vulnerability Atlas prepared by GSDMA shows the estimated inundation based on Probable Maximum Surge (PMS) at highest high tide level in **figure 3.6**.

3.1.6 Fire

There are many causes of fire in the state such as accidents, electrical short-circuit, carelessness, gas leaks, mishandling of flammable chemicals and products, etc. Further, Gujarat being highly industrialized state there is increased threat of fire incidents. Fire causes huge losses of life and property every year.

3.1.7 Industrial and Chemical Disasters

Around 35% of the total Major Accident Hazard (MAH) units of the country are located in Gujarat at Vapi, Hazira, Ankleshwar, Dahej, etc. Gujarat presently has 514 Major Accident Hazard (MAH) prone industrial units.

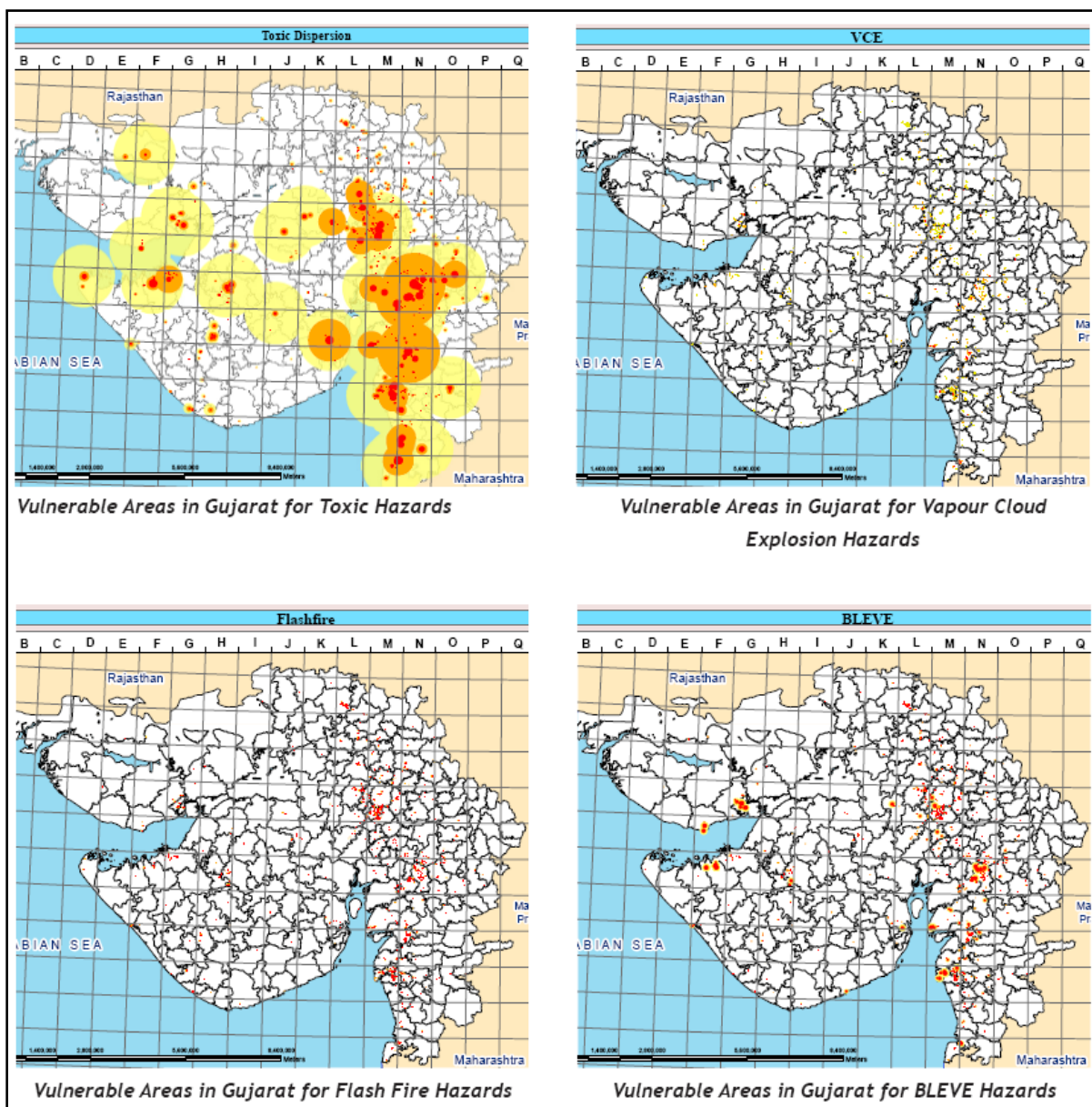


Figure 3.7: Areas of Gujarat Vulnerable to Industrial and Chemical Hazard

All these pose toxic leak risks and over 80% are also prone to fire or explosion risks. Almost the entire range of the chemical process industry exists in Gujarat, including hydrocarbon processing/ refining products, petrochemicals-polymers and man-made fibres, fertilizers, health care products, plant protection chemicals, dyes, pigments and intermediates, fine chemicals, surface coating products, salt and salt-based products, ceramics, glass, cement, vegetable oils, fats, and detergents.

A stretch of 400 kilometres from Ahmedabad to Vapi is known as the 'Golden Corridor'. Ankleshwar (in Bharuch district) situated on the Narmada estuary is Asia's largest chemical zone. Some toxic chemicals with more than 5,000 metric tonnes storages in Gujarat are

acrylonitrile, ammonia, benzene, chlorobenzene, chloroform, cyclohexanone, ethylene dichloride, hydrogen, cyanide, P-xylene, styrene monomer and toluene.

In addition to the manufacturing industries, there is significant infrastructure for handling chemicals such as pipelines, transportation (rail and road), and isolated storages. 70% of country's oils and gas imports are transported through Gujarat via road/rail routes or gas/oil pipelines.

A cross-country 2,300 km Hazira-Bijapur-Jagdishpur (HBJ) gas pipeline originates from Hazira. A hydrocarbon supply pipeline runs from Kandla to Bhatinda (Punjab). A pipeline network of more than 17,000 km is present in the State. This has further increased the incidence of chemical accidents during transportation.

Owing to the presence of most of chemical industries in earthquake prone areas and port based industries in areas prone to tsunami, storm surge and flood, the State is also vulnerable to chemical or industrial disasters in aftermath of a natural disaster.

The Government of Gujarat has categorised districts on the basis of chemical and industrial hazard category such as:

- AA Category (Highly Hazardous)
- A Category (Hazardous)
- B Category (Less Hazardous)
- C Category (Much less Hazardous)

Bharuch and Vadodara districts fall in AA Category (Highly Hazardous) which has large volumes of stored toxic gases such as chlorine and ammonia. The density of MAH installations suggests that Ahmedabad, Bharuch, Vadodara, Valsad and Surat have the largest concentration of MAH units. Vadodara, Dahej, Hazira and Jamnagar have major petrochemical complexes.

3.1.8 Accidents

A total of 4,00,517 accidental deaths were reported in the country during 2013 and Gujarat accounts for 6.6% of this. It includes road accidents, rail-road accidents and other rail accidents. The figure has ever been increasing due to an ever-increasing number of vehicles, rage driving, smooth highways and road infrastructure that allows over speeding, non- adherence of traffic rules, etc.

Gujarat falls under the jurisdiction of the Western Railways Division of Indian Railways. The major railway stations in Gujarat are Ahmedabad Railway Station, Surat Railway Station, Vadodara Railway Station and Rajkot Railway Station. Vadodara Railway Station is the third

busiest railway station in the country. The State has around 241 railway stations and a dense railway network.

Other accidents include building or bridge collapses, failure of dam or levee, breaks in water, gas, or sewer lines, oil spill, etc.

3.1.9 Epidemic

Gujarat has faced severe epidemic or epidemic like situations which includes Swine Flu breakout during 2015 and 2010, Hepatitis B outbreak during 2009, Plague Epidemic of 1994 and Corona Virus Pandemic in 2020.

Additionally, there are also high chances of outbreak of epidemic in the aftermath of any disaster due to overstressed health resources, infrastructure and compromised conditions of hygiene and sanitation. This is particularly seen in case of hydrological disasters like flood leading to threats of water borne diseases and epidemic.

3.1.10 Heat Wave

During summer the maximum temperature often peaks to 45 degrees Celsius leading to severe heat wave conditions. This results in loss of life of many people particularly, homeless, gardeners, daily wagers who work out under direct sun, auto drivers, etc.

3.1.11 Stampede

Gujarat is a culturally vibrant state; it celebrates and hosts many national and regional festivals and fairs with huge enthusiasm. This attracts large number of people at one place. Apart from it, Gujarat attracts large number of religious and other tourists from across the world. This makes it prone to stampede like incidents if proper arrangements of crowd management are not put in place or in case of any rumor or any disaster.

3.1.12 Lightning Risk of Gujarat

Lightning is one of the Weather related Natural Disasters which normally is associated with Thunderstorms. During Lightning, due to the friction between the ice particles in the cloud, a sudden electrostatic discharge occurs between electrically charged regions of a cloud called intracloud lightning (IC), between Cloud to Cloud (CC lightning), or between a cloud and the ground (CG lightning). The charged regions in the atmosphere temporarily equalize themselves through this discharge referred to as a flash. A lightning flash can also be a strike if it involves an object on the ground. Lightning creates light in the form of black body radiation from the very hot plasma created by the electron flow, and sound in the form of thunder. The lightning causes several deaths and loss of property across India and Gujarat.

Gujarat is prone to lightning risk. Lightning & thunderstorm occurs mostly between June - October in Gujarat. According to National Crime Record Bureau, between 2008-2018, 576 deaths were caused due to lightning & thunderstorm. According to the report, Gujarat witnessed 2,14,474 lightning counts during the period 01 April 2019 to 31 July 2019 which accounted for several fatalities in the state.

3.1.13 Nuclear & Radiological Disaster

The growth in the application of nuclear science and technology in the fields of power generation, medicine, industry, agriculture, research and defence has led to an increase in the risk of occurrence of Nuclear and Radiological emergencies. Any radiation incident resulting in or having a potential to result in exposure and/or contamination of the workers or the public in excess of the respective permissible limits can lead to a nuclear/radiological emergency. For Gujarat State, the Kakrapar Atomic Power Station (KAPS) is a nuclear power which lies in the proximity of the Surat city in the State of Gujarat. It consists of two 220 MW pressurized water reactors with heavy water as moderator and another two power station with the capacity of 700MW each is under construction. KAPS-1 went critical on 3 September 1992 and began commercial electricity production a few months later on 6 May 1993. KAPS-2 went critical on 8 January 1995 and began commercial production in 1 September 1995. In addition, there are two heavy water plants in Gujarat (at Vadodara and Hazira).

3.1.14 Cyber Attack

A cyber attack is any type of offensive maneuver that targets computer information systems, infrastructures, computer networks, or personal computer devices. An attacker is a person or process that attempts to access data, functions or other restricted areas of the system without authorization, potentially with malicious intent. Cyber attacks can be part of cyber warfare or cyber terrorism. cyber attack can be employed by sovereign states, individuals, groups, society or organizations and it may originate from an anonymous source.

3.2 History of Disasters

As discussed above, Gujarat is prone to large number of natural and manmade disasters. The list of the major disasters faced by the State is given in **Annexure-1**

3.3 Seasonality of Hazards

By understanding the approximate occurrence of hazard, the state may remain prepared for the respective hazards by activating the relevant departments for the same. The table below is only indicative of the occurrence.

Hazards	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Cyclone												
Drought												
Earthquake												
Epidemic												
Fire												
Flood												
Heat Wave												
Industrial/ Chemical												
Road/ Train Accidents												
Stampede												
Tsunami												
Legend	High Occurrence				Moderate Occurrence				Low Occurrence			

Table 3.1: Seasonality of Hazards

3.4 Vulnerability Analysis

3.4.1 Vulnerable strata of the society:

The potential vulnerable sections of the society include:

(1) Below Poverty Line (BPL) population

According to the Ministry of Social Justice and Empowerment;

- The percentage of population Below Poverty Line (BPL) for Gujarat State accounts for 16.8%
- The total population Below Poverty Line (BPL) is 1,05,33,600
(Source: Ministry of Social Justice and Empowerment, Govt. of India)

(2) **Classification of Marginal Workers**

The classification of Marginal Workers is as follows

Sr. No.	Category	Male	Female	Total
1.	Labourers in Agriculture, Forestry and Fishing	6644	7095	13739
2.	Labourers Mining & Quarrying, Manufacturing and Construction	99050	38407	137457
Total		105694	45502	151196

Table 3.2: Classification of Marginal Workers (Source: Census 2011)

(3) **Persons with Disability**

The disability according to type is classified as follows:

Sr. No.	Type of Disability	Male	Female	Total
1.	In Seeing	113617	100533	214150
2.	In Hearing	100441	90234	190675
3.	In Speech	35277	25077	60332
4.	In Movement	149263	96616	245879
5.	Mental Retardation	39309	27084	66393
6.	Mental Illness	24943	17094	42037
7.	Mental Disability	42539	32572	75111
8.	Others	107415	90310	197725
Total		612804	479498	1092302

Table 3.3: Classification of Disabled Population (Source: Census 2011)

(4) **Old Age Population (Above the age of 60)**

- The total population above the age of 60 is 47,86,559
- Out of which total male population is 22,45,601 and total female population is 25,40,958 (*Source: Census 2011*)

(5) **Population below the age of 6 years**

- The total population below the age of 6 years is 77,77,262
- Out of which total male population is 41,15,384 and total female population is 36,61,878 (*Source: Census 2011*)

(6) Pregnant Women

Often disregarded are the special needs of pregnant women during disasters and emergencies. Pregnant women face increased risk during disasters which includes premature deliveries, underweight infants and infant mortality. Pandemic outbreak may be particularly life threatening for pregnant women and their unborn children and can often expose them to other illnesses and viruses. The registered number of pregnancies according to the National Family Health Survey (NFHS) for Gujarat State was around 4894 for Gujarat State (*Source: Report published by NFHS in 2019*).

3.4.2 Structural Vulnerability

As per Census 2011, the following is the state of housing in Gujarat:

	Total	Good	Livable	Dilapidated
Total	1,17,67,057	79,73,324	36,11,222	1,82,511
Rural	64,36,493	38,87,921	24,12,055	1,36,517
Urban	53,30,564	40,85,403	11,99,167	45,994

Table 3.4: Status of Residential Households

	Total	Good	Livable	Dilapidated
Total	4,14,661	2,19,852	1,90,185	4,624
Rural	3,28,910	1,60,663	1,64,322	3,925
Urban	85,751	59,189	25,863	699

Table 3.5: Status of Residential-cum-other use Households

As per Census 2011, the material of roof and walls of housing also varies widely and include grass/ thatch/ bamboo, mud/un-burnt brick, wood, stone, burnt bricks, concrete, etc. Thus the material of housing is adding to the structural vulnerability if proper building codes and other safety guidelines are not adhered to. This would increase the damage and loss during any disaster particularly earthquake, cyclone, floods, etc.

3.4.3 Economical Vulnerability

Gujarat has many economically vulnerable groups. They have limited resources for daily basic needs. The structures they dwell in are mostly not safe enough to face hazards. Thus the limited resources they have are highly prone to loss and damage in case of any disaster.

These groups include BPL and antoadhya households. According to Census 2011, Gujarat has a total of 247.68 lakhs workers, out of which around 17.8% are marginal workers. Gujarat has around 3.46 lakhs of slum households and around 1.4 lakhs of houseless population. All these groups are economically vulnerable and have limited financial capacity to recover from disaster loss.

Gujarat being developed and industrialized is a hub of important commercial houses, factories, corporate, etc. Manufacturing sector contributes significantly to the state GDP. Many fuel pipelines also cross the state. With respect to the hazard profile of the state, any significant damage to the infrastructure can cause a major economical set back to the State and would take its development many year back.

Different sectors of economy are also vulnerable due to hazard profile of the State. Thus any damage to related sector or any part of supply chain can have serious impact on economy of the State.

3.4.4 Environmental Vulnerability

Gujarat is among the most industrialized states. Around 42 % of its population lives in towns and cities and the State has a decade growth rate of urban population as 5.24 % (2001-2011). Urbanization leading to deforestation, pollution caused by chemical and pharmaceuticals companies to rivers and air, loss of biodiversity, damage to mangroves and coastlines, etc. severely affects local communities and wider ecological systems. Such environmentally degraded area compromises a community's ability to respond to and recover from a hazard event.

3.5 Capacity Analysis

Capacity includes all such resources human, equipment, infrastructure, etc. that aid in responding to any phase of disaster management.

A comprehensive database of disaster management related inventory is essential for an organized response. Lack of proper and adequate information hampers and delays timely response during golden hours.

3.5.1 Human Resources

Staff and officials of various line departments form a huge human resource for various critical functions in both pre and post disaster phase.

Trainings are regularly conducted at state level by GSDMA, GIDM and departmental training institutes. Trainings are also delivered at district, taluka, municipality and village level under Disaster Risk Management Programme. These trainings include trainings on search and rescue, first responders, EOC management, architect and engineer's training for safe construction, flood rescue and many other training of trainers. This has created a large trained human resource both in district and at state level.

3.5.2 Equipment

Over the years GSDMA has provided various fire fighting, search & rescue and other emergency equipment to District Collectorate, Municipal Corporations, ERCs and Municipalities, etc. The detail of same is mentioned in **Annexure 2**.

3.5.3 Infrastructure

Infrastructure acts as great resource during disaster phase as it forms critical part of logistics and supply chain management of responding agencies, relief material, evacuated masses, etc. A brief of infrastructural capacity of the State is mentioned below in table 3.6.

Railways Total Length	5257.22 route kms. (3506.55 kms – Broad-gauge, 1191.77 kms – Meter gauge, 558.90 kms – Narrow gauge)	
Roads Total Length	102501 Kms	
Motor Vehicles	25201084 , 2680808 - transport vehicles, 22520277 -Non Transport Vehicles	
Ports	41 minor and intermediate ports (14 south Gujarat 23 Saurashtra and 4 in Kutch) 1 major port of Kandla is under Administrative control of Central Govt.	
Post and Communications	PostOffice/Branches:8903 Telephone Exchange: 3226 Wireless Subscriber base - 71046166 Wire line subscriber base – 1220010	
Banking	Total nos. of branches 7485	
Education	Primary -	37551
	Secondary and Higher Secondary	10406
	Higher Education Institutions	1857
Health	Major Hospitals with Education Institute	8
Fire Stations	District Level Hospitals	24
Police Stations	Sub-District Hospital	30
DEOC	Community Health Centres	318
	Primary Health Centres	1158
ERCs	Sub Centres	7274

Table 3.6: Infrastructural Capacity



Chapter 4: Disaster Risk Governance in the State

Disaster risk governance is the system of institutions, mechanisms, policy and legal frameworks and other arrangements to guide, coordinate and oversee disaster risk reduction and related areas of policy. Disaster governance goes beyond governmental settings, powers, processes and tools by encouraging collective actions through the engagement of all stakeholders operating at all scales—from village to country.

The legal framework in the country and in Gujarat provides direction to government all other stakeholders for Disaster Risk Management (DRM). The role, composition and key decision making bodies for disaster management at national, State, district and below level are described below. The extent of involvement of central agencies will depend on the type, scale, and administrative spread of the disaster. If the situation requires, the state government shall request central government to provide necessary support. Disaster management structure is in place right from the national to local level. This institutional mechanism plays a crucial role in all activities from policy making to implementation across the entire disaster management cycle.

4.1 National Level

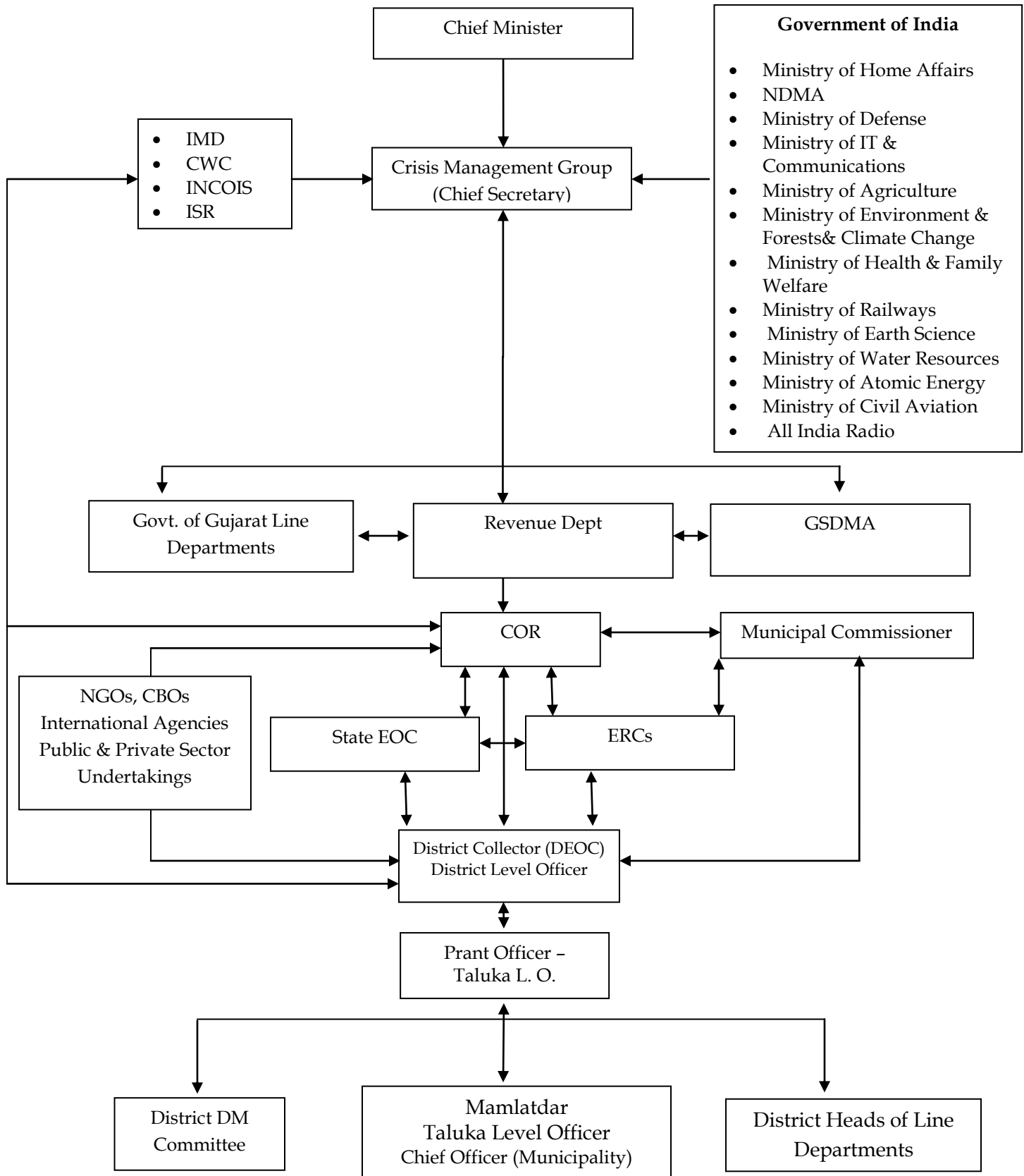
Agencies	Composition	Roles & Responsibilities
National Disaster Management Authority (NDMA)	<ul style="list-style-type: none"> • Prime Minister (Chairperson) • Members (not exceeding nine, nominated by the Chairperson) 	<ul style="list-style-type: none"> • Lays down policies, plans and guidelines for disaster management • Coordinates their enforcement and implementation • Lays down guidelines for Disaster Management to be followed by the different Central Ministries and departments and the State Government.
National Executive Committee (NEC)	<ul style="list-style-type: none"> • Union Home Secretary (Chairperson) • Secretaries to the GOI in the Ministries / Departments of Agriculture, Atomic Energy, Defence, Drinking Water and sanitation, Environment, Forests and Climate Change Finance (Expenditure), Health and Family Welfare, Power, Rural Development, Science and Technology, Space, Telecommunications, Urban Development, Water Resources, River Development and Ganga Rejuvenation, The Chief of the Integrated Defence Staff of the Chiefs of Staff Committee, ex officio as members. • Secretaries in the Ministry of External Affairs, Earth Sciences, Human Resource Development, Mines, Shipping, Road 	<ul style="list-style-type: none"> • Executive committee of the NDMA • Assists the NDMA in the discharge of its functions and also ensure compliance of the directions issued by the Central Government • Coordinates the response in the event of any threatening disaster situation or disaster. • Monitors the implementation of guidelines issued by NDMA • Act as the coordinating and monitoring body for disaster management

	Transport and Highways and Secretary, NDMA are special invitees to the meetings of the NEC.	
National Institute of Disaster Management (NIDM)	<ul style="list-style-type: none"> Union Home Minister; Vice Chairman, NDMA; Members including Secretaries of various nodal Ministries and Departments of Government of India and State Governments and heads of national levels scientific, research and technical organizations, besides eminent scholars, scientists and practitioners. 	<ul style="list-style-type: none"> Develops and builds capacity through training, research, documentation Develops national level information base Functions within the broad policies and guidelines laid down by the NDMA Develop educational materials for disaster management Undertake, organize and facilitate conferences, lectures, seminars.
National Disaster Response Force (NDRF)	<ul style="list-style-type: none"> Specially trained force headed by a Director General Structured like para military forces for rapid deployment. 	<ul style="list-style-type: none"> Provides specialized response and emergency search & rescue to a threatening disaster situation The general superintendence, direction and control of this force is vested in and exercised by the NDMA Command and supervision of the force is vested in the Director General of Civil Defence and National Disaster Response Force Comprises 10 battalions and 4 battalions are equipped and trained to respond to situations arising out of CBRN emergencies Imparts basic training to all the stakeholders identified by the state governments in their respective locations.

Agencies providing Early Warning Information	Sr. No.	Disaster	Nodal Department
	1	Accident – Air (Civil Aviation)	Min. of Civil Aviation (MOCA)
	2	Accident – Rail	Min. of Railways (MOR)
	3	Accident – Road	Min. of Road Transport & Highways (MRTH)
	4	Avalanche	Min. of Defence (MOD)-Border Road organization (BRO)
	5	Biological Emergencies	Min. of Health and Family Welfare (MHFW)
	6	Cold Wave	Min. of Agriculture and Farmers Welfare (MAFW)
	7	Cyclone/Tornado	Min. of Earth Sciences (MOES)
	8	Drought	Min. of Agriculture and Farmers Welfare (MAFW)
	9	Earthquake	Min. of Earth Science (MOES)
	10	Flood	Min. of Jal Sakti
	11	Floods-Urban	Min. of Housing and Urban Affairs (MHUA)
	12	Forest Fire	Min. of Environment, Forests and Climate Change (MEFCC)
	13	Frost	Min. of Agriculture and Farmers Welfare (MAFW)
	14	Hailstorm	Min. of Agriculture and Farmers Welfare (MAFW)
	15	Industrial and Chemical	Min. of Environment, Forests and Climate Change (MEFCC)
	16	Landslides	Min. of Mines (MOM)
	17	Nuclear and Radiological	Dept. of Atomic Energy (DAE)
	18	Oil Spills	Min. of Defence (MOD) – Indian Coast Guard
	19	Pest Attack	Min. of Agriculture & Farmers Welfare (MAFW)
	20	Tsunami	Min. of Earth Sciences

4.2 State Level

The DM structure in the State is as per the Gujarat State Disaster Management Act, 2003.



The State Disaster Management Authority and the Office of the Commissioner of Relief, Revenue Department, are the major institutions in the State that deal with all the phases of disaster management. All the major line departments of the State Government the District Collectors, other technical institutions, community at large, local self governments, NGOs, CBOs, etc. are the stakeholders of the SDMP.

The role of the stakeholders have been prepared with the avowed objective of making the concerned organizations understand their duties and responsibilities regarding disaster management at all levels, and accomplishing them.

Agencies	Roles & Responsibilities
<p><u>Gujarat State Disaster Management Authority (GSDMA)</u></p>	<ul style="list-style-type: none"> • Promotes an integrated and coordinated system of disaster management including prevention or mitigation of disaster by the State, local authorities, stakeholders and communities. • Collect/cause to be collected data on all aspects of disasters and disaster management and analyze it and further cause and conduct research and study relating to the potential effects of events that may result in disasters. • Acts as a repository of information concerning disasters and disaster management • Lays down the policies and plans for disaster management in the State. • Promotes or causes to promote awareness and preparedness, advices and trains the community and stakeholders • Co-ordinating Rehabilitation and Reconstruction activities by different government departments.
<p><u>Commissioner of Relief (COR)</u></p>	<ul style="list-style-type: none"> • On the recommendation of COR, State Government may declare disaster. • Primary responsibility of co-ordinating an effective emergency response and relief on the occurrence of a disaster. • Prepare, review and update State level emergency plans and guidelines and ensure that the district level plans are prepared, revised and updated • Develop an appropriate relief implementation strategy for the State in consultation with the Authority, taking into account the unique circumstances of each district and deficiency in institutional capacity and resources of the State. • Provide directions to the District Collector and the local authority having jurisdiction over the affected area to provide emergency relief in accordance with disaster management plans to minimize the effects of disaster.

<p>State Crisis Group (SCG)</p>	<ul style="list-style-type: none"> • Develop a strategic policy framework for disaster management for the State. • Ensure that the disaster operations in the state are consistent with the State Disaster Management Authority and in line with the policy framework for disaster management for the state. • Identify resources in and outside the State that may be used for disaster operations. • Provide reports and make recommendations about matters relating to disaster management and disaster operations. • Develop a thorough approach to disaster management - Prevention / Preparation / Response and Recovery. • Establish District and Local Crisis Group
<p><u>Gujarat Institute of Disaster Management (GIDM)</u></p>	<ul style="list-style-type: none"> • To serve as the apex institute in the State for Disaster Management Capacity Building. • To provide disaster management related training to all the stakeholders. • To act as a resource centre and clearing house of information on disaster management by documentation of field experiences including case studies, lessons learnt and best practices. • To undertake quality research projects on Disaster Management and mitigation covering both natural and human induced disasters. • To facilitate partnership with reputed national and international organizations, universities, institutions, bodies and individuals specialized in Disaster Management. • To run and award degree/diploma/certificate courses on Disaster Management on its own or with the affiliation to any other institute/ universities, local/ national/ international.
<p>State Fire & Emergency Services (F&ES)</p>	<ul style="list-style-type: none"> • Provides crucial immediate response during any disaster • Provides regular training to the fire staff and all in using and maintaining the equipment and containing fire in the state.
<p>Institute of Seismological Research (ISR)</p>	<ul style="list-style-type: none"> • Engaged in dedicated seismological research • Monitors seismic activity of Gujarat round the clock through a dense network of instruments installed in Gujarat • Reports earthquake location along with magnitudes at the earliest of the arrival of seismic waves • Engaged in seismic microzonation of areas prone to earthquakes • Provide consultancy services to various private companies in feasibility studies related to seismicity of the area prior to establishing a major project

Bhaskaracharya Institute for Space Applications and Geo-Informatics (BISAG)	<ul style="list-style-type: none"> • State level nodal agency to facilitate the use of spatial and geo-spatial technologies for the planning and developmental activities pertaining to agriculture, land and water resource management, wasteland development, watershed development, forestry, disaster management, infrastructure and education. • Provides specialized services and solutions in implementing map-based Geo-Spatial Information Systems. • Provides GIS solutions for disaster management and specialized needs of Public Safety agencies like police, fire and ambulance services. • Provides e-governance solutions to address varying GIS and MIS needs of governments and municipal corporations.
State Disaster Response Force (SDRF)	<ul style="list-style-type: none"> • GSDMA, through the Home Department, has created 11 State Disaster Response Force (SDRF) Companies with a total strength of around 1100 personnel • 11 Companies of SDRF are stationed at Vadodara (2 Companies), Ahmedabad, Madana, Godhra, Nadiad, Gondal, Valiya, Vav, Gandhinagar and Rajkot. • Around 140 types of search and rescue equipments were provided for training. • The SDRF teams are deployed at various locations based on the severity of the disaster.
Local Authorities	<ul style="list-style-type: none"> • Provide assistance to GSDMA, COR and District Collector in disaster management activities. • Ensure training of its officers and employees and maintenance of resources so as to be readily available for use in the event of a disaster. • Ensure that all construction projects under it conform to the standards and specifications lay down. • Each department of the Government in a district shall prepare a disaster management plan for the district. Carry out relief, rehabilitation and reconstruction activities in the affected area within its jurisdiction.

Table 4.0: Institutional Mechanism at State Level

4.2.1 Agencies competent for issuing Disaster Specific Early Warnings:

Early warnings will be published/ issued by the respective agencies during different disaster which are as follows:

Disaster	Agencies
Earthquakes	ISR, IMD
Floods	IMD, Irrigation Dept.
Cyclones	IMD
Tsunami	IMD, INCOIS, ISR
Drought	Agriculture Dept.
Epidemics	Health & Family Welfare Dept.
Industrial & Chemical Accidents	DISH, Labour & Employment Dept.,
Fire	Director, State Fire Prevention Services

4.3 District Level

All the districts in the state have District Emergency Operation Centre (DEOC) headed by the Collector. Further, every DEOCs act as the planning, coordinating and implementing body for disaster management at the District and below level and take all necessary measures for the purposes of disaster management in accordance with the guidelines laid down by the NDMA and GSDMA.

Agencies	Roles & Responsibilities
<u>District Collector</u>	<ul style="list-style-type: none">Facilitate and, coordinate with, local Government bodies to ensure that pre and post - disaster management activities in the district are carried out.Assist community training, awareness programmes and the installation of emergency facilities with the support of local administration, non-governmental organizations, and the private sector.Take appropriate actions to smoothen the response and relief activities to minimize the effect of disaster.Recommend CoR and State Government for declaration of disaster.
<u>District Crisis Group (DCG)</u>	<ul style="list-style-type: none">Ensure that disaster management and disaster operations in the district are consistent with the State.Develop effective disaster management for the district, including a district disaster management plan and regularly review and assess the disaster management arrangements in the disaster district.Provide reports and make recommendations to the State group about matters relating to disaster management and disaster operations in the district.Regularly review and assess the disaster management of Local Groups in the district.

	<ul style="list-style-type: none"> • Ensure that any relevant decisions made by the State group are incorporated in its disaster management arrangements, and the disaster management arrangements of Local Groups in the district. • To ensure the community is aware of ways of mitigating the adverse effects of an event, and preparing for, responding to and recovering from a disaster. • Coordinate the provision of State resources and services provided to support Local Groups in the district. • Identify resources that may be used for disaster operations in the district. • To make plans for the allocation of resources that may be used for disaster operations within the district and the coordination of their use. • Establish and review communications systems in the group, and also with Local Groups in the district for use when a disaster happens. • Ensure information about an event of a disaster in the district is promptly given to the State group and each Local Group in the district; • To assist the district administration in the preparation of a district disaster management plan.
<p><u>Local Crisis Group (LCG)</u></p>	<ul style="list-style-type: none"> • Ensure that disaster management and disaster operations in the area are consistent with the State and in line with the policy framework for disaster management for the state. • Develop effective disaster management, and regularly review and assess the disaster management activities. • Help the local administration for its area to prepare a local disaster management plan. • Identify, and provide advice to the relevant district group about, support services required by the local group to facilitate disaster management and disaster operations in the area. • Ensure the community is aware of ways of mitigating the adverse effects of an event, and preparing for, responding to and recovering from a disaster. • Manage disaster operations in the area under procedures decided by the state group. • Provide reports and make recommendations to the relevant district group about matters relating to disaster operations. • Identify, and co-ordinate the use of resources that may be used for disaster operations in the area. • Establish and review communications systems in the group with the relevant district group and other local groups when a disaster happens. • Ensure information about a disaster in the area is promptly given to the relevant district group.

4.4 Other Stakeholders in Disaster Management

Agencies	Roles & Responsibilities
Private Sector	<ul style="list-style-type: none">• The private sector should ensure their active participation in the pre-disaster activities in alignment with the overall plan developed by the GSDMA or the Collector.• They should also adhere to the relevant building codes and other specifications, as may be stipulated by relevant local authorities.
Community Groups and Voluntary agencies	<ul style="list-style-type: none">• Local community groups, “Aapda Mitra” and voluntary agencies including NGOs should actively assist in prevention and mitigation activities under the overall direction and supervision of the GSDMA or the Collector.• They should actively participate in all training activities as may be organised and should familiarise themselves with their role in disaster management.
Citizen	<ul style="list-style-type: none">• It is a duty of every citizen to assist the Commissioner, the Collector or such other person entrusted with or engaged in disaster management whenever his aid is demanded generally for the purpose of disaster management.

Other than these, there are various agencies, organizations, departments and authorities that constitute a core network for implementing various disaster management related functions and activities. It also includes academic, scientific and technical organizations, media, community, etc. which play important role in various facets of disaster management.



Chapter 5 :Disaster Risk Reduction for Resilience

5. Building Disaster Resilience:

A detailed responsibility framework for disaster risk resilience and building resilience includes aspects of pre disaster risk management. After the paradigm shift from approach to addressing disasters that weighed heavily on relief and response to a radically different one based on DRR & preparedness, there has been another major shift partly incremental and partly dramatic towards building disaster resilience. This global shift centers on disaster risk management rather than disaster management. The principal features of this trend are enhancing resilience through reducing risks, better preparedness, systematic understanding of hazards, minimize the creation of new risks as part of development, investing significantly in DRR and improving governance and mainstreaming DRR.

The DM Act 2005 and The National Policy 2009 had made paradigm shift towards proactive disaster management by laying emphasis on long term DRR. The global frameworks Hyogo (2005-2015) and Sendai (2015-2030) - signify calibrated shift towards internalization of DRR and making it an integral part of development initiatives.

A major component of DRR undoubtedly is various types of mitigation measures. The DM Act 2005 defines, “Mitigation as measures aimed at reducing risk, the impact or effects of a disaster or threatening disaster situation”. The Gujarat State DM Act, 2003 defines, “Mitigation as measures aimed at reducing the impact or effects of a disaster”.

The State Disaster Management Plan (SDMP) incorporates key principles enunciated in the DM Act 2005, National Policy, the three major post 2015 global frameworks, and the PM’s 10 Point Agenda, a special focus on social inclusion and an emphasis on mainstreaming DRR. For each hazard, the approach used in this SDMP incorporates into the planning framework the key themes enunciated in the Sendai Framework and additional ones based on a broader approach to DRR. These are grouped under the following six Thematic Areas for DRR:

1. Understanding Risk
2. Inter-Agency Coordination
3. Investing in DRR – Structural Measures
4. Investing in DRR – Non-Structural Measures
5. Capacity Development
6. Climate Change Risk Management

5.1 Earthquake / Seismic

5.1.1 Understanding Disaster Risk

Seismic		Understanding Disaster Risk			
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1.	<ul style="list-style-type: none"> • Earthquake Monitoring Services • National Seismological Network • Real Time Seismic Monitoring Network (RTSMN) • Earthquake Hazard and Risk Assessment (EHRA) 	ISR IMD	<u>Recurring/Regular (RR)</u> <ul style="list-style-type: none"> • Estimate the earthquake parameters quickly after detection • Disseminate information • Share information relating to undersea earthquakes capable of generating tsunamis in the Indian coastal regions with INCOIS to issue of tsunami related messages and warnings • Share seismic activity data with national and international scientific, academic and R&D institutions <u>Medium Term (T2)</u> <ul style="list-style-type: none"> • Seismic hazard assessment • Seismic zoning • Seismic micro-zoning 	District Magistrate & Collector, DEOC	<u>Recurring/ Regular (RR)</u> Share information widely
2.	Scientific Seismic Zonation	ISR, IMD	<u>Short Term (T1)</u> Inter-Agency Coordination and Collaboration for publishing the guidelines	District Magistrate & Collector, DEOC	<u>Recurring/ Regular (RR)</u> Ensuring implementation, enforcement, compliance and monitoring; Awareness creation

3.	Seismic Micro zonation	ISR, IMD	<u>Medium Term (T2)</u> Develop a status paper based on a consensus among the professionals on the methodologies for micro-zonation studies	District Magistrate & Collector, DEOC	<u>Long Term (T3)</u> Carry out need assessment from end users, conduct micro-zonation studies, prioritize important urban areas for micro zonation, do professional review before adoption
4.	Hazard Risk Vulnerability and Capacity Assessment (HRVCA)	ISR, GSDMA, UDD, ULB	<u>Recurring/ Regular (RR)</u> <ul style="list-style-type: none"> • Promote studies, documentation and research • Studies on vulnerabilities and capacities covering social, physical, economic, ecological, gender, social inclusion and equity aspects • Provide technical support and guidance for comprehensive HRVCA • Undertake HRVCA as part of preparing and periodic revision of DM plans 	District Magistrate & Collector	<u>Recurring/ Regular (RR)</u> Undertake HRVCA as part of preparing and periodic revision of DM plans <u>Short Term (T1)</u> Constitute/ strengthen the mechanisms for consultation with experts and stakeholders
5.	Disaster Data Collection and Management	CoR, GSDMA, All Departments.	<u>Recurring/ Regular (RR)</u> Systematic data management of data on disaster damage and loss assessments <u>Short Term (T1)</u> Disaster Damage and Losses 2005-2015 baseline	District Magistrate & Collector, DEOC	<u>Recurring/ Regular (RR)</u> Systematic data management of data on disaster damage and loss assessments <u>Short Term (T1)</u> Disaster Damage and Losses 2005-2015 baseline

5.1.2 Inter – Agency Coordination

Seismic		Inter – Agency Coordination			
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1.	Overall disaster governance	RD, CoR, GSDMA	<u>Recurring/ Regular (RR)</u> <ul style="list-style-type: none"> • Providing coordination, technical inputs, and support • Preparation and implementation of DM plans and ensure the functioning of agencies with DM tasks • All aspects of disaster risk management and mainstreaming DRR • Ensuring coherence and mutual 	District Magistrate & Collector, DEOC	<u>Recurring/ Regular (RR)</u> <ul style="list-style-type: none"> • Preparation and implementation of DM plans and ensure the functioning of agencies with DM tasks • All aspects of disaster risk management and mainstreaming DRR • Ensuring coherence and mutual reinforcement of DRR, CCA and development
2.	Response	RD, CoR, All relevant departments	<u>Recurring/ Regular (RR)</u> <ul style="list-style-type: none"> • Organising and coordinating central assistance. • Coordinate with central agencies 	District Magistrate & Collectors	<u>Recurring/ Regular (RR)</u> <ul style="list-style-type: none"> • Organizing and coordinating the immediate response • Coordinate with State agencies
3.	Non-structural measures	RD, CoR, All Relevant Departments	<u>Recurring/ Regular (RR)</u> <p>Coordination among central and state agencies for</p> <ol style="list-style-type: none"> revised/ updated rules, norms adoption of new/updated standards, enact/amend laws, regulations and adopt/ review policies 	District Magistrate & Collectors, Municipal Commissioners	<u>Recurring/ Regular (RR)</u> <p>Coordination among state agencies for ensuring implementation, enforcement and monitoring of norms/ codes.</p>

5.1.3 Investing in DRR – Structural Measures

Seismic		Investing in DRR – Structural Measures			
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1.	Social Housing Schemes	CoR, RD, UDD, RDD, ULB, PRI	<u>Recurring/ Regular (RR)</u> Ensure that multi-hazard resistant features are incorporated in planning and execution of social housing schemes (with special focus on earthquake)	District Magistrate & Collectors, District Development Commissioner, Municipal Commissioners	<u>Recurring/ Regular (RR)</u> • Ensure that earthquake resistant features are incorporated in planning and execution of social housing schemes • Ensure compliance with relevant building codes
2.	Strengthening and seismic retrofitting of prioritized lifeline structures and buildings	RD, UDD, ULB, R&B	Medium Term (T2) Implementation strengthening and seismic retrofitting as per recommendations of safety audits	District Magistrate & Collectors, District Development Commissioner, Municipal Commissioners	Medium Term (T2) Implementation strengthening and seismic retrofitting as per recommendations of safety audits in all govt. departments, agencies, public utilities, schools, colleges, community halls, etc.
3.	Hazard resistant construction, strengthening, and retrofitting of all lifeline structures and critical infrastructure	R&B, UDD, ULB	Recurring/ Regular (RR) Guidance and implementation	District Magistrate & Collectors, District Development Commissioner, Municipal Commissioners	<u>Recurring/ Regular (RR)</u> Collaboration with technical agencies and implementation

5.1.4 Investing in DRR – Non – Structural Measures

Seismic Investing in DRR – Non – Structural Measures					
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1.	Regulations and model codes for town planning, civil works and public infrastructure	UDD, ULB, R&B	<u>Recurring/ Regular (RR)</u> <ul style="list-style-type: none"> • Periodic update of codes, rules, regulations • Work with all central ministries, agencies, and state governments to implement techno-legal regime by modifying/ developing necessary rules 	District Magistrate & Collectors, District Development Commissioner, Municipal Commissioners	<u>Medium Term (T2)</u> <ul style="list-style-type: none"> • Adopt suitable byelaws for rural and urban areas, put model codes (e.g., NBC 2016) into practice and ensure proper compliance • Micro-zonation for seismic risk reduction <u>Long Term (T3)</u> Ensure strict compliance with code implementation through relevant Departments and agencies
2.	<ul style="list-style-type: none"> • Structural safety audit of lifeline structures and buildings • Prioritization of lifeline structures and buildings for strengthening and seismic retrofitting 	R&B, UDD, ULBs	<u>Recurring/ Regular (RR)</u> Periodically provide clarifications in line with the relevant national standards <u>Medium Term (T2)</u> Formulate standard procedures and guidelines. Ensure implementation, monitoring, enforcement and proper compliance within state by public, private and individuals.	District Magistrate & Collectors, District Development Commissioner, Municipal Commissioners	<u>Recurring/ Regular (RR)</u> Carry out safety audit of lifeline buildings and critical infrastructure <u>Medium Term (T2)</u> Ensure implementation, monitoring, enforcement and proper compliance within District by public, private and individuals

3.	Licensing and certification of professionals	Relevant Departments professional bodies of architects and engineers	<u>Medium Term (T2)</u> Implement licensing of engineers through appropriate legal framework and institutional mechanism		<u>Medium Term (T2)</u> Ensure strict compliance with code implementation through relevant Departments and agencies
4.	Public Private Partnerships	RD, CoR, GSDMA, UDD	<u>Recurring/ Regular (RR)</u> Promote private participation in disaster management facilities.	District Magistrate & Collectors,	<u>Recurring/ Regular (RR)</u> Promote private participation in disaster management facilities.
5.	Risk Transfer	RD, CoR, GSDMA, FD, UDD	<u>Recurring/ Regular (RR)</u> Implementation of Risk Transfer Arrangements including multi-hazard insurance for life and property <u>Short Term (T1)</u> Policy Framework	District Magistrate & Collectors, District Development Commissioner, Municipal Commissioners	<u>Recurring/ Regular (RR)</u> Implementation of Risk Transfer Arrangements including multi hazard insurance for life and property

5.1.5 Capacity Development

Seismic		Capacity Development			
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1.	Training	GIDM, SIRD, GSDMA, ISR	<u>Recurring/ Regular (RR)</u> • Support regular training programs • Training support for SDRF, Govt. officials,	District Magistrate & Collectors, District Development Commissioner, Municipal Commissioners	<u>Medium Term (T2)</u> • Carry out the national effort to build the requisite number of trained personnel to handle seismic safety in India

			community, Volunteers <u>Medium Term (T2)</u> Promote state efforts to build the requisite number of trained personnel to handle seismic Safety in India.		<u>Recurring/ Regular (RR)</u> • Carry out regular trainings of community and volunteers • Trainings in search and rescue for community, and volunteers
2.	Curriculum Development	GIDM, GSDMA, Education Department.	<u>Medium Term (T2)</u> Facilitate the introduction of subjects related to DM, in the undergraduate and professional courses		<u>Medium Term (T2)</u> DM related aspects to be included in undergraduate and professional courses
3.	Awareness Generation	Information Department, RD, CoR, GSDMA	<u>Recurring/ Regular (RR)</u> • Carry out mass media campaigns • Promote culture of disaster risk prevention, mitigation, and better risk management • Promote attitude and behavior change in the awareness campaigns/ IEC <u>Medium Term (T2)</u> • Promote use of	District Magistrate & Collectors, District Development Commissioner, Municipal Commissioners	<u>Recurring/ Regular (RR)</u> • Carry out mass media campaigns • Promote culture of disaster risk prevention, mitigation, and better risk management • Promote attitude and behavior change in the awareness campaigns/IEC <u>Medium Term (T2)</u> • Promote use of insurance/ risk transfer • Promote Community Radio • Strengthening network of civil society organizations for awareness

			insurance/ risk transfer • Promote Community Radio • Strengthen network of civil society organizations for awareness generation about DRR and DM		generation about DRR and DM • Information on care and protection of disaster-affected animals
4.	Mock Drills/ Exercises	GSDMA, GIDM, RD, CoR, SDRF	<u>Recurring/ Regular (RR)</u> Monitoring Emergency Preparedness of all Departments <u>Short Term (T1)</u> Promoting the planning and execution of emergency drills by all departments and in all districts.	District Magistrate & Collectors, District Development Commissioner, Municipal Commissioners	<u>Recurring/ Regular (RR)</u> Monitoring Emergency Preparedness of Departments <u>Short Term (T1)</u> Joint planning and execution of emergency drills
5.	Documentation and Dissemination	GSDMA, GIDM, RD, CoR	<u>Medium Term (T2)</u> Undertake documentation of major earthquakes and ensure wider dissemination	District Magistrate & Collectors	<u>Recurring/ Regular (RR)</u> Popularization and distribution of documentation in local languages
6.	Empowering women, marginalised, and persons with disabilities	WCD, SJED, GSDMA, GIDM	<u>Medium Term (T2)</u> Incorporating gender sensitive and equitable approaches in capacity development covering all aspects of disaster	District Magistrate & Collectors, District Development Commissioner, Municipal Commissioners	<u>Medium Term (T2)</u> Incorporating gender sensitive and equitable approaches in capacity development covering all aspects of disaster management at the district, and local levels

			management at state, district and local level		
7.	Community-Based Disaster Management	RD, CoR, UD, ULBs, GSDMA, GIDM	<p><u>Recurring/ Regular (RR)</u> Promotion, Guidance, and Support. Training for PRI, SHG, NCC, NSS, Youth, local community organizations.</p> <p><u>Short Term (T1)</u> Strengthen ability of communities to manage and cope with disasters based on a multi-hazard approach.</p>	District Magistrate & Collectors	<p><u>Recurring/ Regular (RR)</u> Training for PRI, SHG, NCC, NSS, Youth, local community organizations</p> <p><u>Short Term (T1)</u> Strengthen ability of communities to manage and cope with disasters based on a multi-hazard approach</p>

5.2 Cyclone and Wind

5.2.1 Understanding Disaster Risk

Cyclone and Wind			Understanding Disaster Risk		
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District/MC	Responsibility - District
1.	Observation Networks, Information Systems, Monitoring, Research, Forecasting & Early Warning	IMD, INCOIS, RMSC, GSDMA, CoR. GIDM	<u>Recurring/Regular (RR)</u> • Promote research and studies – both in-house and extra-mural by providing research grants to researchers and institutions • Studies on ecosystem and shoreline changes • Promote availability in public domain cyclone database and forecasts <u>Short Term (T1)</u> • Constitute State Level Coastal advisory Committee as per need • Enhancement of Observational Network Stations (ONS) • Establishment of planned Automatic Weather Stations (AWS) and Rain-Gauge Network (RGN) • Enhancement of a Doppler Weather Radar Network over coastal regions • Integration of all ONS with AWS & RGN in one single platform	District Magistrate & Collector, Municipal Commissioner	Coordination and Implementation with the state authorities

			<p><u>Medium Term (T2)</u></p> <ul style="list-style-type: none"> • Studies on socio-economic on coping capabilities and impacts • Modernization of observation network, equipment, systems, technology <p><u>Long Term (T3)</u></p> <ul style="list-style-type: none"> • Research and studies to improve forecasts 		
2.	Zoning/ Mapping	BISAG, ISRO, F&E Dept., CCD, GSDMA	<p><u>Recurring/ Regular (RR)</u></p> <p>Support the preparation of detailed maps to delineate coastal wetlands, mangroves and shelterbelts and tracts for coastal bio-shields using best tools, field studies, and satellite data</p>	District Magistrate & Collector, Municipal Commissioner	Recurring/ Regular (RR) Carry out the mapping and related studies
3.	Hazard Risk Vulnerability and Capacity Assessment (HRVCA)	GSDMA, GIDM	<p><u>Recurring/ Regular (RR)</u></p> <ul style="list-style-type: none"> • Promote studies, documentation and research • Studies on vulnerabilities and capacities covering social, physical, economic, ecological, gender, social inclusion and equity aspects. • Provide technical support and guidance for comprehensive HRVCA • Undertake HRVCA as part of preparing and periodic revision of DM plans, and for development planning <p><u>Short Term (T1)</u></p> <p>Constitute/ strengthen the mechanism for consultation with experts and stakeholders.</p>	District Magistrate & Collector, Municipal Commissioner	Coordination with the state authorities and Implementation of HRVCA in DM plans

4.	Dissemination of warnings, data, and information	CoR, RD, Dept. of Information and Technology, GSDMA	<p><u>Recurring/ Regular (RR)</u></p> <ul style="list-style-type: none"> • Quick, clear, effective dissemination among state agencies • Deployment of communication equipment • Warnings using all types of options, types of technologies, and media • Providing weather information online and offline and interface with mobile network service • Providing warnings on radio, TV, and cell phones <p><u>Medium Term (T2)</u></p> <p>Facilitating last-mile connectivity and access to disaster risk information</p>	District Magistrate & Collector, Municipal Commissioner	<p><u>Recurring/ Regular (RR)</u></p> <ul style="list-style-type: none"> • Dissemination of warnings to all (including fishermen), down to the last mile – remote, rural or urban; Regular updates to people in areas at risk • Warnings using all types of options, types of technologies, and media • Monitoring compliance by various network operators and service providers <p><u>Short Term (T1)</u></p> <p>Establishing seamless interface between national and state networks</p> <p><u>Medium Term (T2)</u></p> <ul style="list-style-type: none"> • Ensure facilities and infrastructure for the implementation of adequate access of information to communities at risk • Deployment of communication equipment
5.	Disaster Data Collection and Management	RD, CoR, GSDMA, UDD.	<p><u>Recurring/ Regular (RR)</u></p> <p>Systematic data management of data on disaster damage and loss assessments</p> <p><u>Short Term (T1)</u></p> <p>Disaster Damage and Losses 2005-2015 baseline</p>	District Magistrate & Collector, Municipal Commissioner.	<p><u>Recurring/ Regular (RR)</u></p> <p>Systematic data management of data on disaster damage and loss assessments</p> <p><u>Short Term (T1)</u></p> <p>Disaster Damage and Losses 2005-2015 baseline</p>

5.2.2 Inter – Agency Coordination

Cyclone and Wind			Inter – Agency Coordination		
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1	Overall disaster governance	RD, CoR, GSDMA, UDD.	<u>Recurring/ Regular (RR)</u> <ul style="list-style-type: none">• Providing coordination, technical inputs, and support• Preparation and implementation of DM plans and ensure the functioning of agencies with DM tasks• All aspects of disaster risk management and mainstreaming DRR• Ensuring coherence and mutual reinforcement of DRR, CCA and development.	District Magistrate & Collector, and Municipal Commissioner.	<u>Recurring/ Regular (RR)</u> <ul style="list-style-type: none">• Preparation and implementation of DM plans and ensure the functioning of agencies with DM tasks at district, taluka, local and community level.• All aspects of disaster risk management and mainstreaming DRR
2	Response	RD, CoR, All relevant departments	<u>Recurring/ Regular (RR)</u> <ul style="list-style-type: none">• Organising and coordinating central/state assistance.• Coordinate with central agencies	District Magistrate & Collectors	<u>Recurring/ Regular (RR)</u> <ul style="list-style-type: none">• Organizing and coordinating the immediate response• Coordinate with State / central agencies
3	Warnings, Information, Data	IMD, RD, CoR, GSDMA.	<u>Recurring/ Regular (RR)</u> Effective coordination and seamless communication among central and state agencies to ensure quick, clear, effective dissemination of warnings, information and data	District Magistrate & Collector, and Municipal Commissioner, ULBs, PRIs	<u>Recurring/ Regular (RR)</u> Coordinating the dissemination of warnings to all, down to the last mile – remote, rural or urban; Regular updates to people in areas at risk
4.	Non-structural measures	RD, CoR, All Relevant	<u>Recurring/ Regular (RR)</u> Coordination among central and	District Magistrate & Collectors,	<u>Recurring/ Regular (RR)</u> Coordination with state agencies for

		Departments	state agencies for d) revised/ updated rules, norms e) adoption of new/updated standards, f) enact/amend laws, regulations and g) adopt/ review policies	Municipal Commissioners	ensuring implementation, enforcement and monitoring.
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5.2.3 Investing in DRR – Structural Measures

Cyclone and Wind		Investing in DRR – Structural Measures			
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1.	Establishment/ strengthening of Emergency Operation Centres	CoR, RD, GSDMA, UDD.	<u>Recurring/ Regular (RR)</u> Ensure round the clock operations of SEOCs during the Flood season with adequate manpower/resources	District Magistrate & Collectors, Municipal Commissioners, ULBs & PRIs.	<u>Recurring/ Regular (RR)</u> Ensure round the clock operations of ERC, DEOCs, & TEOCs during the flood season with adequate human resources to respond to urban flood.
2.	Multi-Purpose Cyclone Shelters	GSDMA R&B	<u>Medium Term (T2)</u> Construction of multi-purpose shelters in coastal villages/habitations prone to frequent cyclones <u>Long Term (T3)</u> Ensure compliance with relevant building codes	District Magistrate & Collectors, Municipal Commissioners	<u>Short Term (T1)</u> Identification of safe buildings and sites to serve as temporary shelters for people and livestock evacuated from localities at risk <u>Medium Term (T2)</u> Identification of land for MPCs.
3.	Social Housing Schemes	R&B, CORD, ULBs, UDD, GSDMA.	<u>Short Term (T1)</u> Review all housing schemes to ensure that appropriate multi-hazard safety norms, including cyclone-resistant features are	District Magistrate & Collectors, District Development	<u>Short Term (T1)</u> Review all housing schemes to ensure that appropriate multi-hazard safety norms, including cyclone-resistant

			<p>incorporated in all social housing schemes.</p> <p><u>Medium Term (T2)</u> Ensure that cyclone resistant features are incorporated in planning and execution of social housing schemes</p> <p><u>Long Term (T3)</u> Carry out retrofitting of all social housing without multi-hazard, especially cyclone-resistant features</p>	Officer, Municipal Commissioner.	<p>features are incorporated in all social housing schemes</p> <p><u>Medium Term (T2)</u> • Ensure that multi-hazard, especially cyclone-resistant features are incorporated in planning and execution of social housing schemes</p> <p>• Ensure compliance with relevant building codes</p> <p><u>Long Term (T3)</u> Carry out retrofitting of social housing without multi hazard, especially cyclone-resistant features</p>
4.	Hazard resistant construction, strengthening, and retrofitting of all lifeline structures and critical infrastructure	R&B, UDD, Education, Health, Port & Transportation, All line departments.	<p><u>Recurring/ Regular (RR)</u> Guidance and implementation</p>	District Magistrate & Collectors, District Development Officer, Municipal Commissioners	<p><u>Recurring/ Regular (RR)</u> Implementation</p>

5.2.4 Investing in DRR – Non – Structural Measures

Cyclone and Wind		Investing in DRR – Non – Structural Measures			
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1.	<ul style="list-style-type: none"> • Laws • Regulations • Enforcement mechanisms • Techno-Legal regimes • Institutional Arrangements • Codes for disaster risk reduction • Compliance monitoring 	UDD, ULB, R&B, Forest & Environment dept., All Line Dept.	<p><u>Recurring/ Regular (RR)</u></p> <ul style="list-style-type: none"> • Guidance and Support • Oversight and monitoring of compliance with coastal zone laws <p><u>Short Term (T1)</u></p> <p>Review and Update relevant codes.</p> <p>Notification of coastal zones for different purposes as per CRZ guidelines and techno-legal framework of town and country planning rules; enforcement and monitoring.</p>	District Magistrate & Collectors, District Development Officer, Municipal Commissioner, ULBs.	<p><u>Recurring/ Regular (RR)</u></p> <p>Ecologically sound land-use zonation</p> <p>Regulating aquaculture, and groundwater extraction</p> <p>Strengthen land-use planning</p> <p><u>Recurring/ Regular (RR)</u></p> <p>Consider shoreline erosion, risk to structures, monitoring shoreline changes paying attention to the preservation of natural barriers.</p>
2.	Public Private Partnerships	RD, CoR, GSDMA, UDD	<p><u>Recurring/ Regular (RR)</u></p> <p>Promote private participation in disaster management facilities.</p>	District Magistrate & Collectors,	<p><u>Recurring/ Regular (RR)</u></p> <p>Promote private participation in disaster management facilities.</p>
3.	Risk Transfer	RD, CoR, GSDMA, FD, UDD, CoRD.	<p><u>Recurring/ Regular (RR)</u></p> <p>Implementation of Risk Transfer Arrangements including multi-hazard insurance for life and property</p> <p><u>Short Term (T1)</u></p> <p>Policy Framework</p>	District Magistrate & Collectors, District Development Officer, Municipal Commissioners	<p><u>Recurring/ Regular (RR)</u></p> <p>Implementation of Risk Transfer Arrangements including multi hazard insurance for life and property</p>

5.2.5 Capacity Development

Cyclone and Wind			Capacity Development		
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility – District
1.	Training	GIDM, SIRD, GSDMA, SPIPA, Police Training Academy, SDRF.	<u>Recurring/ Regular (RR)</u> Training and orientation programs for State govt. staff, SDRF, Community, Volunteers, and other direct stakeholders Incorporating disaster response, search and rescue in the training programs of youth such as NCC, NYKS, Scouts and Guides and NSS, Aapda Mitra, Community Volunteers, NGO, CSO, CBO, PRIs.	District Magistrate & Collectors, DSP, District Development Officer, Municipal Commissioners	<u>Recurring/ Regular (RR)</u> Training and orientation programs for state govt. staff, and other direct stakeholders such as: civil society, media-persons, elected representatives, professionals for veterinary care and support to disaster affected animals Incorporating disaster response, search and rescue in the training programs of youth such as village volunteers, protection of disaster-affected animals
2.	Curriculum Development	GIDM, GSDMA, Education Department, Health Dept.	<u>Medium Term (T2)</u> Update curriculum for undergraduate engineering and professional courses to include topics relevant to cyclone risk management. Introducing basic DM concepts in curriculum/crisis management.	District Magistrate & Collectors, District Development Officer.	Implementation in the district, taluka & village.
3.	Awareness Generation	Information Department, RD, CoR, GSDMA,UDD,	<u>Recurring/ Regular (RR)</u> • Carry out mass media campaigns • Promote attitude and behavior	District Magistrate & Collectors, District	<u>Recurring/ Regular (RR)</u> • Carry out mass media campaigns • Promote attitude and behavior change in the awareness campaigns/IEC

		GIDM	<p>change in the awareness campaigns/ IEC</p> <p><u>Medium Term (T2)</u></p> <ul style="list-style-type: none"> • Promote culture of disaster risk prevention, mitigation, and better risk management • Promote use of insurance/ risk transfer • Promote Community Radio • Strengthen network of civil society organizations for awareness generation about DRR and DM 	Development Officer, Municipal Commissioners, PRIs, NGOs, CBOs, Youth Volunteers etc.	<p><u>Medium Term (T2)</u></p> <ul style="list-style-type: none"> • Promote culture of disaster risk prevention, mitigation, and better risk management • Promote use of insurance/ risk transfer • Promote Community Radio • Strengthening network of civil society organizations for awareness generation about DRR and DM • Information on care and protection of disaster-affected animals
4.	Mock Drills/ Exercises	GSDMA, GIDM, RD, CoR, SDRF, All Line Dept.	<p><u>Recurring/ Regular (RR)</u></p> <p>Monitoring Emergency Preparedness of all Departments</p> <p><u>Short Term (T1)</u></p> <p>Promoting the planning and execution of emergency drills by all departments and in all districts.</p>	District Magistrate & Collectors, District Development Officer, Municipal Commissioner, Industry, NGOs.	<p><u>Recurring/ Regular (RR)</u></p> <p>Monitoring Emergency Preparedness of Districts</p> <p><u>Short Term (T1)</u></p> <p>Joint planning and execution of emergency drills with centre / state</p>
5.	Vocational Training/ Skill Development	GSDMA, GIDM, RD, SIRD.	<p><u>Recurring/ Regular (RR)</u></p> <ul style="list-style-type: none"> • Promote skill development for multi hazard resistant construction in cyclone prone areas for different infrastructure. • Creating ToT teams for different Trades relevant to cyclone resistant construction. 	District Magistrate & Collectors, District Development Officer.	<p><u>Recurring/ Regular (RR)</u></p> <ul style="list-style-type: none"> • Conduct training programmes at district, taluka, and village for PRIs and GP level.

6.	Empowering women, marginalised, and persons with disabilities	WCD, SJED, GSDMA, GIDM	<u>Medium Term (T2)</u> Incorporating gender sensitive and equitable approaches in capacity development covering all aspects of disaster management at state, district and local level	District Magistrate & Collectors, District Development Officer, Municipal Commissioners	<u>Medium Term (T2)</u> Incorporating gender sensitive and equitable approaches in capacity development covering all aspects of disaster management at the district, taluka, Village and local levels
7.	Community-Based Disaster Management	RD, UDD, ULBs, GSDMA, GIDM, SIRD.	<u>Recurring/ Regular (RR)</u> Training for PRI, SHG, NCC, NSS, Youth, local community organizations. <u>Short Term (T1)</u> Strengthen ability of communities to manage and cope with disasters based on a multi-hazard approach.	District Magistrate & Collectors, Municipal Commissioner, DDO, PRIs, NGOs, CBOs, Youth Volunteers, Aapda Mitra.	<u>Recurring/ Regular (RR)</u> Training for PRI, SHG, NCC, NSS, Youth, local community organizations at district, taluka and GP level <u>Short Term (T1)</u> Strengthen ability of communities to manage and cope with disasters based on a multi-hazard approach

5.2.6 Climate Change Risk Management

Cyclone and Wind			Climate Change Risk Management		
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility – District
1.	Research, Forecasting, Data Management, Zoning, Mapping	RD, GSDMA, GIDM, ULBs, UDD, SIRD.	<u>Recurring/ Regular (RR)</u> Promote studies and research on climate change-related risks and adaptation options <u>Short Term (T1)</u> • Studies on GACC driven ecosystem and shoreline changes • Assess enhanced risks	District Magistrate & Collectors, DDO.	Recurring/ Regular (RR) • Support national risk reduction efforts related to GACC • Coordination with state agencies • Sponsor and promote district-specific efforts and local efforts for GACC mitigation and adaptation Medium Term (T2)

			(economic, social, etc.) under different GACC impact scenarios <ul style="list-style-type: none"> • Carry out risk zonation / mapping of climate change impacts considering various sea-level rise and shoreline change scenarios • Research studies on mutual coherence and mutual reinforcement of GACC and risk management along the coast <u>Long Term (T3)</u> <ul style="list-style-type: none"> • Develop Data base management system for GACC impacts 		Document district-specific GACC impacts and coping mechanisms <u>Long Term (T3)</u> <ul style="list-style-type: none"> • Promote district-specific studies on enhanced risks (economic, social, etc.) under different GACC impact scenarios • Promote research studies with State specific contexts on GACC and consequent changes in hazards
2.	Hazard Risk Vulnerability and Capacity Assessment (HRVCA)	RD, SJ&ED, UDD.	<u>Long Term (T3)</u> <ul style="list-style-type: none"> • Promote state-specific studies on vulnerabilities, capacities and risks under GACC impact scenarios 	District Magistrate & Collectors, DDO	<u>Long Term (T3)</u> <ul style="list-style-type: none"> • Assess GACC risks of vulnerable and marginalized sections
3.	Climate Change Adaptation (CCA)	CCD, RD, F&ED, SJ&ED, UDD,R&B.	<u>Medium Term (T2)</u> <ul style="list-style-type: none"> • Understanding CCA needs • Study GACC coping mechanisms • Develop CCA mechanisms <u>Long Term (T3)</u> <ul style="list-style-type: none"> • Promote appropriate combination of Green and Blue infrastructure approach • Support the implementation GACC adaptation programs • Promote adaptive measures in social protection programmes for the vulnerable groups 	District Magistrate & Collectors, DDO, DFO/DCF, PRIs, NGOs, CBOs, Youth Volunteers.	<u>Recurring/ Regular (RR)</u> <ul style="list-style-type: none"> • Sensitization and awareness creation • Support national CCA efforts • Coordination with central agencies • Sponsor and promote state-specific efforts and local efforts for GACC mitigation and adaptation <u>Medium Term (T2)</u> Develop local adaptation strategies and pilot projects <u>Long Term (T3)</u> <ul style="list-style-type: none"> • Sponsor and promote state-specific efforts and local efforts • Promote appropriate combinations of Green and Blue infrastructure approach

					<ul style="list-style-type: none"> • Implementation of GACC adaptation programs • Integrate adaptive measures in social protection programmes for the vulnerable groups
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GCAA: Global Adaptation Climate Change.

5.3 Tsunami

5.3.1 Understanding Disaster Risk

Tsunami		Understanding Disaster Risk			
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1.	Research and Development Efforts	BISAG, ISRO, GSDMA, GIDM	<u>Medium Term (T2)</u> <ul style="list-style-type: none"> • Encourage development of standardised methods for tsunami risk assessment and scenario development, support studies to collect the data and compile knowledge • Develop suitable large-scale digital maps indicating the tsunami hazard basis on past tsunami events • Develop detailed computerized maps and databases of vulnerable areas along the coast for planning and coordination of DM activities 	DM & Collectors, DDO, NGOs	<u>Medium Term (T2)</u> Supplement the relevant data for research.
2.	Zoning/ Mapping	ISR, ISRO, CoR, BISAG GSDMA, GIDM	<u>Recurring/ Regular (RR)</u> Ensure support to the Central / State Government agencies in zoning/ mapping and carry out at their level <u>Long Term (T3)</u> Database of Tsunami Risk and Vulnerability in the coastal areas with information on trends of storm surge, high tides, local bathymetry, etc.	DM & Collectors.	<u>Recurring/ Regular (RR)</u> Ensure support to the State Government agencies in zoning/ mapping and carry out at their level

3.	Observation Networks, Information Systems, Monitoring, Research, Forecasting & Early Warning	IMD, INCOIS, CoR, GSDMA.	<p><u>Medium Term (T2)</u> Assess the status of existing important installations in coastal areas to withstand tsunami.</p> <p><u>Medium Term (T2)</u> Securing critical instrumentation to ensure failsafe functioning of these critical instruments and their protection</p>	DM & Collectors, DDO	<u>Recurring/ Regular (RR)</u> Support, cooperation for data collection and updates.
4.	Dissemination of warnings, data, and information	INCOIS, IMD, ISRO, CoR, GSDMA, UDD	<p><u>Recurring/ Regular (RR)</u></p> <ul style="list-style-type: none"> • Monitoring seismic activity, provide warnings based on seismic models and issue periodic bulletins • Quick, clear, effective dissemination among central and state agencies • Warnings using all types of options, types of technologies, and media • Providing weather information online and offline and interface with mobile network service • Providing warnings on radio, TV, and cell phones <p><u>Medium Term (T2)</u> Facilitating last-mile connectivity and access to disaster risk information</p>	DM & Collectors, DDO, MC.	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none"> • Dissemination of warnings to all (including fishermen), down to the last mile – remote, rural or urban; Regular updates to people in areas at risk • Warnings using all types of options, types of technologies, and media <p><u>Medium Term (T2)</u></p> <ul style="list-style-type: none"> • Ensure facilities and infrastructure for the implementation of adequate access of information to communities at risk • Deployment of communication equipment

5.	Hazard Risk Vulnerability and Capacity Assessment (HRVCA)	GIDM, GSDMA, MoEF, SJ&ED.	<u>Recurring/ Regular (RR)</u> Undertake HRVCA as part of preparing and periodic revision of DM plans, and for development planning <ul style="list-style-type: none"> • Promote studies, documentation and research • Studies on vulnerabilities and capacities covering social, physical, economic, ecological, gender, social inclusion and equity aspects. • Provide technical support and guidance for comprehensive HRVCA 	DM & Collectors.	<u>Recurring/ Regular (RR)</u> Undertake HRVCA as part of preparing and periodic revision of DM plans, and for development planning
6.	Disaster Data Collection and Management	CoR, GSDMA, all depts.	<u>Recurring/ Regular (RR)</u> Systematic data management of data on disaster damage and loss assessments <u>Short Term (T1)</u> Disaster Damage and Losses 2005-2015 baseline	DM & Collectors, DDO, MC.	<u>Recurring/ Regular (RR)</u> Systematic data management of data on disaster damage and loss assessments <u>Short Term (T1)</u> Disaster Damage and Losses 2005-2015 baseline

5.3.2 Inter – Agency Coordination

Tsunami		Inter – Agency Coordination			
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1	Overall disaster governance	RD, CoR, GSDMA	<u>Recurring/ Regular (RR)</u> • Providing coordination, technical inputs, and support	District Magistrate & Collector.	<u>Recurring/ Regular (RR)</u> • Preparation and implementation of DM plans and ensure the functioning of

			<ul style="list-style-type: none"> • Preparation and implementation of State DM plans and ensure the functioning of agencies with State DM tasks • All aspects of disaster risk management and mainstreaming DRR • Ensuring coherence and mutual reinforcement of DRR, CCA and development 		agencies with DM tasks <ul style="list-style-type: none"> • Ensuring coherence and mutual reinforcement of DRR, CCA and development
2	Response	RD, CoR, All relevant departments	<u>Recurring/ Regular (RR)</u> <ul style="list-style-type: none"> • Organizing and coordinating central and state assistance. • Coordinate with central and state agencies 	District Magistrate & Collectors, MC.	<u>Recurring/ Regular (RR)</u> <ul style="list-style-type: none"> • Organizing and coordinating the immediate response • Coordinate with central and State agencies
3	Warnings, Information, Data	IMD, INCOIS, CoR, GSDMA.	<u>Recurring/ Regular (RR)</u> Effective coordination and seamless communication among central and state agencies to ensure quick, clear, effective dissemination of warnings, information and data	District Magistrate & Collectors, MC.	<u>Recurring/ Regular (RR)</u> Coordinating the dissemination of warnings to all, down to the last mile – remote, rural or urban; Regular updates to people in areas at risk
4	Non-structural measures	RD, CoR, All Relevant Departments	<u>Recurring/ Regular (RR)</u> Coordination among central and state agencies for <ul style="list-style-type: none"> h) revised/ updated rules, norms i) adoption of new/updated standards, j) enact/amend laws, regulations and k) adopt/ review policies 	District Magistrate & Collectors, DSP, Municipal Commissioners	<u>Recurring/ Regular (RR)</u> Coordination among state agencies for ensuring implementation, enforcement and monitoring.

5.3.3 Investing in DRR – Structural Measures

Tsunami		Investing in DRR – Structural Measures			
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility – District
1.	Strengthening of lifeline structures and high priority buildings	R&B, UDD, CoR, RD, GSDMA and all relevant departments	<u>Recurring/ Regular (RR)</u> Implementation as per recommendations of safety audit where applicable	District Magistrate & Collectors, Municipal Commissioners	<u>Recurring/ Regular (RR)</u> Implementation as per recommendations of safety audit where applicable
2.	<ul style="list-style-type: none"> Shelters from storm surges and tsunamis Construction of large-scale submerged sand barriers Periodical dredging of the inlets and associated water bodies so as to absorb the influx during tsunami Construction of submerged dykes (one or two rows along the stretch of the coast) so as to decrease the impact due to the incoming tsunami and inland dykes to safeguard vital installations 	R&B, UDD, CoR, RD, GSDMA and all relevant departments	<u>Recurring/ Regular (RR)</u> Guidance to implementing agencies. Implementation in compliance with relevant building codes/ standards/ technical guidance	District Magistrate & Collectors, Municipal Commissioners	<u>Recurring/ Regular (RR)</u> Implementation in compliance with relevant building codes/ standards/ technical guidance
3.	Hazard resistant construction, strengthening and retrofitting of all lifeline structures and critical infrastructure	R&B, UDD, ULB all relevant departments	<u>Recurring/ Regular (RR)</u> Guidance and implementation. Collaboration with technical agencies and implementation.	District Magistrate & Collectors, District Development Officer, Municipal Commissioners	<u>Recurring/ Regular (RR)</u> Implementation

5.3.4 Investing in DRR – Non – Structural Measures

Tsunami Investing in DRR – Non – Structural Measures					
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1.	Mainstreaming DM into Development Planning	GAD (Planning), FD, All Line Dept.	<u>Recurring/ Regular (RR)</u> Include DM concerns in plan schemes and non-plan proposals by various departments as per norms	District Magistrate & Collectors, MC.	<u>Recurring/ Regular (RR)</u> Include DM concerns all schemes and proposals by various departments as per norms
2.	Regulation and enforcement of relevant laws	Forest and Environment, All Line Depts.	<u>Recurring/ Regular (RR)</u> • Guidance and Support • Oversight and monitoring of compliance with CRZ laws	District Magistrate & Collectors.	<u>Short Term (T1)</u> • Ensure compliance with coastal environment protection laws and regulations such as the CRZ • Regulating aquaculture, and groundwater extraction <u>Medium Term (T2)</u> • Ecologically sound land-use zonation • Discourage inappropriate/ risky use of coastal areas
3.	Techno-Legal Regime	BIS, R&B, All Depts / Institutions.	<u>Recurring/ Regular (RR)</u> • Ensure implementation of standards through all departments/ institutions <u>Medium Term (T2)</u> Develop suitable byelaws for rural areas (for both engineers and non engineered buildings) considering local conditions	District Magistrate & Collectors, DDO, DSP, Municipal Commissioners	<u>Recurring/ Regular (RR)</u> Ensure implementation of standards through all departments/ institutions

4.	Non-structural shore stabilization measures and bio-shields	F&ES, Agriculture dept. CCD.	<p><u>Recurring/ Regular (RR)</u> Guidance and Support</p> <p><u>Medium Term (T2)</u></p> <ul style="list-style-type: none"> • Developing sand dunes along the coast with sea weeds or shrubs or casuarinas trees for stabilization of the sand dunes • Raising the ground level (above the design water level) with natural beach sand <p><u>Long Term (T3)</u></p> <ul style="list-style-type: none"> • Development of coastal forest (greenbelt) by planting casuarinas or coconut trees along the coastline to cover minimum of about 500m width of the beach • Establishment of bio-shields (e.g., mangrove plantations, as a natural defence) for communities residing along the estuaries 	District Magistrate & Collectors, DDO, Municipal Commissioners	<p><u>Medium Term (T2)</u></p> <ul style="list-style-type: none"> • Developing sand dunes along the coast with sea weeds or shrubs or casuarinas trees for stabilization of the sand dunes • Raising the ground level (above the design water level) with natural beach sand <p><u>Long Term (T3)</u></p> <ul style="list-style-type: none"> • Development of coastal forest (greenbelt) by planting casuarinas or coconut trees along the coastline to cover minimum of about 500m width of the beach • Establishment of bio-shields (e.g., mangrove plantations, as a natural defence) for communities residing along the estuaries
5.	Safety audits and evaluation of all lifeline structures and important facilities	All depts., GSDMA.	<p><u>Recurring/ Regular (RR)</u> Guidance and Support</p> <p><u>Long Term (T3)</u></p> <ul style="list-style-type: none"> • Detailed assessment of tsunami hazard to the structure and foundation and the benefits of strengthening • Carry out structural safety audit of all lifeline structures and important facilities. 	District Magistrate & Collectors, DDO, Municipal Commissioners	<p><u>Long Term (T3)</u></p> <ul style="list-style-type: none"> • Detailed assessment of tsunami hazard to the structure and foundation and the benefits of strengthening • Carry out structural safety audit of all lifeline structures and important facilities.

6.	Public Private Partnerships	RD, CoR, GSDMA, UDD, F&ED, All Line Depts.	<u>Recurring/ Regular (RR)</u> Promote private participation in disaster management facilities.	District Magistrate & Collectors, MC.	<u>Recurring/ Regular (RR)</u> Promote private participation in disaster management facilities.
7.	Risk Transfer	RD, CoR, GSDMA, FD, UDD	<u>Recurring/ Regular (RR)</u> Implementation of Risk Transfer Arrangements including multi-hazard insurance for life and property <u>Short Term (T1)</u> Policy Framework	District Magistrate & Collectors, District Development Commissioner, Municipal Commissioners	<u>Recurring/ Regular (RR)</u> Implementation of Risk Transfer Arrangements including multi hazard insurance for life and property

5.3.5 Capacity Development

Tsunami		Capacity Development			
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility – District
1.	Training and Capacity Development of Professionals	GIDM, SIRD, GSDMA, SPIPA.	<u>Recurring/ Regular (RR)</u> Training and orientation programs for State govt. staff, SDRF, Fire, Police, Community, Volunteers, and other direct stakeholders Incorporating disaster response, search and rescue in the training programs of youth such as NCC, NYKS, Scouts and Guides and NSS	District Magistrate & Collectors, District Development Commissioner, Municipal Commissioners	<u>Recurring/ Regular (RR)</u> Training and orientation programs for state govt. staff, and other direct stakeholders such as: civil society, media-persons, elected representatives, professionals for veterinary care and support to disaster affected animals Incorporating disaster response, search and rescue in the training programs of youth such as village volunteers, protection of disaster-affected animals
2.	Curriculum Development	GIDM, GSDMA,	<u>Medium Term (T2)</u> Introducing basic DM concepts	District Magistrate &	

		Education Department.	in curriculum including Tsunami and develop technical expertise on various subject related to DM including Tsunami	Collectors, DDO.	
3.	Awareness Generation	Information Department, RD, CoR, GSDMA	<p><u>Recurring/ Regular (RR)</u></p> <ul style="list-style-type: none"> • Carry out mass media campaigns • Promote attitude and behavior change in the awareness campaigns/ IEC <p><u>Medium Term (T2)</u></p> <ul style="list-style-type: none"> • Promote culture of disaster risk prevention, mitigation, and better risk management • Promote use of insurance/ risk transfer • Promote Community Radio • Strengthen network of civil society organizations for awareness generation about DRR and DM 	District Magistrate & Collectors, District Development Commissioner, Municipal Commissioners	<p><u>Recurring/ Regular (RR)</u></p> <ul style="list-style-type: none"> • Carry out mass media campaigns • Promote attitude and behavior change in the awareness campaigns/IEC <p><u>Medium Term (T2)</u></p> <ul style="list-style-type: none"> • Promote culture of disaster risk prevention, mitigation, and better risk management • Promote use of insurance/ risk transfer • Promote Community Radio • Strengthening network of civil society organizations for awareness generation about DRR and DM • Information on care and protection of disaster-affected animals
4.	Mock Drills/ Exercises	GSDMA, GIDM, RD, CoR, SDRF	<p><u>Recurring/ Regular (RR)</u></p> <p>Monitoring Emergency Preparedness of all Departments</p> <p><u>Short Term (T1)</u></p> <p>Promoting the planning and execution of emergency drills by all departments and in all districts.</p> <p>Joint planning and execution of emergency drills with Central, State, Local and Community.</p>	District Magistrate & Collectors, District Development Commissioner, Municipal Commissioners	<p><u>Recurring/ Regular (RR)</u></p> <p>Monitoring Emergency Preparedness of Departments</p> <p><u>Short Term (T1)</u></p> <p>Joint planning and execution of emergency drills with State, Local and Community</p>

5.	Documentation	GSDMA	<u>Short Term (T1)</u> <ul style="list-style-type: none"> • Prepare and distribute manuals and tsunami hazard zonation maps to the public through relevant Departments • Documentation of lessons learnt, best practices, success stories 	District Magistrate & Collectors, Municipal Commissioners.	<u>Recurring/ Regular (RR)</u> <ul style="list-style-type: none"> • Create awareness on tsunami risk and vulnerability among the coastal communities by distributing the hazard zonation maps • Documentation of lessons learnt, best practices, success stories
6.	Empowering women, marginalised, and persons with disabilities	WCD, SJED, GSDMA, GIDM	<u>Medium Term (T2)</u> <p>Incorporating gender sensitive and equitable approaches in capacity development covering all aspects of disaster management at state, district and local level</p>	District Magistrate & Collectors, District Development Commissioner, Municipal Commissioners	<u>Medium Term (T2)</u> <p>Incorporating gender sensitive and equitable approaches in capacity development covering all aspects of disaster management at the district, and local levels</p>
7.	Community-Based Disaster Management	RD, CoR, UD, ULBs, GSDMA, GIDM	<u>Recurring/ Regular (RR)</u> <p>Training for PRI, SHG, NCC, NSS, Youth, local community organizations.</p> <u>Short Term (T1)</u> <p>Strengthen ability of communities to manage and cope with disasters based on a multi-hazard approach.</p>	District Magistrate & Collectors	<u>Recurring/ Regular (RR)</u> <p>Training for PRI, SHG, NCC, NSS, Youth, local community organizations</p> <u>Short Term (T1)</u> <p>Strengthen ability of communities to manage and cope with disasters based on a multi-hazard approach</p>

5.4 Floods

5.4.1 Understanding Disaster Risk

Flood		Understanding Disaster Risk			
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1.	Observation Networks, Information Systems, Monitoring, Research, Forecasting & Early Warning	1. CWC 2. IMD 3. WRD 4. CoR 5. GSDMA	<p>Regular/ Recurring</p> <ul style="list-style-type: none"> Assessment, Monitoring, and Scientific studies <p>Short term</p> <ul style="list-style-type: none"> Assist districts in the identification of priority flood protection and drainage improvement works. Monitoring of flood preparedness, river basin and reservoir management plans. <p>Medium Term</p> <ul style="list-style-type: none"> Specialized efforts for different types of floods and causes of flooding, including cloudburst. Studies and monitoring of rivers flowing from neighboring states. <p>Long Term</p> <ul style="list-style-type: none"> Developing/ improving/ updating forecasting methods and models for quantification of inflows and storage of dams 	1. DM & Collector 2. DDO 3. ULBs 4. GPs	<p>Regular/ Recurring</p> <ul style="list-style-type: none"> Support and cooperate with state agencies Support local efforts for flood management Support local information systems and update data for better flood management <p>Short Term (T1)</p> <ul style="list-style-type: none"> Implementing and monitoring of flood preparedness, river basin and reservoir management plans including updating rule curves, improve system of water release from reservoirs Identification of priority flood protection and drainage improvement <p>Medium Term (T2)</p> <ul style="list-style-type: none"> Studies on land use and hydrological changes relevant to flood management in river basins and reservoir command areas of district. <p>Long Term (T3)</p> <ul style="list-style-type: none"> Execution of flood protection and drainage improvement schemes

S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
2.	Zoning, mapping, and classification flood prone areas	1. WRD 2. ISRO 3. BISAG	Short Term (T1) <ul style="list-style-type: none"> • Preparation of large-scale hazard maps of flood prone areas identifying areas of high vulnerability 	1. DM & Collector 2. NGOs 3. CSOs	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Support and cooperate with state agencies • Sponsor district-specific efforts; support local efforts
3.	Research and Development	1. WRD 2. ISRO 3. R&B 4. GSDMA 5. GIDM 6. SIRD 7. WASMO	Short Term (T1) <ul style="list-style-type: none"> • Studies on support systems for people living in flood prone areas • Evolving designs of shelters in flood prone areas • Socio-economic impacts of flood Medium Term (T2) <ul style="list-style-type: none"> • River basin studies • Studies on flood related problems such as soil losses caused by flooding of rivers, sediment transport, river course changes, and appropriate use of embankments Long Term (T3) <ul style="list-style-type: none"> • Hydrological and morphological studies before undertaking major flood control or prevention measures 	1. DM & Collector 2. DDO 3. NGOs 4. CSOs 5. WASMO	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Support and cooperate with State agencies • Sponsor/ carry out district-specific efforts in all these areas; support local efforts
4.	Hazard Risk Vulnerability and Capacity Assessment (HRVCA)	1. GSDMA 2. GIDM 3. BISAG 4. UDD	Recurring / Regular (RR) <ul style="list-style-type: none"> • Promote studies, documentation and research • Studies on vulnerabilities and capacities covering social, physical, economic, ecological, gender, social 		Recurring/ Regular (RR) <ul style="list-style-type: none"> • Undertake HRVCA as part of preparing and periodic revision of DM plans Short Term (T1) <ul style="list-style-type: none"> • Constitute/strengthen the mechanisms for consultation with experts and

			inclusion and equity aspects • Provide technical support and guidance for comprehensive HRVCA		stakeholders
5	Dissemination of warnings, data, and information	1. IMD 2. CoR 3. GSDMA	Recurring/ Regular (RR) <ul style="list-style-type: none"> Quick, clear, effective dissemination among central and state agencies Short Term (T1) <ul style="list-style-type: none"> Facilitate the distribution of necessary communication equipment, last-mile connectivity and access to disaster risk information Promoting reliable networking systems for data and information sharing among central and state agencies Monitoring of Warning systems Providing information in all possible ways and using all types of media Interface with mobile network service providers or warnings 	1. DM & Collector 2. DEOC 3. DDO 4. ULBs 5. WASMO	Recurring/ Regular (RR) <ul style="list-style-type: none"> Inter-district data and information sharing where applicable Coordination and cooperation with the central agencies Ensure facilities and infrastructure for the implementation of adequate access to communities at risk Dissemination of warnings to all, down to the last mile – remote, rural or urban; Regular updates to people in areas at risk Warnings using all types of options, types of technologies, and media Monitoring compliance by various network operators and service provider
6	Disaster Data Collection and Management	1. CoR 2. RD 3. GSDMA	Recurring/ Regular (RR) <ul style="list-style-type: none"> Systematic and proper data management and documentation on disaster damage and loss assessments 	1. DM & Collector 2. DEOC	Recurring/ Regular (RR) <ul style="list-style-type: none"> Systematic and proper data management and documentation on disaster damage and loss assessments

5.4.2 Investing in DRR-Structural measures

S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility – District
	Establishment/ strengthening of Emergency Response Centers/Operation Centers	1. GSDMA 2. CoR 3. Municipal Commissioner	Recurring/ Regular (RR) • Ensure round the clock operations of EOCs during the Flood season with adequate manpower/resources	1.DM & Collector 2. Municipal Commissioner	Recurring/ Regular (RR) • Ensure round the clock operations of EOCs during the flood season with adequate human resources to respond to flood
1.	Flood control measures such as construction of embankments and levees	1. WRD 2. R&B 3. SSNNL	Recurring/ Regular (RR) • Technical support and studies	1. DM & Collector 2. DDO 3. Municipal Commissioner 4. PRI 5. ULB	Short Term (T1) • Identification suitable sites for temporary shelters for people and livestock evacuated from localities at risk Medium Term (T2) • Construction of multi-purpose shelters in villages/ habitations prone to floods • Proper monitoring and maintenance of river embankments
2.	Social Housing Schemes	1. SJED 2. CRD	Recurring/ Regular (RR) • Ensure that flood-resistant features are incorporated in planning and execution of social housing schemes	1. DDO 2. Municipal Commissioner 3. PRI 4. ULB	Medium Term (T2) • Ensure that flood-resistant features are incorporated in the planning and execution of social housing schemes in flood prone areas

3.	Multipurpose Flood Shelters	1. GSDMA 2. UDD	Recurring/ Regular (RR) • To provide with Advisory	1. DM & Collector 2. DDO	Medium Term (T2) • Ensure availability of shelters, undertake proper maintenance, and make arrangements to support the people shied to temporary shelters
4.	Water ways and drainage systems for roads, high ways, and express ways	1. R&B 2. WRD 3. NHAI	Recurring/ Regular (RR) • Proper alignment and design	1. DM & Collector 2. DDO	Recurring/ Regular (RR) • Coordination and cooperation with the state agencies and ensure proper alignment and design in all district projects
5.	Enhancing the safety of dams and reservoirs	1. WRD 2. SSNNL	Recurring/ Regular (RR) • Issuing Advisories and guidance	1. DM & Collector 2. DDO 3. DEOC	Recurring/ Regular (RR) • Carry out measures to increase safety, reduce risks from flooding • Undertake pre- and post-monsoon inspections of dams and reservoirs Monitor the implementation of safety enhancements in accordance with norms
6.	Hazard resistant construction, strengthening, and retro fitting of all lifeline structures and critical infrastructure	1. R&B 2. WRD 3. UDD	Recurring/ Regular (RR) • Guidance and implementation	1.DM & Collector	Recurring/ Regular (RR) • Collaboration with technical agencies and implementation

5.4.3 Investing in DRR-Non Structural Measures

S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility – District
1	Regulation and enforcement of laws, norms, regulations, guidelines including • Regulation for reservoir management • Integrated Water Resources Management (IWRM)	1. WRD 2. SSNNL	Recurring/ Regular (RR) <ul style="list-style-type: none"> Guidance and Support Oversight and monitoring of compliance with coastal zone laws Promote institutional mechanisms for sharing forecasts, warnings, data, and information Short Term (T1) <ul style="list-style-type: none"> Adoption of revised reservoir operation manuals Regulatory framework for flood plain zoning and flood inundation management Medium Term (T2) <ul style="list-style-type: none"> Norms/ regulations applicable to buildings in flood-prone areas 	1. DM & Collector 2. DDO 3. PRI 4. ULB	Recurring/ Regular (RR) <ul style="list-style-type: none"> Implementing land-use regulation for low lying areas as per flood control norms Regulation of inhabitation of low-lying areas along the rivers, nallas and drains Implementing flood management action plan Support and cooperate with state agencies Short Term (T1) <ul style="list-style-type: none"> Enforcing building codes and regulations Review and modification of operation manuals for all major dams/ reservoirs Prevention and removal of encroachment into the water ways and natural drainage systems Medium Term (T2) <ul style="list-style-type: none"> Implementing regulatory framework for flood plain zoning and flood inundation management Implementing flood plain zoning regulations Long Term (T3) <ul style="list-style-type: none"> Implementation of IWRM in major river basins and their sub-basins

			Long Term (T3) <ul style="list-style-type: none"> Facilitate the implementation of IWRM in major river basins and their sub-basins 		
2	Regulations to promote flood resilient buildings and infrastructure	1. UDD 2. R&B	Recurring/Regular(RR) Guidance and Support	1. DM & Collector 2. ULB	Medium Term (T2) <ul style="list-style-type: none"> Revise and implement the relevant rules in flood prone areas
3	<ul style="list-style-type: none"> Wetland conservation and restoration 	1. Forest and Environment dept 2. Climate change	Recurring/ Regular (RR) Guidance and Support	1. District conservator of forest	<ul style="list-style-type: none"> Discourage reclamation of wetlands, natural depressions Medium Term (T2) <ul style="list-style-type: none"> Action plan managing wetlands and natural drainage systems for flood moderation Long Term (T3) <ul style="list-style-type: none"> Implementation of watershed management including catchment area treatment and Afforestation programmes
	<ul style="list-style-type: none"> Catchment Area Treatment/ Afforestation 				

5.4.4 Capacity Development

S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility – District
1.	Training	1. GIDM 2. GSDMA	Recurring/ Regular (RR) <ul style="list-style-type: none"> Training and orientation programs for state govt. staff, SDRF, community, and volunteers 	1. Police 2. Civil Defense	Recurring/ Regular (RR) <ul style="list-style-type: none"> Training and orientation programs for district govt. staff, SDRF, community, and volunteers
			Recurring/ Regular (RR) <ul style="list-style-type: none"> Incorporating disaster response, search and rescue in the training programs of youth such as NCC, NYKS, Scouts and Guides, NSS, SDRF, CDEF, Community, Volunteers 		Recurring/ Regular (RR) <ul style="list-style-type: none"> Incorporating disaster response, search and rescue in the training programs of youth such as village volunteers, and for protection of disaster-affected animals Training for CDEF, Community, Volunteers
2.	Curriculum Development	1. Education dept 2. GIDM 3. GSDMA	Recurring/ Regular (RR) <ul style="list-style-type: none"> Strengthen coverage of flood damage mitigation, flood tolerant designs/ crops, and construction techniques 		Medium Term (T2) Recurring/ Regular (RR) <ul style="list-style-type: none"> Include awareness about flood and some aspects of flood management in school and college teaching while reviewing the curriculum
			Recurring/ Regular (RR) <ul style="list-style-type: none"> Improve coverage of community health and epidemic management medical curriculum Update curriculum for undergraduate engineering courses to include topics relevant for flood Risk Management 		Medium Term (T2) <ul style="list-style-type: none"> Introduction of Crisis Management, emergency medical response/recovery and trauma management at Diploma /UG/ PG levels for Health Professionals

3.	Awareness Generation	1. CoR 2. Revenue 3. GSDMA	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Carry out mass media campaigns • Promote culture of disaster risk prevention, mitigation, and better risk management • Promote attitude and behavior change in the awareness campaigns/ IEC • Strengthening network of civil society organizations for awareness generation about DRR and DM Medium Term (T2) <ul style="list-style-type: none"> • Promote use of insurance/ risk transfer • Promote Community Radio 	1. DM & Collect or 2. DDO 3. CSO 4. NGO	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Carry out mass media campaigns • Promote culture of disaster risk prevention, mitigation, and better risk management • Promote attitude and behavior change in the awareness campaigns/ IEC • Strengthening network of civil society organizations for awareness generation about DRR and DM Medium Term (T2) <ul style="list-style-type: none"> • Promote use of insurance/ risk transfer • Promote Community Radio
4.	Mock Drills/ Exercises	1. GSDMA 2. GIDM	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Promoting the planning and execution of emergency drills by all departments and in all districts 	DM & Collector	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Joint planning by district administration and all the departments and execution of emergency drills
5.	Empowering women, marginalized, and persons with disabilities	1. WCD 2. Social justice and Empowerment	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Incorporating gender sensitive and equitable approaches in capacity development covering all aspects of disaster management 	DM & Collector	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Incorporating gender sensitive and equitable approaches in capacity development covering all aspects of disaster management at the district and local levels
6.	Community-Based Disaster Management	1.GSDMA 2.GIDM	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Promotion, Guidance, and Support 	DM & Collector	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Strengthen ability of communities to manage and cope with disasters based on a multi-hazard approach • Training for PRI, SHG, NCC, NSS, Youth, local community organizations

5.4.5 Climate Change Risk Management

S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility – District
1.	Research, Forecasting / Early Warning, Data Management, Zoning, Mapping	1. CCD 2. F&E Dept 3. DST	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none"> Assessment, Monitoring and Scientific Studies <p>Short Term (T1)</p> <ul style="list-style-type: none"> Assessing GACC effects on catchments and river basins including trends over past decades. Assess enhanced economic and social risks <p>Medium Term (T2)</p> <ul style="list-style-type: none"> Develop Database management system relating to climate change impact on floods <p>Long Term (T3)</p> <ul style="list-style-type: none"> Improve the flood forecasting capabilities consistent with the anticipated GACC impacts on flood- prone areas Coordinate with all neighboring states to understand and monitor GACC impacts on major rivers associated with or flowing from neighboring countries 	1. DM& Collector 2. DDMA 3. ULBs 4. PRIs	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none"> Coordination with state agencies <p>Short Term (T1)</p> <ul style="list-style-type: none"> Sponsor and promote state- specific efforts and local efforts for GACC mitigation and adaptation <p>Medium Term (T2)</p> <ul style="list-style-type: none"> Document state-specific GACC impacts and coping mechanisms <p>Long Term (T3)</p> <ul style="list-style-type: none"> Promote state-specific studies on enhanced risks (economic, social, etc.) under different GACC impact scenarios Promote research studies with district specific contexts on GACC and consequent changes in hazards

2..	Hazard Risk Vulnerability and Capacity Assessment (HRVCA)	1. GIDM 2. GSDMA 3. DST	<p>Medium Term (T2)</p> <ul style="list-style-type: none"> • Improve the understanding of the enhanced vulnerabilities of communities in flood-prone areas to extreme hydro-climatic events • Assess GACC risks of vulnerable and marginalized sections • Provide technical support and guidance for comprehensive HRVCA considering GACC impacts <p>Long Term (T3)</p> <ul style="list-style-type: none"> • Undertake detailed studies on vulnerability and risk under GACC scenarios along the coast 	1. DM& Collector 2. DDMA	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none"> • Undertake HRVCA as part of preparing and periodic revision of DM plans • Develop strategies for structural and non-structural measures based on HRVCA
3.	Climate Change Adaptation (CCA)	1. CCD 2. F&E Dept	<p>Short-Term (T1)</p> <ul style="list-style-type: none"> • Understanding adaptation needs Study coping mechanisms Develop GACC adaptation mechanisms <p>Medium & Long Term (T2, T3)</p> <ul style="list-style-type: none"> • Implement GACC adaptation programs • Promote adaptive measures in social protection programmes for the vulnerable groups 	DM & Collector	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none"> • Sensitization on and awareness creation • Coordination with central agencies • Sponsor and promote state- specific efforts and local efforts for GACC mitigation and adaptation • Medium Term (T2) Develop local adaptation strategies and pilot projects • Long Term (T3) Sponsor and promote state- specific efforts and local efforts

5.5 Urban Floods

5.5.1 Understanding Disaster Risk

Urban Flood		Understanding Disaster Risk			
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1.	Mapping/ Zoning, Estimation of Possible Inundation levels, monitoring networks	UDD RD	Recurring/ Regular (RR) <ul style="list-style-type: none"> Technical support Recurring/ Regular (RR) <ul style="list-style-type: none"> Develop land use planning based on multi-hazard disaster risk assessment Place land-use planning maps in public domain Undertake adequate studies, evaluations, and planning considering land use constraints to prevent flooding Coordinate with the central agencies and implement recommendations Undertake HRVCA as part of preparing and periodic revision of DM plans Constitute/ strengthen the mechanisms for consultation with experts and stakeholders 	Municipal Commissioner DM & Collector UDA	Recurring/ Regular (RR) <ul style="list-style-type: none"> Implement and enforcement of Recommendations
2.	Information Systems, Monitoring, Forecasting, Early Warning	IMD UDD	Recurring/ Regular (RR) <ul style="list-style-type: none"> Regular monitoring Short Term (T1) <ul style="list-style-type: none"> State urban flood monitoring system Set up EOC by ULBs connected to Automatic Rain Gauge Network. Long Term (T3) <ul style="list-style-type: none"> Develop capacities to make quantitative forecasts and simulate inundation levels under various scenarios 	Municipal Commissioner DM & Collector UDA ULBs	Recurring/ Regular (RR) <ul style="list-style-type: none"> Regular monitoring Support coordination with state agencies/dept.

Urban Flood		Understanding Disaster Risk			
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
3.	Hazard Risk Vulnerability and Capacity Assessment (HRVCA)	UDD GIDM GSDMA	Recurring/ Regular (RR) <ul style="list-style-type: none">Promote studies, documentation and researchStudies on vulnerabilities and capacities covering social, physical, economic, ecological, gender, social inclusion and equity aspectsProvide technical support and guidance for comprehensive HRVCA	Municipal Commissioner DM & Collector UDA ULBs	Recurring/ Regular (RR) <ul style="list-style-type: none">Support coordination with state agencies/dept.
4.	Disaster Data Collection and Management	UDD CoR RD GSDMA	Recurring/ Regular (RR) <ul style="list-style-type: none">Systematic data management of data on disaster damage and loss assessments Short Term (T1) <ul style="list-style-type: none">Disaster Damage and Losses 2005-2015 baseline	Municipal Commissioner DM & Collector	Recurring/ Regular (RR) <ul style="list-style-type: none">Systematic data management of data on disaster damage and loss assessments Short Term (T1) <ul style="list-style-type: none">Disaster Damage and Losses 2005-2015 baseline

5.5.2 Inter Agency Coordination

Urban Flood			Understanding Disaster Risk		
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1.	Overall disaster governance	CoR RD UDD	Recurring/ Regular (RR) <ul style="list-style-type: none">• Providing coordination, technical inputs, and support	<ul style="list-style-type: none">• Municipal Commissioner	Recurring/ Regular (RR) <ul style="list-style-type: none">• Preparation and implementation of District DM plans and ensure the

		GSDMA	<ul style="list-style-type: none"> Preparation and implementation of DM plans and ensure the functioning of agencies with DM tasks All aspects of disaster risk management and mainstreaming DRR 	<ul style="list-style-type: none"> DM & Collector 	functioning of agencies with DM tasks
2.	Response	CoR RD UDD GSDMA	Recurring/ Regular (RR) <ul style="list-style-type: none"> Organizing and coordinating the immediate response Coordinate with central agencies 	Municipal Commissioner DM & Collector	Recurring/ Regular (RR) <ul style="list-style-type: none"> Organizing and coordinating the immediate response Coordinate with state agencies
3.	Warnings, Information, Data	CoR RD UDD GSDMA	Recurring/ Regular (RR) <ul style="list-style-type: none"> Effective coordination and seamless communication among central and state agencies to ensure quick, clear, effective dissemination of warnings, information and data 	Municipal Commissioner DM & Collector	Recurring/ Regular (RR) <ul style="list-style-type: none"> Coordinating the dissemination of warnings to all, down to the last mile – remote, rural or urban; Regular updates to people in areas at risk
4	Non-structural measures	UDD RD Line dept.	Recurring/ Regular (RR) <ul style="list-style-type: none"> Coordination central agencies for <ul style="list-style-type: none"> a) revised/ updated rules, norms b) adoption of new/updated standards, c) enact/amend laws, regulations and d) adopt/ review policies 	Municipal Commissioner DM & Collector	Recurring/ Regular (RR) <ul style="list-style-type: none"> Regular implementation, enforcement and monitoring

5.5.3 Investing in DRR – Structural Measures

Urban Flood		Understanding Disaster Risk			
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1.	Civil Works	UDD	City Bridge Design	MC	Short Term (T1)

		R&B	Considerations <ul style="list-style-type: none"> • City Road Level Design • Technical Support 	UDAs ULBs	<ul style="list-style-type: none"> • All road re-leveling works or strengthening/ overlay works to be carried out by milling the existing layers of the road so that the road levels will not be allowed to increase. <p style="text-align: center;">Medium Term (T2)</p> <ul style="list-style-type: none"> • Upgrade the existing drainage and storm water systems • Managing drainage systems • Protection of Water Bodies • Ensure protection of Water Bodies and its restoration/ revival <p style="text-align: center;">Long Term (T3)</p> <ul style="list-style-type: none"> • Bus and Metro Terminals, Railway stations and Airports to be made flood-proof by providing efficient drainage for much higher rainfall intensity. • All future road and rail bridges in cities crossing drains to be designed such that they do not block the flows resulting in backwater effect. • Remove encroachments and take strict action against the encroachers as per the laws/regulations
2.	Establishment/ strengthening of Emergency Operation Centers	CoR RD UDD GSDMA All line dept.	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Ensure round the clock operations of ERCs/OCs during the Flood season with adequate manpower/ resources 	MC UDAs ULBs	<p style="text-align: center;">Recurring/ Regular (RR)</p> <ul style="list-style-type: none"> • Ensure round the clock operations of EOCs during the flood season with adequate human resources to respond • to urban flood
3.	Hazard resistant construction, strengthening, and retrofitting of all lifeline structures and	R&B UDD CBRI, Roorkee BMTPC	Guidance and implementation	MC	<p style="text-align: center;">Medium Term (T2)</p> <ul style="list-style-type: none"> • Collaboration with technical agencies and implementation

	critical infrastructure				
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5.5.4 Investing in DRR – Non-Structural Measures

Urban Flood			Understanding Disaster Risk		
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1.	Preparation of comprehensive Urban Storm Drainage Design Manual (US D DM)	UDD	Medium Term (T2) <ul style="list-style-type: none">Consider current national practices, specific locations and rainfall pattern of the cities and future needs for preparing USD DM	MC	Recurring/ Regular (RR) <ul style="list-style-type: none">Take initiative and collaborate with state agencies
2.	Preparation of Storm Water Drainage System Inventory	UDD R&B	Long Term (T3) <ul style="list-style-type: none">Coordinate in preparing the inventory through ULBs	MC	Long Term (T3) <ul style="list-style-type: none">Implementation
3.	Operation and Maintenance of Drainage Systems	UDD R&B	Recurring/ Regular (RR) <ul style="list-style-type: none">Provide guidelines, and carry out monitoringAdequate budget to be provided to take care of the human resource, material, equipment and machinery	MC	Recurring/ Regular (RR) <ul style="list-style-type: none">O&M of drainage systems on a periodic basis
4.	Environmental Impact Assessment	UDD F&E Dept.	Short Term (T1) <ul style="list-style-type: none">Issue guidelines to corporations for making storm water drainage concerns a part of all EIA norms	MC UDAs ULBs DM & Collector	Short Term (T1) <ul style="list-style-type: none">Ensure strict compliance with the guidelines and land-use planning consistent with sound storm water management

					Medium Term (T2) <ul style="list-style-type: none"> Minimize loss of ecologically important areas and natural wetlands
5.	<ul style="list-style-type: none"> Techno-Legal Regime Land use planning City/Town Planning 	UDD FD RD	Short Term (T1) <ul style="list-style-type: none"> Ensure strict compliance of Techno-Legal Regime especially of land use through ULBs Strengthen land-use planning Medium Term (T2) <ul style="list-style-type: none"> Incorporate water sensitive urban design considerations into land use planning Incorporate the topography and specific terrain elements such as hilly, coastal, etc. in the land use plan to minimize flooding all owing free flow of storm water along natural contours 	MC UDAs ULBs	<ul style="list-style-type: none"> Proper land use planning while ensuring compliance with techno-legal regime. Proper land use planning to minimize flooding of free flow of storm water Proper implementation and periodic O & M
6.	<ul style="list-style-type: none"> Constitution of Urban Flooding Cell for Integrated UFDM 	UDD	Recurring/ Regular (RR) <ul style="list-style-type: none"> Lead role in the establishment of the technical umbrella at the state level 	MC UDAs ULBs	Short Term (T1) <ul style="list-style-type: none"> Nodal Department to constitute Urban Flooding Cell at district level and a DM Cell to be constituted at the ULB level for managing urban flooding at local level
7.	<ul style="list-style-type: none"> Risk Transfer 	UDD	Recurring/ Regular (RR) <ul style="list-style-type: none"> Implementation of Risk Transfer Arrangements including multi-hazard insurance for life and property Short Term (T1) Policy Framework	MC UDAs ULBs	Recurring/ Regular (RR) <ul style="list-style-type: none"> Implementation of Risk Transfer Arrangements including multi-hazard insurance for life and property

***UFDM-Urban Flood Disaster Management**

5.5.5 Capacity Development

Urban Flood		Understanding Disaster Risk			
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1.	• Education and Training	Education dept. UDD	Medium Term (T2) <ul style="list-style-type: none"> • Introduce UFDM modules in school curricula • Support to training of SDRF, community, and volunteers • State Government will encourage school boards to develop similar content in school curriculum 	MC UDA ULBs	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Trainings for urban flood rescue and management for Civil Defense, community, volunteers and others Short Term (T1) <ul style="list-style-type: none"> • Upgrade equipment and skills of F&ES for Urban Flood Disaster Management. • Enlist professionals for veterinary care and support to disaster-affected animals
2.	• Awareness Generation	UDD GSDMA	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Carry out mass media campaigns • Promote culture of disaster risk prevention, mitigation, and better risk management Medium Term (T2) <ul style="list-style-type: none"> • Promote attitude and behavior change in the awareness campaigns/IEC • Promote use of insurance/ risk transfer • Promote Community Radio • Strengthening network of civil society organizations for awareness generation about DRR and DM 	MC UDA ULBs	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Carry out mass media campaigns • Promote culture of disaster risk prevention, mitigation, and better risk management Medium Term (T2) <ul style="list-style-type: none"> • Promote attitude and behavior change in the awareness campaigns/ IEC • Promote use of insurance/ risk transfer • Promote Community Radio • Strengthening network of civil society organizations for awareness genera on about DRR and DM • Information on care and protection of disaster-affected animals

Urban Flood		Understanding Disaster Risk			
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
3.	• Documentation	GIDM GSDMA	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Ensure accurate documentation of all aspects of disaster events for creating good historical records for future research and Risk Management planning 	MC UDA ULBs	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Ensure accurate documentation of all aspects of disaster events for creating good historical records for future research and Risk Management planning
4.	• Empowering women, marginalized, and persons with disabilities		Short Term (T1) <ul style="list-style-type: none"> • Incorporating gender sensitive and equitable approaches in capacity development covering all aspects of disaster management 		Short Term (T1) <ul style="list-style-type: none"> • Incorporating gender sensitive and equitable approaches in capacity development covering all aspects of disaster management at the district, and local levels
5.	• Community-Based Disaster Management	GIDM GSDMA	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Promotion, guidance, support, training for Civil Defense, community, volunteers Short Term (T1) <ul style="list-style-type: none"> • Strengthen ability of communities to manage and cope with disasters based on a multi-hazard approach Medium Term (T2) <ul style="list-style-type: none"> • Training for RWA, SHG, NCC, NSS, Youth, Ward Committees, local community organizations 	MC UDA ULBs	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Regular training of community volunteers
6.	• Mock Drills/ Exercises	UDD GSDMA Line dept.	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Promoting the planning and execution of emergency drills by all line dept in all States/UTs 	MC DM & Collector Police	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Joint planning and execution of emergency drills

5.5.6 Climate Change Risk Management

Urban Flood		Understanding Disaster Risk			
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1.	<ul style="list-style-type: none"> Research, Forecasting / Early Warning, Data Management , Zoning, Mapping 		<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none"> Assessment, Monitoring, and Scientific studies Support national risk reduction efforts related to GACC Coordination with central agencies Sponsor and promote state- specific efforts and local efforts or GACC mitigation and adaptation <p>Short Term (T1)</p> <ul style="list-style-type: none"> Flood vulnerability maps under GACC scenario Assessing GACC effects on catchments and river basins including trends over past decades Assess enhanced economic and social risks under GACC scenarios <p>Medium Term (T2)</p> <ul style="list-style-type: none"> Document state-specific GACC impacts and coping mechanisms <p>Long Term (T3)</p> <ul style="list-style-type: none"> Improve the flood forecasting capabilities consistent with the anticipated GACC impacts on flood- prone areas Promote state-specific studies on enhanced risks (economic, social, etc.) under different GACC impact scenarios Promote research studies with districts specific contexts on GACC and consequent changes in hazards 	MC UDA ULBs	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none"> Support state risk reduction efforts related to GACC Coordination with state agencies <p>Medium Term (T2)</p> <ul style="list-style-type: none"> Document state-specific GACC impacts and coping mechanisms at local level.

Urban Flood		Understanding Disaster Risk			
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
2.	• Hazard Risk Vulnerability and Capacity Assessment (HRVCA)	UDD	<p>Medium Term (T2)</p> <ul style="list-style-type: none"> • Undertake HRVCA as part of preparing and periodic revision of DM plans • Improve the understanding of the enhanced vulnerabilities of communities in flood-prone areas to extreme hydro- climatic events • Provide technical support and guidance for comprehensive HRVCA considering GACC impacts • Assess GACC risks of vulnerable and marginalized sections <p>Long Term (T3)</p> <ul style="list-style-type: none"> • Undertake detailed studies on vulnerability and risk under GACC scenarios along the coast 	MC UDA ULBs	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none"> • Undertake HRVCA as part of preparing and periodic revision of District DM plans • Develop strategies for structural and non-structural measures based on HRVCA <p>Medium Term (T2)</p> <ul style="list-style-type: none"> • Assess GACC risks of vulnerable and marginalized sections
3.	• Climate Change Adaptation (CCA)	CCA Dept F& E Dept UDD GSDMA	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none"> • Sensitization and awareness creation • Support national CCA efforts • Coordination with central agencies • Sponsor and promote state- specific efforts and local efforts for GACC mitigation and adaptation <p>Medium Term (T2)</p> <ul style="list-style-type: none"> • Develop local adaptation strategies and pilot projects <p>Long Term (T3)</p> <ul style="list-style-type: none"> • Sponsor and promote disaster- specific efforts and local efforts • Implementation of GACC adaptation programs 	MC UD ULBs	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none"> • Sensitization and awareness creation • Support National/State CCA efforts • Coordination with state agencies

*GACC-Global Anthropogenic Climate Change

*CCA-Climate Change Adaptation

*F&E- Forest & Environment

5.6 Nuclear and Radiological Disasters

5.6.1 Understanding Risk

Nuclear and Radiological				Understanding Risk	
Sr. No.	Major Themes	State/District Agencies and their Responsibilities			
		State	Responsibility-State	District	Responsibility-District
1.	Monitoring and Warning Network Strengthening Radiation Warning	(DAE, MHA, MoD-Center) CoR, UDD & GSDMA	Short Term (T1) <ul style="list-style-type: none">Establish set ups for monitoring, warning including Indian Environment Radiation Monitoring Network (IERMON) system network. Medium Term (T2) <ul style="list-style-type: none">Strengthening radiation monitoring and detection systems in Public Domain	District Collector, Municipal Commissioner	Short Term (T1) <ul style="list-style-type: none">Follow and support the safety and regulatory requirements
2.	Setting up reliable and dedicated communication network	CoR, UDD & GSDMA	Short Term (T1) <ul style="list-style-type: none">To set up reliable and dedicated communication network at the state level	District Collector, Municipal Commissioner	Short Term (T1) <ul style="list-style-type: none">To extend Logistics

3.	Establish monitoring mechanism to prevent illicit movement of radioisotopes	(DAE, MHA, MoD-Center) CoR, UDD, Health, Home Department, GSDMA	Short Term (T1) <ul style="list-style-type: none"> • Install Radiation Detectors at all Identified locations at border posts and ports 	District Collector, Municipal Commissioner	Short Term (T1) <ul style="list-style-type: none"> • Co-ordination with and support to state authorities.
4.	Disaster Data Collection and Management	(MHA, MOSPI, all relevant departments)-Center UDD, GSDMA, Directorate of Economics & Statistics	Recurring/Regular (RR) <ul style="list-style-type: none"> • Systematic data management of data on disaster damage and loss assessments. Short Term (T1) <ul style="list-style-type: none"> • Disaster Damage and Losses 2005-2015 baseline 	District Collector, Municipal Commissioner	Recurring/Regular (RR) <ul style="list-style-type: none"> • Systematic data management of data on disaster damage and loss assessments. Short Term (T1) <ul style="list-style-type: none"> • Disaster Damage and Losses 2005-2015 baseline

5.6.2 Inter-Agency Co-ordination

Nuclear and Radiological			Inter-Agency Co-ordination		
Sr. No.	Major Themes	State/District Agencies and their Responsibilities			
		State	Responsibility-State	District	Responsibility-District
1.	Overall Disaster Governance	DAE-Center CoR/Revenue Department, UDD, GSDMA, Health Dept	Recurring/Regular (RR) <ul style="list-style-type: none">Nodal Authority for providing co-ordination and inputsAll aspects of disaster risk management and mainstreaming DRR.	District Collector, Municipal Commissioner	Recurring/Regular (RR) <ul style="list-style-type: none">Preparation and Implementation of DM Plans and ensure the functioning of agencies with DM tasks.
2.	*Response	DAE, MHA – Center CoR/Revenue Dept, and GSDMA	Recurring/Regular (RR) <ul style="list-style-type: none">Organizing the immediate response and seeking assistance from central agencies.	District Collector, Municipal Commissioner	Recurring/Regular (RR) <ul style="list-style-type: none">Organizing the immediate response and seeking assistance from state agencies.

Nuclear and Radiological			Inter-Agency Co-ordination		
Sr. No.	Major Themes	State/District Agencies and their Responsibilities			
		State	Responsibility-State	District	Responsibility-District
3.	Warnings, Information and Data	DAE, MHA, NDMA - Center CoR/Revenue Dept, and GSDMA	Recurring/Regular (RR) <ul style="list-style-type: none">Quick, Clear, effective dissemination among state and district agencies.	District Collector, Municipal Commissioner	Recurring/Regular (RR) <ul style="list-style-type: none">Dissemination of warnings to all, remote rural or urban, regular updates to people in risk areas.
4.	*Non-Structural Measures	AERB - Center CoR/Revenue Dept, UDD and GSDMA	Short Term (T1) <ul style="list-style-type: none">Adapting the norms/codes as per state requirement, enforcement and monitoring.	District Collector, Municipal Commissioner	Short Term (T1) <ul style="list-style-type: none">Follow and support the requirements

*Guidelines framed by Govt. of India will be followed

5.6.3 Investing in DRR-Structural Measures

Nuclear and Radiological				Structural Measures	
Sr. No.	Major Themes	State/District Agencies and their Responsibilities			
		State	Responsibility-State	District	Responsibility-District
1.	Shelters	R&B Dept, UDD, GSDMA	Recurring/Regular (RR) <ul style="list-style-type: none">• Identification of safe buildings	District Collector, Municipal Commissioner and Urban Local Bodies (ULB's)	Recurring/Regular (RR) <ul style="list-style-type: none">• Co-ordination with and support

Nuclear and Radiological				Structural Measures	
Sr. No.	Major Themes	State/District Agencies and their Responsibilities			
		State	Responsibility-State	District	Responsibility-District
			<div>and sites to serve as temporary shelters near nuclear installations.</div> <ul style="list-style-type: none">• Construction of multi-purpose shelters near nuclear installations• Ensure compliance with relevant building codes.		<div>to state agencies.</div>
2.	<ul style="list-style-type: none">• Decontamination Centers• Strengthen Protection Systems of nuclear facilities	<div>DAE – Center</div> <div>UDD & GSDMA</div>	<div>Short Term (T1)</div> <ul style="list-style-type: none">• Strengthen physical protection systems along with proper inventory and control procedures of the radiation sources• Co-ordination with and support to central agencies.	<div>District Collector, Municipal Commissioner</div>	<div>Recurring/Regular (RR)</div> <ul style="list-style-type: none">• Co-ordination with and support to state agencies.

5.6.4 Investing in DRR- Non Structural Measures

Nuclear and Radiological			Non-Structural Measures		
Sr. No.	Major Themes	State/District Agencies and their Responsibilities			
		State	Responsibility-State	District	Responsibility-District
1.	*Setting of safety standards and other safety and regulatory documents	DAE, AERB - Center UDD & GSDMA	Short Term (T1) <ul style="list-style-type: none">Prepare safety and regulatory documents for all nuclear/radiological applications, transport, safe custody, waste handling, personal safety and medical aspects etc by center.	District Collector, Municipal Commissioner	Short Term (T1) <ul style="list-style-type: none">To follow the requirements.
2.	Improve regulatory cover	AERB – Center UDD & GSDMA	Short Term (T1) <ul style="list-style-type: none">To set up regional regulatory centers for better coverage of safety and regulatory aspects.To enforce compliance.	District Collector, Municipal Commissioner	Recurring/Regular (RR) <ul style="list-style-type: none">Co-ordination with and support to state agencies.
3.	Public Private Partnerships	NDMA, DAE, MCA, MCF, MOCI, MHIPE and MFIN – Center UDD & GSDMA	Recurring/Regular (RR) <ul style="list-style-type: none">Promote Private participation in disaster management facilities	District Collector, Municipal Commissioner	Recurring/Regular (RR) <ul style="list-style-type: none">To follow and comply with the state agencies.

4.	Risk Transfer	<p>MFIN, NDMA, MHA, MAFW - Center</p> <p>Revenue Department, UDD, Dept of Agriculture, Farmers Welfare and Co-operation Department, GSDMA</p>	<p>Recurring/Regular (RR)</p> <ul style="list-style-type: none"> Implementation of Risk Transfer Arrangements including multi-hazard insurance for life and property. <p>Short Term (T1)</p> <ul style="list-style-type: none"> Policy Framework 	District Collector, Municipal Commissioner	<p>Recurring/Regular (RR)</p> <ul style="list-style-type: none"> Co-ordination with and support to state agencies.
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*Guidelines framed by Govt. of India will be followed

5.6.5 Capacity Development

Nuclear and Radiological			Capacity Development		
Sr. No.	Major Themes	State/District Agencies and their Responsibilities			
		State	Responsibility-State	District	Responsibility-District
1.	Training	GSDMA, GIDM	Recurring/Regular (RR) <ul style="list-style-type: none">Enhancing Public Awareness on nuclear/radiological application, safety, training of first responders and staff.Training support for SDRF, CDEF, community and volunteers.	District Collector, Municipal Commissioner	Recurring/Regular (RR) <ul style="list-style-type: none">To follow and comply with the state authorities.

Nuclear and Radiological			Capacity Development		
Sr. No.	Major Themes	State/District Agencies and their Responsibilities			
		State	Responsibility-State	District	Responsibility-District
		MHA, DAE, NDMA – Center H&FW Dept	Recurring/Regular (RR) <ul style="list-style-type: none">Training of medical and paramedics on various aspects of medical management of radiological events.	District Collector, Municipal Commissioner	Recurring/Regular (RR) <ul style="list-style-type: none">To train local staff, PRI’s, NGO’s, CBO’s etc.
2.	Curriculum Development	MHRD, DAE – Center GSDMA, Education Dept, GIDM	Short Term (T1) <ul style="list-style-type: none">Relevant subjects should be included in the school/college syllabus throughout the state.	District Collector, Municipal Commissioner	-
3.	Awareness Generation	NDMA, NDRF, CAPF and NIDM - Center GSDMA, GIDM, SDRF	Recurring/Regular (RR) <ul style="list-style-type: none">Carry out mass media campaignsPromote culture of disaster risk prevention,	District Collector, Municipal Commissioner	Recurring/Regular (RR) <ul style="list-style-type: none">Promote community RadioStrengthening network of civil

Nuclear and Radiological			Capacity Development		
Sr. No.	Major Themes	State/District Agencies and their Responsibilities			
		State	Responsibility-State	District	Responsibility-District
			<div>mitigation and better risk management.</div> <ul style="list-style-type: none">• Promote attitude and behavior change in the awareness campaigns/IEC• Promote community Radio• Strengthening network of civil society organizations for awareness generation about DRR and DM.		<div>society organizations for awareness generation about DRR and DM.</div> <ul style="list-style-type: none">• Information on safety, care and protection of disaster affected animals.
4.	Mock Drills/Exercise	GSDMA, GIDM, SDRF, All Government Authorities	Recurring/Regular (RR) <ul style="list-style-type: none">• Promoting the planning and execution of emergency drills by all ministries.	District Collector, Municipal Commissioner	Recurring/Regular (RR) <ul style="list-style-type: none">• Joint planning and execution of emergency drills

Nuclear and Radiological			Capacity Development		
Sr. No.	Major Themes	State/District Agencies and their Responsibilities			
		State	Responsibility-State	District	Responsibility-District
5.	Developing Capability for response	MHA, DAE, MOD, AERB – Center GSDMA	Short Term (T1) <ul style="list-style-type: none">• Prepare a plan for nuclear and radiological Emergencies.• State Authorities to comply with the same.	District Collector, Municipal Commissioner	Short Term (T1) <ul style="list-style-type: none">• To follow and comply with the state authorities.
		MHA, DAE, MOD – Center GSDMA	Short Term (T1) <ul style="list-style-type: none">• Prepare nuclear/radiological emergency management plan for municipal corporations and other important cities.• Surveillance at vulnerable locations and early detection capabilities.	District Collector, Municipal Commissioner, Urban Local Bodies (ULB’s)	Short Term (T1) <ul style="list-style-type: none">• To follow and comply.

Nuclear and Radiological			Capacity Development		
Sr. No.	Major Themes	State/District Agencies and their Responsibilities			
		State	Responsibility-State	District	Responsibility-District
		All State Departments	Short Term (T1) <ul style="list-style-type: none">Prepare own plans in line with the national plan.	District Collector, Municipal Commissioner	Short Term (T1) <ul style="list-style-type: none">Prepare own plans in line with the state and national plan
6.	Prepare Comprehensive Plan on Medical Management	H&FW Dept	Recurring/Regular (RR) <ul style="list-style-type: none">To follow and ensure compliance	District Collector, Municipal Commissioner	Recurring/Regular (RR) <ul style="list-style-type: none">To follow and ensure compliance
		H&FW Dept, UDD, R&B	Recurring/Regular (RR) <ul style="list-style-type: none">To establish tertiary care hospitals for treatment of radiation injuries. Establish primary and secondary care hospitals of adequate capacity at selected cities.	District Collector, Municipal Commissioner, PHC's, UHC's and CHC's	Recurring/Regular (RR) <ul style="list-style-type: none">To follow and ensure compliance

Nuclear and Radiological			Capacity Development		
Sr. No.	Major Themes	State/District Agencies and their Responsibilities			
		State	Responsibility-State	District	Responsibility-District
7.	Preparedness	SDRF	Short Term (T1) <ul style="list-style-type: none">Maintain adequate stock of radiation detection, monitoring instruments, safety kits, and first aid medicines.To equip the health and police department appropriately.	District Collector/District Magistrate and Municipal Commissioner	Recurring/Regular (RR) <ul style="list-style-type: none">To follow and ensure compliance
		DAE, NDRF – Center UDD, SDRF	Medium Term (T2) <ul style="list-style-type: none">Adequate number of ERC’s should be set up across the state for covering of any event in reasonable time.	District Collector/District Magistrate and Municipal Commissioner	Recurring/Regular (RR) <ul style="list-style-type: none">To follow and ensure compliance
		UDD, RD, Education Dept and R&B	Short Term (T1) <ul style="list-style-type: none">To identify the places/buildings such as community buildings/schools/hospitals for use as	District Collector/District Magistrate and Municipal Commissioner	Short Term (T1) <ul style="list-style-type: none">To help identify the locations and ensure that evacuation plans are in place.

Nuclear and Radiological			Capacity Development		
Sr. No.	Major Themes	State/District Agencies and their Responsibilities			
		State	Responsibility-State	District	Responsibility-District
			emergency shelters.		
		H&FW Dept, Food & Civil Supply, CoR/RD	Short Term (T1) <ul style="list-style-type: none">Provision of food, water, medicines and other relief materials should be made at the shelters for the affected public.	District Collector/District Magistrate, Municipal Commissioner, Panchayats and ULB’s	Short Term (T1) <ul style="list-style-type: none">To follow and ensure compliance with the state authorities.
		DAE – Center H&FW Dept	Short Term (T1) <ul style="list-style-type: none">To provide support for setting up of mobile radiological laboratories.	District Collector/District Magistrate and Municipal Commissioner	-
		MoH&FW, AERB, MHA & NDMA – Center UDD, H&FW Dept & GSDMA,	Short Term (T1) <ul style="list-style-type: none">Appoint and maintain area wise details of radiological safety officers, trained medical personnel,	District Collector/District Magistrate and Municipal Commissioner.	Short Term (T1) <ul style="list-style-type: none">To maintain the data district wise.

Nuclear and Radiological			Capacity Development		
Sr. No.	Major Themes	State/District Agencies and their Responsibilities			
		State	Responsibility-State	District	Responsibility-District
			first responders, trained volunteers etc.		

5.7 Chemical (Industrial) Disasters

5.7.1 Understanding Risk

Chemical (Industrial) Disaster				Understanding Disaster Risk	
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1.	Information Systems, Monitoring, Research	<ul style="list-style-type: none">• DISH• GPCB• GSDMA• Chemical Industrial Association• PESO (Petroleum and Explosive Safety Organization)	<p>Short Term (T1)</p> <ul style="list-style-type: none">• Online information system on HAZCHEM conforming to international standards• Chemical Accident Information Reporting System• Information on dealing with HAZCHEM <p>Medium Term (T2)</p> <ul style="list-style-type: none">• Research on effective management of HAZCHEM• State Hazardous Waste Information System <p>Long Term (T3)</p> <ul style="list-style-type: none">• Promote research and studies – both in-house and extra-mural by providing research grants to researchers and institutions• Promote R&D for indigenous manufacture of quality personal protection equipment most of which are currently imported• Studies on improving occupational safety & health	<ul style="list-style-type: none">• Pvt Industry• DM & Collector	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none">• Support and coordination

2.	Mapping/ Zoning,	<ul style="list-style-type: none"> • Revenue Dept • UDD • Industries & Mines Dept • Superintendent Land Records cum Consolidation Office 	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none"> • Industrial zones on basis of hazard potential and effective disaster management for worst case scenarios for MAH Units • Separate zoning for siting of MAH units • Carry out the mapping and related studies in collaboration with central agencies/ technical organizations 	<ul style="list-style-type: none"> • DM & Collector • Municipal Commissioner • GIDC 	<p>Medium Term (T2)</p> <ul style="list-style-type: none"> • Data Management & Guidance
3.	Monitoring	<ul style="list-style-type: none"> • DISH • INDUSTRY 	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none"> • Monitoring compliance with safety norms for HAZCHEM and proper disposal of hazardous waste 	<ul style="list-style-type: none"> • DM & Collector 	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none"> • Support Coordination & implementation
4.	Hazard Risk Vulnerability and Capacity Assessment (HRVCA)	<ul style="list-style-type: none"> • GIDM • GSDMA • Chemical Industrial Association 	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none"> • Promote studies, documentation and research • Studies on vulnerabilities and capacities covering social, physical, economic, ecological, gender, social inclusion and equity aspects • Provide technical support and guidance for comprehensive HRVCA • Constitute/ strengthen the mechanisms for consultation with experts and stakeholders 	<ul style="list-style-type: none"> • DM & Collector 	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none"> • Undertake HR VCA as part of preparing and periodic revision of district DM plans <p>Short Term (T1)</p> <ul style="list-style-type: none"> •
5.	Disaster Data Collection and Management	<ul style="list-style-type: none"> • DISH • GPCB • GSDMA 	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none"> • Systematic data management of data on disaster damage and loss assessments <p>Short Term (T1)</p> <ul style="list-style-type: none"> • Disaster Damage and Losses 2005- 2015 baseline 	<ul style="list-style-type: none"> • DM & Collector 	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none"> • Systematic data management of data on disaster damage and loss assessment at district level

5.7.2 Inter Agency Coordination

S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility – District
1	Overall disaster governance	<ul style="list-style-type: none"> • DISH • Labor & Employment Dept • GSDMA 	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Providing coordination, technical inputs, and support • Preparation and implementation of DM plans and ensure the functioning of agencies with DM tasks • All aspects of disaster risk management and mainstreaming DRR 	<ul style="list-style-type: none"> • DM & Collector • POLICE 	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Ensuring coherence and mutual reinforcement of DRR, CCA and development • Preparation & Implementation of DM plan at district level
2	Response	<ul style="list-style-type: none"> • DISH • GSDMA 	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Organizing and coordinating state assistance 	<ul style="list-style-type: none"> • DM & Collector • Police • Respective Pvt Industry 	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Organizing and coordinating immediate response • Coordinate with district agencies
3	Warnings, Information, Data Dissemination	<ul style="list-style-type: none"> • DISH • GSDMA • GPCB 	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Effective coordination and seamless communication among state and district agencies to ensure quick, clear, effective dissemination of warnings, information and data 	<ul style="list-style-type: none"> • DM & Collector • DDO • Police 	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Coordinating the dissemination of warnings to all, down to the last mile – remote, rural or urban; • Regular updates to people in areas at risk to be provided.

4	Non-structural measures	<ul style="list-style-type: none"> • DISH • GPCB 	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Coordination among state agencies for a) revised/ updated rules, norms b) adoption of new/updated standards, c) enact/amend laws, regulations and d) adopt/ review policies 	<ul style="list-style-type: none"> • DM & Collect or • Police 	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Coordination, Implementation, Enforcement and monitoring
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5.7.3 Investing in DRR-Structural measures

S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility – District
1	<ul style="list-style-type: none"> • Shelters, evacuation, and support facilities • Multiple routes for reliable access and escape • Decontamination facilities 	<ul style="list-style-type: none"> • R&B Dept • GSDMA 	Short Term (T1) <ul style="list-style-type: none"> • Identification of shelters with basic facilities like drinking water and first aid for chemical exposure • Ensuring water storage facilities and sources for water for accident containment and firefighting operations Medium Term (T 2) <ul style="list-style-type: none"> • Providing wide roads and multiple routes in the industrial area to allow quick access by first responders and to ensure escape pathways • Establish decontamination facilities for off-site emergencies of MAH units 	<ul style="list-style-type: none"> • DM & Collector • Police • Pvt Industry • NGO • CSO • Youth Volunteers 	Short Term (T1) <ul style="list-style-type: none"> • Identify land for building shelters • Technical support • Implementation, Enforcement and monitoring

5.7.4 Investing in DRR-Non Structural Measures

S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility – District
1	<ul style="list-style-type: none"> • Laws Regulations, Techno-Legal regimes • Enforcement, Compliance and Monitoring • Institutional Arrangements 	<ul style="list-style-type: none"> • Labor & Employment Dept • Industries & Mines Dept • UDD • F&ED • Revenue Dept • DISH • GPCB 	<p>Medium Term (T2)</p> <ul style="list-style-type: none"> • Formulate/ strengthen rules, norms, and laws such as factories rules consistent with that of ensuring greater safety in hazardous industries and to reduce likelihood of disasters • Review land use norms for the siting of hazardous industries • Empower factory inspectorates to take legal actions for noncompliance of MSIHC Rules • Review rules to grant compensation to chemical accident victims to improve them in favour of victims • Amend land use norms to ensure greater safety and to ensure buffer zones without human settlements in close proximity of hazardous industries • Strengthen the conduct of safety audits and enforcement of disaster prevention on norms 	<ul style="list-style-type: none"> • DM & Collector • Police • Pvt Industry 	<p>Medium Term (T2)</p> <p>Implements rules, regulations, laws particularly of land use and siting of hazardous industries</p>

2	Public Private Partnerships	<ul style="list-style-type: none"> • DISH • Labor & Employment Dept • GSDMA • GPCB • Industries & Mine Dept 	<p>Medium Term (T2)</p> <ul style="list-style-type: none"> • Promote private participation in off-site disaster management facilities <ul style="list-style-type: none"> • Provide legal support for Mutual Assistance Groups among industries within clusters • Encourage private participation in enhancing off-site disaster response and Risk Management 	<ul style="list-style-type: none"> • DM & Collector • GIDC • Police • Pvt Industry • NGO • Youth Volunteers • Aapda Mitra • CSO 	Recurring/ Regular (RR) Guidance
3	Risk Transfer	<ul style="list-style-type: none"> • Labor & Employment Dept • DISH • Industries & Mines Dept • Forest & Environment Dept • GPCB 	<p>Recurring/ Regular (RR) Implementation of Risk Transfer Arrangements including multi-hazard insurance for life and property</p> <p>Short Term (T1) Policy Frame work</p>	<ul style="list-style-type: none"> • DM & Collector 	Recurring/ Regular (RR) Implementation of Risk Transfer Arrangements including multi-hazard insurance for life and property

5.7.5 Capacity Building

S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility – District
1.	Training	<ul style="list-style-type: none"> • GIDM • GSDMA • SIRD 	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Training and orientation programs on management and disposal of HAZCHEM • Training support for SDRF, CDEF, community, and volunteers 	<ul style="list-style-type: none"> • DM & Collector • DDO • Police • Civil Defense • PRI 	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Training and orientation programs for district govt. staff, SDRF, community, and volunteers
			Recurring/ Regular (RR) <ul style="list-style-type: none"> • Incorporating disaster response, search and rescue in the training programs of youth such as NSS, NYS, Scouts and Guide 		Recurring/ Regular (RR) <ul style="list-style-type: none"> • Incorporating disaster response, search and rescue in the training programs of youth such as village volunteers, and for protection of disaster-affected animals • Training for SDRF, Community, Volunteers
2.	Curriculum Development	<ul style="list-style-type: none"> • Education Dept • Forest and Environment Dept • GPCB • GIDM • Labor & Employment Dept 	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Promote inclusion of more specializations and electives on HAZCHEM and chemical disaster management 	<ul style="list-style-type: none"> • DM & Collector 	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Sending inputs for Curriculum Development

			<p>Short Term (T1)</p> <ul style="list-style-type: none"> • Review and address gaps in medical education at different levels with respect to emergency medical response • Review the specialization needs in the area of dealing with victims of chemical disasters • Review and take steps to improve the facilities required to treat victims of chemical disasters <p>Short Term (T1) Introducing basic DM concepts and precautions related to HAZCHEM</p>		<p>Short Term (T1)</p> <ul style="list-style-type: none"> • Implement the recommendations of reviews in all educational institutions in the district
3.	Awareness Generation	<ul style="list-style-type: none"> • GSDMA • DISH • GPCB 	<p>Short Term (T1)</p> <ol style="list-style-type: none"> a. Carry out mass media campaigns b. Promote culture of disaster risk prevention, mitigation, and better risk management c. Promote attitude and behavior change in the awareness campaigns/ IEC <p>Medium Term (T2)</p> <ol style="list-style-type: none"> d. Promote use of insurance/ risk transfer e. Promote Community Radio f. Strengthening network of civil society organizations for awareness generation about DRR and D M <ul style="list-style-type: none"> • Focus on safety and compliance with SOP at workplace for workers 	<ul style="list-style-type: none"> • DM & Collector • DDO • CSO • NGO • Youth Volunteers • PRIs 	<p>Short Term (T1)</p> <ol style="list-style-type: none"> g. Carry out mass media campaigns h. Promote culture of disaster risk prevention, mitigation, and better risk management <p>Medium Term (T2)</p> <ol style="list-style-type: none"> i. Promote attitude and behavior change in the awareness campaigns/ IEC j. Promote use of insurance/ risk transfer k. Promote Community Radio l. Strengthening network of civil society organizations for awareness generation about DRR and D M m. Focus on safety and

					compliance with SOP at workplace for workers n. Information on safety, care and protection of disaster- affected animals
4	Mock Drills/ Exercises	<ul style="list-style-type: none"> • GSDMA • GIDM 	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Promoting the planning and execution of emergency drills by all departments and in all districts 	<ul style="list-style-type: none"> • DM & Collector • Police • Industry • NGO • CSO • Youth Volunteers • Aapda Mitra 	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Joint planning by district administration and all the departments and execution of emergency drills
5.	Empowering women, marginalized, and persons with disabilities	<ul style="list-style-type: none"> • WCD • Social justice and Empowerment Dept • UNICEF 	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Incorporating gender sensitive and equitable approaches in capacity development covering all aspects of disaster management 	<ul style="list-style-type: none"> • DM & Collector • DDO • PRI • Youth Volunteers • NGO • CSO • Aapda Mitra 	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Incorporating gender sensitive and equitable approaches in capacity development covering all aspects of disaster management at the district and local levels
6.	Community-Based Disaster Management	<ul style="list-style-type: none"> • GSDMA • GIDM 	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Strengthen ability of communities to manage and cope with disasters based on a multi-hazard approach 	<ul style="list-style-type: none"> • DM & Collector • NGO • Youth Volunteers • Aapda Mitra 	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Training for PRI, SHG, NCC, NSS, Youth, local community organizations • Promotion, Guidance, and Support

5.8 Fire Hazard

Note: The focus of the responsibility framework for fire risk mitigation is on Fire & Emergency Services and therefore it is in a different format.

Fire Hazard					
Sr No	Thematic Area for DRR	State/District Agencies and their Responsibilities			
		State	Responsibility-State	District	Responsibility-District
1.	Understanding Risk	UDD, Industries Dept, DISH, Forest & Env't. Dept, Director of F&ES, Revenue Dept, Home Dept, and GSDMA	Recurring/Regular (RR) <ul style="list-style-type: none"> Systematic data management of data on disaster damage and loss assessments. Short Term (T1) <ul style="list-style-type: none"> Applying the classification system for hazardous industries in rural & urban areas based on norms laid down by the Standing Fire Advisory Committee (SFAC) for Fire Services. Vulnerability analysis of densely population clusters prone to high risk of fire. Disaster Damage and Losses 2005-2015 baseline. Medium Term (T2) <ul style="list-style-type: none"> Mapping of Hazardous sites that pose fire and explosion risks. Assess and fix the requirement of equipment and manpower. Identifying areas prone to forest fires and take preventive measures. 	District Magistrate/ District Collector, DDO, DSP, DCF, Municipal Commissioner, Chief Fire Officer and District Project Officer (DPO)	Recurring/Regular (RR) <ul style="list-style-type: none"> To follow and comply with the State Authorities.

2.	Inter-Agency Co-ordination	UDD, Director of F&ES, Revenue Dept, Home Dept and GSDMA	<p>Recurring/Regular (RR)</p> <ul style="list-style-type: none"> • Preparation and implementation of fire safety and prevention plans in all built environments. • Ensure the functioning of agencies to ensure proper compliance of the fire safety norms. 	District Magistrate/ District Collector, DDO, DSP, DCF, Municipal Commissioner, Chief Fire Officer (CFO) and District Project Officer (DPO)	<p>Recurring/Regular (RR)</p> <ul style="list-style-type: none"> • To follow and comply with the State Authorities.
3.	Investing in DRR-Structural Measures	UDD, Director of F&ES, GSDMA	<p>Medium Term (T2)</p> <ul style="list-style-type: none"> • Identify the gaps in existing capabilities – equipment & Infrastructure. • Address gaps in infrastructure and equipment needs, upgrade equipment including personal protective equipment. • Action Plan for modernization and meeting future needs. • Strengthening & standardizing response mechanisms. <p>Long Term (T3)</p> <ul style="list-style-type: none"> • Procurement of equipment for firefighting, urban search and rescue as per the requirement. • Establish fire stations/posts up to the sub-divisional level to the block level. 	District Magistrate/ District Collector, Municipal Commissioner, ULB's, Chief Fire Officer (CFO) and District Project Officer (DPO)	<p>Recurring/Regular (RR)</p> <ul style="list-style-type: none"> • To follow and comply with the State Authorities.

4.	Investing in DRR-Non Structural Measures	UDD, Director of F&ES and GSDMA	<p>Recurring/Regular (RR)</p> <ul style="list-style-type: none"> • Strict Implementation and strengthening of Fire Safety rules. • Strict procedures for fire safety certification should be followed before issuing building use permissions. • Ensure frequent inspection for fire safety system and equipment in public utilities. • Implementation of Risk Transfer Arrangements including multi-hazard insurance for life and property. <p>Short Term (T1)</p> <ul style="list-style-type: none"> • Enactment of Fire Act and other legal measures as per recommendations of SFAC and other official bodies. • Promotion of building codes as per NBC 2016, especially parts relating to fire and life safety and other relevant sections. • Institutional reform and major changes in organizational setup. • Legal regime for mandatory fire clearance from F&ES for different types of buildings, colonies and other installations. • Risk Transfer Framework Policy. 	District Collector/ District Magistrate, Municipal Commissioner, Chief Fire Officer (CFO), DSP and District Project Officer (DPO)	<p>Recurring/Regular (RR)</p> <ul style="list-style-type: none"> • To follow and comply with the State Authorities.
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5.	Capacity Development	UDD, Education Dept, Forest & Env Dept, Animal Husbandry, Commissioner of Rural Development, GIDM, GSDMA, SIRD, SDRF and CDEF	<p>Recurring/Regular (RR)</p> <ul style="list-style-type: none"> Advanced training on disaster management Civil Defense Emergency Force (CDEF), community and Volunteers. Promoting culture of awareness, alertness and preparedness. Awareness generation programmes for public, utilities, ULB's, PRI's and industries. IEC Materials and ensure wider dissemination to general public through all medium. Information on Safety Care and protection of Disaster affected animals. ToT programmes on various aspects such as firefighting, managing collapsed structure and search & rescue. <p>Medium Term (T2)</p> <ul style="list-style-type: none"> Address the capability gaps-human and institutional. Strengthening & standardizing response mechanisms. 	District Collector, Municipal Commissioner, DSP, DCF, PRI's and District Project Officer (DPO)	<p>Recurring/Regular (RR)</p> <ul style="list-style-type: none"> To follow and comply with the State Authorities
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Note: Every Department or agency of the government not specifically mentioned will also have both direct and indirect supporting role depending on the disaster, location & context.

5.9 Biological and Public Health Emergencies

5.9.1 Understanding Risk

Biological and Public Health Emergencies					Understanding Risk
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1.	Observation network, Information Systems, Monitoring, Research, Forecasting, Early Warning and Mapping/ Zoning,	Health dept. Commissionerate of Health Director of AYUSH	Recurring/ Regular (RR) <ul style="list-style-type: none"> Support for training Extend technical support Medium Term (T2) <ul style="list-style-type: none"> Establishment of Early Warning System Epidemiological disease mapping Health facilities mapping Establishing and maintaining community-based network for sharing alerts Long Term (T3) <ul style="list-style-type: none"> State should, modify or adapt IMD's warning system according to thresholds applicable 	DM & Collector DDO CDHO	Recurring/ Regular (RR) <ul style="list-style-type: none"> Maintaining preventive measures as per norms Short Term (T1) <ul style="list-style-type: none"> Strengthening integrated health surveillance systems Medium Term (T2) <ul style="list-style-type: none"> Strengthening IDSP and early warning systems at district level
2.	Hazard Risk Vulnerability and Capacity Assessment (HRVCA)	Health dept. Commissionerate of Health Director of	Recurring/ Regular (RR) <ul style="list-style-type: none"> Promote studies, documentation and research Studies on vulnerabilities and capacities covering social, physical, economic, ecological, gender, social inclusion and 	DM & Collector DDO CDHO	Recurring/ Regular (RR) <ul style="list-style-type: none"> Updating HRVCA Identifying the vulnerable population/ communities/ settlements Identification of groups

		AYUSH	equity aspects <ul style="list-style-type: none"> • Provide technical support and guidance for comprehensive HRVCA • Develop guidelines 		requiring special attention <ul style="list-style-type: none"> • Conduct audit of equipment and human resource requirements
3.	Dissemination of warnings, data & information	Centre: <ul style="list-style-type: none"> • MoHFW • WHO • ICMR State: <ul style="list-style-type: none"> • Health dept. • Comm.of Health • Director of AYUSH • UDD 	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Support for organizing training • Extend technical support • Awareness and proper messages for elderly, young children, outdoor workers and slum residents across the state. 	DM & Collector DDO CDHO M.C UHC	Short Term (T1) <ul style="list-style-type: none"> • Create awareness preventive measures in the district level. • Extensive IEC campaigns to create awareness through print, electronic and social media in the district level. Medium Term (T2) <ul style="list-style-type: none"> • Specific messages for highly vulnerable groups such as elderly, young children, outdoor workers and slum residents in the district level.
4.	Disaster Data Collection and Management	Centre: <ul style="list-style-type: none"> • MoHFW • WHO • ICMR State: <ul style="list-style-type: none"> • Health dept. • Comm.of Health • Director of AYUSH • UDD 	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Systematic data management of data on disaster damage and loss assessments Short Term (T1) <ul style="list-style-type: none"> • Disaster Damage and Losses 2005-2015 baseline 	DM & Collector DDO CDHO M.C UHC	Recurring/ Regular (RR) <ul style="list-style-type: none"> • Systematic data management of data on disaster damage and loss assessments in the district level.

5.9.2 Inter Agency Coordination

Biological and Public Health Emergencies			Understanding Disaster Risk		
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1	Overall disaster governance	Centre: <ul style="list-style-type: none">• MoHFW• WHO• ICMR State: <ul style="list-style-type: none">• Health dept.• Comm.of Health• Director of AYUSH UDD UNICEF IRCS 108 GVK Emergency Services	Recurring/ Regular (RR) <ul style="list-style-type: none">• Preparing guidelines• Promote the mainstreaming of DRR in healthcare• Technical inputs for implementation based on experience from different locations• Collaboration with NGOs/CSOs Medium Term (T2) <ul style="list-style-type: none">• Develop a clearly defined interagency emergency response plan with roles and information flows clearly marked out.• Coordinate with the IMD office regarding forecasts, early warning and alert system. Long Term (T3) <ul style="list-style-type: none">• Partnering local institutions with national institutions / experts• Adapting HAPs developed in other countries /cities, monitoring and evaluating implementation and impact on mortality and morbidity	DM & Collector DDO CDHO M.C UHC	Short Term (T1) <ul style="list-style-type: none">• Implementation as per specific conditions in the state• Team mobilization and coordination - officials and agencies• Involving local administration
2	Preparedness & Response	Centre: <ul style="list-style-type: none">• MoHFW• WHO/ ICMR	Short Term (T1) <ul style="list-style-type: none">• Strengthening of integrated surveillance systems based on epidemiological	DM & Collector DDO	Short Term (T1) <ul style="list-style-type: none">• Rapid health assessment and provision of

		State: <ul style="list-style-type: none"> • Health dept. • Comm.of Health • Director of AYUSH UDD UNICEF /IRCS / 108services	surveys; detection and investigation of any disease outbreak. <ul style="list-style-type: none"> • Development of SEOC & its integration with centralized EOC • Developing specialized response capabilities for biological emergencies 	CDHO M.C UHC	laboratory support
3	Warnings, Information, Data	<ul style="list-style-type: none"> • Health dept. • Comm.of Health • CoR • RD • UDD • GSDMA • Line dept 	<p style="text-align: center;">Short Term (T1)</p> <ul style="list-style-type: none"> • Public awareness and community outreach • Documentation & Data collecting <p style="text-align: center;">Medium Term (T2)</p> <ul style="list-style-type: none"> • Collecting Data/ Information necessary for review/ update of the plan • Maintaining state level database 	DM & Collector DDO CDHO M.C UHC	<p style="text-align: center;">Short Term (T1)</p> <ul style="list-style-type: none"> • Follow the alerts/warning • “Do's-and-Don'ts” should be available in vernacular languages and widely disseminated • Dissemination of warnings to all, down to the last mile – remote, rural or urban • Regular updates to people in areas at risk <p style="text-align: center;">Medium Term (T2)</p> <ul style="list-style-type: none"> • Collecting Data/ Information necessary for review/ update of the plan

5.9.3 Investing in DRR – Structural Measures

Biological and Public Health Emergencies			Understanding Disaster Risk		
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1	Strengthening Response	Health dept. CoH Director of AYUSH	<p>Short Term (T1)</p> <ul style="list-style-type: none">Strengthening Pre-hospital Care and Emergency Medical Care NetworkIdentifying infrastructure needs for formulating mitigation plansLaying down minimum standards for water, food, shelter, medical care, sanitation, and hygieneEstablishing adequate decontamination systems, critical care Intensive Care Units (ICUs) and isolation wardsAdequate Personal Protective Equipment for all the health workers associated with the responding to biological emergencies <p>Medium Term (T2)</p> <ul style="list-style-type: none">Strengthening/mainstreaming the network medical assistance facilitiesEquipping Medical First Responders /Quick Reaction Medical Teams with all material logistics and backup support <p>Long Term (T3)</p> <ul style="list-style-type: none">Up gradation of earmarked hospitals to cope with Biological emergency services	DM & Collector DDO CDHO M.C UHC	<ul style="list-style-type: none">Strengthen pre hospital and medical state of isolation wards.Strengthening medical logistics at district levelStrengthening of infrastructure of district hospital, taluka hospital, CHC,PHC's

2	Upgrading Medical Facilities	Health dept. CoH Director of AYUSH	Medium Term (T2) <ul style="list-style-type: none"> Guidelines and technical support Specialized health care and laboratory facilities Long Term (T3) <ul style="list-style-type: none"> Creating a chain of public health laboratories with at least one such laboratory in each district Stockpiling of essential medical supplies such as vaccines and antibiotics, etc. Guidance for establishing and strengthening quarantine facilities 	DM & Collector DDO CDHO M.C UHC	Medium Term (T2) <ul style="list-style-type: none"> Specialized health care and laboratory facilities to address biological emergencies/ incidents Long Term (T3) <ul style="list-style-type: none"> Establishing and strengthening quarantine facilities Creating at least one public health laboratory in each district
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5.9.4 Investing in DRR – Non-Structural Measures

Biological and Public Health Emergencies			Understanding Disaster Risk		
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1.	Techno-Legal Regime	Health dept. CoH Director of AYUSH	<div>Recurring/ Regular (RR)</div> <ul style="list-style-type: none">Guidance and Support <div>Medium Term (T2)</div> <ul style="list-style-type: none">Dovetail norms and regulations relevant for BPHE with the DM Act 2005Enact/ amend any Act, Rule or Regulation, if necessary, for better implementation of BPHE Programme	DM & Collector DDO CDHO M.C	<div>Recurring/ Regular (RR)</div> <ul style="list-style-type: none">Strengthen institutional arrangements

2.	Biosafety and Biosecurity Measures and Environmental Management	Health dept. CoH Director of AYUSH	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none"> • Strict compliance with Biosafety and biosecurity provisions • Environmental monitoring to prevent outbreaks • Integrated vector management for elimination of breeding places • Biological and chemical interventions for vector control • Monitoring of water supply and se wage systems to prevent the dispersal of biological agents that can cause epidemics 	DM & Collector DDO CDHO	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none"> • Strict compliance with Biosafety and biosecurity provisions • Environmental monitoring to prevent outbreaks
3.	Risk Transfer	Health dept. CoH Director of AYUSH	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none"> • Implementation of Risk Transfer Arrangements including multi-hazard insurance for life and property <p>Short Term (T1)</p> <p>Policy Framework</p>	DM & Collector DDO CDHO	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none"> • Implementation of Risk Transfer Arrangements including multi-hazard insurance for life and property

5.9.5 Capacity Development

Biological and Public Health Emergencies			Understanding Disaster Risk		
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1.	Human Resource Development & Training	Health dept. Commissioner of Health Director of AYUSH IIPH	<p style="text-align: center;">Medium Term (T2)</p> <ul style="list-style-type: none">• Strengthening of medical first responders, medical professionals, paramedics and other emergency responders <p style="text-align: center;">Long Term (T3)</p> <ul style="list-style-type: none">• Development of human resources for monitoring and management of the delayed effects of BPHE in the areas of mental health and psychosocial care• Training programmes in the areas of emergency medicine and biological emergency management for hospital administrators, specialists, medical officers, nurses and other health care workers• Training support for SDRF, CDEF, community, and volunteers• Training for youth through NCC, NYKS, Scouts and Guides and NSS	DM & Collector DDO CDHO	<p style="text-align: center;">Medium Term (T2)</p> <ul style="list-style-type: none">• Training for surveillance• Training for deployment of Rapid Medical Response Teams• Training for All Health and allied healthcare professions, AYUSH doctors and practioners, community health workers, ASHA, MPWS, ANM and aanganwadi workers. <p style="text-align: center;">Long Term (T3)</p> <ul style="list-style-type: none">• Organizing community awareness programmes for first aid and general triage• Training support for CDEF, community, and volunteers
2.	Knowledge management & Curriculum Development	Health dept. Commissioner of Health	<p style="text-align: center;">Recurring/ Regular (RR)</p> <ul style="list-style-type: none">• Incorporating basic knowledge of BPHE management through the educational curricula• Support for proper education and training health emergency personnel• Promote continuing medical education programmes and workshops at regular intervals• Defining the role of public, private, and corporate sector for their active participation and their sensitization	DM & Collector DDO CDHO	<p style="text-align: center;">Recurring/ Regular (RR)</p> <ul style="list-style-type: none">• Support for proper education and training health emergency personnel• Promote continuing medical education programmes and workshops at regular intervals

Biological and Public Health Emergencies				Understanding Disaster Risk	
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
3.	Awareness Generation	Health dept. CoH CoR GIDM GSDMA Information Broadcasting dept UDD WCD	Recurring/ Regular (RR) <ul style="list-style-type: none">• Support awareness campaigns/ IEC• Support network of civil society organizations for awareness generation about emergencies caused by biological agents	DM & Collector DDO CDHO M.C UHC CHC UDA PRI ULB	Recurring/ Regular (RR) <ul style="list-style-type: none">• Promoting awareness, alertness and preparedness• Training programs for public, PRIs/ ULBs• Community awareness programme for first aid• Dos and Don'ts to mitigate the effects of medical emergencies caused by biological agents• Awareness about the importance of personal hygiene• With due consideration to the social, ethnic and religious issues involved, utmost care will be exercised in the disposal of dead bodies.
4.	Mock Drills/ Exercises	H&FW Dept GSDMA UDD CoR Home Dept.	Recurring/ Regular (RR) <ul style="list-style-type: none">• Promoting the planning and execution of emergency drills by all line dept in all States/UTs• Technical support for identifying and resolve communication gaps between participating departments, partners and the public	DM & Collector DDO CDHO Civil Defense Police PRI Aapda Mitras ULB	Recurring/ Regular (RR) <ul style="list-style-type: none">• Defining the role of the community as a part of the disaster management• Testing of various elements of the hospital emergency preparedness through table top exercises, and mock drills• Identify and resolve communication gaps between participating departments, partners and the public• Joint execution of emergency drills with local bodies

Biological and Public Health Emergencies			Understanding Disaster Risk		
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
5.	Hospital Preparedness	H&FW Dept CoH GMCSL WCD UDD	<ul style="list-style-type: none">Identifying, stockpiling, supply chain and inventory management of drugs, equipment and consumables including vaccines and other agents for protection, detection, and medical management <p>Medium Term (T3)</p> <ul style="list-style-type: none">Institutionalization of advanced Emergency Medical Response System (EMRS)Upgrading existing Biosafety lab oratories and establishing new ones	DM & Collector DDO CDHO District Programm e Officer M.C UHC	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none">Preparation of DMP by all the hospitals including those in the private sector <p>Medium Term (T2)</p> <ul style="list-style-type: none">Developing a mechanism to augment surge capacities to respond to any mass casualty event following a biological emergency <p>Long Term (T3)</p> <ul style="list-style-type: none">Specialized health care and laboratory facilities
6.	Applied Research	H&FW Dept CoH IIPH	<p>Recurring/ Regular (RR)</p> <p>Post-disaster phase medical documentation procedures and epidemiological surveys</p> <p>Short Term (T1)</p> <p>Regular updating by adopting activities in Research and Development (R&D) mode, initially by pilot studies</p> <p>Medium Term (T 2)</p> <p>Development of post-disaster medical documentation procedures and epidemiological surveys</p> <p>Long Term (T3)</p> <p>Strengthening of scientific and technical institutions for knowledge management and applied research and training in management of CBRN emergencies</p>	DM & Collector DDO CDHO District Programm e Officer M.C UHC	<p>Long Term (T3)</p> <p>Inculcating scientific temper for knowledge management and applied research and training in management of CBRN emergencies</p>

Biological and Public Health Emergencies			Understanding Disaster Risk		
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
7.	Empowering women, marginalized, and persons with disabilities	H&FW Dept WCD F&ED SJ&E Dept TDD UDD	Recurring/ Regular (RR) <ul style="list-style-type: none">• Guidance• Promote gender sensitive and equitable approaches	DM & Collector DDO CDHO District Programme Officer M.C UHC	Recurring/ Regular (RR) <ul style="list-style-type: none">• Incorporating gender sensitive and equitable approaches in capacity development for coping with BPHE

***TDD-Tribal Development Dept**

5.9.6 Climate Change

Biological and Public Health Emergencies			Understanding Disaster Risk		
S. No.	Sub – Thematic Area for DRR	State / District Agencies and their Responsibilities			
		State	Responsibility – state	District	Responsibility - District
1.	Research, Forecasting / Early Warning, Data Management, Zoning, Mapping	CCD H&FW D F&ED GIDM GSDMA	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none">• Share information and updates <p>Short Term (T1)</p> <ul style="list-style-type: none">• Strengthening integrated health surveillance systems based on GACC scenarios <p>Medium Term (T2)</p> <ul style="list-style-type: none">• Detailed assessment and monitoring of biological threats under GACC impact scenarios• Develop Database management system relating to Biological Disasters & climate change <p>Long Term (T3)</p> <ul style="list-style-type: none">• Improve forecasting and assessment capabilities consistent with the anticipated changes	DM & Collector DDO DCF	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none">• Support and cooperate with State agencies• Sponsor and support state-specific and local efforts
2.	Hazard Risk Vulnerability and Capacity Assessment (HRVCA)	CCD H&FW D F&ED UDD GSDM A	<p>Medium & Long Term (T2, T3)</p> <ul style="list-style-type: none">• Undertake detailed studies on vulnerability and risk under GACC scenarios• Assess GACC risks of vulnerable and marginalized sections• Provide technical support and guidance for comprehensive HRVCA considering GACC impacts	DM & Collector DDO DCF	<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none">• Undertake HRVCA as part of preparing and periodic revision of DM plans <p>Medium Term (T2)</p> <ul style="list-style-type: none">• Assess GACC risks of vulnerable and marginalized sections
3.	Climate Change Adaptation (CCA)		<p>Short-Term (T1)</p> <ul style="list-style-type: none">• Understanding adaptation needs• Study coping mechanisms• Develop adaptation mechanisms• Develop local adaptation strategies and pilot projects		<p>Recurring/ Regular (RR)</p> <ul style="list-style-type: none">• Sensitization and awareness creation• Support State CCA efforts• Coordination with state

			<p>Medium & Long Term (T2, T3)</p> <ul style="list-style-type: none"> • Environmental monitoring to reduce risks from GACC • Support the implementation of CCA programs • Promote appropriate combinations of Green and Blue infrastructure approach • Promote adaptive measures in social protection programmes for the vulnerable groups • 		<p>agencies</p> <ul style="list-style-type: none"> • Sponsor and promote state-specific efforts and local efforts for GACC mitigation and adaptation <p>Medium Term (T2)</p> <ul style="list-style-type: none"> • Sponsor and promote state-specific efforts and local efforts
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***GACC-Global Anthropogenic Climate Change**

***CCA-Climate Change Adaptation**

Chapter 6 :Mainstreaming Disaster Risk Reduction and Climate Change Adaptation

1. **Disaster risk affects the health, safety and security of the people. Disasters risk drivers such as inadequate development planning, poverty, unchecked urban expansion; environmental degradation and weak risk governance have led to increased risk. The disaster risk continues to increase as the growing exposure of people and assets to hazards outpaces risk reduction capacities.** Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA) efforts share the immediate common aim of building resilience of people, economies and natural resources to the impacts of extreme weather and climate change.
2. Mainstreaming DRR is a process of integrating DRR and CCA at all levels of decision-making including state, district and village government & community levels and creating direct linkages with international and regional commitments like SFDRR,SDG, Paris Agreement, etc.
3. With escalating disaster risks, there is a growing consensus that the key to sustained risk reduction lies in ‘mainstreaming’ the reduction of risks into development. This could be done by incorporating the key principles of DRR and CCA.

The mainstreaming needs to be integrated in all phases of planning, programming, budgeting, implementation, monitoring etc. into development goals, governance arrangements, policies and practice. Mainstreaming requires the analysis of how potential hazard events could affect the performance of policies, programs and projects, and on the other hand, it needs to look at the impact of the same policies, programs, and projects on vulnerability to hazards.
4. **As per the provisions of GSDM Act, 2003, all government departments local authorities, have to prepare their own DM Plans. The plans will be prepared after considering the types of disaster hazards that may occurs and their possible**

effects, the property at risk, provision for prevention and mitigation strategies, promote capacity building and contingency plans etc

- 5.** Disasters and development are closely linked. Disasters can both destroy development initiatives and create development opportunities. Development schemes can both increase and decrease vulnerability. It has four separate but interrelated dimensions:
 - i. Disasters set back development programming, destroying years of development initiatives.
 - ii. Rebuilding after a disaster provides significant opportunities to initiate development programmes.
 - iii. Development programmes can increase an area's susceptibility to disasters.
 - iv. Development programmes can be designed to decrease the susceptibility to disasters and their negative consequences.

Thus, it is desirable that development initiatives and DRR are dealt with concurrently in a seamless manner, into all the relevant policies, planning and implementation. All development initiatives must factor in the likelihood of greater risk and decrease in climate change induced vulnerabilities

The second and third priorities of the Sendai Framework namely risk governance and investing in disaster risk reduction for resilience, recognize the importance of DRR within and across all sectors of development. Sectors of focus include Agriculture, Building and Construction, Education, Energy, Environment, Finance, Health, Planning, Telecommunications, Tourism, Transportation, Urban and rural development, Water and Sanitation. Mainstreaming DRR and CCA into development planning has been a priority concern for the State Government. It should ensure that development plans and programs do not create new forms of vulnerabilities.

6. Planning based on Hazard, Exposure, Vulnerability and capacity assessment of the State

GSDMA has done a risk assessment for integrating disaster risk management into development planning. Each line department, Municipal Corporation, District Collectorate and District Development Office of the State is required to use it for initiating all the projects depending on the vulnerability of the project area.

In addition, line departments and even some private industries do seek the advice of GSDMA on vulnerability of the region before finalizing projects that require major investment. Dholera Special Investment Region Project is one such example where GSDMA has provided guidance in carrying out vulnerability studies for flood and seismic activities before finalizing the development plan.

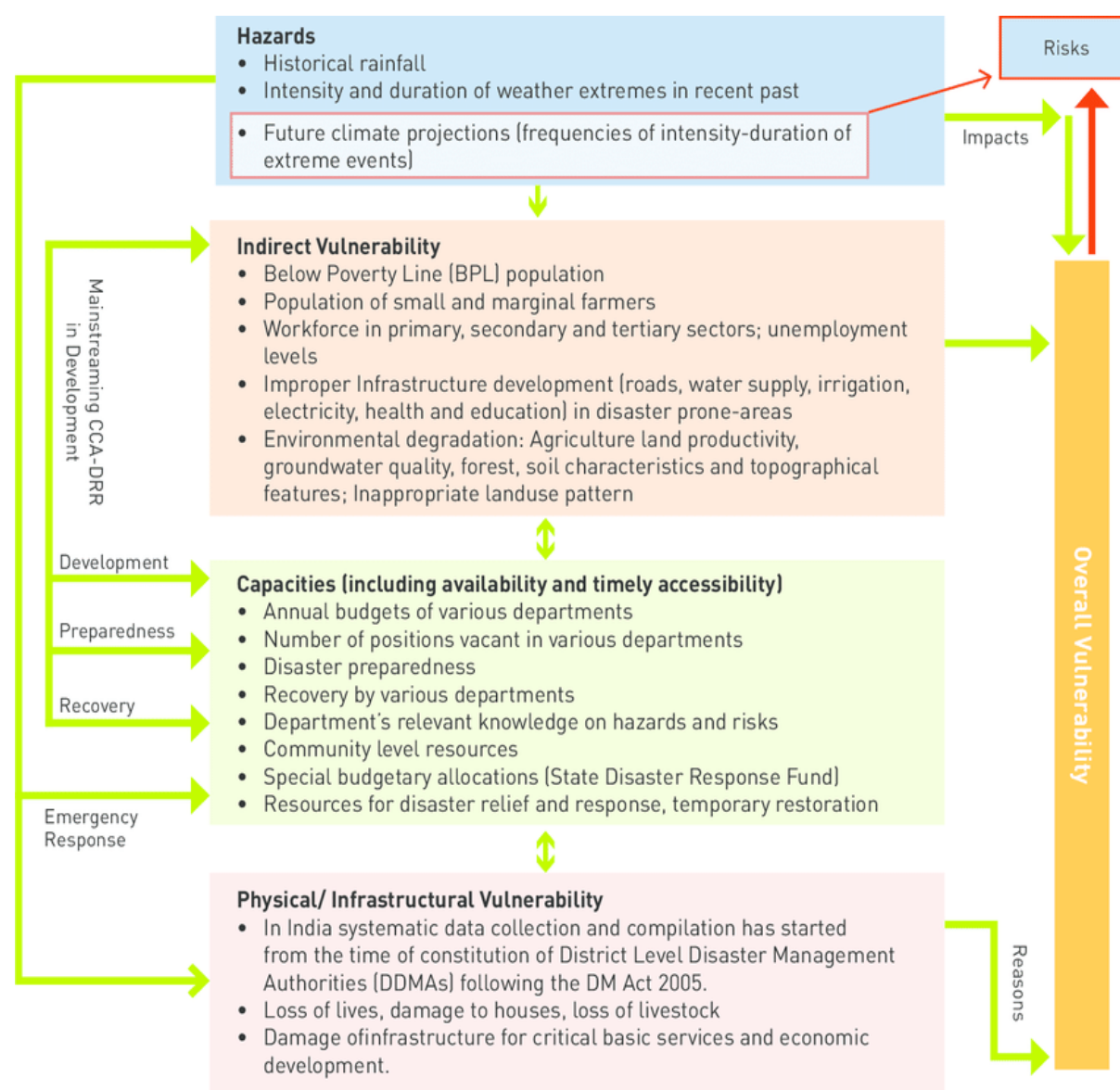
Based on the same, each line department and other relevant state agencies should carry out and ensure the following:

1. Ensure that the DRR policies and practices must be based on improved understanding of disaster and climate risk in all its dimensions and communities made aware of various aspects of disaster and climate risk so that they are able to proactively take preventive measures.
2. Ensure adequate and appropriate legislative arrangements for disaster risk management, including the mainstreaming of DRR and CCA into development.
3. Plan land use of the State in view of hazard, risk and vulnerability of the project.
4. Ensure all the development schemes of the state are undertaken in view of hazard, risk, vulnerability and micro-zonation and climate risk attached with it and facilitated with the provision for adequate funds.
5. Undertake revision of land-use regulations and building codes and introduction of judicial and other measures to ensure enforcement.
6. Integrate various risk financing instruments within an overall DRR strategy, enabling policies and supporting legal framework.
7. Provide engineering inputs to improve infrastructures including dams and reservoirs, building design, construction, etc.

8. Ensure financing and budgeting for investment in resilience.
9. Investing in capacity building, organization, and mobilization of community members (especially of women) at local level, in particular to access resources, to take leadership in the community and to engage with local authorities.
10. Strengthen inter agency coordination and integration involved in development initiatives at state and district level.
11. Ensuring social inclusiveness in disaster risk management.

6.1 Formats for Pre-approval of Projects

In continuation with the efforts to integrate disaster management into development planning especially for new projects that are under preparation stage, the Central Government has revised the formats for pre-approval from EFC (Expenditure Finance Committee) and for preparing the DPR (Detailed Project Report) to address disaster management concerns.



Source: https://www.researchgate.net/figure/key-elements-of-mainstreaming-cca-Drr-in-Development-planning_fig3_311608070

6.2 Expenditure Finance Committee (EFC) Format

To ensure the implementation of key areas, a check list for EFC format and the responsible departments are as shown in **table 6.1:**

Activity	Responsibility
1. To ascertain whether project involve any creation/ modification of structural/ engineering assets	<ul style="list-style-type: none"> Line Depts. <ul style="list-style-type: none"> - Irrigation - Power - Water supply - Health - Roads & Buildings - Education - Others
2. To ascertain the possible risks, likelihood and impact from disasters and climate change due to the location of project sites	<ul style="list-style-type: none"> Dept. approving the project <ul style="list-style-type: none"> ○ Administratively ○ Financially ○ Technically
3. To ascertain whether probable risks both structural and non-structural measures have been prioritized and the prevention and mitigation measures being contemplated.	<ul style="list-style-type: none"> Urban Development Authorities
4. To ascertain whether the design and engineering of the structure has taken into consideration the National Building Code 2016, the appropriate BIS Codes, other applicable sources as per the type of the project and the NDMA guidelines . List of codes/guidelines for safety of building/structures is given in Annexure 3.	<ul style="list-style-type: none"> Concerned Dept. GSDMA
5. To ascertain whether the cost of disaster prevention/ mitigation measures been included in the overall project cost	<ul style="list-style-type: none"> Local Bodies
6. To ascertain whether the process of risk assessment has been done based on available information and secondary evidence	

Table 6.1: Checklist for EFC Format

6.3 Detailed Project Report (DPR) Format

To ensure the implementation of key areas, a checklist for DPR format and the responsible departments are as shown below:

Activity	Responsibility
<p>1. Impact Assessment of project (damage that can be caused to the project by natural & Man-made hazards, design of the project that could accentuate the vulnerability of the area to hazards and / or lead to rise in damage / loss of lives, property, livelihood and surrounding environment) and ensure creation of new risk; Checklist for natural & man-made hazards impact assessment if given in Annexure 4.</p> <p>2. Disaster & Climate Risk assessment of project</p> <p>Evaluation of site with regards to parameters such as probable maximum seismicity, probable maximum storm surge, probable maximum wind speed, probable maximum precipitation, probable maximum flood discharge and level, soil liquefaction proneness under probable earthquake intensities</p> <p>3. Compliance of</p> <ul style="list-style-type: none"> ○ Land Use Management ○ Building Code ○ Building Use Regulation ○ Directives and Legislation ○ Maintenance Requirement <p>4. Details about the location of the project, proneness of the project area to various hazards and analysis of impact on safety of the project</p> <p>5. Impact of the project on the environment and the surrounding population with respect to the type of the project and adoption of prevention and mitigation measures to prevent and mitigate the impact.</p>	<ul style="list-style-type: none"> • Line Depts. preparing the project <ul style="list-style-type: none"> - Irrigation - Power - Water supply - Health - Roads & Buildings - Education - Others • Dept. approving the project <ul style="list-style-type: none"> ○ Administratively ○ Financially ○ Technically • Urban Development Authorities • R & B Dept • GSDMA • Local Bodies

Table 6.2: Checklist for DPR Format

6.4 Relevant Government Schemes and Projects

Many government schemes targeted at different vulnerable groups could be used in pre-disaster phase as a tool for minimizing their vulnerability and empowering them to better respond to any disaster. Some of the schemes/ subsidies could also be used in post-disaster phase to rebuild their lost infrastructure, housing, to avail basic amenities/ facilities like education, health, to restore livelihood, etc. by availing the entitlement of these schemes.

These schemes include Agri-Implements Subsidiary, Animal Husbandry Aid Scheme, Rastriya Madhyamik Shiksha Abhiyan (RMSA), Targeted Public Distribution System, Annapurna Scheme, Janani Shishu Suraksha Karyakram (JSSK), Rashtriya Swasthya Bima Yojana (RSBY), Welfare Scheme for Salt Workers, Shramik Suraksha Accident Group Insurance Scheme, Sardar Patel Awas Yojna, Pradhan Mantri Awas Yojna, Indira Gandhi National Disability Pension Scheme, Assistance to Disabled Widows for House Construction, Vanbandhu Kalyan Yojna, etc.

To ensure that the entitlement of these schemes reach the targeted population, it is necessary that population is well aware of such schemes/ projects and their entitlement.

Inter department coordination is very crucial for these entitlement to reach the affected population especially in a post-disaster scenario.

6.5 Budget Allocation

It should be ensured that the expenditure on risk reduction is sufficient and there are adequate financial arrangements to manage the residual risks. While there are certain budgeting allocations to partially address requirements of relief through NDRF/SDRF each department must make adequate provision for DRR.

Mainstreaming is the internalisation of risk awareness and incorporation of risk reduction measures into the main or the overall policies and programmes within and outside

government. The SDMP provides broad perspective on mainstreaming DRR and CCA. Each department and agency must review current programmes to include DRR and CCA to the extent possible cost effectively within their main budget and ensure comprehensive appraisal of all new initiatives (policies, plans, programmes, projects, etc.) based on the perspectives provided in the SDMP.



***Chapter 7 : Disaster Preparedness &
Capacity Building:
Strengthening Institutional
Capacity for Resilience***

All institutions relevant to a state's resilience must have the capabilities they need to discharge their roles. It is critical to involve all stakeholders right from the pre-disaster phase and to work together in a risk-informed and integrated approach. For this, all stakeholders should be aware and informed of the existing and imminent risks, incorporate disaster risk reduction as part of their policy and routine functioning and should allocate resources and develop capacities to increase the level of commitment to disaster risk reduction for resilience.

7.1 Preparedness Measures

Preparedness for any probable disaster is an essential and proactive step to deal with any emergency. It is a peacetime phase and provides opportunity to develop and build capacity of the system and society.

Each stakeholder needs to develop and enhance his/her skills and resources so as to be able to perform the respective role and responsibility at the onset of the disaster. The key stakeholders at state level and the respective preparedness measures to be undertaken are discussed below.

7.1.1 State Government

The State Government shall:

1. Ensure that appropriate policies and guidelines are developed
2. Ensure that the State Administration and local authorities take into consideration the guidelines laid down by GSDMA while planning its activities
3. Ensure that State Government, GSDMA, Heads of Government Departments, COR, District Collectors and local authorities take necessary steps to be prepared for all probable disasters.
4. Facilitate timely procurement related to disaster management of materials, equipment and services in connection with the disaster management and ensure their quality
5. Ensure preparation, implementation and timely updation of disaster management plans by respective state departments, local authorities, communities and stakeholders.

7.1.2 Departments of the State Government

a. Revenue Department

1. Revenue Department is the nodal department for controlling, monitoring and directing measures for organizing rescue, relief and rehabilitation. All other concerned line departments shall extend full cooperation in all matters pertaining to the management of the disaster whenever it occurs.
2. The department will develop socially inclusive relief norms and packages.

3. Arrange with service provider companies for multiple warning messages to community, officials, etc as per need.
4. Develop and promote insurance, disaster bonds, tax rebate, etc. against the disaster.
5. Arrange for relevant resources in coordination with districts officials for disaster management.

b. Agriculture & Cooperation Department

1. Identify areas prone to various hazards i.e. droughts, heavy rain, floods, cyclones / heavy wind, pest attack, etc. and monitor them during vulnerable seasons and promote risk sharing and risk transfer mechanisms
2. Strengthening institutional and technical capacities and Mainstreaming Disaster Risk Reduction (DRR), Climate Change Adaptation (CCA), and Sustainable Land Management(SLM) within agriculture related policies, strategies and plans.
3. Spread awareness amongst farmers regarding various crop diseases, water conservation and Management, prescribed use of fertilisers and pesticides, crop insurance, crop diversification, adaption of improved technology, alternate cropping pattern in disaster prone areas, proper seed and fodder management, etc. to build resilience of agriculture communities to disaster impacts.
4. Ensure a proper mechanism for communicating early warning to farmers regarding rainfall, flood, droughts, cyclone, etc.
5. Formulate a trained team for assessing damage to crops, soil and other agricultural damage
6. Enhance preparedness measures to improve effectiveness of emergency response and recovery actions in agriculture
7. Ensure that the relief is extended to the farmers and agriculture labourer in case of disaster.
8. Ensure integration and mainstreaming of gender priorities in all activities of the plan of action to enhance overall long term resilience.

c. Animal Husbandry Department

1. Ensure proper mechanism for disease surveillance among animals
2. Prepare a database of veterinary hospitals, clinics and agencies working for welfare of animals
3. Identify source for procurement of fodder for livestock in scarcity hit areas.
4. Identify safe locations for cattle camps

5. Ensure proper administration of de-worming and vaccinations for cattle, sheep, goats, pigs and other relevant measures for disease management
6. To spread awareness among rural population regarding management of sick or diseased animals
7. Ensure proper transportation facilities for sick or critically injured animals
8. Identify space for disposal of animal carcasses
9. Requirement of proper and clean shelter for milch animals like cows and buffalos
10. To take preventive measures to ensure animal to human disease transfer and vice versa.

d. Civil Aviation Department

1. Ensure that sites for helipads are identified across the state as per the laid guidelines
2. Ensure that the helicopters are available in ready condition during any emergency
3. Ensure that the human resources and technical team is available to deal with any emergency

e. Climate Change Department

1. Undertake studies and assist state government in understanding impacts of climate change on the risk of natural hazards
2. Establish linkages with national and international experts/ agencies on climate research to address better hazard trends.
3. Establish environmental and economic benefits on use of renewable energy and promote the same
4. Promote use of green technology, CNG usage, use of solar energy, etc.
5. To make citizens aware regarding ways to preserve ground water, **saving energy** and reducing carbon footprint in day-to-day life
6. Increase and protect flora and fauna
7. Prepare a comprehensive policy on Climate Change for the state and guidelines to be followed for the same
8. Ensure that the Air and Water pollution is contained as per the existing norms.
9. Use of Science and technology for better understanding the climate and weather change.
10. Integrate climate change measures into national policies, strategies and planning.
11. Improve education, awareness-raising and human and institutional capacity on climate change mitigation and adaptation.
12. Monitor climate change activities, help mitigate its consequences, and reduce the uncertainties that surround projections.
13. **To study the Earth's climate system and support decision-making about climate change adaptation, prediction and mitigation.**
14. **Promote use of Space-based technologies as they play a key role in climate knowledge, science, monitoring and early warning.**

f. Education Department

1. Advocate for inclusion of vulnerability and capacity assessment, disaster risk reduction measures and corresponding budget in disaster preparedness & response at school level
2. Develop a policy framework for school safety to be integrated into existing education policy and processes,
3. Organise camps in school and colleges for awareness of do's and don'ts of possible hazards in the state, hygiene and other issues of public health
4. To include aspects of disaster risk management in the school and college curriculum
5. Engage students, parents and communities in school management/maintenance to prevent future risks and in reinforce messages about disaster risk reduction.
6. Ensure preparation of disaster management plans and first aid kits in all schools and colleges
7. Maintain all the equipment like fire extinguishers, fire-fighting systems, etc. and keep in up-to-date condition
8. Identify safe sites near the schools/ in the villages to set up temporary learning spaces
- 9. Updating and refilling of equipments like fire extinguishers**
- 10. To include and ensure implementation of school safety programme in each school at the primary level.**
11. Identify safe schools and colleges which can be used as relief shelters for short duration of time, aftermath of any disaster

g. Fire & Emergency Services

1. Carry out a systematic, critical appraisal of all potential Fire hazards involving personnel, premises, services & operation method
2. Improve outreach of the fire services right up to the village level
3. Develop and implement fire hazards mitigation and response plan
4. Ensure proper operation, maintenance and functioning of all fire fighting vehicles, equipment and personal protection equipments
5. Ensure adequate training of human resource to deal with disaster situation
6. Prepare a database of private fire fighting agencies and their resources
7. Keep vigil regarding MAH units and other hazardous installations in the state and prepare for possible emergency situation
8. To take adequate steps for institutional reforms, modernisation and organisational restructuring of fire and emergency services.

h. Food & Civil Supplies Department

1. Prepare for safety of stored food grains in god owns against inundation and water logging, fire and other possible hazards
2. Ensure that food grains and cereals are available in stock for emergency purpose
3. Prepare for transportation of stored food grains to a pre-identified safer location
4. Enlist god owns and cold storage facilities, refrigerated transportation vehicles present in the state along with their storage capacities and facilities available
5. Enlist private retailers and wholesale dealers of food items and packaged drinking water
6. Enlist available kerosene depots, petrol pumps, CNG pumps, diesel depots, LPG agencies, etc.
7. Availability of adequate/ready to eat meals and appropriate food supplies to the disaster affected areas.

i. Forest & Environment Department

1. Formulate a team to catch wild animals in case they enter inhabited areas
2. Gujarat Pollution Control Board should ensure that all industries are following proper guidelines for hazardous waste management.
3. Ensure implementation of policies and programmes for conservation of the ecosystem, natural resources, welfare of animals and prevention of air pollution etc.
4. To ensure preservation of biodiversity by spreading awareness
5. Ensure restoration of mangroves
6. Ensure effective wetland management, preservation, and restoration

j. Health & Family Welfare Department

1. Organize **frequent** awareness camps for hygiene and other public health issue
2. Develop **a comprehensive and workable** plan for hospital preparedness and mass casualty management
3. Establish paramedic cadre through training programmes and accredit / license them
4. Recognize and accredit trauma centers
5. Establish statewide medical emergency access number and make public awareness
6. **Ensure authentic medical care database enlisting public and private facilities available in the state. This includes details of human resources, logistics, medical equipments,**

medicines, antidotes, personal protective equipments, disinfectant, vaccines, diagnostic labs, blood banks, etc.

7. Standardize and license ambulance services for smooth operation
8. Ensure availability of adequate supply of life saving equipment and drugs, portable supplies like portable oxygen cylinders, portable x-ray machines, triage tags, etc.
9. Formulate trained medical first responder, Quick Response Team, stationary and mobile decontamination facilities, identification of poison centers, mobile hospital, and antidotes plan.
10. **An updated Disaster / emergency management plan at hospitals for chemical, biological, epidemiological, toxicological, nuclear and radiological for or any public health emergencies.**
11. Prepare trained psychological and psychosocial care teams
12. Ensure proper and safe management of medical waste
13. Keep at disposal list of various hazardous chemicals present in the state and their antidotes
14. **Promote studies on vulnerabilities and capacity development for inclusion**
15. **Disaster data collection and management**
16. **Risk transfer arrangements including multi hazard insurance for life and property.**
17. **Ensure facemasks, hand gloves, ventilators, oxygen concentrators, biomedical equipments, Personal Protective Equipments, diagnostic test kits and relevant accessories etc and other relevant kits for biological hazards are available**
18. **To ensure proper training of human resources viz doctors, nurses, paramedics and other relevant stakeholders**
19. **Use of high end technologies like data analytics should be used for better understanding of problems of diseases and its effects and to take relevant mitigation measures**

k. Industrial Safety And Health

1. Create awareness for health & safety for workers and factory management
2. Conduct health & hygiene survey and inspection in various industrial sectors
3. Make a database of MAH, A, B and C types of units and hazardous installations in the state and their safety officers
4. Ensure preparation of onsite emergency management plan by all industrial units and off-site plan for MAH units. Ensure updation of the same on **regular basis.**
5. Prepare a database of suppliers/ manufactures of antidotes for hazardous chemicals
6. **Ensure availability of emergency human resources, vehicles, equipments and antidotes to address the emergency.**

7. **Enlist nearby hospitals and medical care facilities in case of any chemical emergency.**

l. Information Department

1. Display verified Information Education and Communication (IEC) materials for mass dissemination and awareness among the **public and all stakeholders for response and relief**
2. Prepare a database of popular media channels and media persons (both print and electronic)
3. Ensure proper mechanism/ channels for addressing public so as to avoid and manage rumours with help of various media
4. **Prepare a plan for providing / broadcasting warnings, dos and don'ts to media and ensure its dissemination to public before, during and after the disaster**
5. **Ethical guidelines for coverage of disaster is prepared and shared with media**
6. **Develop a media management plan for media briefings (depending on the severity of the disaster) and designate nodal officer(s) for interacting with media.**

m. Narmada, Water Resources, Water Supply & Kalpsar Department

1. Ensure proper early warning mechanism for flood by monitoring water level of surface water bodies
2. Ensure proper and timely inspection of conditions of bunds, embankments, inlet and outlets of lakes, drains--, channels and pump houses
3. **Ensure proper functioning of all equipments including vehicle mounted heavy duty dewatering pumps and its availability in terms of emergency**
4. Prepare for arrangement of safe drinking water supply for community in the affected areas, relief camps and shelters
5. Prepare for prompt repair of pipelines supplying potable water **in case of any disaster/scarcity.**
6. Ensure availability of adequate number of water tankers, drums, jerry cans or identify their private suppliers to prepare for supply of water, in scarcity period and in emergency
7. Ensure availability of water supply/ filling points for fire tenders, water cannons, hospitals and other necessary life saving infrastructure

n. Home Department

1. Ensure proper functioning of all equipment and vehicles
2. Develop a communication protocols for effective response

3. Prepare for quick deployment of SDRF, Civil Defence, Home Guards and volunteers for providing safety to affected population and evacuated structures/ houses
4. Prepare plan for management of terrorist attack, bomb blast, stampede, etc.
5. Train police personnel and staff of PCR van in first aid and basic life support
6. Prepare communication plan for uninterrupted communication to all police posts and various control room and emergency centres across the state
7. **Availability of police/SDRF personnel 24*7 for any untoward emergency
Ensure law and order in times of emergency.**

o. Port & Transport Department

1. Ensure proper functioning of filling station, vehicles and equipment
2. Prepare for prompt deployment of vehicles at short notice for various purposes like mass evacuation, transportation of response teams, relief items, **health team to deal with emergency and** victims, etc.
3. Prepare mechanical team for prompt repair of equipment and vehicles
4. Train drivers, conductors, crew members, port officials in first aid and basic life saving techniques

p. Roads & Buildings Department

1. Ensure availability and functioning of all equipments like cranes, earthmovers, JCBs etc. Prepare a data base of availability of the same with private agencies also
2. Prepare for prompt clearance of debris post disaster
3. Prepare the demolishing squad for prompt demolition of unsafe buildings post disaster
4. Prepare for prompt clearing and repairing of damaged roads, culverts, bridges and flyovers
5. Ensure prompt construction of new temporary roads for diverting traffic from the affected area
6. Prepare for construction of temporary facilities like that of medical post, temporary shelters, etc at short notice.
7. Prepare for prompt establishment of helipad near the affected site for responding teams
8. Prepare for restoration of government buildings damaged during disaster

q. Science & Technology Department

1. Ensure proper mechanism to issue alert/ warning through SMS through service providers
2. Prepare for providing safety and serviceability of critical communication towers through respective service providers
3. Prepare for prompt establishment of alternate communication links like HF, VHF, HAM, Satellite Phones, etc., in case of failure of primary communication channels during disaster
4. Ensure restoration of emergency communication in disaster affected areas.
5. Emergency response teams with detailed technical plan to restore communication in disaster affected areas.
6. Contingency plan including pre disaster contacts with suppliers government and private for easy availability of resources at the time of emergency.

r. Social Justice & Empowerment Department

1. Prepare and regularly update database of scheduled castes, developing castes, social and economically backward classes, minorities communities, physically and mentally challenged persons, orphans, destitute, beggars, old aged persons and ensure that they are able to avail benefits under respective welfare schemes so as to reduce their vulnerability to disasters
2. Address peoples' underlying vulnerabilities, increase their capacities to cope with the effects of natural hazards and facilitate empowerment processes.

s. Sports Youth & Cultural Activities Department

1. Organise training and awareness camps for youth for first aid, relief and camp management, psycho social care, search and rescue for small incidents, fire fighting
2. **Creation of database of trained volunteers in case of emergencies**
3. Build awareness of Youth and mobilise them to play key roles on practical community based actions for Disaster Risk Reduction and climate change adaptation.

t. Tribal Development Department

1. Prepare a database of tribal groups in the state, their population and habitats
2. Ensure they are well covered under all government schemes targeted to them with special focus on the five particularly Vulnerable Tribal Groups
3. Conduct a specific study on indigenous knowledge on various coping mechanisms and early warning systems and build upon the same.

u. Women & Child Development Department

1. Prepare for prompt action in aftermath of any disaster so as to prevent human trafficking particularly that of women, girls and young children
2. Ensure women and children in vulnerable circumstances are well covered under
3. various government schemes targeted to them. Prepare a database of authentic NGOs working for women and child empowerment/ rights
4. Update database of pregnant women/ women with disabilities.
5. Identification of separate shelter homes for the pregnant women / children and person with disabilities with all necessary primary requirements

7.1.3 Gujarat State Disaster Management Authority (GSDMA)

1. Assist the State Government in formulation of policy for relief, rehabilitation, reconstruction and recovery.
2. Monitor preparation, updation and implementation of disaster management plans
3. Promote **disaster management capacity building and training** awareness and preparedness among all stakeholders regarding potential disasters
4. Assist in development of methodologies for reduction of vulnerability of disasters
5. Publish various guidelines to be followed for various phases of disaster management
6. Inspect existing development plans made by various authorities and recommend measures to be incorporated for disaster management
7. Develop database of key experts, consultants, organisations, agencies, etc working in the field of disaster management.

8. Policy related to mechanisms for risks transfer including insurance

7.1.4 The State Relief Commissioner (COR)

1. Prepare, review and update State level emergency plans and guidelines and ensure that the district level plans are prepared, revised and updated
2. Develop an appropriate relief implementation strategy for the State in consultation with the Authority, taking into account the unique circumstances of each district and deficiency in institutional capacity and resources of the State.
3. Strengthen relief distribution and accounting system at state and district level through identification of centralized system for receipt, storage and distribution of relief and by ensuring rate contract, procurement and stockpile of relief material
4. **Ensure that Disaster Management mock exercises are carried out regularly.**

- 5. Ensure that communication system is in order and contingency plans provide for maximum involvement of local agencies.**

7.1.5 Collectors/ Municipal Commissioners

1. Ensure an updated database of critical resources (equipments, life saving facilities, trained personnel, etc.) and its availability in the District/ Corporation
2. Ensure that all critical life saving equipments are maintained and ready to use
3. Ensure that District/ Mahanagarpalika Disaster Management Plans are prepared and are timely updated
4. Ensure that local authorities in the District/ Corporation are involved in developing their own mitigation plans
5. Ensure that disaster management drills are carried out periodically
6. Ensure that District Emergency Operation Centre/ Control Room is fully functional and communication systems is in order
7. Ensure that open and safe places for mass evacuation are identified
8. Ensure that safe buildings are identified for purpose of relief camps
9. Ensure that site for helipad is identified at key locations

10. Coordinate the activities of reconstruction and rehabilitation in the districts

7.1.6 Local Authority

1. Provide assistance to GSDMA, COR and Collector in disaster management activities
2. Ensure training of its officers and employees and maintenance of resources so as to be readily available for use in the event of a disaster
3. **Ensure that all construction projects under it conform to the standards and laid down specifications**
4. Each department of the Government in a district shall prepare a disaster management plan for the district. Carry out relief, rehabilitation and reconstruction activities in the affected area within its jurisdiction
5. **Prepare database of vulnerable community and most vulnerable groups at risk**
6. Advice and issue direction wherever necessary for community disaster prevention, mitigation and preparedness through local resources and participatory approach
7. Take appropriate actions to enhance community preparedness
8. **Conduct Disaster Management drills periodically.**

7.1.7 Indian Railways

1. Ensure proper security and safety measures at each railway station in the state
2. Ensure that Do's and Don'ts about relevant hazards are properly displayed at each railway station
3. Ensure proper mechanism for crowd control at each major railway station particularly during festival seasons
4. Ensure that disaster management plan is in place for the railways
5. Ensure proper mechanism for transportation of mass community and proper handling and distribution of relief material

7.1.8 Private Sector

1. The private sector should ensure their active participation in the pre-disaster activities in alignment with the overall plan developed by the GSDMA / Collector.
2. They should also adhere to the relevant building codes and other safety guidelines prescribed by relevant authorities.
3. **Participate in capacity building vulnerability reduction programme and training activities.**

7.1.9 Community Groups and Voluntary agencies

1. Local community groups and voluntary agencies including NGOs should actively assist in prevention and mitigation activities under the overall direction and supervision of the GSDMA or the Collector.
2. They should actively participate in all training activities as may be organised and should familiarise themselves with their role in disaster management.

7.1.10 Citizen

It is a duty of every citizen to assist the Commissioner, the Collector or such other person entrusted with or engaged in disaster management whenever his aid is demanded generally for the purpose of disaster management.

All citizens should also ensure preparedness at family and individual level by being aware and proactive.

7.2 Capacity Building Measures

Various stakeholders should engage in building their respective coping capacities by conducting regular trainings to upgrade their skills, by developing techno- legal regime to better deal with different aspects of disaster management and by taking

other proactive measures for the same. Some of the suggestive measures are discussed below.

7.2.1 Techno-legal Regime

1. Formulation of professional Civil Engineers Act
2. Formulation of Emergency Medical Service Act
3. Creation of an Emergency Medical Services Authority (EMSA)
4. Creation of guidelines for Emergency Care of special section of people like children, elders, BPL beneficiaries, citizens of remote and disaster
5. Review and revise building by-laws
6. Review and revise GDCR/CRZ etc.
7. Review and revise town planning Act & Rules
8. Fire Prevention and Life safety Measures Act
9. Ensure strict implementation of Code and Rules
10. Monitoring of quality construction
11. Construction/Strengthening of SEOC/ DEOC/ TEOC/ ERC

7.2.2 Training

Training is one of the essential processes to build and enhance capacity to deal with disasters. Training the community ensures skilled and trained first responders during any emergency without panic. Secondly, training the officials and responders ensures rapid and appropriate response from various stakeholders, thus minimising the loss.

Training	Responsibility
Training to civil defence personnel in various aspect of disaster management	Home Dept. Commandant General Home Guards
Training to Home Guards personnel in various aspect of disaster management including search and rescue	Director Civil Defence GSDMA GIDM
Training of NCC and NSS personnel in various aspect of disaster management	Education Department Director, NCC GIDM
Training to educational and training institutions personnel in various aspect of disaster management	Education Department GSDMA GIDM
Training to civil society, CBOs and corporate entities in various aspect of disaster management	GSDMA GIDM NGOs
Training to fire and emergency service personal in various aspect of disaster management	UDD Municipal Corporation GSDMA GIDM

Training to police and traffic personal in various aspect of disaster management	GSDMA GIDM Home Dept. Police training Institute
Training to State Disaster Response Force (SDRF) Teams in various aspect of disaster management	NIDM/NDRF Home Dept. Addl. DGP (Arms) Addl. DGP (Training) GSDMA/GIDM
Training to media in various aspect of disaster management	NIDM Information Dept. Information Training Centre GSDMA/GIDM
Training to govt. officials in various aspect of disaster management	NIDM GSDMA/GIDM Departmental Training Institutes
Training to engineers, architects, structural engineers, builders and masons in various aspect of disaster management	Departmental Training Institutes under R & B and Irrigation Dept. NIDM GSDMA/GIDM
Incorporation of DRM curriculum in all the government training institute	All Department GSDMA, GIDM
Training to all the newly appointed government officials on the various aspects of DRM	GAD, SPIPA, GSDMA, GIDM

(Table 7.1 Training of various stakeholders)

7.2.3 Awareness

Awareness in the masses regarding dos and don'ts, vulnerable areas and emergency numbers empower them to do the needful proactively as and when the situation arises. Awareness of community also reduces the chances of chaos and panic.

GSDMA regularly undertakes media campaigns through radio, television and newspapers. These include audio-visual campaigns through jingles, pamphlets, videos, etc. The campaigns cover probable hazards and other safety measures as per seasonality of hazards in the State like Uttarayan, heat wave, cyclone, Diwali safety, etc.

Similarly, following measures can be taken by respective department towards generating awareness:

1. Mass awareness through advertisement, hoarding, booklets, leaflets, banners through **print media etc.**

2. Organize awareness camps for children and make use of folk dance and music, plays, painting competition, debate competition, etc. **and to** disseminate the information
3. Organize disaster management exhibition and use scientific tools like shake-table demonstration, etc to disseminate awareness about various hazards and ways to deal with them
4. Arrange for TV Spot, radio spot, audio-visual and documentary, etc. to reach out to masses at large
5. Media can play a vital role in public awareness and preparedness through educating the public about disasters; warning of hazards; gathering and transmitting information about affected areas; alerting government officials, helping relief organizations and the public towards specific needs; and even in facilitating discussions about disaster preparedness and response

7.2.4 Developing Technical and Computer Aided Databases

1. Update the disaster risk assessment based on new districts created and any change in risk profile of population over the years
2. Develop GIS based information system for quick decision making at the time of disaster
3. Develop comprehensive decision support system **with** real-time data access and management
4. Create and disseminate database of contact details, resources, response agencies, NGOs, trained personnel, most vulnerable groups, evacuation routes, available shelters, relief centers, critical infrastructures, storage godowns, etc.

7.2.5 Knowledge Management

1. Document disasters, their impacts, lessons learnt and make it available in easily accessible format **in the public domain.**
2. Undertake research studies and apply the outcomes in disaster management practices
3. Document field data, experience and indigenous technological knowledge from local community
4. Share data/ information/ reports/ proceeding of consultation meeting/seminars etc.
5. Use information and communication technology at disaster management centres, state, district, taluka, village EOCs
6. Each department should have in place departmental disaster management plan and hazard wise SOPs

7. Each department should also conduct mock drill at regular interval and update the plan based on gaps identified in the mock drill

7.3 Current Projects/ Programmes

Currently GSDMA is undertaking various preparedness and capacity building projects and programmes at different level. Some of the key projects and programmes are:

7.3.1 Gujarat School Safety Programme

7.3.2 School Safety Week

Gujarat State Disaster Management Authority has organized the School Safety Week in 400 selected schools of Kutch, Jamnagar and Devbhumi – Dwaraka districts covered under the NSSP program to aware, educate and build the culture of preparedness among the school children.

The key activities include orientation program, creating awareness about disaster through IEC materials, film screening, understanding non-structural risks, and basic life saving skills, slogan and drawing competition and project competition for school children. The initiative also includes shakeout drills and mock exercises.

- **For 2019, the Gujarat School Safety Week was celebrated in 55,465 government and primary private schools of all districts of Gujarat.**
- **1347Masters Trained and 71075 teachers were trained for the year 2019.**
- **267 Engineers were trained *from Sarva Siksha Abhiyan.***

GSDMA celebrates Gujarat School Safety Programme for five days along with agencies like NDRF,SDRF, Fire and Emergency Services, 108 GVK Emergency, Aapda Mitra, Indian Red Cross Society and Indian Coast Guard which conducts various mock drills and demonstrations in schools during this week.

From the year 2015-2019, following developments have taken place:

- 1. Refilling and regular updating of Fire Extinguishers and First Aid Kits is also done during this week.**
- 2. *Rapid Visual Survey and Structural-Non Structural Assessment by Civil Engineers of Sarva Siksha Abhiyan* is also carried out.**
- 3. *Over 3,335 mock drills conducted***
- 4. *2,09,395 teachers trained in last 3 years***
- 5. *872 engineers from Sarva Siksha Abhiyan (Education Department) trained***

7.3.3 Disaster Risk Management Programme

The Disaster Risk Management (DRM) Programme was initiated by Ministry of Home Affairs (MHA), Govt. of India in collaboration with United Nations

Development Programme (UNDP) in the year 2002. Gujarat State Disaster Management Authority was the nodal agency for implementing programme activities in Gujarat state. The DRM Programme was formulated with a goal of sustainable reduction in disaster risk in most hazard prone districts in Gujarat state. The DRM Programme was aiming at strengthening of response, preparedness and mitigation measures over a period of time through a variety of activities at the state, district, taluka and village levels.

Considering the impact of DRM Programme activities, GSDMA included DRMP as a new scheme and made financial provision in state budget since 2008-09. With implementation of exit strategy of UNDP in the year 2008, GSDMA started utilising State Government resources and made necessary arrangements to maintain flow of DRM Programme activities all across the State. After UNDP's withdrawal in June-2009, GSDMA owned the DRM Programme and started implementing programme activities more rigorously.

The activities under DRM Programme includes preparation of Disaster Management Plans at all levels (Village, Taluka, City, Municipal Corporation & District), capacity building activities for stakeholders like orientation programmes, training, practical demonstrations and awareness generation activities. The plan and preparedness is also regularly assessed through periodic mock drills and mock exercises.

The following Disaster Management Plans are annually prepared and updated under the DRM Programme:

1. District Disaster Management Plan
2. Mahanagarpalika Disaster Management Plan
3. City Disaster Management Plan
4. Ward Disaster Management Plan
5. Taluka Disaster Management Plan
6. Village Disaster Management Plan

Currently, GSDMA focuses on all 33 Districts and 8 Municipal Corporations of the State for strengthening of Response, Preparedness and Mitigation measures. In order to ensure effective implementation of programme activities, GSDMA has also appointed District Project Officer/ Project Officers at District / Corporation level who work under direct supervision of respective District Collector/ Municipal Commissioner.

The set of activities under DRM Programme includes:

- i. Development of Disaster Management Plan at various administrative levels viz. District, Taluka, Municipality, Villages, etc.
- ii. Capacity building through training/ orientation programmes
- iii. Updating of National and State level online resource network for Disaster Preparedness and Management

- iv. Awareness generation programmes at various levels
- v. **Preparation of manuals for trainers and practitioner at all levels.**

7.3.4 Aapda Mitra

Gujarat state disaster management authority undertakes various capacities building activities to mitigate the impact of disasters. As part of such capacity building measures, GSDMA had initiated a project –“*Aapda Mitra*” on training of community volunteers in conducting basic search and rescue operations and to assist the district administration for effective disaster response.

The objectives of the program may be summarized as below:

- Reduce the response time during a disaster
- Mitigate the impact of disaster through effective response
- Build the capacity of local administration
- Mass Awareness generation

These objectives will be achieved through following three components of Aapda Mitra:

1. Deep diving and advanced swimming skills
2. Search & Rescue Trainings
3. First Aid Trainings

For successful implementation of this programme it is planned that 6 *Aapda Mitra* would be trained from each district and taluka. At the end of the training, they would be certified as “*Aapda Mitra*” by GSDMA and also provided with an identity card for the same. The “*Aapda Mitra*” shall remain present for assistance during any emergency.

GSDMA has empanelled 11 SDRF training centers for the purpose of providing training to the volunteers for Aapda Mitra.

SDRF training center has been empanelled to train the volunteers in search and rescue training first aid and deep diving.

- As of now GSDMA has trained 3645 volunteers in the whole of Gujarat. 200 community volunteers were trained in the year 2017-2018 in the Bharuch District under CSS scheme Aapda Mitra. In the year 2018-2019, GSDMA has trained 1762 volunteers in 37 training programs by SRPF. For the year, 2019-2020, GSDMA has till date trained 1683 volunteers in 33 training programs by SRPF.

7.3.5 Hospital Safety

Hospitals and medical services are an integral part of response to any unforeseen event whether natural or man-made, biological or chemical. GSDMA, with a view to develop the resilience and to augment efficacy of response for such events, started Hospital Safety project. The project aims at bringing various stakeholders on same platforms through various mock exercises. Conducting Mock-drills exercise involves the following key aspects:

- i. Preparation/ review of Hospital Disaster Management Plan with special focus on Hazard Vulnerability Risk and Capacity (HRVC) Analysis of the Hospital and its evacuation plan
- ii. Understanding and undertaking structural and non structural mitigation measures
- iii. Formulation of Disaster Management teams of Hospital
- iv. Training of Teams and staff including doctors, administrations, class IV employees, etc.
- v. Safety audits of the Hospital Building (Fire / electrical safety audits etc.) through concerned agencies

GSDMA has conducted mock exercise in two of the most important Government Hospitals that is Civil Hospital Ahmedabad and Civil Hospital, Gandhinagar.

GSDMA also assists private hospitals in reviewing their Disaster Management Plan and in planning and conducting mock exercise with them.

Capacity Development Themes:

The capacity development is applicable to all aspects of disaster management. The State government and its institutions will take actions for capacity development of different stakeholders. The capacity development themes for DRR and related responsibilities are summarized in the below given table.

Table: Capacity Development for DRR Themes - State

S. No.	Thematic Area	Sub Thematic Area
1.	Deploying advanced technology and equipment	<ul style="list-style-type: none">• Adopting the best global technologies• Identifying technology needs based on hazard risk and vulnerability and experiences• Procurements of best and most appropriate equipment
2.	Disaster Information System	<ul style="list-style-type: none">• Maintaining the resource network• Monitoring and maintaining the resource data• Regular updating the resource data• Developing fail-safe communications with advance technology• National and state level disaster information system• Improve data flows across Central Ministries/ Dept./ States and other authorised users

		<ul style="list-style-type: none"> • Integration of HRVCA data with disaster information systems • Ensuring reliable and credible database on disaster losses (direct and indirect) and post-disaster reconstruction
3.	Disaster Risk Governance	<ul style="list-style-type: none"> • Mainstream and integrate DRR and strengthen institutional mechanisms for DRR • Promote participatory approaches, partnerships and networks • Promote quality standards, certifications, and incentives
4.	Disaster Risk Management	<ul style="list-style-type: none"> • Promote, encourage and facilitate appropriate risk transfer instruments by collaborating with insurance companies and Financial institutions. • Design and implement social safety-net mechanisms, including community-based systems • Disaster resilience of health care systems by integrating disaster risk management into primary, secondary and tertiary health care • Business resilience, and protection of livelihoods and productive assets throughout the supply chains, ensure continuity of services and integrate disaster risk management into business models and practices.
5.	DM and DRR capacities at local levels	<ul style="list-style-type: none"> • Trainings in DRR at different levels of local governance • Improve awareness and preparedness of stakeholders at all levels • Preparing DM plans, regular updating, and mock drills
6.	DRR– in education, research and professional disciplines	<ul style="list-style-type: none"> • Incorporate subjects of relevance to DRR in curriculum • Introduced specialized programs, degrees, courses and diplomas <ul style="list-style-type: none"> • Promote relevant research projects, programs within institutes and through research grants • Technical and professional programs relevant to various specialized aspects of DRR • Develop ToTs • Research in diverse areas of DRR
7.	Early Warning	<ul style="list-style-type: none"> • Deploy the state of art methods and technologies • Up-grade technical infrastructure and systems • Improve EW dissemination and ensure the last mile connectivity to the most remote parts • Improve the alerts system to make it more relevant to different regions and sections
8.	Emergency Operation Centres - Strengthening	<ul style="list-style-type: none"> • Enhance emergency response capabilities • Strengthen EOCs, improve infrastructure, upgrade equipment, adopt best available technologies • Improve capabilities based on experience after each disaster event

		<ul style="list-style-type: none"> • Deploy best of ICT • Conduct capacity audits of EOCs • Set up State and District level EOCs with adequately trained manpower • Regular reviews and improvement of SOPs, protocols, etc. • Mobile control rooms
9.	Global Anthropogenic Climate Change Risks	<ul style="list-style-type: none"> • Recognise and address climate change risks in DRR • Strengthen adaptations to GACC
10.	Mainstreaming DRR	<ul style="list-style-type: none"> • Incorporating DRR into development plans and programs • Incorporating PM's Ten Point Agenda for DRR into development plans • Making DRR as an inherent part of all ministry, department, state development plans • Extending convergence to the domain of DRR
11.	Non-Structural Measures for DRR	<ul style="list-style-type: none"> • Incorporating DRR into development plans and programs • Incorporating PM's Ten Point Agenda for DRR into development plans • Making DRR as an inherent part of all ministry, department, state development plans • Extending convergence to the domain of DRR
12.	Post-2015 Global Frameworks – coherence and mutual reinforcement across DRR themes	<ul style="list-style-type: none"> • Understanding post 2015 global frameworks and their implementation for DRR • Understanding Sendai Framework and its integration into the implementation of DMP at different levels • Understanding DRR aspects of SDG and its implementation for DRR • Understanding COP21 (Paris Agreement on Climate Change) and the integration of climate-related concerns into various DMPs
13.	Preparedness and Response	<ul style="list-style-type: none"> • Institutional reforms, modernization, and changes in legal framework • Strengthening of Fire and Emergency Services • Strengthening of the Fire and Emergency Service through revamping, institutional reforms, and modernization • Comprehensive revamping of Fire and Emergency Services with institutional reforms and modernization • Adoption and adaptation of emerging global good practices • Rigorous training and HRD of first responders • Table-top exercises, simulations, and mock drills to improve operational readiness of the plans • Rescue equipment at all levels

		<ul style="list-style-type: none"> • Systems to provide basic services in emergencies • Preparedness and response plans at all levels • Community-based DRR and DM
14.	Recovery and Build Back Better	<ul style="list-style-type: none"> • Post-Disaster Needs Assessment (PDNA) systems and expertise • Credible damage assessment mechanisms and expertise • Planning capabilities to ensuring coherence of BBB with overall development efforts and goals • Studies and research for incorporating resilience into BBB models • Studies on past disasters and recovery to draw useful lessons
15.	Skill Development for Disaster Resilience	<ul style="list-style-type: none"> • Training and skill development for masons and other artisans • Promoting community-based DM considering specific needs, regional diversities and multi-hazard vulnerabilities • Training on CBDR and preparedness at local levels • Address gender issues, and special needs of children, disabled, aged, etc. holistically in the DM context • Promote private sector and civil society involvement • Promote PPPs
16.	Social Inclusion in DRR	<ul style="list-style-type: none"> • Gender-based vulnerabilities • Scheduled Castes and Scheduled Tribes • Elderly • Children • Persons with Disabilities
17.	Understanding Risk	<ul style="list-style-type: none"> • Observation Networks, • Information Systems, • Research • Forecasting • Zoning/ Mapping • Monitoring • Hazard Risk Vulnerability and Capacity Assessment (HVCA)

The National Institute Disaster Management (NIDM), in partnership with other research institutions has capacity development as one of its major responsibilities, along with training, research, documentation and development of a National level information base. The NIDM will play an important role in developing and facilitating the implementation of a National training schedule for Disaster Management. NDRF can also support capacity development and training needs of SDRF, Civil Defense, community and volunteers in preparedness and response. At the state level the major responsibility of the training in disaster management lies with the GSDMA and GIDM. Also, the training would be conducted in all other state level training institutions.



Chapter 8: Disaster Response & Relief

8.1 Level of Disasters

L concept has been developed to define different levels of disasters in order to facilitate the responses and assistances to states and districts.

Level	Description	Activities
L0	Normal time	Prevention, preparation and capacity building activities like trainings, preparation and updation of plans, mock drills, procurements of equipments, etc
L1	Can be managed at district level	State and Centre remain ready to assist if need arises
L2	Beyond the capacity of district	Require active participation and mobilisation of resources from State Government
L3	Resources of District and State Government have been overwhelmed	Require Central Government for reinstating the State and District machinery as well as for rescue, relief, and other response and recovery measures

8.2 Emergency Operations Centres

EOC is an offsite facility which functions from the State / District/ Taluka headquarters. It includes the space, facilities and protection necessary for communication, collaboration, coordination and emergency information management. It is a combination of various line departments of Government and other agencies whose services are generally required during incident response.

There is a comprehensive network for effective disaster management which includes emergency communication, operation and response management. It includes the State Emergency Operation Centre (SEOC) at Gandhinagar with 33 District Emergency Operation Centers (DEOCs), 252 Taluka Emergency Operation Centers (TEOCs) and 5 Emergency Response Centres (ERC)

The existing State Emergency Control Centre (SEOC) is a State-of-the-art infrastructure comprising of main control room, conference room, exhibition area, media briefing room, offices/meeting rooms for senior officers, rest rooms, etc. The whole facility is equipped with all the latest amenities /facilities as per **Annexure 5**

8.2.1 Security of SEOC

State Emergency Operation Centre (SEOC) being the nerve centre during occurrence of any disaster needs to be secured properly. Presence of important data, information, technical support and human resource makes security of SEOC of utmost importance. Along with this, frequent visits of Hon'ble Ministers and Senior Officials in SEOC makes it necessary to secure the centre.

In order to avoid any untoward incident at this point of juncture vigilance by Poice is must. Hence, when the SEOC is activated due to any imminent disaster services of police should be activated for the safety and security of SEOC. Hence, Police shall take over

security operations of SEOC apart from services rendered by local security agencies for SEOC.

Communication:

SEOC comprises of State of art Conference Room with video conferencing facilities, along with facilities of internet and connection to all desktops so that easy communication can prevail. SEOC is a secure centralized location, with adequate communications for planning, decision support and coordination during a disaster or emergency. To ease the process of communication a permanent helpline number 079-23251900 is installed. For communication with other stakeholder's number like 104 as health helpline number, 100 for police are also provided.

A separate media room for on the spot information dissemination on the current natural disaster is also part of SEOC. Briefing to press and media on the imminent disaster is also carried out.

8.2.2 Activation of EOC

The EOC is a nodal point for the overall coordination and control of response and relief work. In case of an L1 Disaster the DEOC will be activated, in case of an L2 disaster SEOC will be activated along with the DEOC. Working of EOC can further be understood by following states:

- i. **Normalcy (Steady State)**- When full activation of the EOC is not warranted
- ii. **Emergency / Disaster Alerts**- When the EOC is brought into full or partial activation to preemptively reduce the impact of impending incidents and respond to the impact of the incident when it transpires
- iii. **Emergency/ Disaster**- When an incident occurs with or without prior warning requiring full activation of the EOC in response to the incident

8.2.3 Command & Control of EOCs

The EOC, its system and procedures are designed in such a way that information can be promptly assessed and relayed to concerned parties. Immediate dissemination of information contributes to quick response and effective decision-making during emergency. Being the main coordination and control point for all disaster specific efforts, the EOC is the place of decision-making, under a unified command.

The EOC in normal circumstances works under the supervision of Relief Commissioner at the State level and under the District Collector at the district level. It is the nerve centre to support, co-ordinate and monitor the disaster management activities at the district level. In a disaster situation, the EOC will come under the direct control of Chief Secretary or any other person designated by the Chief Secretary as Chief of Operations.

8.2.4 Functions of EOC

1. Receive, monitor, and assess disaster information

2. Monitor, assess, and track response units and resource requests
3. Manage resource deployment for optimal usage
4. Make policy decisions and proclaim local emergencies as needed
5. Provide direction and management for EOC operations through set priorities and establish strategies
6. Coordinate operations of all responding units, including law enforcement, fire, medical, **transport, shelter, food, water etc**
7. Augment comprehensive emergency communication from EOC to any field operation when needed or appropriate
8. Maintain EOC security and access control
9. Keep Senior, subordinate and relevant officials informed
10. Keep local jurisdictions (Village/town/City, district and State) informed
11. Operate a message centre to log and post all key disaster information **and keep media informed about the current situation of the disaster.**
12. Develop and disseminate public information warnings and instructions **through media.**

8.3 Emergency Response Centres (ERCs)

In order to have speedy response in search, Rescue and relief, GSDMA has established ERCs at five strategic locations of the state viz. Gandhinagar, Vadodara, Rajkot, Surat and Gandhidham. The ERCs are equipped with trained manpower, State-of-art **vehicle and equipments** to provide support to the District EOCs **to fight the local emergency, if any. ERC performs response related activities and increase the preparedness through capacity building.**

8.3.1 Activation

ERC will get activated in case of:

- An event is or has the potential to becoming an L2 disaster or
- Specialist rescue operation is required or
- There are insufficient local emergency rescue resources

8.3.2 Command & Control

The ERCs work under the direct control of Commissioner of Relief (CoR) during response time and under representative, Municipal Corporation/ District Administration during peace time. The ERC is the instrument to provide multi-hazard emergency response to L2 events.

District Collectors/ Municipal Commissioners request the assistance from the ERC team as soon as it is established that district resources are insufficient to deal with the emergency situation at hand.

They issue instructions regarding exact quantum of resources (in terms of manpower, equipments and essential items from key departments/ stakeholders) that is required, 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.

8.4 Trigger Mechanism

The response mechanism shall be put into action considering the situation prevailing at a given point of time as per the provision made vide Section 2 (h) of the Gujarat State Disaster Management Act, 2003. Response process begins as soon as it becomes apparent that a disastrous event is imminent and lasts until the disaster is declared to be over. Response is triggered on receiving any early warning or at occurrence of disaster as the case may be. On receipt of alert/ early warning or information about onset of disaster, District Collector or Relief Commissioner assume the role of the Incident Commander (IC) for L1 or L2 level disaster respectively, as the case may be.

Immediate access to the disaster site through various means of communications such as mobiles, VSAT, wireless communication and hotline contact is also made. Depending on level of disaster, the required and relevant Incident Response Teams (IRTs) shall be activated. The State Government may publish a notification in the official gazette, declaring such area to be disaster-affected area under Section 32 (2) (a) GSDMA, Act, 2003.

The EOCs and ERCs will be put on full alert and will continue to operate as long as the need for emergency relief and operations continue and the longer term plans for rehabilitation are finalised.

8.4.1 Early warnings will be published/ issued by the respective agencies during different disaster which is as follows:

Disaster	Agencies
Earthquakes	ISR, IMD
Floods	IMD, Irrigation Dept.
Cyclones	IMD
Tsunami	IMD, INCOIS, ISR
Heat Wave	IMD
Drought	Agriculture Dept.
Epidemics	Health & Family Welfare Dept.
Industrial & Chemical Accidents	DISH, Labour & Employment Dept.,
Fire	Fire & Emergency Services

Table 8.1: Agencies Competent for Issuing Disaster Specific Early Warning

8.4.2 In case of Early Warning

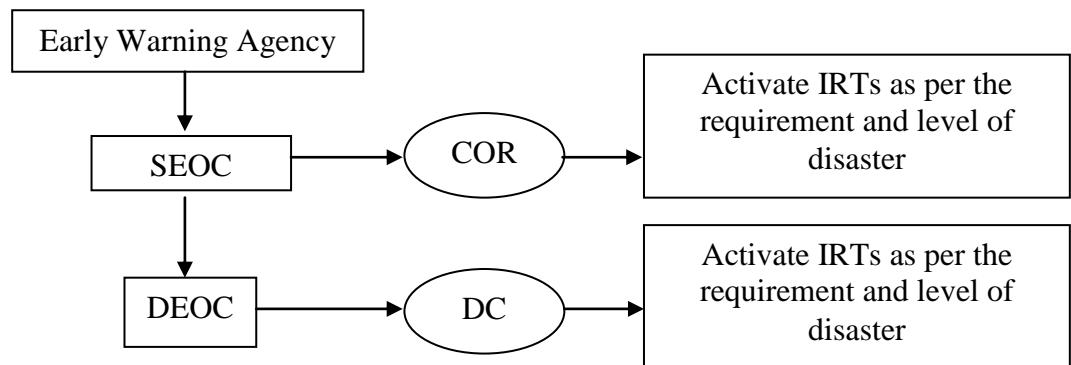


Figure 8.1: Trigger Mechanism in Case of Early Warning

8.4.3 Without Early Warning

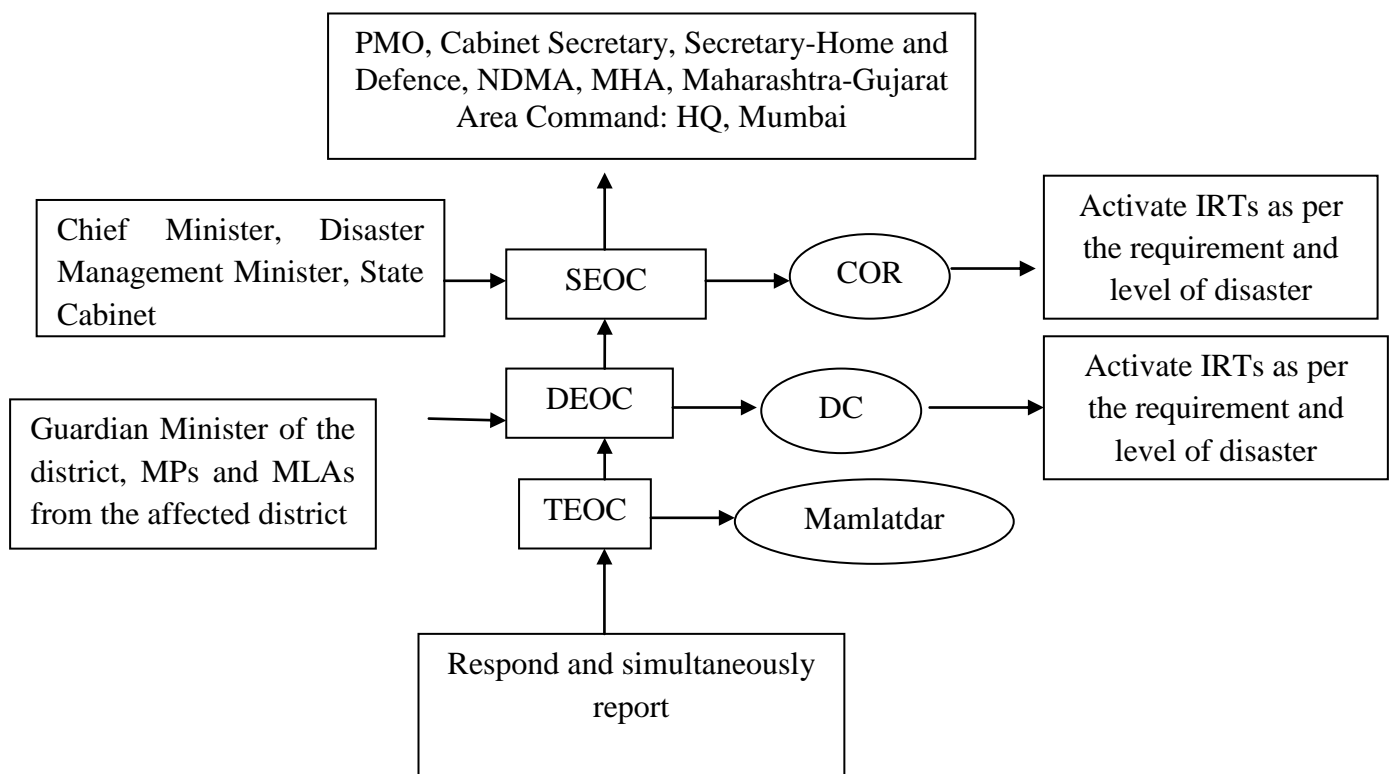


Figure 8.2: Trigger Mechanism without Early Warning

8.5 Incident Response System

Incident Response System (IRS) is one of the crucial tools for coordinated response. The system envisages that the roles and duties are laid down in advance, the personnel earmarked and trained in their respective roles and duties. It fixes accountability of the earmarked personnel and also avoids duplication of efforts by clearly demarcating the area specific task force teams.

It provides a participatory, well structured, fail safe, multi disciplinary, multi-departmental and systematic approach to guide administrative mechanisms at all levels of the government. It also provides scope for private sector, NGOs, CBOs, PRIs and communities to work seamlessly in the response activities.

Flowchart of IRS is depicted in **Figure 8.3**. The detailed roles and responsibilities of each section, branch and group are mentioned in **Annexure 6**.

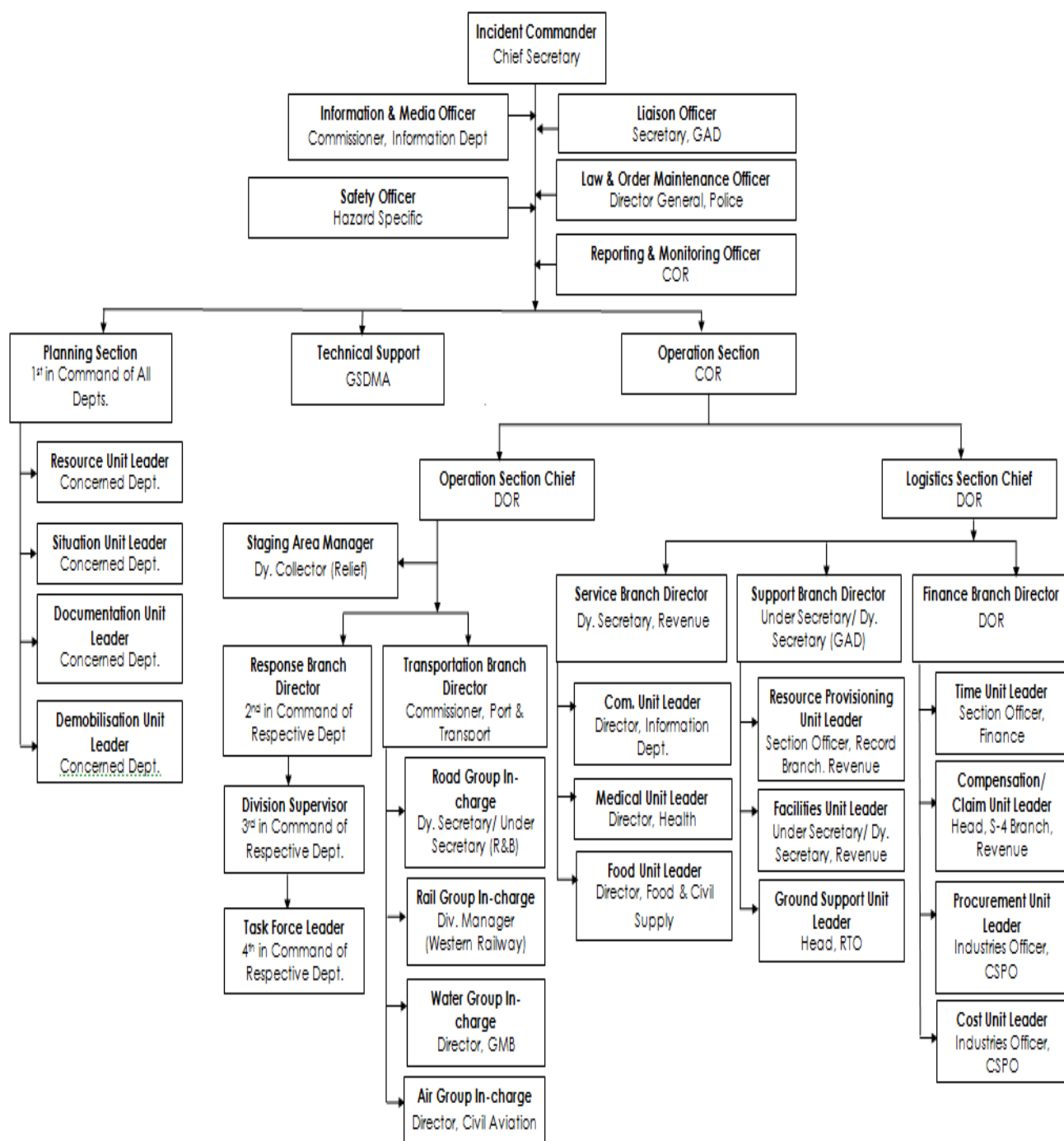


Figure 8.3: Incident Response System

8.6 Emergency Support Functions

Emergency Support Functions (ESF) are critical services which are performed in post disaster scenario to minimise life loss and address various issues in a post disaster situation. The key ESFs are listed in Table 8.3.

ESF	Aim	Responsibilities	Primary Dept./ Agency	Secondary Dept./ Agency
Early Warning, Communication & Dissemination	To activate warning systems and alert responding agencies, departments/ offices and public at large for necessary actions in safeguarding life, property and assets. To provide safe communication and last mile connectivity	<ul style="list-style-type: none"> • Failsafe communication plan is prepared with all early warning agencies • Logistic section of the state level IRT coordinates with all the agencies to provide effective communication support to the field level IRTs for response. • Ensure all communication equipment, especially the satellite phones are in good working condition 24x7 on all days through regular testing • Plans for communication including telephone and HAM is prepared for smooth coordination with the field level IRTs • To disseminate early warning signals to the district administration, local authorities, and the public at large in the areas likely to be affected by a disaster so as to reduce loss of life and property • Dissemination of warnings and information up to the last mile. • Establish protocols and responsibilities for coordination with central agencies and various providers • Prepare, update and maintain a District wise list of HAM Operators who could be contacted and deployed at the site of emergency. • Have binding agreements 	<ul style="list-style-type: none"> • Central Water Commission- Flood • Indian Meteorological Department – Flood, Heat wave & Cyclones • Indian National Centre for Ocean Information Services - Tsunami • Health & Family Welfare Department – Epidemic • Department of Science & Technology 	<ul style="list-style-type: none"> • Collector and DM • District Emergency Operations centre • AapdaMitra and other Youth and Volunteer Organisations • Communication Service Providers • GIL

ESF	Aim	Responsibilities	Primary Dept./ Agency	Secondary Dept./ Agency
		<p>with telecom service providers to restore damaged facilities and setup temporary facilities on emergency basis</p> <ul style="list-style-type: none"> • Ensure Inter-Operability among different telecom service providers 		
Evacuation	To ensure urgent, organised and safe escape of people from an area of imminent or ongoing threat or risk to life and property	<ul style="list-style-type: none"> • Quick assessment of evacuation needs information such as the number of people and animals to be evacuated and mode of evacuation • Special attention to evacuation of persons with disability, Senior Citizen ,Old age persons, Women, Pregnant Women, Children • Mobilize transport and resources for evacuation • Identify Shelter Homes, Schools, Hostels, Colleges, Dharmashala, Multi purpose halls and any other place as sites for temporary relocation for affected people and animals • Identify requirements of resources for evacuation such as helicopters, aircrafts, high speed boats and ships, Trains and Buses to be provided • Request for central resources, if needed • Coordination with central agencies to mobilise required resources • Earmark resources/ units / battalions of NDRF /SDRF for quick deployment • Prepare handbook/manuals and SOP for evacuation for people and animals 	<ul style="list-style-type: none"> • Revenue Department • CoR • Home Department • Transport Deaprtment 	<ul style="list-style-type: none"> • District Administration • Police • Transport Dept . • Aapda Mitra and NCC, NSS and other Youth and Volunteer Organisations
Data Collection & Management	To ensure sound reporting	<ul style="list-style-type: none"> • GSDMA works with the planning section at state level for making of Incident Action 	<ul style="list-style-type: none"> • GSDMA • CoR • Revenue 	DM & Collector

ESF	Aim	Responsibilities	Primary Dept./ Agency	Secondary Dept./ Agency
	mechanism to meet the information needs of both Central and State governments about the disaster	Plan (IAP) and dissemination of information. <ul style="list-style-type: none"> • Creation of a cell at the District level and place dedicated resources to collect/ update data on all essential services (as per the template given in the IRS guidelines) which will help during the response phase for effective reporting and compilation. 	Dept	
Fire fighting	To provide prompt and organized services for controlling and managing of fire incidents to save life, property and environment	<ul style="list-style-type: none"> • Quick assessment of the situation and deploy the team along with necessary equipments • Assess and make additional requirement of resources from nearby districts, states 	<ul style="list-style-type: none"> • State Fire & Emergency Services • ERC s • ULBs 	DM & Collector <ul style="list-style-type: none"> • Police • Fire Stations
Oil and Hazardous Material Response	To provide expert and technical support in case of release of any hazardous material	<p>Ensure strict compliance with guidelines</p> <ul style="list-style-type: none"> • Activation of the On-site & Off- site evacuation of the persons to avoid any casualty <p>To keep in readiness the Antidote for the relevant chemical / hazardous gases.</p>	<ul style="list-style-type: none"> • Director Industrial Safety and Health (DISH) 	<ul style="list-style-type: none"> • DM & Collector • Emergency Response Centres • Fire & Emergency Services • Health/UHC • Police
Drinking Water and Sanitation	Supply of clean drinking water and to prevent the spread of water borne diseases in the disaster affected areas.	<ul style="list-style-type: none"> • Provide disaster-affected areas with clean drinking water and to prevent the spread of water • Provide emergency water supplies when there is scarcity of potable water • Respond to the public health needs to prevent and mitigate outbreak of epidemic, water and food contamination as well as other public health-related problems in the 	<ul style="list-style-type: none"> • NWR&K Department 	<ul style="list-style-type: none"> • Revenue Dept • Panchayat, Rural Housing and Rural Development Department • UD & UHD

ESF	Aim	Responsibilities	Primary Dept./ Agency	Secondary Dept./ Agency
		aftermath of a disaster		<ul style="list-style-type: none"> Health & Family Welfare Dept
Search & Rescue	To provide life saving assistance in aftermath of disaster	<ul style="list-style-type: none"> Various positions of IRTs (State, District and Taluka) are trained and activated for response Ensure SDRF teams are trained, equipped and ready to move at a short notice to the affected areas Strategic stationing of state-of-the-art equipment for search ,rescue and response with dedicated trained manpower Activation of the MoU for emergency supply like blankets, tarpaulins, tents, boats, etc. Nodal officer selected for coordination is in regular touch with MHA /NDMA for additional requirements (including help from other Central Ministries) Deploy Quick Response Teams (QRT) and Quick Medical Response Teams (QMRT) 	<ul style="list-style-type: none"> SDRF/ NDRF Police Fire & Emergency Services 	<ul style="list-style-type: none"> Health Aapda Mitra and other Youth and Volunteer Organisations Fire & Emergency Services Home Guards
Medical Care	To provide emergency medical and mental health assistance during a disaster event or health and medical emergency	<ul style="list-style-type: none"> Health and Family Welfare Dept. works with the logistic section of the state level IRT to provide effective services (Medical Unit) to the field level IRTs for response. District wise repository of hospitals (both Government and Private), availability of beds, Doctors, paramedics and other trained staff available along with other infrastructure details and update it on a regular basis 	<ul style="list-style-type: none"> Health & Family Welfare Dept 	<ul style="list-style-type: none"> Civil Hospital UHC/PHC/ CHC Red Cross Society EMRI 108 AapdaMitra and other Youth and Volunteer Organisations

ESF	Aim	Responsibilities	Primary Dept./ Agency	Secondary Dept./ Agency
		<ul style="list-style-type: none"> • Include the hospital wise information in the DM Plans at local levels • Tie-up with the companies for easy availability of common medicines during the emergency situations • Hygienic conditions are prevalent at all times in various facilities established as well as hospitals to curb the spread of diseases • Establishment of sound protocols for coordination between state's health Dept. and the central agencies • Ensure strict compliance with minimum standards of relief as decided by the state 		
Dignified Management of the Dead	<p>To ensure proper identification and record-keeping of the dead</p> <p>To facilitate in appropriate cremation or burial</p> <p>Timely claim of compensation and belongings of the dead to minimise the physical, psycho-social,</p>	<ul style="list-style-type: none"> • Adopt SOP in SDMP and DDMP as per GoG guidelines and implement it properly • Establishing Dead Body Management Group in the IRS at state and district levels • Deploy trained squads for detection and recovery of the survivors and the dead as early as possible • The recovery team will use basic personal protective kit and follow adequate precautions • Follow the protocols for the identification of the dead, recording evidence, transport and burial (i.e., disposal as per norms) • If required, establish temporary mortuaries with adequate facilities where it is possible • In special cases, appropriate arrangements and relevant 	<ul style="list-style-type: none"> • Police 	<ul style="list-style-type: none"> • Revenue • Health • Local Authorities • GFSU

ESF	Aim	Responsibilities	Primary Dept./ Agency	Secondary Dept./ Agency
	ethical, religious and cultural issues faced by aggrieved families	<p>protocol must be followed for victims in certain types of disaster keeping in view the safety of survivors and emergency workers</p> <ul style="list-style-type: none"> • Inform the affected community by giving wide publicity to the procedure for the management of the dead • Take urgent steps for release of ex-gratia payment • Ensure to the extent possible ethical management of the dead, along with respect for religious and cultural sensitivities • Deal with the psychological impacts and psycho-social support • Ensure due documentation such as inventory record of the dead, dead body identification and all other relevant information 		
Relief Logistics and Supply Chain Management	To provide water, food, clothing, medicines and other basic supplies to the people at affected areas and relief centres	<ul style="list-style-type: none"> • Establish a mobilisation centre at the airport/railway station for the movement of relief supplies within the state. <ul style="list-style-type: none"> • Deploy special transportation for the movement of relief supplies within the state • Make arrangements to receive and distribute relief and emergency supplies received from different parts of the state and country • Coordinate transportation (air, rail, road, water) with state and Central ministries/ departments/ agencies • Arrange alternative means of 	<ul style="list-style-type: none"> • Revenue Dept. • Food, Civil Supplies & Consumer Affairs Department • 	<ul style="list-style-type: none"> • Revenue • Police • Panchayat, Rural Housing and Rural Development Department • All line Dept.

ESF	Aim	Responsibilities	Primary Dept./ Agency	Secondary Dept./ Agency
		transportation to reach relief supplies to the affected locations		
Transportation	To provide transportation services and support for efficient and timely response and recovery to a disaster	<ul style="list-style-type: none"> • Transport Department works with the logistic section of the state level • IRT to provide effective services(Ground Support Unit) to the field level IRTs for response • Requirement of transport for the transportation of relief material, responders are arranged • Need of the transport of various activated section of the IRT as per Incident Action Plan is fulfilled • Indian Railway works with the logistic section of the state level IRT to provide effective services(Ground Support Unit) • Coordinate with central govt. for transportation of relief materials • Within and near Airports: AAI works with the logistic section of the state level IRT to provide effective services (Ground Support Unit) and also provide Nodal Officer for coordination of the relief operations • Restoration of Airport at the earliest involving specialised response force of the central government • Coordination with state and district administration to provide air support • Cater to the needs of transport to affected people, if required. 	Port & Transport Department	<ul style="list-style-type: none"> • RTA-GSRTC • Local Transport Agencies/R Ts • Railways • Civil Aviation • Municipal Corporations/ ULBs
Temporary Shelter/ Camp	To address all basic	<ul style="list-style-type: none"> • Ensure strict compliance with minimum standards of relief 	Revenue Department	<ul style="list-style-type: none"> • DM & Collector

ESF	Aim	Responsibilities	Primary Dept./ Agency	Secondary Dept./ Agency
Management	needs of the affected population and ensure safe, accessible, and secure shelter environment for evacuees.	<p>of state government</p> <ul style="list-style-type: none"> • Logistic section of the state level IRT must coordinate with Railways to provide effective services to the field level IRTs for response • Alternate places for establishment of facilities as mentioned in the IRS guidelines such as relief camp, base, camp etc. are identified in advance and included in the local DM Plan • Stockpile tents, tarpaulins and temporary shelter material in regional warehouses/ stores/ EOCs/ ERCs • Depending upon the requirement, coordinate with the relevant Central Ministry to make sure that the tents/ shelters reach the site on time. • Deploy a dedicated team at the local level to receive the tents/ shelters • Maintain logs (manual or computerized) of all material movements and details of distribution to required locations 		<ul style="list-style-type: none"> • Panchayat, Rural Housing and Rural Development Department • Food & Civil Supplies • Health • Police • Water Supply • Energy & Petrochemical Dept
Energy	To ensure rapid restoration of power to affected areas particularly to critical facilities on the priority	<ul style="list-style-type: none"> • Electricity Board and Power Distribution Companies work with the logistic section of the state level IRT to provide effective services to the field level IRTs for response • Pre-disaster arrangements for quick restoration of power supply with alternate mechanisms to critical facilities usually within 6 to 12 hours of placement of order • Mobile power supply units or other arrangements with 	Energy & Petrochemicals Dept.	<ul style="list-style-type: none"> • Gujarat Electricity Companies

ESF	Aim	Responsibilities	Primary Dept./ Agency	Secondary Dept./ Agency
		power generation companies for quick deployment at the site during emergency		
Public Safety & Security	To ensure safety and security of affected population first responders and their property	<ul style="list-style-type: none"> • Maintain law and order during emergency situations; • Ensure safety of Women & Children • Protect property in evacuated areas; • Controlled access to damaged areas; • Establish and coordinate traffic control points as needed; • To carry out the crowd control as needed; • Participate in the local warning system; • Assist in the evacuation of prisoners from the jail by providing perimeter security 	Home Department	<ul style="list-style-type: none"> • DM & Collector • Police • Home Guards • Panchayat, Rural Housing and Rural Development Department • WCD • Social Justice & Empowerment Dept.
Media Management	To ensure precise and accurate incident briefing to public and ensure proper rumour and panic management	<ul style="list-style-type: none"> • Information and Broadcasting Department works with staff as Information and media officer of the state level IRT to provide effective services • Ethical guidelines for coverage of disaster is prepared and shared with all media agencies • Plan is prepared for providing/broadcasting warnings, do's and don'ts etc. to media and ensure its dissemination 	Information Department	<ul style="list-style-type: none"> • DM & Collector • Police • District Information Officer
Disposal of Animal Carcasses	Ensure safe disposal of animal carcasses	<ul style="list-style-type: none"> • Activate the Animal Carcass Management Group in the IRS • Equip and train the staff in carcass removal/ disposal at pre-identified sites to ensure that no other health hazard is created both for the staff as well as the public • Use of recommended safety kits and personal protection 	U D Department Panchayat & RDD	Local Municipality ULBs / Local Sanitary Inspector Gram Panchayat

ESF	Aim	Responsibilities	Primary Dept./ Agency	Secondary Dept./ Agency
		<p>by the staff deployed in carcass disposal so that they are not infected</p> <ul style="list-style-type: none"> • Take measures for dispersal of financial relief as per norms 		

Table 8.2 Emergency Support Functions

8.7 Disaster Reporting and Assessments

There are three kinds of assessment reports made at different timeframe. Each assessment report has different format for collection of data and reporting of information. These reports are designed to assess:

- a) Life threatening situation
- b) Need for emergency food, water, shelter and medical assistance
- c) Need for restoration of critical facilities and services

The format for Damage and Need Assessment is mentioned in Annexure 7.

8.7.1 Rapid Report

It is aimed at obtaining a broad picture of extent of damage. It should ideally be undertaken within 4-8 hours of all clear. It helps in identifying the immediate actions necessary to be made.

8.7.2 Preliminary Report

Preliminary report is made within first 7 days of all clear. Within these 7 days, interim SITREP should be prepared and submitted at the end of 48 hours followed by SITREPS at the end of each 24 hours period. The objective of this report is to obtain more detailed and specific data regarding damage and needs. The 48 hours report should include wherever possible preliminary cost estimates of damage.

8.7.3 Detailed Report

Detailed report is made within 21 days of all clear. This assessment is conducted sector-wise and is aimed at finding the detailed damage and post disaster needs of each sector so as to plan recovery and rehabilitation of the sector. The direct costs associated with recovery and rehabilitation of each sector should be mentioned in details wherever possible.

8.7.4 Deactivation of the Process

After the process of damage and need assessment is over, the designated authority shall issue the appropriate directives to deactivate the damage and need assessment process.

8.8 Minimum Standard of Relief

National Disaster Management Act, 2005 mandates the State government to lay down detailed guidelines for providing standards of relief to persons affected by disaster in the State.

State government has laid down detailed guidelines for providing relief at the time of disaster. The copy of the same is given as **Annexure 7**

8.8.1 Finalizing relief payouts 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.

If in the opinion of GSDMA the relief provided by the Commissioner or the Collector is not adequate, GSDMA shall recommend the Government to modify the norms followed and whenever necessary would recommend other relief measures.

GoG should also ensure that all Government Departments, responding agencies and forces are striving to achieve the Minimum Standards for Disaster Relief by GoI/ GoG. These standards deal with various domains like water supply, sanitation, hygiene promotion, food security and nutrition, shelter and medical cover.

8.8.2 Relief Kits

Indicative details of immediate relief kit, household kits and family ration kits are mentioned in **Annexure 8**.

8.8.3 Post-relief Assessment

GSDMA, with assistance from Government Departments, District Administration and local authorities shall document learning from the relief experience and incorporate the same for relief or rehabilitation and reconstruction plans.

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



Chapter 9: Reconstruction and Rehabilitation for Resilient Recovery

9.1 Introduction:

Rehabilitation and Reconstruction plays an important role in the disaster recovery phase. The reconstruction and rehabilitation activities, which follow the disaster response stage, aim at achieving long term recovery. On the expiry of a disaster declaration, the GSDMA shall, where necessary, act as an agency for facilitating and coordinating rehabilitation and reconstruction activities by departments of the Government.

Globally, the approach towards post-disaster reconstruction and rehabilitation has shifted to building back stronger, faster and inclusive to achieve resilience. While disasters result in considerable disruption of normal life, enormous suffering, loss of lives and property, global efforts consider the recovery, rehabilitation and reconstruction phase as an opportunity to **“Build Back Better”** (BBB) integrating disaster risk reduction into development measures and making communities resilient to disasters

The proposed reconstruction and rehabilitation actions/measures in this plan are keeping in view the worst -case scenarios in which the capacity of the State and District administration would be overwhelmed and require assistance from the Central Government for re-establishing normalcy in the disaster affected areas. This chapter provides a general framework for the role of Government and its development partners in restoring after a disaster, various essential and basic services. Much of this support will involve the coordinated working of multiple agencies – government and non-government. All the agencies are required to closely monitor response activities and to obtain valuable data regarding the severity and intensity of the event, the affected geographical area and the potential unmet critical needs of the affected population while evolving a comprehensive recovery plan. The key activities in the phase are discussed as below.

9.2 Recovery Process

Effective post -disaster recovery usually has the following three broad aspects:

- Physical aspects of recovery, i.e. restoration and reconstruction of damaged community infrastructure, critical infrastructure, private houses and cultural heritage buildings
- Economic aspects of recovery, i.e. livelihoods, productive activities and market services
- Social recovery, i.e. social and psychological aspects of personal, family and community functioning and wellbeing.

Recovery is most successful when the wide-ranging needs of communities, organizations, different vulnerable groups and individuals are addressed in the coordinated manner that recovery frameworks enable. Disaster recovery process is rarely a set of orderly actions. It will consist of several related activities such as the following:

9.2.1 Relief Memorandum [for seeking assistance from National Disaster Response Fund(NDRF)]

While a preliminary rapid damage assessment is carried out during disaster phase, a damage and loss assessment is conducted following the provisions and norms in the manual of National Disaster Response Fund/ State Disaster Response Fund. The CoR / Revenue Department of each is mandated to collect information on damage and losses after any disaster and to provide the required disaster response thereafter.

The relevant government departments and local authorities shall initiate a detailed assessment at their respective level for the damages occurred in their respective jurisdiction in the affected regions.

For assessing the damage and need of the affected community, the damage and need assessment team should take into account the composite representation of all the different communities and vulnerable groups in the affected area. An ideal team would include expert in the related field, government official and representatives from majority and minority communities, Women, Scheduled Caste, Schedule Tribes, Panchayat member or nagarpalika member, etc.

The format for development of Relief Memorandum is as per **Annexure 9.**

9.2.2 Post Disaster Needs Assessment

The primary objective of any Post Disaster Needs Assessment (PDNA) is to assess the full extent of a disaster's impact, define the needs for recovery and design a recovery strategy. A PDNA looks ahead to restoring damaged infrastructure, houses, livelihoods, services, governance and social systems, and includes an emphasis on reducing future disaster risks and building resilience..

National Disaster Management Authority (NDMA) with the assistance of National Institute of Disaster Management (NIDM) has developed PDNA Tools for India with the objective to establish a standardized mechanism based on scientific approach for conducting post disaster needs assessment for recovery and reconstruction.

The PDNA is an assessment covering 23 thematic areas as follows

- Social Sectors:
 1. Housing
 2. Health & Population
 3. Nutrition
 4. Education
 5. Cultural Heritage
- Productive Sectors:
 1. Agriculture
 2. Irrigation
 3. Commerce & Industry

4. Tourism
5. Financial Sector
- Infrastructure Sectors:
 1. Electricity
 2. Communications
 3. Community Infrastructure
 4. Transport
 5. Water, Sanitation & Hygiene
- Cross-cutting Sectors:
 1. Governance
 2. Disaster Risk Reduction
 3. Environment & Forestry
 4. Employment & Livelihoods
 5. Social Protection
 6. Gender Equity & Social Inclusion
 7. Poverty and Human Development
 8. Macroeconomic Impact Assessment

Operational Activities and Protocols for PDNA

Planning for PDNA

1. The GSDMA / R & R branch of Revenue department, based on the initial assessment and in consultation with NDMA will recommend for PDNA exercise after a week of the disaster event.
2. As per the approval by the Hon. Chief Minister (Chairman, Governing Board of GSDMA) on requirement of PDNA, the State shall inform the national nodal ministries and invite the other government departments and technical agencies such as CWC, IMD, ISRO etc. to participate in the PDNA activities. The GSDMA/ R & R branch of Revenue department shall lead the PDNA in cooperation and coordination.
3. The PDNA should be a well-coordinated inter-agency mechanism. Agreement on the management structure of the PDNA is important: The management structure shall comprise of the following:
 - i. ***PDNA management team:*** The assessment team is normally led by the CEO, GSDMA / Secretary (R & R). The management team shall meet regularly to oversee the process of assessment, provide strategic guidance, take decisions and shall ensure that the necessary resources are available for undertaking the assessment.
 - ii. ***Coordination team:*** The members can be from national ministries or state departments. The team shall be responsible for managing day-to-day planning, coordinating with the sector team members as well as state government and donors in conducting the assessment, analyzing the data, preparing the reports,

- and the development of the recovery and reconstruction framework under the guidance on the PDNA management team. The Coordination team shall have the principal responsibility in organizing the conduct of the assessment and in ensuring that all logistic arrangements are in place.
- iii. **Sector teams:** the sector teams shall be composed of designated technical representatives from line departments at national, state and district offices, as well as with representatives from development partner agencies. The sector team will be responsible for collecting sector specific baseline data, damage and loss data, undertaking field visits to validate the data collected, analyzing the data and writing the sectoral assessment report on damage and loss and propose sector priorities for recovery and reconstruction.
 - iv. **Report Preparation Secretariat:** the coordination team, with technical support from development partners (if required), shall be responsible for coordinating with the sectoral team members for the sector report based on data analysis for their sector. The coordination team will then compile and summarize the individual sectoral report into consolidated report.
4. The CEO,GSDMA/ Secretary (R & R) as the leader of the PDNA management team will brief the Chairman, GSDMA and State Crisis Group on the conduct of the PDNA and recommend appropriate actions to be taken, including timeframe for completing the assessment and delivering the report. The CEO,GSDMA / Secretary (R & R) will also decide if assistance from development partners, in the conduct of the PDNA, is needed. If required, the nodal ministry at national level will coordinate with the Ministry of External Affairs (MEA), to issue a formal letter requesting for assistance from development partners in the conduct of PDNA.
 5. Once the formal request is made by the MEA to development partners, the MHA will call for an internal meeting – called “**Stakeholder Consultation**” between the international agencies and development partners. The cost of the assessment shall be borne by the GSDMA / Revenue Department.
 6. Prior to starting the assessment, an “**Orientation Training**” will be organised to refresh the designated PDNA team members on the broad concept of the damage, loss and needs as well as methodology for undertaking the assessments for each sector/sub-sector and issues to be aware when the team is in the field for individual sector members.
 7. Finally, Sector teams will initiate **collection of baseline data** as per the templates prescribed in the sector specific Guidance Notes (GOI) on undertaking damage, loss and needs assessment. The Central Statistical Organization (CSO) as well as the line departments will maintain and update key baseline data of sectors.

9.2.3 Developing Reconstruction and Rehabilitation Strategy for Resilient Recovery

In parallel to the PDNA planning process, the formulation of Reconstruction and Rehabilitation will be initiated by GSDMA / Revenue Dept. (R &R) with the objectives to –

- Provide indicative steps to facilitate a sequenced, prioritised and flexible multisectoral planning guide for recovery programmes.
 - Provide guidance to state for organising post-disaster recovery in accordance with the damages, losses and needs following a disaster event.
 - Plan and implement a post-disaster recovery programme in an inclusive and transparent manner (including financial planning and institutional arrangements).
 - Recommend policies, strategies, areas of technical assistance and monitoring support needed for recovery programming.
 - Optimise the use of national and state flagship programmes, other schemes and resources for implementing recovery.
- Provide guidance to reduce future disaster risks and allow for further opportunities for long-term sustainable development.

9.3 Short-term, Mid-term and Long-term Recovery

The disaster recovery programmes usually proceed in three distinct stages to facilitate a sequenced, prioritized, and flexible multi-sectoral approach. Three recovery stages, in which appropriate policies and programmes tend to be planned and implemented are: a) Short term, b) Mid -Term, and c) Long-term.

9.4 Repair and Restoration

The state governments as per the existing policy provides assistance to the affected citizen to repair and restore damaged houses and dwellings. Respective departments should carry out repair and restoration of the related infrastructure, facilities, services, etc. at the earliest so that the essential services can be resumed to bring the life back to normalcy.

The government shall also coordinate with national and international NGOs, donor agencies and other government bodies to prioritise restoration of critical infrastructure like health, temporary housing, lifesaving facilities, critical government infrastructure, etc.

9.5 Reconstruction

Gujarat State Disaster Management Authority (GSDMA) shall oversee reconstruction and rehabilitation work and ensure that it takes into account the overall development plans for the state. These reconstruction efforts include:

- Reconstruction of public infrastructures and social services damaged by the disaster, which can be completed over long-term
 - Re-establishment of adequate housing to replace that which has been destroyed
 - Restoration of jobs / livelihood that was lost
- Restoration of the economic base of the disaster areas

a. Owner Driven Reconstruction

- Reconstruction should be done on the principle of Owner Driven Reconstruction. Here the district administration aids in provision of funds and technical expertise for construction activity. In principle allow active participation of the affected family/owner in rebuilding their houses and ensures that their houses suit their cultural, occupational and other personal needs and context. It also gives them a sense of ownership and change their mindset from 'being a beneficiary' to 'being an owner' which also aids in psychological rehabilitation.
- The active participation of the owner also ensures regular monitoring of the process, quality of material used, etc. which helps in speeding up the reconstruction process.

b. Build Back Better

- Reconstruction post disaster also gives an opportunity to build back better. The new construction post disaster should comply with all safety norms, guidelines and building codes. The design of these buildings should be disaster resilient as per the hazard profile of the state.
- Government of Gujarat shall monitor the reconstruction process and ensure that the principle of build back better is followed through disaster resilient reconstruction.

9.6 Rehabilitation

Holistic rehabilitation post disaster includes many inter linked aspects. It is critical to address the need of affected population in order to achieve early recovery and to bring back life to its normalcy.

9.6.1 Socio-economic Rehabilitation

Socio-economic rehabilitation is aimed at revamping the social and economic fabric to the pre-disaster or a better situation. It also addresses issues like that of restoration and generation of livelihoods. This is done by providing required training, skill, tools and equipment to restart the previous or new livelihood options.

Care should also be taken to address the needs of various socially and economically vulnerable groups like that of women, adolescent girls, old age persons, person with disabilities, children, destitute, below poverty line population, scheduled castes, scheduled tribes, particularly vulnerable tribal groups, etc.

9.6.2 Psychological Rehabilitation

Disasters often lead to long time stress and trauma due to loss of near and dear ones, injuries, loss of limbs, loss of housing and related property, trauma generated by facing the disaster

and fearful sites, fear of repetition of the disaster, etc. If not addressed appropriately, it may lead to lifelong psychological fear and disorders, thus it is necessary to provide psycho-social first aid and psychological care to the affected population.

9.6.3 Environmental Rehabilitation

Environmental impacts of disasters can result in serious risk to life and livelihoods if not addressed. Environmental emergencies like uncontrolled, unplanned or accidental release of a substance into the environment not only impact human life in many ways but also damage environment to great extent which may be impossible or may take years to restore to its original.

Thus without proper consideration of the environment, pre-existing vulnerabilities may be re-created or exacerbated. Thus GoG along with other concerned department should ensure measures to decontaminate the affected elements like air, river, water bodies, forests, etc.

9.6.4 Relocation

The state government believes that need-based considerations and not extraneous factors drives the relocation of people. The local authorities, in consultation with the affected persons and under the guidance of GSDMA, shall determine relocation needs taking into account criteria relevant to the nature of the calamity and the extent of damage. Relocation efforts will include activities like:

1. Gaining consent of the affected population
2. Land acquisition
3. Urban/ rural land use planning
4. Customizing relocation packages
5. Obtaining due legal clearances for relocation
6. Getting the necessary authorization for rehabilitation
7. Livelihood rehabilitation measures for relocated communities, wherever necessary

While planning on site reconstruction or relocation, care should be taken to provide the community with all basic amenities in close vicinity of the reconstruction site. This leads to inclusive and holistic reconstruction process. Some of the basic amenities are as follows:

1. Health
2. Education
3. Provision of adequate drainage system
4. Provision to drinking water
5. Provision for proper sanitation
6. Provision for Electricity
7. Provision for waste collection and management
8. Market place
9. Connectivity to road and railway

9.6.5 Restoration of Damaged Cultural Heritage Sites, their Precincts and Museums

Post disaster repairs and reconstruction of damaged sites / precincts to be undertaken based on sound documentation and assessment practices. Poor reconstruction practices cause further physical damage to heritage structures, may worsen its structural vulnerability and carries the risk of erasing the heritage features. Restoration or reconstruction of heritage after disasters should go beyond buildings and it should look at heritage livelihood, traditional trades/ crafts etc.

9.7 Project Management

Since rehabilitation and reconstruction effort typically involves the co-ordinated efforts of several entities / institutions , the GoG shall encourage the respective entities to strengthen program management capabilities to ensure that synergies across and within entities are managed efficiently. In addition, it is also necessary to constantly monitor the activity to ensure that the project is executed on time, in accordance with the technical specifications and to the satisfaction of the beneficiaries. GSDMA, in coordination with relevant government departments, will monitor the reconstruction activity that is carried out by various implementation agencies.

Typical implementation activities would include:

- Disaster proofing and retrofitting of houses
- Creation/ retrofitting of structures – including roads, bridges, dams, canals etc that may have been destroyed/ damaged due to the disaster
- Restoration of basic infrastructure facilities, for example, ports, airports, power stations etc.
- Creation of health centres, first aid centres, hospitals, groups of doctors and surgeons etc.
- Restoration of the industrial viability of the affected area.
- Restoration of livelihood.

For managing long-term rehabilitation programmes, such as reconstruction of houses, infrastructure and other social amenities, the responsibilities will be that of respective line departments through a well-structured R & R Programme.

9.8 Information, Education and Communication

Communication activities are necessary to convey to the larger community the scope and nature of the proposed reconstruction and rehabilitation effort so as to increase the stakeholders awareness and buy-in for the ongoing activities. Hence, GSDMA and relevant government departments, district administration and local authorities shall undertake:

- **Ongoing media management/ Public Relations:** To ensure that accurate communication of the reconstruction and rehabilitation measures are being informed to the various stakeholders;
- **Community management:** This includes communicating to the affected communities with a view to appraising them of efforts being made for their relocation/ rehabilitation/ reconstruction;
- **Feedback mechanisms:** Using the communication network to get feedback on reconstruction and rehabilitation measures.

9.9 Dispute Resolution Mechanisms

GSDMA, in coordination with relevant agencies, shall institutionalize mechanisms to address beneficiary grievances at various levels, as well as explore innovative ways of dispute minimisation like involving the community in reconstruction initiatives. Appropriate mechanism with penalties for dealing with false claims will be evolved to prevent misuse of assistance.

9.10 Implementing Initiatives for Recovery of Reconstruction Costs

The GoG shall finalise and implement selected recovery measures such as:

- Imposing tax surcharge levies (central)
- Imposing local taxes
- Facilitation of funding responsibility sharing by beneficiaries etc.



Chapter 10 : Financial Arrangements

The DM Act, 2005 recommended central government and state government to have a Disaster mitigation and response funds. The 15th Finance Commission recommended setting up National and State Disaster Risk Management Funds (NDRMF and SDRMF) for the promotion of local-level mitigation activities. The Commission has recommended retaining the existing cost-sharing patterns between the centre and states to fund the SDRMF and the SDRF (existing). The cost-sharing pattern between centre and Gujarat is 75:25.

The DM Act, 2005 has clearly mandated upon the Government to ensure that the funds are provided by the Ministries and Departments within their budgetary allocations for the purpose of disaster management. The Act has stressed upon the need for mainstreaming of the Disaster Risk Management by way of making definite budgetary arrangements for the purpose by the respective Ministries and Departments within their overall agenda.

10.1 Funds at National Level

10.1.1 National Disaster Risk Management Funds (NDRMF)

National Disaster Risk Management Funds (NDRMF) has been set up as per the recommendation of 15th Finance Commission (FC). NDRMF comprises of the National Disaster Mitigation Funds (NDMF) and National Disaster Response Funds (NDRF). Out of the total NDRMF, the share of NDRF shall be 80 per cent and the share of NDMF 20 per cent. Within the NDRF allocation of 80 per cent, there would be three sub-allocations. They are Response and Relief (40 per cent), Recovery and Reconstruction (30 per cent) and Preparedness and Capacity-building (10 per cent). While the funding windows of NDRF and NDMF are not inter-changeable, there could be flexibility for re-allocation within the three sub-windows of the respective Funds and such re-allocation shall not exceed 10 percent of the allotted amount of that sub-window.

10.1.2 Prime Minister's National Relief Fund (PMNRF)

Prime Minister's National Relief Fund (PMNRF) was established entirely with public contributions and does not get any budgetary support. PMNRF accepts voluntary contributions from Individuals, Organizations, Trusts, Companies and Institutions etc. All contributions towards PMNRF are exempt from Income Tax under section 80(G) of the Income Tax Act, 1961.

The resources of the PMNRF are utilized to render immediate relief to families of those killed in calamities like floods, cyclones and earthquakes, etc. Assists partially to defray the expenses for medical treatment like heart surgery, kidney transplantation, cancer treatment of needy people and acid attack etc. The corpus of the fund is invested in various forms with scheduled commercial banks and other agencies. Disbursements are made with the approval of the Prime Minister.

10.2 State Level

10.2.1 State Disaster Risk Management Funds (SDRMF)

State Disaster Risk Management Funds (SDRMF) has been set up as per the recommendation of 15th Finance Commission (FC). SDRMF comprises of the State Disaster Mitigation Funds (SDMF) and State Disaster Response Funds (SDRF). Out of the total SDRMF, the share of SDRF shall be 80 per cent and the share of SDMF 20 per cent. Within the SDRF allocation of 80 per cent, there would be three sub-allocations. They are Response and Relief (40 per cent), Recovery and Reconstruction (30 per cent) and Preparedness and Capacity-building (10 per cent). While the funding windows of SDRF and SDMF are not inter-changeable, there could be flexibility for re-allocation within the three sub-windows of the respective Funds and such re-allocation shall not exceed 10 percent of the allotted amount of that sub-window.

SDMF shall be used for those local level and community-based interventions which reduce the risks and promote environment-friendly settlements and livelihood practices. However, large-scale mitigation interventions such as construction of coastal walls, flood embankments, support for drought resilience etc. should be pursued through regular development schemes and not from the mitigation fund. The detailed guidelines for the constitution and utilisation of these funds shall be issued by the Ministry of Home Affairs,

10.2.2 Chief Minister's Relief Fund

This provides immediate support to the distressed people affected by the disasters, or road, air or railway accidents, Communal riots, Crop failure, Floods etc. The funds can be used for those people who have been affected by cancer, Heart surgery and other ailments, too.

10.3 Other Sources of Funds

a. Public Private Partnership

There are projects/schemes in which funding can be done by a public sector authority and a private party in partnership. In this State Govt. along with Private organizations and with Central Govt. share their part.

b. Grant in Aid

State government may receive a grant in aid from Central Govt, or a local authority, bilateral or multilateral funding agencies, etc. to carry out specific projects/schemes related to disaster risk reduction and management.

c. Corporate Social Responsibility (CSR) Funds

Corporate social responsibility is a broad concept that can take many forms depending on the company and industry. Through CSR programs, philanthropy, and volunteer efforts, businesses can benefit society while boosting their brands.

Section 135 of the Act, Schedule VII and Companies (CSR) Policy Rules, 2014, provide a robust framework for companies to partner in contributing to the country's development challenges through its managerial skills, technology and innovation. Besides providing an overall guidance framework for the corporates to carry out their CSR initiatives, it also provides them with ample autonomy and flexibility to design and implement programmes. The monitoring is based on disclosures made by the company in the prescribed form and annual report. The company has to disclose its details on CSR implementation, including allocation of funds, destination state and development sector where the CSR expenditure is done, etc. annually to this Ministry through filing of annual report on CSR. The mandatory CSR reporting has its advantages as it allows the corporates to demonstrate their commitment towards CSR and communicate with different stakeholders, including shareholders, regulators, customers and society at large.⁷

d. Loan

GSDMA may borrow money from the open market with the previous approval of State government to carry out disaster management functions as described in DM Act, 2003.

e. Disaster Bonds

State government can also raise funds for major disasters by exploring the options of long term disaster bonds.

f. Donations

As per the provisions of clause 33 of The Gujarat State Disaster Management Act, 2003 the Authority may accept grants, subventions, donations and gifts from the Central or State Government or a local authority or any individual or body, whether incorporated or not.

⁷http://www.mca.gov.in/Ministry/pdf/CSRHLC_13092019.pdf

g. Recovery Measures -Introduction of Special Tax

The GoG shall finalise and implement select recovery measures such as imposing tax surcharge levies (central), imposing local taxes, facilitation of funding responsibility sharing by beneficiaries etc.

h. Funds Disbursement and Audit

The funds raised from funding agencies are usually accompanied by stringent disbursement and usage restrictions. It is therefore important to monitor the disbursement of such funds to ensure that none of the covenants are breached. GSDMA, in conjunction with relevant agencies, shall monitor disbursal of funds by:

- Prioritizing resource allocation across approved projects
- Establishing mechanisms (like a chain of banks, collection centres, nature of accounts, spread etc) for collection of funds
- Ongoing monitoring and control of fund usage throughout actual project implementation



Chapter 11 :Plan Maintenance

Plan maintenance is a dynamic process of updating the plan on a periodic basis. The plan must be periodically updated to make it harmonious with the changes in Government policies, initiatives, priorities and to incorporate various technological changes and national experiences. The back-bone of maintaining the plan is carrying out mock exercises and updating the plan based on the lessons learnt as an outcome of the mock exercise which consists of identifying the gaps, rectifying them and improving the efficiency of the plan. Further, the priorities for an organisation may change as the communities are included, as resources expand or contract, and as capabilities evolve over a period of time.

11.1 Trainings and drills

Mock drills and trainings must be organized to test the readiness of system to deploy within the shortest possible time following the activation of a disaster response. The stakeholder's agencies/departments are required to train their personnel, so that they have the knowledge, skills and abilities needed to perform the task identified in the plan.

The objective of all these trainings and drills would be to both familiarize the teams with the DMP and to increase their operational efficiencies

The workshops and drills also provide an opportunity to practice SOPs. These workshops would also give the teams an opportunity to develop all the stakeholders into a cohesive response unit.

11.2 Plan Testing

As per the clause 22 of GSDM Act, 2003, The Commissioner of Relief, shall prepare, review and update State level Emergency Plans. He shall also ensure that disaster management drills and rehearsals are carried out periodically.

The process of evaluation and testing of plan will identify, illuminate, and correct problems with the DMP.

While updating the plan the following aspects need to be considered by the CoR every year:

- a. Critical analysis of the outcome of exercises & mock drills as part of plan testing.
- b. Incorporation of lessons learnt in the updated plan as an outcome of mock exercises through identification of gaps and measures to fill them.

The plan must be thoroughly tested and evaluated once in a year. The plan testing should preferably be organized on the first Monday in the months of March every year.

The main objective of Plan testing is to:

- a. To determine whether the goals, objectives, decisions, actions and timings outlined in the plan led to a successful response.
- b. Determine the feasibility and compatibility of back up facilities and procedures
- c. Identify areas in the plan that needs modification.

- d. Identify training needs of key stakeholders.
- e. Assess the ability of the organization/department to respond to disasters.

After plan testing and incorporation of lesson learnt, the CoR should send a final copy of the revised and updated plan to the following officials:

- a. Chief Secretary, Government of Gujarat
- b. Chief Executive Officer, Gujarat State Disaster Management Authority
- c. Principal Secretary, Revenue Dept
- d. Head of all line Depts.
- e. State EOC
- f. District EOCs
- g. ERCs
- h. IMD
- i. CWC/ACWC

All the stakeholders' viz., departments, which have specific roles and responsibilities in State Disaster Management Plan, must have a system to ensure that all officers of their departments who have a specific role to play are fully up to date with their responsibilities/tasks.

11.3 Mock Exercise

- a. Mock exercise debriefing and evaluation is of critical importance so that insights are collected from participants (who participated in the exercise) and that is further used to modify the plan.
- b. Hot debriefing is very effective as it is carried out immediately after the exercise. It also includes documentation in terms of recommendations and improvements of the plan.

11.4 Review, Revise & Updation of Plan

The State Disaster Management Plan should be reviewed and updated annually. All the relevant stakeholders should establish a process for reviewing and revising the plan. It focuses on adding the information gained by exercising the plan to the lessons learnt while executing and start the planning cycle all over again

The plan updation process should begin in January in each year and should be completed by month of April, based on inputs from the following:

- a. Drills and rehearsals
- b. Recommendations from all depts. in their Annual DM Report

- c. After any significant change in operational resources (e.g., policy, personnel, organizational structures, management processes, facilities, and equipment)
- d. After enactment of a new law or amended law or ordinance
- e. Directions from Ministry of Home Affairs, National Disaster Management Authority, Government of India, etc.
- f. Lessons learnt from any disaster event in other states and countries

GSDMA and all other concerned Depts. should encourage formal and informal interaction with various stakeholders at different levels to learn and document their experiences, so that such experiences can contribute constructively towards updation of State Disaster Management Plan for further improving the capability to deal with future disasters.



Annexures

Annexure -1 (Ref page 28)
List of major disaster which affected the State

Date	Disaster	Damage/ Loss
1945	Tsunami	Kandla coast was hit by a Tsunami of 12 meters height, due to an earthquake in the Makran fault line.
21/07/1956	Earthquake Mw 6.1	Anjar, Kutch - 115 people killed and hundreds injured. 1350 buildings destroyed at Anjar alone. (Source: GSI)
23/03/1970	Earthquake Mw 5.4	Bharuch - 26 people killed and 200 people injured in Bharuch and neighbouring villages. Heavy damage in Bharuch city. (Source :ANSS/ ASC)
1972-1973	Drought	[Source: Revenue Dept – DoR]
22/10/1975	Cyclone 160 -180 km/h	15 km NW of Porbandar - 85 people died; damage to property estimated at Rs. 750 million [Source: IMD (1999)]
03/06/1976	Cyclone 167km/h	Saurashtra coast - 70 people died. 51 villages badly affected; 25,000 houses damaged; 4,500 cattle died; damage to property estimated at Rs. 30 million. [Source: IMD (1999)]
11/08/1979	Flood	Morbi – Heavy rainfall followed by breakdown of one dam- About 12000 people died in this flood (Source: Morbi City Web Site)
01/11/1981	Cyclone 125 km/h	West of Veraval & Porbandar - 13,942 animals dead; 1,128 huts and 677 houses collapsed; 8,686 huts and 6,034 houses damaged; 1.18 m Ha crops damaged with a loss of Rs. 836 million. One ship sinks off Veraval [Source: Gujarat State Gazetteer (1989)]
08/11/1982	Cyclone 200 km/h	5 km west of Veraval - Surge of 6 to 8 m; 544 dead; 0.2 million animals dead – loss Rs. 125 million; 60,000 huts collapsed; 0.22 million huts damaged; 45,000 houses collapsed; 0.11 million damaged; 2,800 km of roads

		damaged – Rs. 356 million loss; 70 dams affected – Rs. 175 million loss; 2,530 settlements deprived of power – loss Rs. 103 million; 1,036 SSI and 27 large industrial units affected; 1,359 fishing vessels damaged; Port loss Rs. 19.1 million; agriculture and orchards loss Rs. 1,050 million [Source: Gujarat Planning Atlas (1987); Gujarat State Gazetteer (1989)]
June 1983	Cyclone	Heavy rain (70 cm in two days) in Saurashtra [Source: Gujarat Planning Atlas (1987)]
1984-1987	Drought	Faced continuous rainfall deficiency, with 1987 being the worst drought year (rainfall deficits of -42% for Gujarat and -74% for Saurashtra/ Kutch). In 1985, a dry spell of 12–14 weeks affected more than 75% of the crops. During 1986 and 1987, India as a whole suffered from drought, but it was a chronic drought for Gujarat and the Saurashtra/Kutch regions. [Source: Revenue Dept. DoR]
1994	Epidemic	Plague- 49 deaths in Surat
18/06/1996	Cyclone	Diu - 14 people died, 1611 houses damaged [Source: IMD (1999)]
1993, 1994, 1996, 1997, 1998	Flood	Different regions of the Gujarat State (Revenue Dept. DoR)
09/06/1998	Cyclone	North of Porbandar - 1,173 people died, 1,774 missing. Losses estimated at Rs. 18.65 billion [Source: IMD (1999)]
20/05/1999	Cyclone	International border with Pakistan - 453 died; 5,153 buildings damaged and estimated loss to property Rs 800 million [Source: IMD (1999)]
1999-2000	Drought	9449 villages in 155 taluks of 17 out of 25 districts with a population of 250 lakhs were affected. The failure of

		fodder crop affected livestock population of 71.33 lakhs. Banaskantha, Jamnagar, Kutch and Patan districts were severely affected. Food-grain production is estimated to be lower by 29.45% compared to that of last year. Oilseeds production is estimated to be lower by 49.23% as compared to that of last year. The crop area under food-grains, oilseeds and cotton has gone down by 4.27 lakh ha during the last kharif and Rabi seasons. (Source: MoA-GoI)
26/01/2001	Earthquake Mw 7.9	Kutch - Over 13000 people killed. A total of about 1.3 million houses, lifeline infrastructures were damaged to variable extent. (Source: IRIS/NEIC/TARU/GSI)
2001-2002	Drought	40% damage of crops sown after the first rains due to delayed and scanty rains. (Source: Relief Web)
July 2005	Flood	About 125 people died (Source: Indian Red Cross Gujarat state branch)
July-August 2006	Flood	Surat city and south and central Gujarat - Nearly 150 people had died in the floods while over 100 others had died in post-flood epidemic of leptospirosis. Direct and indirect monetary losses has been estimated at Rs 16,000 crore, of which Rs 9,500-cr was in form of direct damages and Rs 6,500 crore in form of lost production. (Source: WSEAS-Issue 2 – Vol. 3)
2009	Hepatitis B Outbreak	Sabarkantha district- 456 cases and 89 deaths
2012-2013	Drought	Severe deficiency of rainfall in Gujarat during the Monsoon-2012. As on 02.08.2012, Saurashtra & Kutch Regions of Gujarat had -79% departure from Long Period Averages (LPAs) while Gujarat region had -55% departure from LPA. All the districts of the State were deficient in rainfall, ranging from -24% to -91%. Drought was declared

		in 132 Talukas of 17 Districts of the State. (Drought Memorandum - Revenue Department)
5th January, 2013	Fire	A major fire broke out with an explosion at IOC – Hazira on 05/01/2013 at about 12:41 hours in the tank having 5004 KL petrol; 5 workers lost their lives. 71 Nos. of fire tenders from different Municipal Corporations, Municipalities and Industries were applied for fire fighting and transportation of water. The fire completely doused at 11.30 am on 07/02/2013 and all-clear message has been given to concerned authorities (CFO-Surat report).
2013-14	Flood	<p>In the month of August, due to heavy rainfall in the catchment area of Narmada river and release of water from Narmada Dam, Bharuch, Narmada and some part of Vadodara districts got affected. During rescue operation in Bharuch, Narmada and Vadodara districts about 8159 persons and 3588 cattles were evacuated.</p> <p>The State experienced extremely heavy rainfall from 21st to 28th September 2013, almost in all the districts. 14 districts that received unprecedented rainfall during this period and were worst affected include Surat, Vadodara, Bharuch, Navsari, Narmada, Rajkot, Junagadh, Porbandar, Jamnagar, Kutch, Patan, Banaskantha, Sabarkantha and Mehsana.</p> <p>The rains impacted more than 50% of the geographical area of the state. More than 1500 villages were severely affected. 27 persons lost their lives. Infrastructure including power, water supply and roads were badly hit. Agriculture and cultivation were also severely affected. Over 2.23 lakh persons were evacuated by administrative efforts and were shifted to safer locations.</p>

Oct 2014	Cyclone	Nilofar- Rapidly weakened into cyclonic storm before the landfall
2015	Swine Flu	6593 cases and 439 deaths (till March 2015)
June 2015	Flood	70 human deaths; 443563 persons affected; loss of thousands of cattle & wild animals; destruction in 390 villages. Affected districts include Amreli, Bharuch, Bhavnagar, Gir Somnath, Jamnagar, Junagadh, Porbandar, Rajkot, Surat, Valsad.
July 2015	Flood	86 human deaths and 89373 animal's deaths. Worst affected districts include Banaskantha, Patan, Kutch and Mehsana
2016	Drought	1115 villages of 6 Districts (Banaskantha, Dwarka, Kutch, Jamnagar, Porbandar and Rajkot) declared drought affected
2017	Flood	Devastating floods in parts of Gujarat during July 2017 damaged agricultural crops affecting 6.44 lakh farmers from 17 districts. The worst affected districts were Banaskantha and Patan districts receiving 163 percent and 143 percent of the seasons rainfall.
24th May, 2019	Fire	On 24 May 2019, a fire occurred at a commercial complex in Sarthana jagatnaka area of Surat. Twenty-two students died and others were injured in an academic coaching centre located on the building's terrace.
June, 2019	Cyclone	Cyclone VAYU considered as a Very Severe Cyclonic Storm was a strong tropical cyclone that caused moderate damage in the state during June 2019. Approximately 3,00,000 residents of coastal Gujarat region were evacuated on June 12th in the preparation for the cyclone's arrival and thousands of personnel's were deployed in the region to assist with the preparations and rescue operations.

November 2019	Cyclone	Cyclone Maha caused widespread rainfall in areas of Junagarh, Gir Somnath, Amreli, Bhavnagar, Surat, Bharuch, Anand, Ahmedabad, Botad, Porbandar, Rajkot and Vadodara.
July, 2019	Urban Flood	Torrential Rains swept Vadodara City and created loss of life and infrastructure and low lying areas were totally inundated which disrupted the day today activities for almost a week.
March 2020 onwards	Pandemic	The first two cases of COVID-19 pandemic were confirmed in Gujarat on 19th March, 2020 from Rajkot and Surat. There are a total of 8541 confirmed cases in the state which include 2780 recovered cases and 513 deaths. (as of Date:)
3 rd June, 2020	Cyclone	Cyclone Nisarga, a severe cyclonic storm made an impact in the form of gusty winds coupled with heavy rainfall in the state's coastal belt. People living near the coastline in Gujarat's Valsad and Navsari Districts were shifted to safer places.
3 rd June, 2020	Fire	Fire incident took place due to storage tank blast consisting of Ortho Di Chloro Benzene in Yashashvi Rasayan. Pvt. Ltd a chemical company in Luvara Village of Bharuch District.
11 th June, 2020	Fire	Fire incident took place due to high pressure and high temperature in one of the reactors in Hemani Industries Pvt. Ltd Ankleshwar-Bharuch District. The blast occurred due to the exothermic process in the reactor resulting in high pressure.
20 th June, 2020	Fire	Fire incident took place at Jay Agro Industries Waghodia, GIDC of Vadodara due to fire in the solvent storage house which was considered as the prime factor where many solvents were stored in a single storage house.

Annexure 2 (Ref Page 33)

2.1 List of Search & Rescue Equipments Provided to Emergency Response Centre (ERC's) by GSDMA

Sr. No.	Equipments/Vehicles	Gandhidham	Gandhinagar/ Ahmedabad	Surat	Rajkot	Vadodara	Total Equipments
1	2	3	4	5	6	7	8
Vehicle							
1	Multifunctional Rescue Vehicle with Crane	1	2	1	1	2	7
2	High capacity pumps	2	4	5	2	4	17
3	Water tanker	2	4	4	2	4	16
4	Foam tanker	1	2	2	1	2	8
5	Emergency Rescue vehicle	3	3	3	2	2	13
6	Water transport unit	1	0	0	1	0	2
	Vehicle Sub-Total A	10	15	15	9	14	63
Container							
1	USAR Container	2	2	1	2	1	8
2	Medical Mass Casualty Container	1	1	1	1	1	5
	Container Sub-Total B	3	3	2	3	2	13
Equipments							
1	Self contained clean air breathing apparatus	4	5	5	4	6	24
2	Personal protection suites	12	15	12	12	12	63
3	Spare cylinders	0	1	1	1	1	4

Sr. No.	Equipments/Vehicles	Gandhidham	Gandhinagar/ Ahmedabad	Surat	Rajkot	Vadodara	Total Equipments
4	AirLine Equipment	0	1	1	1	1	4
5	Positive pressure ventilator	0	1	1	1	1	4
6	Gas Tight Suits	5	7	7	5	9	33
7	Inflatable decontamination system	0	1	1	1	1	4
8	Leak sealing equipment	2	2	2	2	2	10
9	Non sparking tools	1	1	1	1	1	5
10	Multi gas detector	1	2	1	1	2	7
11	Emergency lighting System	2	4	3	3	2	14
12	Under Water Search Camera	1	1	1	0	1	4
13	Blower (Petrol Operated)	0	1	0	0	0	1
14	Fireman Kit	0	0	0	12	0	12
	Equipment Sub-Total C	28	42	36	44	39	189
	TOTAL EQUIPMENTS AT EACH ERC	41	60	53	56	55	265

2.2 Boats Provided by Gujarat State Disaster Management Authority

Sr. No.	Types of Boat	Handed-over to Department/Agencies	No. of Boats
1.	Inflatable Rescue Boat	SDRF 11 groups	55
		ERCs	8
2.	HDPE life boat 8-seater	SDRF 11 groups	11 (each one)
		Collectors	33 (each one)
		Municipal Corporations	08 (each one)
		Emergency Response Centers (ERCs)	20
		Gujarat State Fire Prevention Services	1
3.	HDPE life boat 14-seater	SDRF 11 groups	11 (each one)
		Emergency Response Centers (ERCs)	4
4.	Air Boat	Under supervision of Director, State Fire Prevention Services/ERCs	5
Total			156

2.3 Vehicles/Equipments provided to Municipalities by GSDMA

S. No.	Municipality	District	Portable Inflatable Emergency Lighting Systems	Motor-cycled Mounted Water Mist	Trolley Mounted Water Mist	Water Bowser	Mini Fire Tender	FRP Boat
1	Bareja	Ahmedabad	1	0	0	0	1	0
2	Barvala		1	0	0	1	2	0
3	Bavla		1	1	0	1	1	0
4	Dhandhuka		1	1	0	2	1	0
5	Dholka		1	1	0	2	1	0
6	Sanand		1	1	0	2	1	0
7	Viramgam		1	1	0	2	1	0
8	Amreli	Amreli	2	1	0	2	1	1
9	Babra		2	0	0	0	1	0
10	Bagsara		2	1	0	1	1	0
11	Chalala		2	0	0	0	1	0
12	Damnagar		2	0	0	0	0	0
13	Jafrabad		2	1	0	1	1	0
14	Lathi		2	0	0	1	1	0
15	Rajula		2	1	0	1	1	0
16	Savarkunda		2	1	0	1	1	0
17	Aaklav	Anand	2	0	0	0	0	0
18	Anand		2	3	2	1	1	1
19	Boriyavi		2	0	0	0	0	0
20	Borsad		2	1	0	1	1	0
21	Karamsad		2	1	0	1	0	0
22	Khambhat		2	1	0	1	1	0
23	Oad		2	0	0	0	0	0
24	Petlad		2	1	0	1	1	0

S. No.	Municipality	District	Portable Inflatable Emergency Lighting Systems	Motor-cycled Mounted Water Mist	Trolley Mounted Water Mist	Water Bowser	Mini Fire Tender	FRP Boat
25	Sojitra		2	0	0	1	1	0
26	Umreth		2	1	0	1	1	0
27	Vallabh-vidhyanagar		2	1	0	1	1	0
28	Bhadhar	Banaskantha	1	0	0	0	1	0
29	Deesa		1	1	0	1	1	0
30	Dhanera		1	0	0	1	1	0
31	Palanpur		1	3	2	1	1	0
32	Thara		1	0	0	0	0	0
33	Tharad		1	0	0	1	1	0
34	Amod	Bharuch	2	0	0	0	1	0
35	Ankhleshwar		2	1	0	1	1	0
36	Bharuch		2	3	2	2	2	2
37	Jambusar		2	1	0	1	1	0
38	Botad	Bhavnagar	2	3	2	2	2	0
39	Gadhda		2	1	0	1	1	0
40	Gariyadhar		2	1	0	1	1	0
41	Mahuva		2	1	0	1	1	0
42	Palitana		2	1	0	1	1	0
43	Sihor		2	1	0	1	1	0
44	Talaja		2	1	0	1	1	0
45	Vallabhipur		2	0	0	1	0	0
46	Dahod	Dahod	1	1	0	1	1	0
47	Devgarh Baria		1	0	0	1	0	0
48	Jhalod		1	1	0	1	1	0

S. No.	Municipality	District	Portable Inflatable Emergency Lighting Systems	Motor-cycled Mounted Water Mist	Trolley Mounted Water Mist	Water Bowser	Mini Fire Tender	FRP Boat
49	Dehgam	Gandhinagar	1	1	0	1	1	0
50	Kalol		1	3	2	2	1	0
51	Mansa		1	1	0	1	1	0
52	Pethapur		1	0	0	0	0	0
53	Bhanvad	Jamnagar	2	0	0	1	1	0
54	Dhrola		2	0	0	1	1	0
55	Dwarka		2	1	0	1	1	0
56	Jamjodhpur		2	0	0	1	1	0
57	Jam-rawal		2	0	0	1	0	0
58	Kalavad		2	0	0	1	1	0
59	Khambadia		2	1	0	1	1	0
60	Okha		2	1	0	1	1	0
61	Salaya		2	1	0	1	1	0
62	Sikka		2	0	0	0	1	0
63	Batava	Junagadh	2	0	0	0	1	0
64	Chorwad		2	0	0	0	1	0
65	Keshod		2	1	0	1	1	0
66	Kodinar		2	1	0	1	1	0
67	Manavadar		2	1	0	1	1	0
68	Mangrol		2	1	0	1	1	0
69	Sutrapada		2	0	0	0	1	0
70	Talala		2	0	0	0	0	0
71	Una		2	1	0	1	0	0
72	Vanthali		2	0	0	0	0	0
73	Veraval		2	3	2	2	1	0

S. No.	Municipality	District	Portable Inflatable Emergency Lighting Systems	Motor-cycled Mounted Water Mist	Trolley Mounted Water Mist	Water Bowser	Mini Fire Tender	FRP Boat
74	Visavadar	Kheda	2	0	0	0	0	0
75	Balasinor		1	1	0	1	1	0
76	Chaklasi		1	1	0	0	0	0
77	Dakor		1	0	0	1	1	0
78	Kanjari		1	0	0	0	0	0
79	Kapadvanj		1	1	0	1	1	0
80	Kathlal		1	0	0	0	0	0
81	Kheda		1	0	0	1	1	0
82	Mahudha		1	0	0	0	0	0
83	Mehmdabad		1	1	0	0	2	0
84	Nadiad		1	3	2	3	2	2
85	Thasra		1	0	0	0	0	0
86	Anjar	Kutch	2	1	0	1	1	0
87	Bhachau		2	0	0	1	1	0
88	Bhuj		2	1	0	2	2	0
89	Gandhidham		2	3	2	1	2	0
90	Mandvi		2	1	0	1	1	0
91	Rapar		2	0	0	1	1	0
92	Kadi	Mehsana	1	1	0	3	3	0
93	Kheralu		1	0	0	0	0	0
94	Mehsana		1	3	2	2	1	1
95	Unjha		1	1	0	1	1	0
96	Vadhnagar		1	1	0	1	1	0
97	Vijapur		1	0	0	0	1	0
98	Visnagar		1	1	0	1	1	0

S. No.	Municipality	District	Portable Inflatable Emergency Lighting Systems	Motor-cycled Mounted Water Mist	Trolley Mounted Water Mist	Water Bowser	Mini Fire Tender	FRP Boat
99	Rajpipla	Narmada	2	1	0	2	1	0
100	Bilimora	Navsari	2	1	0	2	1	0
101	Gandevi		2	0	0	1	1	0
102	Navsari		2	3	2	2	2	1
103	Vijalpore		2	1	0	0	1	0
104	Godhra	Panchmahal	1	3	2	2	1	2
105	Halol		1	1	0	1	1	0
106	Kalol		1	0	0	1	1	0
107	Lunawada		2	1	0	1	1	0
108	Sahera		2	0	0	0	0	0
109	Santrampur		2	1	0	1	1	0
110	Chansama	Patan	1	0	0	1	1	0
111	Harij		1	0	0	1	1	0
112	Patan		1	3	2	2	2	1
113	Radhapur		1	1	0	1	1	0
114	Siddhpur		1	1	0	1	1	0
115	Chhaya	Porbandar	2	1	0	0	1	0
116	Kotiyana		2	0	0	1	0	0
117	Porbandar		2	3	2	2	1	1
118	Ranavav		2	0	0	1	1	0
119	Bhayavadar	Rajkot	2	0	0	0	0	0
120	Dhoraji		1	1	0	1	1	0
121	Gondal		1	1	0	1	1	0
122	Jasdan		1	1	0	1	1	0
123	Jetpur		1	3	2	2	1	0

S. No.	Municipality	District	Portable Inflatable Emergency Lighting Systems	Motor-cycled Mounted Water Mist	Trolley Mounted Water Mist	Water Bowser	Mini Fire Tender	FRP Boat
124	Madiya Miyana		2	0	0	0	1	0
125	Morbi		2	3	2	2	2	0
126	Upleta		2	1	0	2	1	0
127	Wankaner		1	1	0	2	1	0
128	Bayad	SabarKantha	1	0	0	0	1	0
129	Himmatnagar		1	1	0	2	1	1
130	Idar		1	1	0	2	1	0
131	Khedbrahma		1	1	0	1	1	0
132	Modasa		1	1	0	1	1	0
133	Prantij		1	0	0	1	1	0
134	Talod		1	0	0	0	1	0
135	Vadali		1	0	0	0	1	0
136	Bardoli	Surat	2	1	0	1	1	0
137	Kansad		2	0	0	0	0	0
138	Mandvi		2	0	0	1	1	0
139	Tarsadi		2	0	0	0	1	0
140	Chotila	Surendranagar	2	0	0	0	1	0
141	Dhangadra		2	1	0	1	1	0
142	Hadvad		2	0	0	0	1	0
143	Limbdi		2	1	0	1	1	0
144	Patdi		2	0	0	0	1	0
145	Surendranagar		2	3	2	2	1	0
146	Thangadh		2	1	0	1	1	0
147	Vadhwan		2	1	0	1	0	0
148	Songarh	Tapi	2	0	0	1	1	0

S. No.	Municipality	District	Portable Inflatable Emergency Lighting Systems	Motor-cycled Mounted Water Mist	Trolley Mounted Water Mist	Water Bowser	Mini Fire Tender	FRP Boat
149	Vyara		2	1	0	2	1	0
150	Chota Udaipur	Vadodara	2	0	0	1	1	0
151	Dabhoi		2	1	0	1	1	0
152	Karjan		2	1	0	1	1	0
153	Padra		2	1	0	1	1	0
154	Savli		2	0	0	1	0	0
155	Dharampur	Valsad	2	0	0	1	1	0
156	Pardi		2	1	0	1	1	0
157	Umargam		2	0	0	1	0	0
158	Valsad		2	3	2	1	1	2
159	Vapi		2	3	2	2	2	0

2.4 Equipments Provided to District Collectorate by GSDMA

Sr. No.	Dist. Collector	Portable Inflatable Emergency Lighting Systems	Life Jacket	Life Buoy	PP Ropes 26 mm		Boats			MFT	Temporary Instant Shelter	LDPE Tent	Portable Generator Set (Honda)
					100 ft.	200 ft.	FRP	Inflatable	HDPE (8 Seater)				
1	Ahmedabad	2	1800	1500	300	450	0	0	1	0	2500	2500	0
2	Anand	3	1750	1250	250	425	0	1	1	0	0	0	0
3	Kheda	3	2000	1500	300	450	0	1	1	0	0	0	0
4	Vadodara	2	3250	2750	550	875	0	0	1	0	1500	1500	0
5	Bharuch	3	2750	2250	450	675	0	6	6+1	0	0	0	0
6	Surat	2	3250	2850	400	800	0	0	1	0	1850	1850	0
7	Navsari	3	1500	1100	200	250	0	0	1	1	0	0	0
8	Narmada	3	450	250	50	25	0	0	1	0	0	0	5
9	Valsad	3	2000	1600	300	450	0	0	1	0	0	0	0
10	Dang	3	50	50	10	5	0	0	1	2	0	0	2
11	Gandhinagar	3	250	250	50	25	0	0	1	0	0	0	5
12	Surendrenagar	3	250	250	50	25	0	0	1	0	0	0	0
13	Kutch	3	120	120	24	12	0	0	1	0	1500	1500	0
14	Junagadh	2	250	250	50	25	0	0	1	0	0	0	0
15	Jamnagar	2	250	250	50	25	0	0	1	0	0	0	0
16	Bhavnagar	2	750	250	50	25	0	0	1	0	0	0	0
17	Amreli	3	250	250	50	25	0	0	1	0	0	0	0
18	Porbandar	3	250	250	50	25	0	4	1	0	0	0	0
19	Mehsana	3	120	120	24	12	0	0	1	0	1500	1500	11
20	Sabarkantha	3	120	120	24	12	0	0	1	0	0	0	16
21	Banaskantha	3	250	250	50	25	0	0	1	0	0	0	0

Sr. No.	Dist. Collector	Portable Inflatable Emergency Lighting Systems	Life Jacket	Life Buoy	PP Ropes 26 mm		Boats			MFT	Temporary Instant Shelter	LDPE Tent	Portable Generator Set (Honda)
					100 ft.	200 ft.	FRP	Inflatable	HDPE (8 Seater)				
22	Panchmahal	3	250	250	50	25	0	0	1	0	0	0	13
23	Dahod	3	250	250	50	25	0	0	1	0	0	0	9
24	Rajkot	2	750	250	50	25	0	0	1	0	1150	1150	0
25	Patan	3	120	120	24	12	0	0	1	0	0	0	0
26	Tapi	3	0	0	0	0	0	0	1	0	0	0	0
27	Morbi	3	0	0	0	0	0	0	1	0	0	0	0
28	Dev Bhoomi Dwarka	3	0	0	0	0	0	2	1	0	0	0	0
29	Gir Somnath	3	0	0	0	0	0	0	1	0	0	0	0
30	Aravali	3	0	0	0	0	0	0	1	0	0	0	0
31	Chota Udaipur	3	0	0	0	0	0	0	1	0	0	0	0
32	Botad	3	0	0	0	0	0	0	1	0	0	0	0
33	Mahisagar	3	0	0	0	0	0	0	2+1	0	0	0	0

2.5 Vehicles/Equipments Provided to Municipal Corporations by GSDMA

Sr. No.	Equipments	Ahmedabad	Vadodara	Surat	Rajkot	Jamnagar	Bhavnagar	Junagadh	Gandhinagar
1	Portable Inflatable Emergency Lighting Systems	5	5	7	5	7	7	5	2
2	Motorcycle Mounted Water Mist	4	2	2	3	3	1	3	3
3	Trolley Mounted Water Mist	5	5	5	5	5	5	2	3
4	Water Bowser	1	1	1	1	1	1	1	1
5	Mini Fire Tender	0	0	0	1	1	1	1	0
6	Life Jacket	250	250	250	250	120	120	50	0
7	Life Buoy	250	250	250	250	120	120	50	0
8	PP Rope (100 ft)	50	50	150	50	24	24	10	0
9	PP Rope (200 ft)	25	25	75	25	12	12	5	0
10	FRP Boat	9	7	7	2	2	1	1	0
11	Inflatable/Rubber Boat	6	10	11	9	1	2	1	1
12	HDPE Boats (8 seater)	1	1	1	1	1+1	1	1	1
13	Trolley for HDPE Boats	0	0	0	0	1	0	0	0
14	Under Water Search Camera	1	1	1	1	1	0	1	0
15	Under Water Breathing Apparatus	12	0	0	0	0	0	0	6
16	Rapid Response Vehicle	1	0	0	0	0	0	0	0
17	Resent skid/ trailer	2	0	0	0	0	0	0	0

Annexure 3 (Ref Page 145)

List of Codes/Guidelines for Safety of Building/Structures

As these codes and guidelines are being updated from time to time by different Institutions/organizations therefore the latest updated version shall be referred at the time of conceiving a project. List has been attempted which may not be complete.

I. General Structural Safety

1. BIS National Building Code 2005
2. IS: 456:2000 "Code of Practice for Plain and Reinforced Concrete
3. IS: 800-1984 "Code of Practice for General construction in Steel
4. IS: 801-1975 "Code of Practice for Use of Cold Formed Light Gauge Steel Structural Members in General Building Construction
5. IS 875 (Part 2) : 1987 Design Loads (other than earthquake) for buildings and structures part 2
Imposed Loads
6. IS 875 (Part 4) : 1987 Design Loads (other than earthquake) for buildings and structures part 4
Snow Loads
7. IS 875 (Part 5) : 1987 Design Loads (other than earthquake) for buildings and structures part 5
special load and load combination
8. IS: 883:1966 "Code of Practice for Design of Structural Timber in Buildings
9. IS: 1904:1987 "Code of Practice for Structural Safety of Buildings: Foundation's
10. IS:1905:1987 "Code of Practice for Structural Safety of Buildings: Masonry Walls
11. IS 2911 (Part 1): Section 1: 1979 "Code of Practice for Design and Construction of Pile
Foundation Section 1
Part 1: Section 2 Based Cast-in-situ Piles
Part 1: Section 3 Driven Precast Concrete Piles
Part 1: Section 4 Based precast Concrete Piles
Part 2: Timber Piles
Part 3: Under Reamed Piles
Part 4: Load Test on Piles

II. Protection from Cyclones / Wind Storms

1. IS 875 (3) -1987 "Code of Practice for Design Loads (Other than Earthquake) for Buildings and Structures, Part 3, Wind Loads"
2. IS: 15498 - 2004 "Guidelines for construction of cyclone shelters."
3. IS: 15498 - 2004 "Guidelines for improving the cyclonic resistance of low rise houses & other building/structures.
4. Guidelines (Based on IS 875 (3)-1987) for improving the Cyclone Resistance of Low rise houses and other building.

III. Earthquake Protection

1. IS: 1893-2002 "Criteria for Earthquake Resistant Design of Structures (Fifth Revision)"
2. IS: 13920-1993 "Ductile Detailing of Reinforced Concrete Structures subjected to Seismic Forces - Code Practice"
3. IS:4326-1993 "Earthquake Resistant Design and Construction of Buildings - Code of Practice (Second Revision)"
4. IS:13828-1993 "Improving Earthquake Resistance of Low Strength Masonry Buildings - Guidelines"
5. IS:13827-1993 "Improving Earthquake Resistance of Earthen Buildings -Guidelines"
6. IS:13935-1993 "Repair and Seismic Strengthening of Buildings - Guidelines"

IV. Flood Management / River Valley Projects

1. IS: 4189-1985 "Guide for preparation of project report for river valley projects."
2. IS: 4410 (Part 3): 1988 "Glossary of terms relating to river valley project part 3 River and river training."
3. IS: 4410 (Part 11): Sec 5-1977 "Glossary of terms relation to river valley projects: Part 11 Hydrology Section 5 Floods."
4. IS: 4410 (Part 21): 1987 "Glossary of terms relating to river valley projects: Part 21 Flood control."
5. IS:11532-1995 "Construction and maintenance of river embankments (levees) -Guidelines"
6. IS: 12094 - 2000 "Guidelines for planning and Design of River Embankments (Levees)"
7. IS: 14262 - 1995 "Planning and design of revetments - Guidelines".
8. IS: 5477 (Part 4) : 1971 "Methods for Fixing the capacities or reservoirs: part 4 Flood storage"
9. IS: 7323 - 1994 " Operation of Reservoirs - Guidelines".
10. IS: 8408 - 1994 "Planning and design of groynes in alluvial river - Guidelines".
11. IS: 14815 - 2000 "Design Flood for River Diversion Works - Guidelines".

V. Landslide Hazard

1. IS: 14458 (Part 1): 1998 Guidelines for retaining wall for hill area: Part 1 Selection of type of wall.
2. IS: 14458 (Part 2): 1997 Guidelines for retaining wall for hill area: Part 2 Design of retaining? Breast walls.
3. IS: 14458 (Part 3): 1998 Guidelines for retaining wall for hill area: Part 3 Construction of dry stone walls.
4. IS: 14496 (Part 2): 1998 Guidelines for preparation of landslide - Hazard Zonation maps in mountainous terrains: Part 2 Macro-Zonation.
5. IS: 14680: 1999 Guidelines for land slide control.
6. IS: 14948: Code of practice for Reinforcement of Rock Slopes with plain edge of failure
7. BIS 12023: Code of practice for Field Monitoring and Movement of Structures using Tape Extensometer.
8. BIS: 14804: Guidelines for Sitting, Designing and selection of materials for Residential Building in Hilly Areas.

VI. For Protection of Saline Embankments and Coastal Canals

1. IS: 8835 - 1978 "Feasibility study and preparation of preliminary project report".
2. IS: 10635 - 1993 (reaffirmed 2003) "Freeboard requirements in embankments and dams".
3. IS: 12169 - 1987 - "Criteria for design of small embankment dams."
4. IS: 8835- 1978: Feasibility study, preparation of
5. IS: 12094 - 1978: Preliminary Project Report
6. IS: 10635 - 1993 (reaffirmed 2003): Freeboard requirements in embankments in embankments and dams.
7. IS: 11532 - 1995 (reaffirmed 2005): Construction and maintenance of river embankments
8. IS: 12094 - 2000 (reaffirmed 2005): Planning and design of river embankment
9. IS: 12169 - 1987: Criteria for design of small embankments dams.

VII. Railway Codes & Manuals - RDSO Publications

1. RBF - 20: "Estimation of design discharge based on regional flood frequency approach for sub-zones 3(a), 3(b), 3(c), 3(e)".
2. RBF - 22: "50 year 24 hour set of is pluviat maps of India maps of short duration ratios".
3. RBF - 23: "Validation of flood estimation report No.UTN-7-1983 for sub-zone-3 (f)".
4. RBF - 24: "Validation of flood estimation report No.3/1980 for sub-zone-3 (f)".
5. RBF - 25: "Estimation of design discharge based on regional flood frequency approach for sub-zone-3 (f)".

6. RBF - 26: "Validation of flood estimation report No.UGP-9-1984 for sub-zone-1 (e)".
7. RBF - 27: "Validation of design discharge based on regional flood frequency approach for sub-zone-3 (e)".
8. RBF - 28: "Estimation of design discharge based on regional flood frequency approach for sub-zone-3 (i)".
9. RBF - 29: "Estimation of design discharge based on regional flood frequency approach of sub-zone-3 (b)".
- 10.RBF - 32: "Validation of flood estimation report no.c/16/1988 subzone - 1 (b) (chambal basin)".
- 11.RBF - 33: "Estimation of design discharge based on regional flood frequency approach for sub-zone-1 (d) (sone basin)".
- 12.RBF - 34: "Validation of flood estimation report no.S/15/1987 sub-zone-1 (d) (sone basin)".
- 13.GE - 1: "Guidelines - Erosion control on slopes of banks and cuttings".
- GE - 6: "Guidelines for earthwork in conversion projects".

VIII. Indian Road Congress (IRC) Codes/Manuals

1. IRC: 5 -1998 (Seventh Revision) - "Standard specifications and codes of practice for Road, Bridges Section 1 - General features of Design".
 2. IRC: 10-1961 - "Recommended Practice for Borrow pits for Road Embankments constructed by Manual Operation".
 3. IRC: 34-1970 - "Recommendations for Road Construction in Waterlogged Area".
 4. IRC: 36-1970 - "Recommendations Practice for the construction of Earth Embankments for Road Works".
 5. IRC: 45-1972 - "Recommendations for Estimating the Resistance of Soil Below the Maximum Scour Level in the Design of well foundations of Bridges".
 6. IRC: 52-2001 (Second Revision) - "Recommendations about the Alignment Survey and Geometric Design of Hill Roads."
 7. IRC: 56-1974 - "Recommendations Practice for treatment of Embankment Slopes for Erosion Control."
 8. IRC: 75-1979 - "Guidelines for the Design of High Embankments."
 9. IRC: 78-2000 (Second Revision) - "Standard specifications and Code of practice for road, bridges, section VII - Foundations and substructure.
 10. IRC: 89-1997 (First Revision) - "Guidelines for Design and Construction of River Training and Control Works for Road Bridges".
 11. IRC: 104-1988 - "Guidelines for Environmental Impact Assessment of Highway Projects".
 12. IRC: SP: 13-2004 (First Revision) - "Guidelines for the Design of Small Bridges and Culverts."
 13. IRC: SP: 35-1990 - "Guidelines for Inspection and Maintenance of Bridges".
 14. IRC: SP: 42-1994 - "Guidelines on Road Drainage".
 15. IRC: SP: 50-1999 - "Guidelines of Urban Drainage".
 16. IRC: SP: 54 -2000 - " Project preparation Manual for Bridges".
 17. IRC: 6 - 2000 - "Standard specifications and code of practice for road bridges - section II Loads & Stresses".
 18. IRC: SP: 57 -2001 - "Guidelines for quality systems for road construction."
 19. IRC: 28 - 1967 - "Recommendation of road construction in water logged areas".
 20. IRC: SP: 26 1984 - "Project preparation manual for bridges".
 21. IRC: 87 - 1984 - "Guidelines for design and erection."
 22. IRC: 21 - 2000 - "Standard specification and codes for roads and bridges."
 23. IRC: SP: 20 - 2002 - "Rural Roads."
 24. MORT & H Pocket Book for Highway Engineers, 2002 (Second Revision)
- IRC: SP33: 1989 Guidelines on supplemental Measures for Design, Detailing & Durability of Important Bridge Structures.

Annexure 4 (Ref Page 146)

Check List for Natural Disaster Impact Assessment

Name of the Project:

State:

District:

Project Estimate Rs. _____ (In Lakhs)

1. Sitting of the Project

1.1 Location of Project site

- Latitude
- Longitude
- Height above mean sea level

1.2 Earthquake Zone (Any known geological fault nearby may be listed)

1.3 Flood proneness & Vulnerability:

- Past history of floods the area
- Observed Highest flood level
- Frequency of flooding
- Depth of flooding
- Duration of flooding
- Damage/loss (maximum, average, potential)

1.4 Cyclone Proneness (If close to sea coast) & Vulnerability:

- Frequency and Intensity
- Wind speed zone - information on highest wind speed
- Distance of site from sea coast
- Record of past storm surge

1.5 Landslide Proneness & Vulnerability:

- Location of Hill slope vis-a-vis the project's location
- Past history of landslides,
- Possibility of mud flows/rock falls/snow avalanches etc.

1.6 Tsunami proneness (If close to sea coast) & Vulnerability:

- Past history

1.7 Existence of Dams or Barrages upstream

- Distance from the project. Was dam breach effect considered on the project?
- If so, have the dam break analyses been carried out? Has their impact on safety of the project been evaluated?

2. Natural / Type of Project

2.1 All the projects of the natural/type mentioned below are liable to damage by natural disasters and inadequacies of design or any of their components is likely to accentuate the

vulnerability of the area to the disasters and / or lead to rise in damage/loss to lives, property, livelihood systems environment,

- Communications: towers, lines, building
- Transportation: Roads, Railways, Bridges, Tunnels
- Power: Power houses, sub stations, power lines
- Water Resources: Dams, barrages, appurtenant structures, river training structures, Canals
- Habitations: townships- planning from the point of view of safety against hazards
- Water supply and sanitation projects including water supply and sewer lines
- Ports & Harbors
- Building projects
- Any other

3. Hazards Risk to the Project

Have the following been evaluated:

- Probable maximum seismicity at site and site dependant seismic design parameters
- Probable Maximum storm surge
- Probable Maximum wind speed
- Probable Maximum precipitation
- Probable maximum flood discharge and level
- Probability of occurrence of floods, earthquakes, landslides, mud flows, avalanches, cyclones, tsunamis
- Soil liquefaction proneness under probable earthquake intensities

4. Mitigation / Reduction of Risk:

4.1 There are specific codes, manuals, guidelines etc. developed by Bureau of Indian Standards, NDMA and concerned organizations for sitting, design, construction and maintenance of various types of infrastructures, Indicative and not exhaustive list of some of them is at Annex-2.

4.2 Have the relevant BIS codes and guidelines been complied with?

4.3 Have adequate safeguards to meet the risks of natural hazards as evaluated at Para 3 above, been adopted?

5. Impact of the project on People and Environment

Has the impact of the environment and the people been studied with the respect to the following and what mitigation measures have been adopted? An illustrative but not exhaustive list of scenarios is given below:

- 5.1 The earthquakes and landslides may damage the pipelines to transport and storages to store harmful and inflammable materials and gases in the project area. Has any study been made to assess the danger to the environment and the people posed by those occurrences? And if so what measures have been proposed?

- 5.2 The railway lines and roads run across the drainage lines and if adequate waterways at appropriate locations are not provided, it may result in rise in water level and drainage congestion in up-stream areas. Has this aspect been studied and if so, what mitigation measures have been proposed?
- 5.3 Land-slides triggered by earthquakes as well as due to inherent instability of slopes accentuated by rains, may lead to blockage of drainage channels and accumulation of water up-stream. These blockages may collapse due to their inherent instability or aided by rains. Men, machines and explosives can also be used to remove blockage and reduce flooding upstream. These lead to sudden release of water and flooding and erosion in down-stream areas. It may be stated whether any study has been carried out in this regard and what mitigation measures have been proposed?
- 5.4 As all the projects involve acquisition of land and influx of large number of people in the area to take up construction activities, it may result in deforestation and soil erosion. Measures for prevention of deforestation and arresting soil erosion are required to be taken. It may be stated whether any study has been carried out in this regard and what mitigation measures have been proposed?
- 5.5 If the project involves storage of water, failure of any component may cause flooding and large scale damage to lives, property and infrastructure etc. Please state whether any study has been made and if there is a possibility thereof, what measures have been proposed to meet the eventuality?

Annexure – 5 (Ref Page 173)
Facilities at SEOC, Gandhinagar

1. State Control Room
2. Reception Room
3. Waiting Room
4. Exhibition Room
5. Media Room
6. Room for Hon'ble Ministers and Senior Officers
7. Small Control Room
8. Facility Management Room
9. State Alert & Warning Facility
10. State of art Conference Room with video conferences facilities
11. Department Room – 6
12. Designing and Consulting room for GSDMA
13. Rest Room – 2
14. Ladies and Gents wash Rooms – General
15. Pantry Room
16. Electric Room
17. Incident Commander Chamber
18. CEO GSDMA Chamber
19. Chamber for Relief Commissioner
20. Lounge Room

The SEOC compound also has the following utilities:

1. Garden
2. Fire Fighting System
3. Parking
4. Generator Room – 160 KVA
5. Security Cabin and main gates
6. Water Harvesting System
7. Electric and Transformer Room – 315 KVA

Each room has been provided with air conditioning system and CCTV cameras. SEOC is also equipped with fire extinguishers, announcing systems and smoke detectors. SEOC also has a digital display board to display early warning, rainfall data, relevant information etc. to public.

Annexure 6 (Ref Page 178)

Incident Response System- Roles & Responsibilities

Incident Commander (IC)- Chief Secretary

- Obtain information on:
 - Situation status like number of people and the area affected etc.
 - availability and procurement of resources
 - Requirement of facilities like Incident Command Post (ICP), Staging Area, Incident Base, Camp, Relief Camp, etc.
 - availability and requirements of Communication system
 - future weather behavior from IMD; and other relevant agencies
 - any other information required for response from all available sources and analyze the situation
- Determine incident objectives and strategies based on the available information and resources. Establish priorities of the same.
- Assess requirements for maintenance of law and order, traffic etc. and make arrangements with help of the local police
- Establish Incident Command Post (ICP) at a suitable place. There will be one ICP even if the incident is multijurisdictional.
- Ensure that the Incident Action Plan (IAP) is prepared and team members are briefed about it.
- Approve and authorize the implementation of an IAP and ensure that IAP is regularly developed and updated as per debriefing of Incident Response Team (IRT) members. It will be reviewed every 24 hours and circulated to all concerned
- Ensure proper coordination between all Sections of the IRT, agencies working in the response activities and make sure that all conflicts are resolved
- Consider requirement of resources, equipment which are not available in the functional jurisdiction, discuss with Planning Section Chief (PSC) and Logistic Section Chief(LSC) and inform Responsible Officer (RO) regarding their procurement
- If required, establish contact with Panchayati Raj Institutions (PRIs), Urban Local Bodies (ULBs), Community Based Organizations (CBOs), NGOs etc. and enlist their support to act as local guides in assisting the external rescue, relief teams and for any other relevant task.
- Approve the deployment of volunteers and such other personnel and ensure that they follow the chain of command
- Authorize release of information to the media
- Review public complaints and recommend suitable grievance redressal measures.

Information & Media Officer (IMO)- Commissioner of Information

- Prepare and release information about the incident to the media agencies and others with the approval of Incident Commander (IC).
- Minutise decisions taken and directions issued in case of sudden disasters when the Incident Response Team has not been fully activated and hand it over to the Planning Section (PS) on its activation for incorporation in the Incident Action Plan
- Monitor and review various media reports regarding the incident that may be useful for incident planning
- Organize meetings as directed by the Incident Commander as & when required;

<ul style="list-style-type: none"> • Coordinate with IMD to collect weather information and disseminate it to all concerned • Maintain record of various activities performed
<p style="text-align: center;">Safety Officer (SO) – Hazard Specific Department Secretary</p> <ul style="list-style-type: none"> • Recommend measures for assuring safety of responders. • Assess or anticipate hazardous and unsafe situations and review it regularly • Obtain details of accidents that have occurred within the incident area if required or as directed by Incident Commander and inform the appropriate authorities • Review and approve the Site Safety Plan, as and when required • Maintain record of various activities performed
<p style="text-align: center;">Liaison Officer (LO)-Secretary, GAD</p> <ul style="list-style-type: none"> • Maintain a list of concerned line departments, agencies (CBOs, NGOs, etc.) and their representatives at various locations • Carry out liaison with all concerned agencies including NDRF and Armed Forces and line departments of Government • Monitor Operations to identify current or potential inter-agency problems • Participate in planning meetings and provide information on response by participating agencies • Keep the Incident Commander informed about arrivals of all the Government and Non-Government agencies and their resources • Help in organizing briefing sessions of all Governmental and Non-Governmental agencies with the Chief Secretary • Maintain record of various activities performed
<p style="text-align: center;">Law & Order Maintenance Officer (LOM)-Director General of Police</p> <ul style="list-style-type: none"> • Ensure proper mechanism for crowd management & public address so as to prevent any rumors or stampede like situation • Provide security/ cordon off to evacuated structures so as to prevent cases of thefts • Provide security to affected population with an aim to prevent human trafficking
<p style="text-align: center;">Operation Section Chief (OSC) – Director of Relief</p> <ul style="list-style-type: none"> • Coordinate with the relevant Section Chief (Planning, Operation and Logistics) • Manage all field operations for the accomplishment of the incident objectives • Deploy, activate, expand and supervise organizational elements (Branch, Division, Group, etc,) in his Section in consultation with Incident Commander/Chief Secretary and in accordance with the Incident Action Plan. • Assign appropriate personnel, keeping their capabilities for the task in mind and maintain On Duty Officers list (IRS Form-007) for the day as enclosed in Annexure-VII. • Prepare Section Operational Plan in accordance with the Incident Action Plan; if required • Determine the need for additional resources and place demands accordingly and ensure their arrival • Ensure record of various activities performed by members of Branches, Divisions, Units/Groups are collected and maintained
<p style="text-align: center;">Staging Area Manager (SAM)-Dy. Collector, Relief</p> <ul style="list-style-type: none"> • Establish the Staging Area with proper layout and ensure that there is no obstruction to the incoming and outgoing vehicles, resources etc. • Organize storage and dispatch of resources received and dispatched it as per Incident Action Plan. • Report all receipts and dispatches to Operation Section Chief (OSC)/Director of Relief and maintain their records

- Utilize all perishable supplies expeditiously
- Ensure that communications are established with the Incident Commandant Post and other required locations e.g. different Staging Areas, Incident Base, Camp, Relief Camp etc
- Maintain and provide resource status to Planning Section (PS) and Logistics Section (LS)
- Demobilize Staging Area in accordance with the Demobilization Plan
- Maintain record of various activities performed and send to Sections concerned

Response Branch Director (RBD) – Mamlatdar

- Work under the supervision of the Operation Section Chief (OSC)/ Director of Relief and is responsible for the implementation of Incident Action Plan as per the assigned role
- Attend planning meetings & Review Assignment Lists for Divisions/Groups under his Branch
- Assign specific tasks to Division and Groups-in-Charge
- Report to the Operation Section Chief (OSC)/ Director of Relief regarding modifications required if any in the Incident Action Plan, need for additional resources, availability of surplus resources and when hazardous situations or significant events occur, etc.
- Provide Single Resource, Strike Team and Task Force support to various operational areas
- Ensure that all team leaders maintain record of various activities performed relating to their field Operations and send to Operation Section Chief (OSC)/ Director of Relief

Division Supervisor (DS) - Dy. Mamlatdar

- Implement Division or Group assignment list
- Report on the progress of Operations, and the status of resources within the Division or Group
- Circulate Organizational Assignment List (Divisional / Group) to the leaders of the Group, Strike Team and Task Force
- Review assignments and incident activities with subordinates and assign tasks as per the situation
- Coordinate activities with adjacent Divisions or Groups, if required
- Submit situation and resource status to the Response Branch Director (RBD)/Mamlatdar & the Operation Section Chief (OSC)/ Director of Relief
- Report all hazardous situations, special occurrences or significant events (e.g., accidents, sickness, deteriorating weather conditions, etc.) to the Response Branch Director (RBD)/Mamlatdar & the Operation Section Chief (OSC)/ Director of Relief
- Ensure that record of various activities performed are collected and sent to the Response Branch Director (RBD)/Mamlatdar & the Operation Section Chief (OSC)/ Director of Relief

Single Resource Leader/ Task Force Leader- Dy. Mamlatdar

- Take charge of necessary equipment and supplies
- Assess local weather and environmental conditions, law and order situation etc. in the assigned area and report to the in-charge

Transportation Branch Director (TBD)-Commissioner of Ports & Transport

- Activate and manage different Operations Groups like Road, Rail, Water and Air
- Coordinate with the Logistics Section for required resources, and activate Groups of this Branch

- Coordinate with railways, road transport, waterways and airport authorities for support as required
- Ensure that Organizational Assignment List (Divisional / Group) is circulated among the Group-in-charge(s) and other responders of his Branch
- Provide ground support to the air operations and ensure appropriate security arrangements
- Provide Road transport support to the Rail and Water Operations Group as required
- Ensure safety of all personnel of his Branch involved in the Incident Response activities
- Ensure that all units moving in the area are familiarized with route with the help of road maps or local guides
- Report to the Operation Section Chief (OSC)/ Director of Relief and Incident Commander about progress of the Transportation Branch
- Determine the need for additional resources, their proper and full use and place demand accordingly in advance
- Ensure the maintenance of the status of hired resources, their full utilization and timely release
- Ensure that the record of various activities performed by different operational groups (Road, Rail, Water and Air) are collected and sent to the Section concerned

Group In-charge (Road Operations)-Dy. Secretary (R&B)

- Ensure transportation of resources by Road to the affected sites
- Determine coordination procedures with various destinations as per Incident Action Plan
- Ensure proper parking locations
- Update Road Operations plan as required and share them with higher authorities
- In case of accidents, inform the Transportation Branch Director/ Commissioner of Ports & Transport, the local police and provide assistance in investigation, if required
- Ensure that mechanics are available for repair of vehicles and also ensure adequate availability of Petrol, Oil and Lubricants (POL)
- Maintain the records of all important activities relating to the number of vehicles deployed, source of vehicles (i.e. Government or private), locations where vehicles are deployed along with resource details they are carrying, etc.
- Support and coordinate the Road Operations part of the Rail, Water and Air Operations as required
- Collect record of various activities performed from coordinator and other members and send to Transportation Branch Director/ Commissioner of Ports & Transport or Operation Section Chief (OSC)/ Director of Relief

Group In-charge (Rail Operations)- Divisional Manager Western Railway

- Ensure safe storage and warehousing of the materials
- Evaluate storage locations, ensure safety and obtain guidance from the Transportation Branch Director/ Commissioner of Ports & Transport, if required
- Coordinate with Road Operations Group for movement of resources
- Prepare and provide Rail Operations Summary including time of departure and arrival, destinations, resource details, etc as and when required by the senior officers
- Request for additional personnel support, if required
- Update Rail Operations Plan & the TBD from time to time and seek support, if required
- Establish and maintain communications with various storage and warehousing areas, destination points and railway officers
- Collect record of various activities performed IRS from Coordinator and other in-charges and send to Transportation Branch Director/ Commissioner of Ports & Transport or Operation Section Chief (OSC)/ Director of Relief

Group In-charge (Water Operations) – MD GMB

- Ensure transportation of rescue teams and relief materials by motor boats / country boats or by any other water transport to the affected sites with communication facilities and a local guide for guidance with each team.
- Determine coordination procedures with various destinations as per Incident Action Plan
- Supervise all Water Operations and related activities associated with the incident
- Evaluate and ensure docking or harboring locations
- Update Water Operations plan and share it with the higher authorities, including the Logistic Section Chief.
- Arrange for an accident investigation team as and when required and cooperate with the appropriate investigating authorities
- Ensure availability of Petrol, Oil and Lubricants (POL) and other logistic support for boat operations
- Collect record of various activities performed from Coordinator and other in-charges and send to Transportation Branch Director/ Commissioner of Ports & Transport or Operation Section Chief (OSC)/ Director of Relief.

Nodal Officer (Air Operations) - Director Civil Aviation

- Coordinate with concerned authorities for air operations
- Project the type of Air support required to the appropriate authorities based on the Incident Action Plan and place the demand at least 24 hours in advance or as early as possible
- Inform the Incident Commander/Chief Secretary and Operation Section Chief (OSC)/ Director of Relief about the Air movements and landing schedules in their respective areas.
- Ensure that relevant maps of the incident locations are available with all agencies involved in the Air Operations to give the correct coordinates etc. of the locations where Air support is required
- Determine the suitability of Helipads or Helibases in coordination with the Air Force authorities and the State authorities
- Maintain communication with Air Traffic Control and the ground support staff regarding the Air movements and other related activities
- Assist the Incident Commander/Chief Secretary and the Logistic Section Chief in the procurement of required Aviation Turbine Fuel etc.
- Report on Air Operations activities to the Responsible Officer

Group In-charge (Air Operations)

- Provide ground support to Air Operations as per the Incident Action Plan
- Report to Transportation Branch Director/ Commissioner of Ports & Transport the progress of Air Operations and work in close coordination with the Nodal Officer, Incident Commander, Operation Section Chief and Transportation Branch Director/ Commissioner of Ports & Transport.
- Ensure resources and supplies required for the Air Operations are available at the concerned locations
- Keep appropriate maps in order to provide correct coordinates to the pilots and others involved in the Air Operations
- Ensure refueling facilities are available at the landing and takeoff locations
- Ensure that helibase and Helipad locations are identified, marked and approved by the appropriate authorities
- Determine the need for assignment of personnel and equipment at each helibase and

helipad

- Ensure that the communication systems are in place
- Update landing and takeoff schedule of aircrafts and helicopters as informed by Nodal Officer.
- Ensure preparation of the load manifest for proper loading or unloading of relief supplies
- Arrange for unloading and dispatch or storage of relief materials that arrive at the airports, helipads and helibase. In order to keep airports operational, special attention needs to be paid to unsolicited relief supplies that may arrive. They should be immediately cleared from the operational area
- Ensure that proper packaging and weighing facilities are in place and used for loading of relief materials
- Liaise with the road operations group for the road transportation needs
- Ensure the functionality of Aircraft rescue and firefighting service at helibases, helipads, security, proper lights, smoke candles/devices, weighing facilities, wind direction socks, etc. are in place
- Collect record of various activities performed from helibase and helipad-in-charge and send to Commissioner of Ports & Transport/Incident Commander

Planning Section Chief (PSC)-Secretary of Line Department

- Coordinate with the activated section chiefs for planning and preparation of Incident Action Plan in consultation with Incident Commander.
- Ensure that decisions taken and directions issued in case of sudden disasters when the Planning Section had not been activated are obtained from the Information & Media Officer and incorporated in the Incident Action Plan.
- Ensure collection, evaluation, and dissemination of information about the incidents including weather, environment toxicity, availability of resources etc. from concerned departments and other sources. The Planning Section must have a databank of available resources with their locations from where it can be mobilized
- Coordinate by assessing the current situation, predicting probable course of the incident and preparing alternative strategies for the operations by preparing the Incident Action Plan. It includes:
 - Initial information and assessment of the damage and threat
 - Assessment of resources required
 - Operations briefing
 - Implementation & Review of IAP
 - Formulation of incident objectives for the next operational period, if required
- Ensure that Incident Status Summary is filled and incorporated in the IAP
- Ensure that Organizational Assignment List (Divisional / Group) is circulated among the Unit leaders and other responders of his Section
- Plan to activate and deactivate Incident Response System organizational positions as appropriate, in consultation with the Chief Secretary and Director of Relief
- Determine the need for any specialized resources for the incident management
- Utilize IT solutions for pro-active planning, GIS for decision support and modeling capabilities for assessing and estimating casualties and for comprehensive response management plan
- Provide periodic projections on incident potential
- Report to the Chief Secretary/Incident Commander of any significant changes that take place in the incident status
- Compile and display incident status summary at the Incident Commandant Post

<ul style="list-style-type: none"> • Oversee preparation and implementation of Incident Demobilization Plan • Assign appropriate personnel, keeping their capabilities for the tasks in mind and maintain on Duty Officers List for the day • Ensure that record of various activities performed by members of Units are collected and maintained
<p>Resource Unit Leader (RUL)-Respective Line Department Officer</p> <ul style="list-style-type: none"> • Maintain and display the status of all assigned resources (Primary and Support) at the incident site by overseeing the check-in of all resources, and maintaining a resource status-keeping system. Primary resources are meant for responders and support resources are meant for affected communities • Compile a complete inventory of all resources available. He will also access information about availability of all required resources at other locations and prepare a plan for their mobilization, if required. IDRN, CDRN and IDKN facilities will also be used for this purpose • Ensure and establish Check-in function at various incident locations • Update the Secretary of the department and Incident Commander about the status of resources received and dispatched from time to time • Coordinate with the various activated Branches, Divisions and Groups of OS for checking status and utilization of allotted resources • Ensure quick and proper utilization of perishable resources • Maintain record of various activities performed and send to Section concerned
<p>Situation Unit Leader (SUL)-Respective Line Department Officer</p> <ul style="list-style-type: none"> • Collect process and organize all incident information as soon as possible for analysis. For such purposes, he can take the help of members of the Single Resource, Task Forces, Strike Teams, field level Government officers and members of PRIs, CBOs, NGOs etc; • Prepare periodic future projections of the development of the incident (along with maps if required) and keep the Secretary of the department and Chief Secretary informed • Prepare situation and resource status reports and disseminate as required • Provide authorized maps, photographic services to responders, if required • Attend Incident Action Plan Meeting with required information, data, documents and Survey of India maps etc • Maintain record of various activities performed and send to Section concerned
<p>Documentation Unit Leader (DUL)-Respective Line Department Officer</p> <ul style="list-style-type: none"> • Ensure that all the required forms and stationery are procured and issued to all the activated Sections, Branches, Divisions, Groups and Units • Compile all information and reports related to the incident • Review and scrutinize the records and various Incident Response System forms for accuracy and completeness. • Inform appropriate Units of errors or omissions in their documentation, if any, and ensure that errors and omissions are rectified • Maintain record of various activities performed and send to sections concerned
<p>Demobilization Unit Leader (Demob. UL)-Respective Line Department Officer</p> <ul style="list-style-type: none"> • Prepare Incident Demobilization Plan (IDP) • Identify surplus resources and prepare a tentative IDP in consultation with the PSC and give priority to demobilization of surplus resources • Develop incident check-out functions for Sections, Branches, Divisions and units in

<p>consultation with all Sections and send to the Planning Section</p> <ul style="list-style-type: none"> • Plan for logistics and transportation support for Incident Demobilization in consultation with Logistic Section • Disseminate Incident Demobilization Plan at an appropriate time to various stakeholders involved • Ensure that all Sections, Units, Teams and Resources understand their specific Incident Demobilization responsibilities and avail Demobilization facilities • Arrange for proper supervision and execution of the Incident Demobilization Plan • Request the PSC for additional human resources, if required • Maintain record of various activities performed and send to Sections concerned
<p style="text-align: center;">Technical Support(TS)</p> <ul style="list-style-type: none"> • Provide technical support to the response management • Function in close coordination with the Secretary of line department and Chief Secretary
<p style="text-align: center;">Logistic Section Chief (LSC)-Director of Relief</p> <ul style="list-style-type: none"> • Coordinate with the activated Section Chiefs • Provide logistic support to all incident response effort including the establishment of Staging Area, Incident Base, Camp, Relief Camp, Helipad etc. • Participate in the development and implementation of the Incident Action Plan • Keep c informed on related financial issues • Ensure that Organizational Assignment List (Divisional / Group) is circulated among the Branch Directors and other responders of his Section • Request for sanction of Imprest Fund, if required • Supervise the activated Units of his Section • Ensure the safety of the personnel of his Section • Assign work locations and preliminary work tasks to Section personnel • Ensure that a plan is developed to meet the logistic requirements of the IAP with the help of Comprehensive Resource Management System • Brief Branch Directors and Unit Leaders • Anticipate over all logistic requirements for relief Operations and prepare accordingly • Constantly review the Communication Plan, Medical Plan and Traffic Plan to meet the changing requirements of the situation • Assess the requirement of additional resources and take steps for their procurement in consultation with the Director of Relief • Provide logistic support for the Incident Demobilization Plan as approved by the Chief Secretary • Ensure release of resources in conformity with the Incident Demobilization Plan • Ensure that the hiring of the requisitioned resources is properly documented and paid by the Finance Branch • Assign appropriate personnel, keeping their capabilities for the tasks to be carried out and maintain On Duty Officers List • Ensure that cost analysis of the total response activities is prepared; • Ensure that record of various activities performed by members of Branches and Units are collected and maintained
<p style="text-align: center;">Service Branch Director (SBD)-Dy Secretary, Revenue</p> <ul style="list-style-type: none"> • Work under the supervision of Logistic Section Chief and manage all required service support for the incident management • Manage and supervise various activated Units of the Branch • Discuss with activated Unit leaders for the materials and resources required and procure

<p>the same through Logistic Section;</p> <ul style="list-style-type: none"> • Ensure proper dispatch of personnel, teams, resources etc. as per the Incident Action Plan. • Maintain record of various activities performed and send to sections concerned • Perform any other duties assigned by the Chief Secretary
<p style="text-align: center;">Communication Unit Leader (Com. UL)-Director of Information</p> <ul style="list-style-type: none"> • Work under the direction of the Dy Secretary, Revenue and provide communications facility as and when required • Ensure that all communications equipment available are in working condition and that the network is functional • Supervise Communication Unit activities • Maintain the records of all communications equipment deployed in the field and recover equipment provided by Communication Unit after the incident is over. • Ensure setting up of a message centre to receive and transmit radio, telephone and other messages from various activated Sections, Branches, Units and higher authorities and maintain their records • Prepare an alternative communication plan for execution in case of possible failure of the normal communications network. The alternative communications network may have wireless, satellite phones, cell phones, HAM radios etc • Prepare a plan for integration of the communications set up of the central teams (NDRF, Armed Forces) with the local communications set up for the management of large scale disasters when they come to assist in the response effort • Maintain record of various activities performed and send to SBD • Perform any other duties assigned by the Director of Relief
<p style="text-align: center;">Medical Unit Leader (MUL)-Director Of Health</p> <ul style="list-style-type: none"> • Work under the direction of the Support Branch Director • Prepare the Medical Plan and procurement of required resources as per Incident Action Plan, provide medical aid and ambulance for transportation of victims and maintain the records of the same, obtain a road map of the area from the PS for the ambulance services, transportation of medical personnel and victims; • Respond to requests of the Operation Section for medical aid, transportation and medical supplies etc. under intimation to the Dy Secretary, Revenue/Director of Relief • Maintain the list of medical personnel who could be mobilized in times of need • Prepare and circulate list of referral service centers to all the medical team leaders • Maintain record of various activities performed and send to Dy Secretary, Revenue • Perform any other duties assigned by the Dy Secretary, Revenue and Director of Relief
<p style="text-align: center;">Food Unit Leader (FUL)-Director, Food and Civil Supply</p> <ul style="list-style-type: none"> • Work under the direction of the Dy Secretary, Revenue • Supply resources to various activated Sections, Branches, Units and Groups of Incident Response Team as per direction of the Dy Secretary, Revenue • Supply food to: <ul style="list-style-type: none"> a) Personnel of Incident Response Team (s) at Incident Command Post, Camps, Incident Base, SA, etc., and b) Victims at the temporary shelters, relief camps etc. • Request for assistants if the task becomes very large. The Food Unit Leader (FUL) may request the Director of Relief to split the unit into two groups—one to supply food for personnel and another for victims. Requisition transport for supply of food to incident base, relief camp and other facilities • Determine food and drinking water requirements and their transportation, and brief the

<p>Dy Secretary, Revenue and Director of Relief</p> <ul style="list-style-type: none"> • Maintain an inventory of receipt and dispatch of resources • Supervise the Unit activities • Maintain record of various activities performed and send to Dy Secretary, Revenue
<p>Support Branch Director (Sup. BD)-US/DS,GAD</p> <ul style="list-style-type: none"> • Work under the supervision of Director of Relief, and supervise the function of various activated units • Procure and dispatch required tactical materials and resources for Operations with the concurrence of the Section Chief • Participate in the planning meeting of the Logistics Section • Maintain record of various activities performed and send to Section concerned
<p>Resource Provisioning Leader (RPUL)-SO, Record Branch, Revenue</p> <ul style="list-style-type: none"> • Work under the supervision of Sup.BD and organize movement of personnel, equipment and supplies, etc. • Receive and store safely all supplies required • Maintain the records of receipt and dispatch of supplies including equipment and personnel • Organize repair and servicing of non-expendable supplies and equipment • Monitor the kind, type and quantity of supplies available and dispatched • Receive and respond to requests for personnel, supplies and equipment from the activated sections, branches, divisions, units and groups • Maintain record of various activities performed and send to Under Secretary/Deputy Secretary, GAD
<p>Facilities Unit Leader (Fac. UL)- US/DS, Revenue</p> <ul style="list-style-type: none"> • Prepare the layout and activation of incident facilities, e.g., Incident Base, Camp(s), Relief Camp(s), Incident Command Post, etc., and provide basic amenities to the responders • Report to the Under Secretary/Deputy Secretary, GAD • Locate the different facilities as per the Incident Action Plan • Participate in the planning meeting of the section, prepare list for each facilities and its requirements in coordination with the Director of Relief • Maintain record of various activities performed and send to Under Secretary/Deputy Secretary, GAD
<p>Ground Support Unit Leader (GSUL)- Head, RTO</p> <ul style="list-style-type: none"> • In case air operations are activated, organize and provide required ground support through Commissioner of Ports & Transport • Provide maintenance and repair services for all the vehicles and related equipment used for incident management as per proper procedures and keep the concerned line departments informed through the Under Secretary/Deputy Secretary, GAD and Director of Relief • Develop and implement the Incident Traffic Plan • Inform Resource Unit about the availability and serviceability of all vehicles and equipment • Arrange for and activate fueling requirements for all transport including aircrafts in consultation with the Under Secretary/Deputy Secretary, GAD • Maintain inventory of assigned, available and off road or out of service resources • Ensure safety measures within his jurisdiction • Maintain record of various activities performed and send to the Under Secretary/Deputy Secretary, GAD
<p>Finance Branch Director (FBD)- Director of Relief</p> <ul style="list-style-type: none"> • Work under the Logistic section chief (LSC) and attend planning meetings

<ul style="list-style-type: none"> • Prepare a list of resources to be mobilized, procured or hired in accordance with the IAP. Obtain orders of the competent authority as per financial rules and take steps for their procurement without delay • Ensure that time records of hired equipment, personnel and their services are accurately maintained as per Government norms for payment. • Examine and scrutinize cost involved in the entire response activity including the demobilization, analysis the cost effectiveness and keep the LSC informed • Ensure that all obligation documents initiated at the incident are properly prepared, completed, verified and signed by the appropriate Section Chief and Branch Director • Brief the Director of Relief or Chief Secretary on all incident related financial issues needing attention or follow-up • Maintain record of various activities performed and send to Sections concerned
<p style="text-align: center;">Time Unit Leader (TUL) - Section Officer, Revenue Dept.</p> <ul style="list-style-type: none"> • Maintain time recording of hired equipment and personnel and ensure their maintenance on a daily basis and as per government norms • Examine logs of all hired equipment and personnel with regard to their optimal utilization • Ensure that all records are correct and complete prior to demobilization of hired resources • Brief the Director of Relief on current problems with recommendations on outstanding issues, and any follow-up required • Ask for additional support of human resources for assistance, if required • Maintain record of the activities performed and send to Director of Relief
<p style="text-align: center;">Procurement Unit Leader (PUL) -Industries Officer, CSPO</p> <ul style="list-style-type: none"> • Attend to all financial matters pertaining to vendors and contracts • Review procurement needs in consultation with the Director of Relief • Prepare a list of vendors from whom procurement can be done and follow proper procedures • Ensure all procurements ordered are delivered on time • Coordinate with the FBD for use of imprest funds, as required • Complete final processing of all bills arising out of the response management and send documents for payment with the approval of the Director of Relief, and Chief Secretary • Brief FBD on current problems with recommendations on outstanding issues and follow-up requirements • Maintain record of activities performed and send to Director of Relief
<p style="text-align: center;">Compensation/ Claim Unit Leader (Com. / CUL)-Section Officer,S-4 Branch, Revenue Dept.</p> <ul style="list-style-type: none"> • Collect all cost data and provide cost estimates • Prepare and maintain a list of requisitioned premises, services, resources and vehicles, etc. with correct date and time of such requisition • Follow appropriate procedures for preparation of claims and compensation • Requisition additional human resources, if required • Maintain record of various activities performed and send to Director of Relief/(FBD)
<p style="text-align: center;">Cost Unit Leader (CUL)-Industries Officer, CSPO</p> <ul style="list-style-type: none"> • Develop incident cost summaries in consultation with the FBD on the basis of Cost Analysis Report • Make cost-saving recommendations to the FBD • Complete all records relating to financial matters prior to demobilization • Maintain record of various activities performed and send to FBD

Annexure 7 (Ref Page 190)
Detailed guidelines for providing relief

Detailed guidelines for providing relief to persons affected by disaster in the State can be downloaded from the website of Revenue Department, Government of Gujarat :

www.revenuedepartment.gujarat.gov.in



E-citizen



Govt. Resolution



- (i) GR No.CLS/102012/253/S.3 dated 27/4/2015
- (ii) GR No. CLS/102012/253/S.3 dated 15/12/2016

Annexure 8 (Ref Page 191)

Relief Kits (Indicative)

1. Immediate Family Relief Kit (For initial 1-2 days)

- a. Packaged drinking water
- b. Roasted peanuts/ roasted gram (*chana*)
- c. Salt, sugar
- d. Local snacks- *thepla*, *khakra*, flattened rice, *sukhi puri*, *sev* (*dry snacks*)
- e. Glucose biscuits
- f. Energy drink (Glucon-D/Electrolyte)

2. Family Ration Kit (1 Month)

Items	Description
Non Perishable Food Items	<ul style="list-style-type: none"> • Milk (Powdered or canned) • Sugar- 1 kg • Salt- 1 kg • Tea leaves- 500gm • Jaggery (1 kg) • Local snacks- peanuts, <i>chana</i>, <i>khakhra</i>, flattened rice, etc • Dry fruits • Rice- 15 kg • Green Moong Dal- 2 kg • Edible Oil- 2 kg • Spices- Red Chilli Powder (100 gm), Coriander Powder (100 gm), Turmeric Powder (100 gm)
Cooking Set and Associated Items	<ul style="list-style-type: none"> • Bowl -5 (1 L, stainless steel) • Plates -5(deep, stainless steel, diameter 22 cm, capacity 0.75 L) • Cooking pot- 1 (7 L, stainless steel, diameter 24 cm, with handles) • Cup- 5(stainless steel, with handle, 300 ml) • Knife -1 (stainless steel) • Serving Spoons-2 (stainless steel) • Spoons -5 (stainless steel) • Scrubber pad -1 (for cleaning dishes) • Soap- 2 • Plastic Bucket-1 • Plastic tumbler-1

3. Household Kit

Items	Description
Male Clothes	2
Female Clothes	4
Children Clothes	6
Blanket Cotton	1-2
Blanket Woolen	1
Mosquito Net	1-2
Tarpaulin White (4 x6 m)	1-2
Candle Packet	5
Match Box	5
Torch and Cell	1
Washing Powder	1kg
Bathing Soap	3
Detergent Soap	4
Toothpaste	2 tube (200gm)
Toothbrush	5
Sleepers	5 pair
Sanitary Napkins	3 packets
Blankets/ Bed sheets	3 (Depending on weather)
Tarpouline Sheets	2 (12'*8')

Annexure 9 (Ref page 194)

Format for Damage and Loss Assessment (Relief Memorandum)

A. Inspection Team Structure Engineer: _____ Civil Engineer: _____ Junior Engineer: _____ Officer of Local Competent: _____ Authority (from engg. section) _____ Photographer: _____	Inspection Date & Time: _____ Area Inspected: <input type="checkbox"/> Exterior Only <input type="checkbox"/> Exterior & Interior
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B. Type of Disaster

☐ Earthquake ☐ Flood ☐ Fire ☐ Cyclone ☐ Blast ☐ Other

C. Location, Type & Occupancy of Building:

Location: Building Name: _____ Address: _____ _____ Contact: _____ Phone: _____ Survey No.: _____ Final Plot No.: _____ Sub Plot No.: _____ Town Planning Scheme No.: _____	Brief Details: Number of stones above ground: _____ below ground: _____ Parking Floor: <input type="checkbox"/> Ground Level <input type="checkbox"/> Basement Level Approx. Footprint area (sqm): _____ No. of residential units: _____ No. of residential units: _____ not habitable
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(To be collected from Competent Authority)

Type of Construction:

<input type="checkbox"/> Timber Construction <input type="checkbox"/> Masonry Construction <input type="checkbox"/> Kiln burnt bricks <input type="checkbox"/> Unburnt bricks <input type="checkbox"/> Random Rubble Uncoarsed <input type="checkbox"/> Random Rubble Coarsed <input type="checkbox"/> Hollow Concrete Blocks <input type="checkbox"/> Steel Structure <input type="checkbox"/> Other: _____	<input type="checkbox"/> Reinforced Masonry <input type="checkbox"/> Kiln burnt bricks <input type="checkbox"/> Hollow Concrete Blocks <input type="checkbox"/> Concrete Frame <input type="checkbox"/> Concrete Shear Wall <input type="checkbox"/> Dual System <input type="checkbox"/> Precast Concrete Construction <input type="checkbox"/> Composite Structure
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Primary Occupancy:

<input type="checkbox"/> Individual House <input type="checkbox"/> Offices <input type="checkbox"/> Government <input type="checkbox"/> Semi Government <input type="checkbox"/> Emergency Services <input type="checkbox"/> Hospital	<input type="checkbox"/> Commercial <input type="checkbox"/> Restaurant <input type="checkbox"/> Hotel <input type="checkbox"/> Industrial <input type="checkbox"/> Cinema House, Auditoriums, Assembly Halls <input type="checkbox"/> Other: _____	<input type="checkbox"/> Educational <input type="checkbox"/> School <input type="checkbox"/> College <input type="checkbox"/> University	<input type="checkbox"/> Group Housing <input type="checkbox"/> Tenaments <input type="checkbox"/> Flats <input type="checkbox"/> Historic <input type="checkbox"/> Fire Stations
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D. Assessment:

Investigate the building for the conditions given below and check the appropriate column.

Observed Conditions	None	Minor	Moderate	Severe
● Collapse, partial collapse, or subsidence or uneven settlement of foundations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
● Building or story leaning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
● Structural Damage to Bearing Walls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
● Structural Damage to Frame Structure				
Columns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Beams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Column-Beam Junction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stairs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Walls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
● Parapet Wall, Architectural Elements, other Falling Hazard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
● Subsidence of ground, cracking ground slope movement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
● Internal Services				
Water supply	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drainage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electricity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lift	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire Fighting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
● Site Hazards				
Gas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electricity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water Supply	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drainage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Storm Water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Toxic Chemicals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Sketches:

Photographers:

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