Gujarat State

TSUNAMI MANAGEMENT PLAN

2009











GSDMA

GUJARAT STATE DISASTER MANAGEMENT AUTHORITY

GOVERNMENT OF GUJARAT

सत्यमेव जयते



Message

Gujarat has 1600 Kms. of coast line which makes it vulnerable to disasters such as Cyclone, Flood, Storm Surge and Tsunami. The nature which has made Gujarat vulnerable to various disasters has also provided the capacity and resilience in the people of Gujarat to withstand and overcome these disasters.

Though Tsunami is not a frequent disaster, it is necessary to prepare ourselves to present, mitigate and respond to Tsunami. In this context a complete integrated Tsunami Management Plan has been prepared by GSDMA. I appreciate the good work done by GSDMA and urge upon all the departments to make use of this plan to ensure a disaster free Gujarat.

Narendra Modi
Chief Minister
Gujarat

सत्यमेव जयते



FOREWORD

Precise contingency plans to meet any calamity are essential in order to minimize loses to life and property. At the same time, such contingency plans should not only detail how people need to be trained in advance of the calamity, but also the role of each and every Government Department, civil society and other stake holders during the calamity, as also actions to be taken in the aftermath of the event.

Keeping these factors in mind, GSDMA has drawn up a Tsunami Action Plan which will prove to be of value, I hope not only in Gujarat but also other States in the country which are more prone to Tsunami than Gujarat. We believe that this is the first time an Action Plan is being drawn up for Tsunamis, anywhere in India.

The Action Plan itself is a dynamic document. Depending on the experiences that we gain in operationalising different aspects of this plan, we hope to get useful insights that will enable us to refine this plan further in the coming years.

R. BANNERJI
Chief Executive Officer, GSDMA

सत्यमेव जयते



Acknowledgement

The word Tsunami was unheard of in India, has become common place after the Indian Ocean Tsunami which occurred on 26th December, 2004. One of the lessons learnt from the devastating Tsunami which occurred in the Indian Ocean is the need for an integrated Tsunami Management Plan, which includes prevention, mitigation and emergency response. As per the Gujarat State Disaster Management Act, GSDMA as the nodal agency is responsible to develop or cause to be developed guidelines for preparation of disaster management plans, and it is the responsibility of the office of the Commissioner of Relief to prepare, based on the guidelines, State level emergency plans and guidelines for various disasters.

Based on the State level plan, each department is expected to prepare its own Disaster Management plans. However, as Tsunami is a rare disaster which does not occur frequently, GSDMA decided to undertake responsibility of preparing an integrated Tsunami Management Plan for the state. The revision and upgradation of the plan will be the responsibility of the office of the Commissioner of Relief. Based on this State plan each department should prepare the Departmental Tsunami Management Plan.

This Tsunami Management Plan is the first of its kind in India and hence, I have made an attempt to prepare this plan using available data, guidelines and information on Tsunami and also learning lessons from international experiences. As it is said, no plan can be cast in concrete or no plan is perfect. Any disaster management plan should be updated periodically on the basis of lessons learnt and also on the basis of new scientific information and data available.

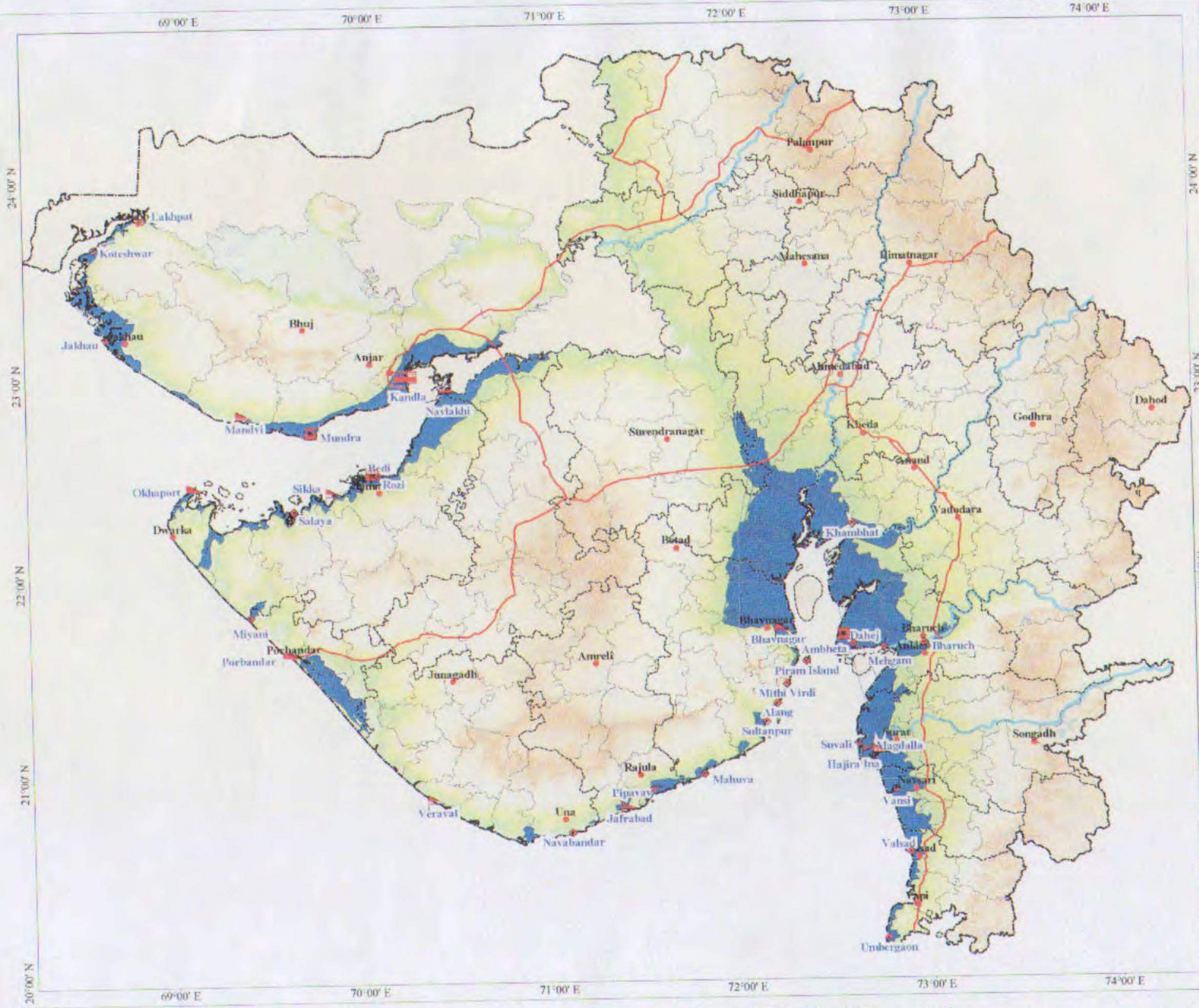
The preparation of this Tsunami Management Plan would not have been possible without the efforts of Shri Jagdish Gadhavi, Deputy Director (Disaster Management), who with his immense patience has made several corrections and revision of the plan to bring it to the present level. I also thank Shri Sudha Kant and Shri Siddharth Chaudhary, Senior Executives for the layout and cover design, and also Shri Manish Rege for finally checking the plan. My sincere thanks to Shri Shailesh Ramanuj, Clerk for his excellent typing work.

I hope this plan will be useful for all the stake holders to prepare for facing future Tsunamis.

[V. Thiruppugazh]
Additional Chief Executive Officer
Gujarat State Disaster Management Authority

Gujarat Tsunami Hazard Risk Zonation : Indicative Inundation based on PMS at Highest High Tide level

GSDMA



LEGEND

- Major Ports
- GMB Ports
- Private Sector Ports
- Joint Sector Ports
- Other Ports
- State Boundary
- District Boundary
- Taluka Boundary
- National Highway
- Major Rivers
- Mud Flats and Runn
- Inundation

Based on Probable Maximum Surge Levels as per
The Vulnerability Atlas of India, GoI, 1997.
Ghosh, S. K. Probable Maximum Storm Surge on the Coast of India and Bangladesh, Aspects of Mechanics, 1983.
Chittibabu, P. Development of Storm Surge Prediction Models for the Bay of Bengal and the Arabian Sea, IIT Delhi, 1999.

Note : In the absence of scientific data on tsunami-genic submarine earthquakes in the Gujarat earthquake catalogue and hence a rigorous tsunami run-up model, the most pragmatic approach to assist administrative action and mitigation planning is to take the worst case Storm surge scenario i.e. PMS at HHTL to be the area potentially exposed to tsunami impact. This is a working approximation based on engineering judgement and not on a scientific probabilistic model. This indicative assessment should be updated based on additional scientific studies of inter-plate submarine earthquakes in the northern Indian Ocean basin, near shore bathymetry, on-shore topography and a rigorous tsunami run-up model for Gujarat.

Source : UKHO, 2003; SRTM, 2003; ETOPO, 2003; Survey of India, Indian Tide Tables, various years; Vulnerability Atlas of India, GoI, 1997; Gujarat Maritime Board, GoG, 2004; BISAG, GoG.

0 100 km

N

Projection : Lambert Azimuthal Equal Area
Datum : WGS 84

MAP No. : HTSM - 01 of 01

Date : 24/6/2005

Tsunami Management Plan

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Chapter I : Introduction

1.1 Plan Objectives and Plan Approaches

Gujarat has a very long coastline of 1600 km. Large part of it is vulnerable to the impacts of Tsunami which may develop in North Indian Ocean and the Arabian Sea. The last recorded tsunami on the Gujarat coast was in 1945, and little is known about its impact on human lives and property. In case of Gujarat, in order to mitigate the adverse impact of future Tsunamis and for better preparedness there is need for a comprehensive Tsunami Management Plan.

Objectives

Following are the main objectives of this plan:

1. To protect and minimize loss of human lives from Tsunami effects
2. To minimize sufferings of people due to Tsunami effects
3. To minimize property and infrastructure damage and losses
4. To reduce Tsunami vulnerability of people and infrastructure
5. To develop efficient Tsunami response mechanism in the state
6. To build the capacity of all stakeholders in the state to cope with the Tsunami
7. To prepare the state government to cope with the future Tsunami attacks and to carry out quick relief, recovery, reconstruction and rehabilitation after the Tsunamis

Approach

1. The vulnerability based planning is taken as basic approach towards plan preparation
2. This plan clearly defines the roles and responsibilities of all government departments at state level to work in co-ordinated manner under the Incident Command system (ICS)
3. To identify, procure / hire, maintain and ensure optimal utilization of resources
4. This plan has taken into consideration, the lessons drawn from the state, national and international experiences in Tsunamis management
5. This plan is based on the realistic approach in practical application of all measures mentioned in the plan.

1.2 Plan Authority

Every department in the state government shall prepare a Tsunami Management Plan. There will also be a comprehensive State Tsunami Management Plan. The responsibility for initiation and execution of emergency response / relief measures during and after the

Tsunami event rests with the Commissioner of Relief in conjunction with other relevant government departments. The GSDMA has made this State level Tsunami Management Plan since it is being prepared for the first time. The Commissioner of Relief shall review, update and maintain this plan hereafter.

1.3 Levels of Disaster (L Concept)

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

L0 level: Denotes normal times, which will be utilized for close monitoring, documentation and preparatory activities. Training of search and rescue teams, rehearsals, evaluation and inventory updation for response activities will be carried out during this period.

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

L2 level: Disaster situations that require assistance and active participation of State resources for management of the disaster.

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

1.4 Facts about Tsunami

(A) What is a Tsunami ?

A tsunami is a series of waves most commonly caused by an earthquake under the sea floor. As tsunamis enter shallow water near land, they increase in height and can cause great loss of life and property damage.

Recent research suggests that tsunamis can occur at any time of the day or night, under any and all weather conditions, and in all seasons. Beaches open to the ocean, bay entrances, tidal flats, and coastal rivers are especially vulnerable to tsunamis.

(B) What is the difference between a 'Distant' and a 'Local' Tsunami?

When a tsunami has been generated by a distant earthquake, it will not reach the coast for several hours, and there is time to issue a warning. When a tsunami is generated by a strong

offshore earthquake, its first waves would reach the outer coast minutes after the ground stops shaking. Feeling an earthquake could be the only warning.

(C) What generates tsunami?

Tsunami(s), also called seismic sea waves, are a series of waves generated by large, violent earthquakes occurring under the ocean. Not all earthquakes generate tsunamis. By far, the most destructive tsunamis are generated from large shallow earthquakes with an epicenter or fault line near or on the ocean floor. Vertical displacements of the earth's crust along the rupture, resulting from such earthquakes, can generate destructive tsunami waves, which can travel across an ocean spreading destruction when it hits shore. Similar displacements of the ocean floor can also be produced by volcanic eruptions, and submarine avalanches or submarine landslides. However, these sources are considered as point sources and, although destructive locally, the energy of the waves is rapidly dissipated as they travel across the ocean.

The wave crests of a tsunami may be a hundred kilometers or more apart as they travel across the ocean. The height from trough to crest may be only a few centimeters or meters in the open ocean. A tsunami cannot be felt aboard ships in deep water.

(D) How are tsunamis generated?

- Tsunamis are generated by any large, impulsive displacement of the sea bed level.
- Earthquakes generate tsunamis by vertical movement of the sea floor. If the sea floor movement is horizontal, a tsunami is not generated. Earthquakes of $M > 6.5$ are critical for tsunami generation.
- Tsunamis are also triggered by landslides into or under the water surface, and can be generated by volcanic activity and meteorite impacts.

(E) How often do tsunamis occur?

- On an average, there are two tsunamis per year in Pacific Ocean which may cause damage near the source.
- Approximately every 15 years a destructive, Pacific-wide tsunami occurs.

(F) How fast does a tsunami travel?

- Tsunami velocity is dependent on the depth of water through which it travels (Velocity equals the square root of water depth h times the gravitational acceleration g, $V = \sqrt{g\,h}$).

- Tsunamis travel approximately at the speed of 700 kmph when the depth of sea is 4,000 m. In 10 m deep water depth the velocity drops to about 36 kmph.
- For example, the tsunami from Sumatra coastal earthquake traveled to Tamil Nadu coast in about two hours. The tsunami speed is about 35 to 45 kmph, which is much faster than human running speed.

(G) How big is a tsunami?

- Tsunamis range in size from centimeters to over 30 m in height. Most tsunamis are less than 3 m in height.
- In deep water (greater than 200 m), tsunamis are rarely over 1m high and will not be noticed by ships due to their long period (time between crests).
- As tsunamis propagate into shallow water, the wave height can increase by over 10 times.
- Tsunami heights can vary greatly along a coast. The waves are amplified by certain shoreline and bathymetric (sea floor) features.
- A large tsunami can inundate land up to 1.5 km from the shore line. However, mitigation measures need to be taken to protect up to 2 km area.
- The force of some tsunamis is enormous. Large rocks weighing several tons along with boats and other debris can be moved inland hundreds of feet by tsunami wave activity. Homes and other buildings get destroyed. All this material and water move with great force and can kill or injure people.

(H) Why are tsunamis so destructive?

As the tsunami enters the shoaling water near the coast, its velocity decreases and it height increases. It is in these shallow waters that tsunamis becomes a threat to life and property, for they can crest to heights up to 30-50 meters and hence strike with devastating force. Finally, terminal height or run-up of the tsunami at the point of impact will depend on how the energy is focused, the travel path of the waves, the coastal configuration, and the offshore topography. Tsunami run-up is the vertical distance between the maximum heights reached by the water on shore and the mean sea level surface. They have been responsible for tremendous loss of life and property throughout history.

1.5 Declaration of Tsunami Disaster

The Gujarat State Disaster Management Act, 2003 provides for the state government to declare any area where Tsunamis have occurred or likely to occur as disaster affected area on the recommendations of the State Relief Commissioner or the District Collector. The purpose of declaration of disaster is to organize effective response in mitigating the Tsunami effects. Such a declaration provides wide powers and responsibilities to the State Relief Commissioner and the District Collectors in order to handle the incident effectively.

1.6 Tsunami Management System in Gujarat

1. The primary responsibility for undertaking measures for Tsunami preparedness, emergency response and relief is the Revenue Department. In addition, following departments of the state supplement the efforts of Revenue Department.

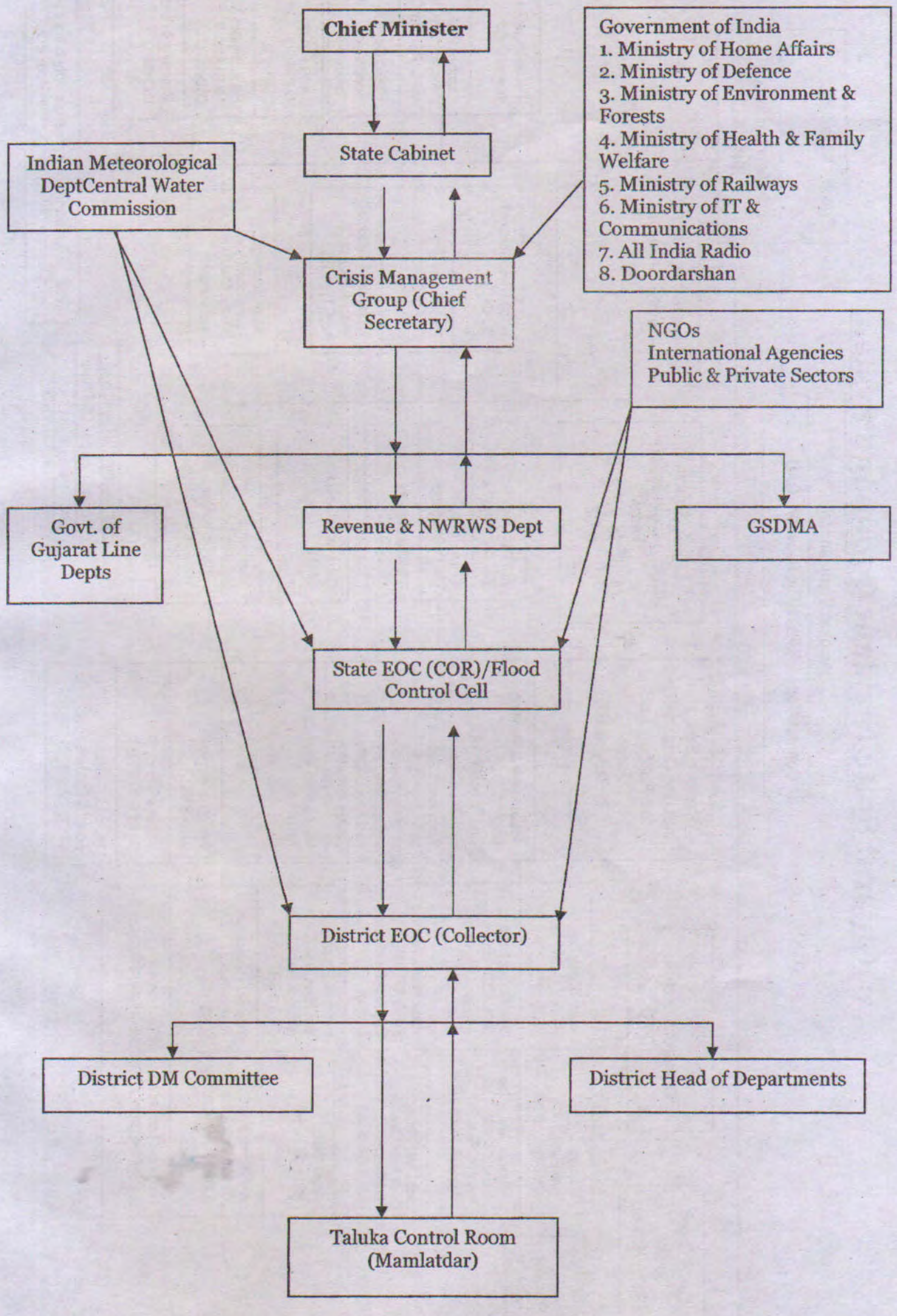
    1. Finance
    2. Agriculture & Co-operation
    3. Narmada, Water Resources & Water Supply
    4. Energy & Petrochemicals
    5. Home
    6. Road & Building
    7. Health & Family Welfare
    8. Food & Civil Supplies
    9. Panchayat, Rural Development & Rural Housing
    10. Urban Development & Urban Housing
    11. Education
    12. Social Justice & Empowerment
    13. Forest & Environment
    14. Ports & Fisheries

2. GSDMA, as a nodal agency in the state for disaster management is responsible for capacity building for long-term cyclone prevention, mitigation activities in the state and also helps in preparing policy guidelines for emergency rescue and relief measures in the state.
3. At the state level, a High Powered Standing Committee has been formed under the chairmanship of the Chief Secretary to monitor emergency situation and issue necessary directions to deal with emergency situation in the state. The Commissioner of Relief is the Member Secretary of this committee. Other Members of this Committee are: ACS[1] (Forest & Environment), PS[2] (Finance), PS (Home), PS (Revenue), PS (Flood & Civil Supplies), PS (Health & Family Welfare), Secretary (Agriculture), Secretary (R & B), Secretary (NWRWS), Secretary (Ports and Fisheries), Director General of Police and Principal Chief Conservator of Forest.

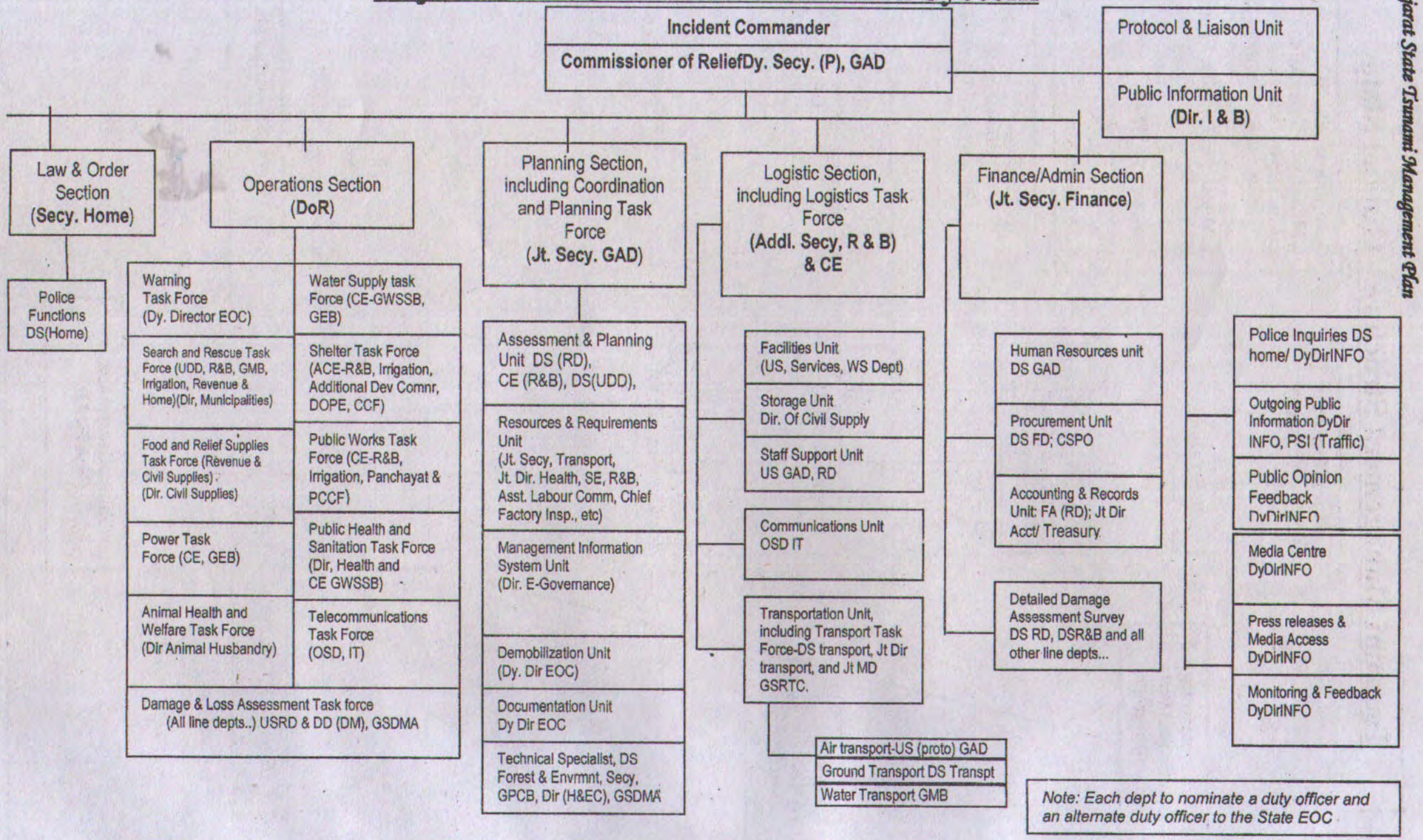
[1] Additional Chief Secretary
2 Principal Secretary

4. If required, a Sub-Committee may be constituted under the Chairmanship of PS (Revenue) and/or Commissioner of Relief for coordination of activities of all agencies and officials engaged in relief operation. Director of Relief (DOR) is designated as the Member Secretary and the liaison officer of all line departments are members of this committee.
5. The Relief Commissioner is the overall in charge of preparedness, rescue and relief operations and in the state.
6. A separate cell named as Directorate of Relief has been created within the Revenue department to monitor the emergency response operations.
7. The Revenue Department has established State Emergency Operation Centre equipped with state of the art communication equipment and other resources. It functions round the clock through out the year. It keeps all disaster management plans, hazard and all relevant maps, charts, contact directory and resources directory etc that are required for emergency operation.
8. During emergency situation, the EOC functions under overall supervision of the Commissioner of Relief. All relevant information received by the EOC shall be communicated to the Commissioner of Relief and relevant authorities.
9. During emergency situation, a senior officer is nominated from the above-mentioned departments to liaison with the Commissioner of Relief. The liaison officer shall ensure suitable instructions are issued to their field officers before, during and after a cyclone. He shall provide all relevant information to the Commissioner of Relief required for submission of reports to the state government and Government of India. He shall also keep a list of senior officers; preferably those who have worked in vulnerable areas.

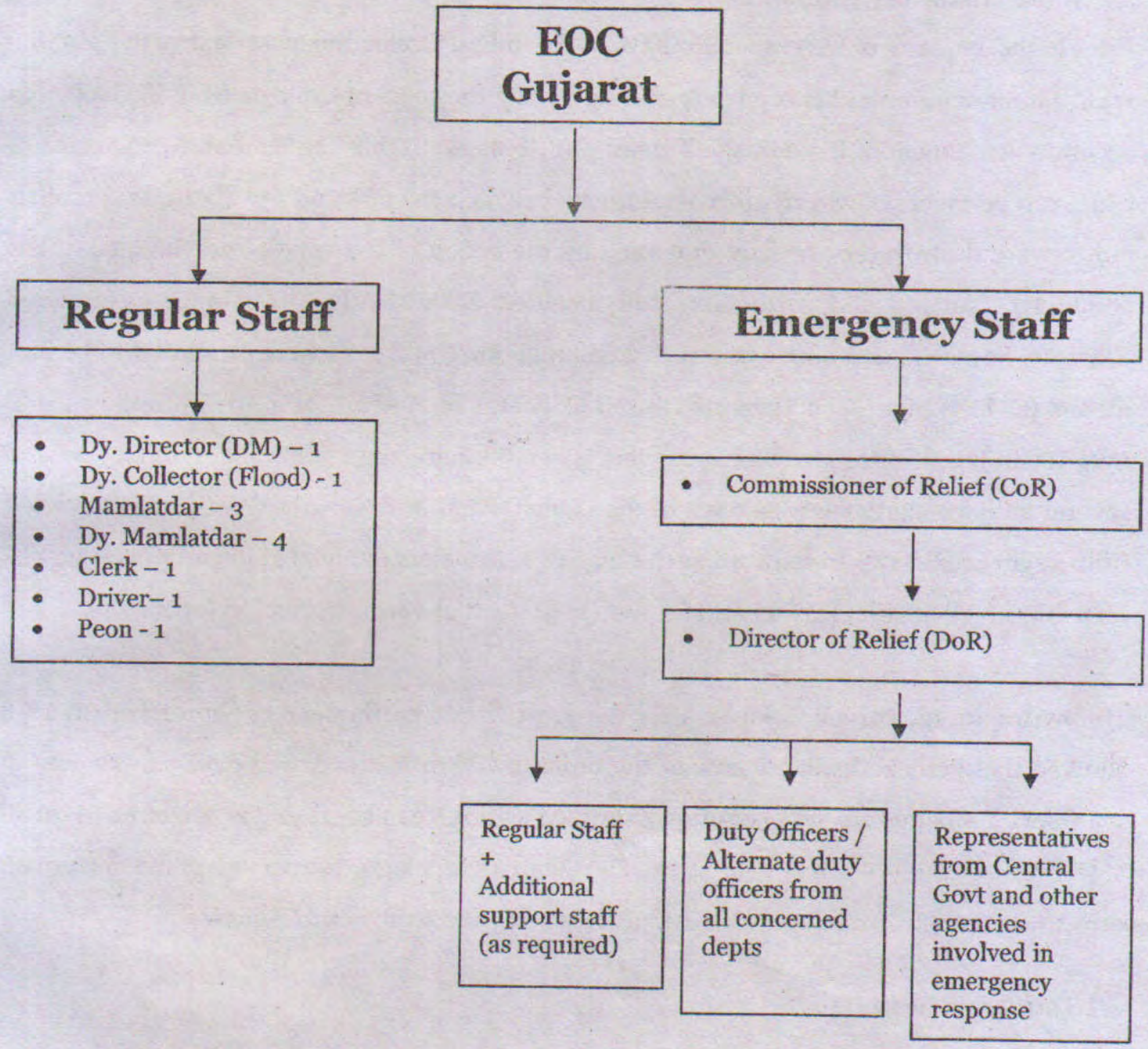
Tsunami Management Structure – Gujarat State



Gujarat State Incident Command System



Composition of Gujarat State EOC



Note:
1. *EOC will function round the clock throughout the year with the Regular Staff*
2. *EOC will be activated under the COR with emergency staff on report of tsunami / any other emergency.*

Chapter II: Tsunami Risk and Vulnerability Assessment

2.1 Some Historical Tsunamis

Prior to the Tsunami of December 26, 2004, in the Indian Ocean, the most destructive Pacific-wide Tsunami in recent history was generated along the coast of Chile on May 22, 1960. No accurate assessment of the damage / deaths attributable to this Tsunami along the coast of Chile can be given; however, all coastal towns between the 36th and 44th (latitude) parallels either were destroyed or heavily damaged by the action of the waves and the quake. The combined Tsunami and earthquake toll included 2,000 deaths, 3000 injuries, rendered 2,000,000 homeless and damages worth $.550 million. The waves were estimated to be 20.4 meters (67 feet) high. The Tsunami caused 61 deaths in Hawaii, 20 in the Philippines, and over 100 in Japan. Estimated damages were $.50 million in Japan, $.24 million in Hawaii and several millions along the west coast of the United States and Canada. Wave heights varied from slight oscillations in some areas to range of 12.2 meters (40 feet) at Pitcairn Islands; 10.7 meters (35 feet) at Hilo, Hawaii and 6.1 meters (20 feet) at various places in Japan.

The hydrographic survey in Japan after the great Kwato earthquake of September 01, 1923 showed that vertical displacements of the order of 100 m had occurred over a large area of sea floor. Tsunamis are very common over the Pacific Ocean because it is surrounded on all sides by a seismically active belt. In the Hawaiian archipelago, Tsunamis approach from all directions, namely, from Japan, the Aleutian Islands and from South America.

2.2 Tsunamis in India

Waves accompanying earthquake activity have been reported over the North Bay of Bengal. During an earthquake in 1881, which had its epicenter near the centre of the Bay of Bengal, Tsunamis were reported. The earthquake of 1941 in Bay of Bengal caused some damage in Andaman region. This was unusual because most Tsunamis are generated by shocks, which occur at or near the flanks of continental slopes. During the earthquakes of 1819 and 1845 near the Rann of Kutch, there were rapid movements of water into the sea. There is no mention of waves resulting from these earthquakes along the coast adjacent to the Arabian Sea, and it is unlikely that Tsunamis were generated. Further west, in the Persian Gulf, the 1945 Makran earthquake (magnitude 8.1) generated Tsunami of 12 to 15 metres height. This caused a huge deluge, with considerable loss of life and property at Ormara and Pasi (now

in Pakistan). The estimated height of Tsunami at Gulf of Cambay was 15 m but no report of damage is available. The estimated height of waves was about 2 m at Mumbai, where boats were taken away from their moorings and casualties occurred. A list showing the Tsunami that affected Indian coast in the past is given in Annexure II.

Above facts indicate the coastal region of Gujarat is vulnerable to Tsunamis from great earthquakes in Makran coast. Earthquake of magnitude 7 or more in this region may be dangerous to Gujarat. It may be noted that all earthquake do not generate Tsunami. Research is still being undertaken in this field.

2.3 Basics of Tsunami risk & vulnerability assessment

The basics of Tsunami risk & vulnerability assessment is the record of seismic activities in the oceans & seas around the landmass for which the assessment is being done. Also, the vulnerability assessment can be carried out based on tsunami run-up model for that area. Such a model for Gujarat is yet to be prepared. In the absence of scientific data on tsunami-genic submarine earthquakes for the Arabian Sea & North Indian Ocean in the Gujarat earthquake catalogue and a rigorous tsunami run-up model, the most pragmatic approach to assist administrative action and mitigation planning is to take the worst case Storm surge scenario i.e. PMS (Possible maximum Surge) at HHTL (Highest High Tide Level) to be the area potentially exposed to tsunami impact. This is a working approximation based on engineering judgment and not on a scientific probabilistic model. This indicative assessment should be updated based on additional scientific studies of inter-plate submarine earthquakes in the north Indian Ocean basin, near shore bathymetry, on-shore topography and a rigorous tsunami run up model for Gujarat when they are available.

Gujarat Tsunami Hazard Risk Zonation : Indicative Inundation [illegible] on PMS at Highest High Tide level

Sr. No.	Taluka	*District Name*	Maximum possible inundation (Area of Taluka in percentage) at Highest High Tide level and 100% PMS (Probable maximum surge)
1	Barwala	Ahmedabad	46
2	Bavla	Ahmedabad	23
3	Dhandhuka	Ahmedabad	71
4	Dholka	Ahmedabad	32

Sr. No.	Taluka	District Name	Maximum possible inundation (Area of Taluka in percentage) at Highest High Tide level and 100% PMS (Probable maximum surge)
5	Viramgam	Ahmedabad	2
6	Jafrabad	Amreli	7
7	Rajula	Amreli	16
8	Borsad	Anand	3
9	Khambhat	Anand	66
10	Tarapur	Anand	31
11	Amod	Bharuch	37
12	Ankleshvar	Bharuch	29
13	Bharuch	Bharuch	27
14	Hansot	Bharuch	58
15	Jambusar	Bharuch	71
16	Jhagadia	Bharuch	4
17	Vagra	Bharuch	91
18	Bhavnagar	Bhavnagar	73
19	Ghogha	Bhavnagar	4
20	Mahuva(B)	Bhavnagar	5
21	Sihor	Bhavnagar	4
22	Talaja	Bhavnagar	14
23	Vallabhipur	Bhavnagar	30
24	Jamnagar	Jamnagar	14
25	Jodiya	Jamnagar	46
26	Kalyanpur	Jamnagar	9
27	Khambhalia	Jamnagar	7
28	Lalpur	Jamnagar	2
29	Okhamandal	Jamnagar	17
30	Kodinar	Junagadh	5
31	Mangrol (J)	Junagadh	6
32	Una	Junagadh	1
33	Abdasa	Kachchh	15
34	Anjar	Kachchh	12
35	Bhachau	Kachchh	18
36	Gandhidham	Kachchh	42
37	Lakhpat	Kachchh	10
38	Mandvi (K)	Kachchh	5
39	Mundra	Kachchh	23
40	Gandevi	Navsari	42
41	Jalalpore	Navsari	77
42	Navsari	Navsari	8
43	Kutiyana	Porbandar	4
44	Porbandar	Porbandar	30
45	Ranavav	Porbandar	13
46	Maliya (R)	Rajkot	48
47	Chorasi	Surat	68
48	Olpad	Surat	69
49	Surat City	Surat	26
50	Limbdi	Surendranagar	23
51	Padra	Vadodara	7
52	Pardi	Valsad	6
53	Umbergaon	Valsad	22
54	Valsad	Valsad	25

Chapter III: Plan for Risk Reduction and Mitigation of Tsunami

3.1 Tsunami Risk Reduction and Mitigation Measures

Although mitigation activities cannot guarantee that there will be no loss of life from future Tsunamis, they can certainly reduce casualties and property damage. Since the return period of destructive Tsunamis is very large, Tsunami mitigation measures should be considered along with mitigation measures of other natural hazards like tropical cyclone etc. However, specific Tsunami protective measures have to be undertaken for the vital installations like important ports etc. Keeping all this in view all the Government departments / agencies should undertake Tsunami risk reduction measures as described below in phased manner. They must plan and implement the activities in highest risk zones as a top priority.

3.2 General Measures

- Adopting integrated multi-hazard approach with emphasis on cyclone and tsunami risk mitigation in coastal areas

3.3 Plans for Tsunami Risk Reduction and Mitigation

(A) Structural measures:

1. Application of science and technology and engineering inputs to improve building design, construction and sites.
2. Demonstration of technology and construction techniques as well as local capacity building through education, training etc.
3. Upgrading the disaster resistance of public building with high occupancy levels such as educational institutes, hospitals, cinema halls, police station, power stations, government offices, etc.
4. Institutionalising incentives to remove unsafe buildings or buildings on unsafe sites or upgrade the level of safety of the buildings. All new construction in the Tsunami vulnerable area should be with the disaster resistant features.
5. Reducing possible damage from secondary effects by
   - Restricting construction in coastal areas
   - Verifying the capacity of all engineering works to resist and upgrading as necessary.
6. Construction of shelters for Tsunami
7. Plantation of mangroves and coastal forests along the coast line

8. Development of a network of local knowledge centers (rural / urban) along the coast lines to provide necessary emergency communication during crisis time
9. Construction of location specific sea walls and coral reefs if and as suggested by the experts
10. Development of break waters along the coast to provide necessary cushion against tsunami.
11. Development of a "Bio-Shield" - a narrow strip of land along coastline. Permanent structures should come up in this zone with strict implementation of suggested norms. Bio-Shield can be developed as coastal zone disaster management sanctuary, which must have thick plantation and public spaces for public awareness, dissemination and demonstration.
12. Identification of vulnerable structures and appropriate retrofitting of all such buildings as well as appropriate planning, designing, construction of new facilities like:
    - Critical infrastructure such as power stations, warehouses, oil and other storage tanks etc.
    - All other infrastructure like schools, colleges, fire stations, police station, Army establishments, hospitals, etc. facilities.
    - Public buildings, VIP and other govt. residencies, offices and other building etc. and private houses
    - All marine structures
    - National and state highways and other coastal roads
    - All hazardous industries
13. Development of Tsunami detection, forecasting and warning dissemination centers.

(B) Non-Structural Measures:

1. To achieve the satisfactory level of disaster mitigation in coastal area, revision of coastal zone regulation Act in wake of Tsunami and cyclone may be carried out and the same may be strictly implemented.
2. Table below is proposed for damage Risk Zone classification on sea coast for consideration.

Table Proposed Damage Risk Zone Classification on Sea Coasts

Area 0-1 m above high tide Level	Very High Damage Risk Zone
Area 1-3 m above high tide Level	High Damage Risk Zone
Area 3-5 m above high tide Level	Moderate Damage Risk Zone
Area 5-10 m above high tide Level	Low Damage Risk Zone
Area 10m or more above high tide Level	No Damage Risk Zone

3. Mapping the coastal area for multiple hazards, vulnerability and risk analysis upto taluka / village level. Development of Disaster Management Information System (DMIS) in all the coastal districts.

4. The State EOC should have the authority for monitoring all activities related to disaster in coastal areas.

5. Aggressive capacity building and awareness of the local people and the administration for facing the disasters in wake of tsunami

6. Developing tools and techniques for risk transfer in highly vulnerable areas and risk transfer through promoting life and property insurance especially housing and important government and private buildings, infrastructures etc.

7. Studies focusing on the tsunami risk may be taken under National Cyclone Risk Mitigation project.

8. Sensitization of policy makers, planners, administrators and other stakeholders about potential Tsunami risk various workshops may be organized in the state on Tsunami risk mitigation. Establishing extensive public awareness programme and dissemination of information about risks, preparedness and mitigation measures.

9. Seismological monitoring through establishment of seismic observatories and strong motion accelographs in identified locations in the state.

10. Integration of risk reduction measures in development planning.

11. Development and enactment of building codes and standards and means of enforcing them.

12. The staff in regulatory agencies should be given defined responsibility for which they should be made accountable towards implementing the measures recommended for safer constructions.

13. Instituting incentives to encourage future development on safer sites and safer methods of constructions through:

    - Favorable taxation, loans, or subsidies for qualifying buildings / sites for use of Tsunami resistant building methods
    - Land development incentives
    - Developing public private partnerships

3.4 Task/Responsibility/Activities of Stakeholders for Prevention & Mitigation

SN	General Measures	Responsibility	Activities
1.	Approach and DM Plan for Tsunami	COR, GSDMA, All Line Depts.	Adopting integrated multi-hazard approach with emphasis on cyclone and tsunami risk mitigation in coastal areas 1. COR 2. GSDMA } State Level plan 3. All Line Departments should prepare their detailed departmental plan.
SN	Structural Measures	Responsibility	Activities
1.	Application of Science and Technology in construction	R&B Dept., Science & Technology, ISR, GSDMA	Application of Science and Technology and engineering inputs to improve building design, construction and sitting.
2.	Identification and strengthening of existing academic centers	Dept. (Higher & Technical Education), GIDM-GSDMA, All Line Depts., COR, GSDMA	1. Introduction of Tsunami study in Universities/Engineering Colleges- 2. Conducting training courses by the concerned line departments on Tsunami planning, mitigation, preparedness and response for Tsunami through their respective training centers. 3. Conducting training programs for emergency medical response etc.
3.	Demonstration of technology and construction techniques.	R&B, GSDMA	Demonstration of technology and construction techniques as well as local capacity building through education training, workshops, Seminars etc.
4.	Up grading the earthquake resistance of public buildings	Revenue, R&B, Irrigation, Home, Water Supply, Health, Education, GEB and other departments	Upgrading the earthquake resistance of public buildings with high occupancy levels such as schools, hospitals, cinema, police stations, power stations, govt. offices, colleges, hostels etc.
5.	Instituting incentives to remove unsafe private buildings or upgrading the buildings and new construction with disaster resistant features	Panchayat & Rural housing Dept., UD&UHD Dept., Revenue Dept., Finance Dept. R&B Dept.	– Formulate the scheme for encouraging and assisting the private public for removing unsafe buildings and for retrofitting the existing building with disaster resistance features. – Implement and monitor the scheme. – Provide technical guidance to the people. – Promote special schemes for life and property insurance.

SN	General Measures	Responsibility	Activities
6.	Reducing possible damage from secondary effects	Revenue Dept., Panchayat & Rural Housing Dept., UD&UHD Dept., Forest & Environment Dept. R&B Dept. and Irrigation Dept.	– Implementation of coastal zone regulation should be strictly monitored. – Restrict new construction of critical infrastructure and private buildings in the area. – Verify the capacity of all structures in coastal area. – Retrofit and upgrade them to the level of safety against the disaster.
7.	Construction of shelters for Tsunami/Cyclone	Commissioner of Relief, Revenue Dept., R&B Dept. GSDMA	– Identification of sites. – Design of the shelters – Allotment of land – Construction of shelters.
8.	Plantation of mangroves and coastal forests	Forest & Environment Dept.	Mangrove and coastal forest may be developed and maintained along the coast line.
9.	Development of a network of local knowledge centers (rural/urban)	Commissioner of Relief & GSDMA	Development of local knowledge centers (rural/urban) along the coastlines to provide necessary training and emergency communication during emergency.
10.	Construction of sea walls and coral reefs	R&B Dept.	– Identification and survey of specific locations with consultation of experts –. Construction and maintenance
11.	Development of break waters	Ports & Fisheries Dept.	Identification and survey of specific locations in consultation with experts Construction and Maintenance of the same
12.	Development of a "Bio-Shield" - a narrow strip of land along coastline.	Forest and Environment Dept., Panchayat & Rural Housing Dept., UD & UHD Dept., Ports & Fisheries Dept. Revenue Dept.	– Development of a Bio-Shield - a narrow strip of land along coastline. – Permanent structure of Bio-shield should come up in this zone with strict implementation of suggested norms – Bio-shield can be developed as coastal zone disaster management sanctuary which must have; (1) Thick plantation (2) Public places with a facility to provide public awareness, dissemination of information and demonstration of disaster management aspects.

SN	General Measures	Responsibility	Activities
13.	Identification of vulnerable structures and appropriate retrofitting for tsunami/cyclone resistance of all such buildings as well as appropriate planning, designing, construction of new facilities.	Revenue Dept., Health Dept., Energy Dept., Panchayat Dept., UD&UHD and Other line Dept. connected with the activity	– Identification of vulnerable structures – Programme for retrofitting – Planning, designing and construction of new facilities with the tsunami/cyclone resistance features. – Proper maintenance of such infrastructures and buildings. – Identification of vulnerable structures should include schools, colleges, fire stations, police stations, Army structures, hospitals, etc. and all other infrastructure facilities located in the coastal areas such as public buildings, VIP and other govt. residencies, offices and other building including private houses – All marine structures – National and state highways and other coastal roads – All Hazardous industries etc.
14.	Development of Tsunami detection, forecasting and warning dissemination centers.	Revenue Dept., Science & Technology Dept.	– Identification of system and locations – Procurement of system – Funding – Development of centers – Maintenance of centers etc.

(B) Non-Structural Measures:

SN	Non Structural Measures	Responsibility	Activities
1.	Revision of coastal zone regulation Act in wake of Tsunami and cyclone.	Forest and Environment Dept., Ports & Fisheries Dept., Revenue Dept., Panchayat & Rural Housing Dept., UD & UHD Dept.	– Revision of coastal zone regulation act in wake of Tsunami & Cyclone – Strict implementation of the regulation (within 500 m of the high tide line with elevation of less than 10 m above mean sea level)
2.	Risk zone classification and mapping of coastal area	GSDMA, Commissioner of Relief	– Mapping the coastal area for multiple hazards – Vulnerability and risk analysis up to village and taluka level – Development of Disaster Information Management system in the state.
3.	A state-of-the-art EOC may be established for monitoring all activities related to disaster in coastal areas.	Commissioner of Relief	Arrangements for special monitoring of all activities related to Tsunami and Cyclone disaster in coastal area.
4.	Aggressive capacity building and awareness program	GSDMA and Respective Line Department	Aggressive capacity building and awareness program to be launched for the local people and the administration for facing the disasters in wake of Tsunami and Cyclone based on "Cutting edge level".
5.	Developing tools and techniques for risk transfer in highly vulnerable areas	Finance Dept., Revenue Dept., UD&UHD Dept., Panchayat & Rural Housing Dept.,	Providing legislative back up to encourage people to adopt Tsunami / Cyclone resistant features in their homes in form of (1) Assistance, (2) Tap rebate, (3) Loan and Subsidy etc.
6.	Studies	GSDMA	Studies focusing on Tsunami risk and mitigation measures early warning etc may be taken up under national Cyclone Risk Mitigation Programms and such other programmes.

7.	Sensitization of policy makers, planners, administrators and other stakeholders and public awareness	GSDMA, GIDM, Others Line Depts., NGOs etc.	Planning and organizing Workshops, Seminars and training of following different sensitization through stake holders in wake of Tsunami/Cyclone risk mitigation. 1. Policy makers 2. Planners, Engineers and Architectures 3. Senior Administrators of the state 4. District and Taluka level officials 5. Employees engaged in disaster management 6. Other stake holders <u>Other activities</u> : 1. Development, publication and distribution of IEC materials 2. Launching IEC campaigns including media publicity 3. Launching awareness programmes for students in schools and colleges 4. To organize sensitization programmes at community levels. 5. Dissemination of information regarding ▪ Risk and vulnerability of Tsunami and Cyclone disaster ▪ Community preparedness ▪ Mitigation measures Do's and Don'ts about the disasters like Tsunami/Cyclone
8.	Seismological monitoring through establishment of seismic observatories and strong motion accelographs in identified locations in the state.	GERI, ISR, Narmada & Water Resources Dept., GSDMA	1. Organizing studies 2. Identification of locations 3. Procurement of accelographs 4. Establishment of Seismic observatories 5. Monitoring seismic activities, data analyses and reporting 6. GSDMA to establish co-ordination mechanism among these agencies.
9.	Integration of risk reduction measures in development planning.	General Administration Department (Planning) and Line Department such as R&B, Irrigation, Forest, Industries, Ports & Fisheries, Panchayat & R.H., UD&UHD etc.	1. Development of techniques to ensure : ▪ Risk reduction measures forms integral part of each plan activity ▪ Certain plan amount is earmarked 2. Implementation and monitoring of the plan provision made by each dept. in their departments plan.

10.	Development and enactment of building codes and standards	GSDMA, R&B Dept., UD&UHD Dept., Panchayat & Rural Housing Dept.	1. Organizing Seminars & Workshop on development and enactment of building codes in wake of Tsunami and Cyclones. 2. Undertaking studies of building codes 3. Revision and enactment of building codes in wake of reports and recommendation from the experts 4. Strict implementation of building codes
11.	Defined responsibilities for the staff in regulatory agencies	UD & UHD Dept., Panchayat & Rural Housing Dept., R&B Dept., Other Line Depts.	Defined responsibilities of staff and officers of different levels the regulatory authorities who are involved in : 1. Supervision 2. Recommendation and giving approval or certification of construction. 3. Technique and means should be developed for making them accountable.
12.	Instituting incentives to encourage future development on safer sites and safer methods of constructions ➢ Favorable taxation, loans, or subsidies for qualified building sites and use of Tsunami/Cyclone resistant building methods. ➢ Land development incentives. ➢ Developing public private partnerships.	Finance Department Revenue Dept. UD & UHD Dept. Panchayat Dept.	1. Favorable taxation, loans, or subsidies for qualified building sites and use of Tsunami/Cyclone resistant building methods. 2. Land development incentives. 3. Developing public private partnerships.

Chapter IV: Plan for Tsunami Preparedness

From the experience of 2001 Kutch Earthquake, the thinking in management of disasters has undergone a paradigm shift in the state. As per the current thinking and policy of the state government, it is recognized that disaster management is a multidiscipline agency, multi-department and multi-level activity. As such, the focus of the state government has shifted from response and relief activities in post-disaster scenario to prevention, mitigation, and preparedness for all likely disasters, which may affect the state.

In view of above, a number of measures for Tsunami preparedness have been identified which are described below.

4.1 Tsunami preparedness general measures:

(a) Development of policies and guidelines: Effective Tsunami preparedness requires the formulation of clear guidelines and subsequent compliance by all government authorities, private sector entities and the public at large. Government of Gujarat and its concerned departments will develop appropriate guidelines to ensure the implementation of the Tsunami preparedness measures.

(b) Development of Disaster Management Plans: The Gujarat State Disaster Management Act, 2003, under section 5(2) (a) specifies that every department of Government of Gujarat shall prepare a Disaster Management Plan. As such, all departments and agencies of the Government to incorporate preparedness measures as listed in this chapter in their Tsunami Disaster Management Plans.

- A detail plan for reconstruction and rehabilitation should be a part of all disaster management plans at all levels.
- Emphasis on mental health and to socio psychological issues should be recorded in every plan.
- A detail plan for evacuation should be essential component of the disaster management plan.
- A plan for reestablishing disrupted communication lines should be a part of DM Plan for Tsunami. Evacuation plan for animals should be prepared.
- The plans for re-establishing disrupted communication lines must be prepared by the concerned department.

- Each department plan must incorporate details of duty officer and an alternate duty officer who will maintain continuous liaison with state EOC.
- Hospitals preparedness plan and emergency medical response plan should be prepared by Health Department
- A detailed plan for maintenance of Law and Order for the area in case of disaster should be prepared by Home Department.
- Animal & Husbandry Department should cover following aspects in their Departmental plan
  - Identification of safer site for evacuation of cattle in case of disaster.
  - Means and route of evacuation
  - Registration and management of cattle evacuation center
  - Procurement and stockpile of medicines
  - Animal health care in affected area and at the center
  - Prevention of epidemic
  - Plan for fodder
  - Plan for water supply
  - Disposal of carcasses

(c) Establishment of early warning system for Tsunami and Development of Tsunami detection, forecasting and warning dissemination centers.

(d) Prepare a Hazard Risk Vulnerability Atlas for Tsunami showing low-lying areas vulnerable to tsunami: infrastructure, population, road network etc. and circulate it to all concerned.

- Identify the exact places where water may enter town / villages and take appropriate measures for prevention and protection.

(e) Make necessary arrangements about safety measures along the beaches.

- Identify important beaches along the coast line
- Provide warning dissemination systems along the coastline.
- Provide lifeguards.
- Arrangement should be made with Air force so that the people can be rescued through helicopters in case of emergency.
- Provide for education facilities about the Tsunami disaster to the people visiting the beach.

(f) Action for streamlining relief distribution system in disaster-affected area should be taken in advance.

- Establishment of centralized center for receipt of relief should be opened.
- Stock, Receipt and Issue records should be maintained item wise.

- Allotment to the district relief center should be made on need base. Receipts from the district center should be obtained and kept in record.
- A senior officer and a team of experienced persons should be allotted to this duty.
- District relief centers should follow the above instructions. Distribution should be made according to policy and norms of the state. Any relaxation required during emergency it should be done only after the approval of the collector or senior officer in-charge of the district relief center and reasons to that effect should be recorded.
- Prior identification of Relief Material. Procurement and stockpile or have rate contract. Store it in a decentralized venue in a place near vulnerable areas.

(g) Establishing Communication Mechanism

- Establishment of multiple means of communications with Tsunami prone areas. These communication links should include landlines, cellular phones, satellite phones, and HF & VHF Radio communication links.
- Make prior arrangements with mobile companies to send messages, SMS message to people.
- Plans for reestablishing disrupted communication systems.
- All line department must have a multiple or alternative communication with their district and taluka authorities as well as in-charge of important projects.

(h) Develop Repository of information

- The contact details of necessary resources, persons and agencies (NGOs etc) that may be needed in the event of Tsunami must be readily available and disseminated to all concerned.
- Upgradation, validation and maintenance of state disaster resource network and National Disaster Resource network.
- District-wise trained and experienced officers database should be maintained by each department.
- Database of land and site available for relocation should be created and updated time to time
- Database of shelters available with all details like location, type of construction capacity of the shelter and facilities available at the shelters.

(i) Prior identification of –

- Storage godowns for storage of relief and other essential items.
- Centres for receipt and distribution of relief materials.
- Human resources and infrastructure for rescue operations.
- Human resources for medical assistance and relief operation.
- Human resources for maintenance of law and orders
- Human resources for survey, damage and loss assessment
- Human resources for relief distribution

- The officers and teams who will be in-charge of the evacuation operation.
- Safe sites mode of evacuation and accommodation for evacuated population.
- Safe sites mode of evacuation and accommodation of evacuate cattle.
- Vehicles to be utilized for evacuation.
- Full proof management of evacuation centers / relief centers. Setting up of procedure and management mechanism for human & cattle at the centers.
- Prior identification of agencies, NGOs for disposal of dead bodies at the state level and also by the collectors at district level.
- Setting up appropriate mechanism for waiving post mortem of dead bodies in case of large-scale disaster.
- Setting up coordinating desk / center in Airport in the affected district and in the state headquarter for receiving / storing and dispatching relief material.
- Identifications of families to be evacuated and to whom emergency relief to be distributed.
- Identification of women and child who will be require special attention during and after the disaster
- Keep informed the local community about the location, routes to the evacuation center, capacity and facilities available at evacuation centers.
- Prior meeting with armed forces - assessing the need for helicopters in Rescue / providing relief / search / damage assessment etc - identifying the availability of helicopters in government and private sector and getting into all arrangement for the same.

(j) Strengthening of state EOC and District and Taluka control Rooms:

- EOC buildings should be constructed or retrofitted with all hazard resistant features and equipped
- Communication equipment and other infrastructure of the EOC should be strengthened.
- Emergency staff of EOC should be identified in advance.
- Identify leaders and deputy leaders of the different task forces.
- Minimum necessary staff required to operate EOC must be identified, trained and deputed.
- Co-ordination meetings should be held with members of sector wise taskforces in advance for identification of tasks and developing the SOPS.
- The tasks pertaining to each department should be identified in the coordination meeting of the task forces.
- All concerned departments will discuss the task allotted to their department with the staff members of their department as a part of familiarization of the department disaster management plan.
- Identify setting up of a coordination cell in the state head quarter for coordinating NGOs and other agencies providing relief.

- Appropriate mechanism for receiving, storing and dispatching the aid and relief material to affected areas.
- Identify setting up of a coordinating desk / center in Airport in the affected district and in the state headquarter for receiving / storing and dispatching relief material.
- A map as mentioned in (d) above should be displayed in EOC at the desk of all task forces.
- Incident command system should be introduced and strengthen
- Proper training regarding incident command system should be given to all staff / officers of the EOC

4.2 Tsunami preparedness other measures related to Emergency Response & Relief

- Purchase of equipments.
- Maintenance, testing and repair of equipments.
- Conduct of mock drill.
- Revising the plan after mock drill.
- Arrangement for essential suppliers and adequate stock in safe storage near vulnerable areas.
- Procurement, storage and maintenance of Relief and Rescue materials. Critical supply should be stockpiled
- Procurement and stock of temporary shelters.
- Procurement and maintenance of rescue machinery and equipments
- Annual inspection report of vital and sensitive installations in the State.
- Inspection and Strengthening of unsafe buildings.
- Inspection and strengthening of all protection embankments, dams, bunds and ring bunds etc.
- Inspection, strengthening and repairing of all approach roads and culverts to villages / towns in low-lying areas.
- Arrangements of water pumps for dewatering
- Inspection of transmission lines, electric lines etc.
- Purchase and storage of essential medicines.
- Adequate stock of essential medicines.
- Epidemic surveillance for controlling and prevention of epidemic.
- Detailed alternative plan for power and water supply arrangements.
- Verify functioning of emergency communication equipment
- Inspect the warning dissemination system
- Meeting and liaisoning with armed forces for help required in emergency for rescue and relief.

- Procurement and stockpiles of spares by the departments like Water Supply, GEB etc for requirement of their machinery, equipments and plants.
- A meeting with railway and state transport authority and transport department regarding traffic control during and after disaster. Preparation and plans of these authorities regarding restoring transport immediately after disaster may be reviewed. Arrangements for establishing traffic points to control traffic to the disaster-affected area should be reviewed.
- Meeting with NGOs for determining area of work and type of work, which can be entrusted to NGOs.
- Necessary arrangements for disposal of human dead bodies and animal carcass.
- Arrange for disinfectants.
- Prevention of epidemics
- Arrangements for helpline and information counter at important places.
- Checking of rescue equipments
- Planning and necessary training for documentation.
- Review of preparedness at regular interval.
- Establish reporting procedures

4.3 Tsunami Preparedness Training and Capacity Building measures:

A. Training to:

- Training to trainers
- Training of first responders.
- Training of local bodies Panchayatiraj institutions.
- Training of NGO's, CBO's and other voluntary agencies,
- Community Training.
- Training of search and rescue teams.
- Training on forecasting and warning dissemination.
- Training of engineers, masons and builders for Tsunami resistant constructions.
- Training of teachers
- Training for task force of EOC

B. Training on:

- Training on S & R
- Training on emergency warning communication and dissemination of information.
- Training on relief operations
- Hospital preparedness

- First aid
- Training on evacuation
- Community Awareness and education programme
- Schools/colleges/other educational institutes awareness programme
- Training for DMTS at village level.

C Training of doctors and para medical staff

- Rehearsal of hospital preparedness plan
- Emergency medicines stock and equipments to handle the casualties
- Mobile van, ambulances, dad body vans, and other vehicles management
- Camps and mobile hospital management
- Co-ordination with other hospitals in the state.

4.4 Tsunami preparedness measures: - Tasks and responsibilities.

Sr. No.	Task	Responsibility	Activity
Tsunami Preparedness - General measures			
(a)	Development of Policies and guidelines	1. GSDMA 2. Revenue Department 3. UD & UHD 4. R&B Department 5. Finance 6. Other line departments	(a) Effective Tsunami preparedness requires the formulation of clear policy and guidelines and subsequent compliance by all government authorities, private sector entities and the public at large. Government of Gujarat and its concerned departments will develop appropriate policies and guidelines for: **Revenue Dept:** Rescue and Relief norms. **GSDMA:** Disaster Management, Reconstruction and Rehabilitation. **R & B, UD&UHD, Panchayat:** Building construction with disaster resistant features. Retrofitting of buildings, Removal of unsafe buildings and structures. **Finance:** Incentives, Tax rebate and Insurance of lives & property. **Other line departments:** Relief packages for agriculture, industries, fisheries etc.
(b)	Development of Tsunami Management Plan	1. COR 2. GSDMA 3. All other Depts of the state	1. **COR:** Develop and prepare state's Tsunami Management Plan. 2. **GSDMA:** Prepare & provide guidelines and help to all concerned departments in preparing their department Tsunami Management Plan. Review and rehearsal of the plan. Integrate the department's plans into a state plan. 3. **Line Departments:** The Gujarat State Disaster Management Act, 2003, under section 5(2) (a) specifies that every department of

			Government of Gujarat shall prepare a Disaster Management Plan. As such, all departments and agencies of the Government to incorporate preparedness measures as listed in this chapter in their Tsunami Disaster Management Plans.
			• A detailed plan for reconstruction and rehabilitation should be a part of all disaster management plans of all levels.
			• Emphasis on mental health and to socio psychological issues should be recorded in medical Disaster Management Plan.
			• Hospital preparedness plan should be prepared by health department in wake of Tsunami Disaster.
			• A detailed plan for evacuation should be essential component of the disaster management plan.
			• A plan for reestablishing disrupted communication lines should be a part of DM Plan for Tsunami / Cyclone. Evacuation plan for animals should be prepared.
			• Plan for re-establishing disrupted communication lines must be prepared by the concerned department.
			• Each department plan must incorporate details of duty officer and an alternate duty officer who will maintain continuous liaison with state EOC.
			• A detailed plan for maintenance of Law and order for the area in case of disaster should be prepared by Home Department.
			• Animal & Husbandry Department should cover following aspects in their Departmental plan
			  ○ Identification of safer site for evacuation of cattle in case of disaster.
			  ○ Means and route of evacuation
			  ○ Registration and management of cattle evacuation center
			  ○ Procurement and stockpile of medicines

			○ Animal health care in affected area and at the center ○ Prevention of epidemic ○ Plan for fodder ○ Plan for water supply ○ Disposal of carcasses
(c)	Establishment of early warning system and Development of Tsunami Detection, forecasting and warning dissemination centers	1. GSDMA 2. Revenue Department 3. COR 4. Science & Technology Department 5. ISR 6. GERI	GSDMA : - Conduct study analyzing study report & recommend Tsunami Earlywarning system - Coordination with MHA in establishing early warning system. - Coordination with Revenue Department, Science and Tech Department and ISR, GERI etc. - Undertake study about the development of Tsunami detection, forecasting and warning dissemination centers. - Analyze study report and recommend to government Revenue Department : In coordination with science and technology department establishing early warning system and monitor. COR: Coordinate with the science & technology department, ISR, GERI, etc. and initiate action to implement the recommendation of the study report. Science & Tech Dept: Establishing early warning system in the state. Establish Tsunami detection forecasting and warning dissemination centers

(d)	Prepare hazard risk vulnerability atlas showing low lying areas vulnerable to Tsunami, infrastructures population, road network etc.	1. GSDMA 2. COR 3. Line Department	GSDMA : Prepare maps showing low lying area vulnerable to Tsunami, infrastructure, population, road network etc. COR : Circulate maps to all concerned Line Depts : To undertake prevention and protection measures 1. Identify the place where water may enter 2. Take prevention and protection measures
(e)	Arrangement about safety measure along the beaches	1. Revenue department 2. Ports and Fisheries Dept 3. Science & Tech. Dept	1. Identify important beaches along the coast line 2. Provide warning dissemination systems along the coastline. 3. Provide lifeguards. 4. Arrangement should be made with Air force so that the people can be rescued through helicopters in case of emergency. 5. Provide for education facilities about the Tsunami disaster to the people visiting the beach.
(f)	Streamlining relief distribution system	1. COR 2. DOR	1. Establishment of centralized center for receipt of relief should be opened. 2. Stock, Receipt and Issue records should be maintained item wise 3. Allotment to the district relief center should be made on need base. Receipts from the district center should be obtained and kept in record. 4. A senior officer and a team of experienced persons should be allotted to this duty. 5. District relief centers should follow the above instructions. Distribution should be made according to policy and norms of the state. Any relaxation required during emergency it should be done

			only after the approval of the collector or senior officer in-charge of the district relief center and reasons to that effect should be recorded. 6. Prior identification of Relief Material. Procurement and stockpile or have rate contract. Store it in a decentralized venue in a place near vulnerable areas.
(g)	Establishing communication mechanism	1. Revenue Department 2. Home Department 3. Science and Technology Department 4. Other line department	1. Multiple or alternative means of communication should be provided to the Tsunami / cyclone prone districts. 2. Plans for reestablishing disrupted communication systems. 3. All line department must have a multiple or alternative communication with their district and taluka authorities as well as in-charge of important projects. 4. Make prior arrangements with mobile companies to send messages, SMS message to people.
(h)	Develop repository of information	1. Revenue department 2. All line department 3. COR 4. GSDMA	1. Creating and disseminating database of contact, details, resources equipments of human resources, agencies and NGOs. 2. Database of trained and experienced officers should be maintained by each department. 3. Database of land and sites available for relocations should be erected 4. Database of shelters available with all details like location, type of construction capacity of the shelter and facilities available at the shelters. 5. Periodic upgradation validation and maintenance of state disaster resource network and national disaster resource network.

(i)	Prior identification of tasks required for response and relief in case of disaster	1. Revenue Department 2. COR 3. Civil Supply Department 4. Health Department 5. Transport Department 6. R&B Department 7. Irrigation Department 8. Ports & Fisheries Department 9. Panchayat Department 10. UD & UHD 11. Home Department 12. Energy Department 13. Agricultural Department 14. Animal Husbandry Dept. 15. Social Welfare Dept. 16. Women & Child Dept. 17. Industries Dept. 18. Water Supply Dept.	Prior identification of the following: 1. Storage godowns for storage of relief and other essential items. 2. Centres for receipt and distribution of relief materials. 3. Human resources and infrastructure for rescue operations. 4. Human resources for medical assistance and relief operation. 5. Human resources for maintenance of law & order. 6. Human resources for survey, damage and loss assessment. 7. Human resources for relief distribution. 8. The officers and teams who will be in-charge of the evacuation operation. 9. Safe sites mode of evacuations and accommodation for evacuated population. 10. Safe sites, mode of evacuation and accommodation of evacuated cattle. 11. Vehicles to be utilized for evacuation. 12. Full proof management of evacuation centers / relief centers. Setting up of procedure and management mechanism for human and cattle at center. 13. Prior identification of agencies, NGOs for disposal of dead bodies at the state level and also by the collectors at district level.

			14. Setting up appropriate mechanism for waiving post mortem of dead bodies in case of large-scale disaster. 15. Setting up coordinating desk / center in Airport in the affected district and in the state headquarter for receiving / storing and dispatching relief material. 16. Identifications of families to be evacuated and to whom emergency relief to be distributed. 17. Identification of women and child who will be require special attention during and after the disaster 18. Keep informed the local community about the location, routes to the center, capacity and facilities available at evacuation centers. 19. Prior meeting with armed forces - assessing the need of helicopters in rescue / providing relief / search / damage assessment etc, identifying the availability of helicopters in government and private sectors in getting into all arrangement for the same. 20. Identification of members of weaker section and help that may required by them.
(j)	Strengthening of state EOC, district and taluka control Room	1. Revenue Department 2. COR 3. R&B Department 4. GSDMA 5. Science & Technology Dept. 6. Finance Department 7. GAD	1. EOC buildings should be constructed or retrofitted with all hazard resistant features. 2. Communication equipment and other infrastructure of the EOC should be strengthened. 3. Emergency staff of EOC should be identified in advance. 4. Identify leaders and deputy leaders of the different task forces.

		8. Other line Departments	5. Minimum necessary staff required to operate EOC must be recruited initially. 6. Co-ordination meetings should be held with members of sector wise taskforces in advance for identification of tasks and developing the SOPS. 7. The tasks to be undertaken by each department should be identified in the coordination meeting of the task forces. 8. All concerned departments should discuss the task allotted to their department with the staff members of their department as a part of familiarization of the department disaster management plan. 9. Set up a coordination cell in the state head quarter for coordinating NGOs and other agencies providing relief. 10. Appropriate mechanism for receiving, storing and dispatching the aid and relief material to affected areas. 11. Set up setting up coordinating desk / center in Airport in the affected district and in the state headquarter for receiving / storing and dispatching the aid and relief material to affected areas. 12. A map as mentioned in (e) above should be displayed in EOC at the desk of all task force. 13. Incident command system should be introduced and strengthen 14. Proper training regarding incident command system should be given to all staff/officers of the EOC.
4.2	Tsunami Preparedness Other	1. Revenue Department	1. Purchase of equipments. 2. Maintenance, testing and repair of equipments.

	measures related to response and relief	2. Civil Supply Department 3. COR 4. R & B Department 5. UD & UHD 6. Panchayat & R H Department 7. Water Supply Department 8. Irrigation Department 9. Health Department 10. Energy Department 11. Science & Technology Dept. 12. Home & Transport Dept. 13. A H Department	3. Conduct of mock drill. 4. Revising the plan after mock drill. 5. Arrangement for essential supplies and adequate stock in safe storage near vulnerable areas. 6. Procurement, storage and maintenance of Relief and Rescue materials. Critical supply should be stockpiled 7. Procurement and stock of temporary shelters. 8. Procurement and maintenance of rescue machinery and equipments 9. Annual inspection report of vital and sensitive installations in the State. 10. Inspection and Strengthening of unsafe buildings. 11. Inspection and strengthening of all protection embankments, dams, bunds and ring bunds etc. 12. Inspection, strengthening and repairing of all approach roads and culverts to villages / towns in low lying areas. 13. Arrangements of water pumps for dewatering 14. Inspection of transmission lines, electric lines etc may be carried out 15. Purchase and storage of essential medicines. 16. Adequate stock of essential medicines may be maintained 17. Epidemic surveillance for controlling and prevention of epidemic. 18. Detailed alternative plan for power and water supply arrangements. 19. Verify functioning of emergency communication equipment 20. Inspect the warning dissemination system 21. Meeting and liaisoning with armed forces for help required in emergency for rescue and relief. 22. Procurement and stockpiles of spares by the departments like Water Supply, GEB etc for requirement of their machinery, equipments and plants.

			23. A meeting with railway and state transport authority and transport department regarding traffic control during and after disaster. Preparation and plans of these authorities regarding restoring transport immediately after disaster may be reviewed. Arrangements for establishing traffic points to control traffic to the disaster-affected area should be reviewed. 24. Meeting with NGOs for determining area of work and type of work, which can be entrusted to NGOs. 25. Necessary arrangements for disposal of human dead bodies and animal carcasses procedure and mechanism. 26. Arrange for disinfectants. 27. Prevention of epidemics. 28. Arrangements for helpline and information counter at important places. 29. Checking of rescue equipments 30. Planning and necessary Training for documentation. 31. Review of preparedness at regular interval. 32. Establish and setup reporting procedures.
4.3	Tsunami Preparedness Training and capacity Building measures	1. Revenue Department 2. Home Department, Police, Civil Defence and Home Guards 3. UD & UHD and all municipal corporations 4. Health Department	Training and Capacity Building measures: A Training to: 1. Training to trainers 2. Training of first responders. a) Police including traffic personnel b) Home Guards

		5. R & B Department 6. Panchayat & R H Department 7. Education Department 8. Labour & Employment Department 9. GAD 10. GSDMA 11. GIDM 12. Information Department	c) Civil Defense Personnel d) Fire brigade 3. Training of local bodies Panchayatiraj institutions. a) Members of District, Taluka & Gram Panchayats b) President Mayors and members of urban bodies 4. Training of NGO's, CBO's and other voluntary agencies, including youth organizations. 5. Community Training. Awareness and Education 6. Training of search and rescue teams. 7. Training on personnel engaged in forecasting and warning dissemination activities. 8. Training of Government officials and staff. 9. Training of engineers, masons and builders for Tsunami resistant constructions. 10. Training of teachers 11. Training of task force of EOC B. Training on 12. Training on S & R 13. Training on emergency warning communication and dissemination of information. 14. Training on relief operations 15. Hospital preparedness 16. First aid

			17. Training on evacuation 18. Community Awareness and education programme 19. Schools/colleges/other educational institutes awareness programme 20. Training for DMTS at village level. C Training of doctors and para medical staff 1. Rehearsal of hospital preparedness plan 2. Emergency medicines stock and equipments to handle the casualties 3. Mobile van, ambulances, dad body vans, and other vehicles management 4. Camps and mobile hospital management 5. Co-ordination with other hospitals in the state.

Chapter V : Plan for Emergency Response in Tsunami

5.1 General.

Tsunamis are likely to cause deaths and injuries to human beings and damage to property on a large-scale. If the epicenter of the tsunami-generating earthquake under the ocean is detected, the approximate arrival time of tsunami waves at specific coastal location can be determined. However, it is yet not possible to predict the wave height, number of waves, duration and force of the hazard. Suitable computer program could be developed for predicting these parameters with reasonable accuracy. Therefore planning should be done for a quick response at all levels to reduce the effects of tsunami waves for minimum of 1 km area from the sea shore likely to be hit.

The Nodal Department for controlling, monitoring and directing measures for organizing rescue, relief and rehabilitation is the Revenue Department of the State. All other concerned Departments should extend full cooperation in all matters pertaining to the management of the Tsunami disaster whenever it occurs. The state departments like Revenue, Home including Transport, Ports & Fisheries, R & B, Power, Finance, Information and Broadcasting etc. shall have a major role in emergency response during occurrence of Tsunami generating earthquake and Tsunami hitting the shore. The state EOC and other control rooms at the state level as well as district control rooms should be activated with full strength. The state Government may publish a notification in the official gazette, declaring such area to be disaster-affected area under GSDMA Act (Section 32 (2) (a)).

In absence of an early warning system for Tsunami, presently there can be two different scenarios for response measures to a Tsunami Disaster

1. Tsunami hits coastal area without any warning as it struck south Asia on 26th December 2004.
2. Seismological Net work of IMD detect epicenter of massive earthquake under the Indian/Arabian Sea and reports its occurrence and possibilities of Tsunami generation, to coastal states.

In the first scenario, the state administration has to arrange quick emergency response and relief measures. Some of the measures are identified and given in para 5.3.

In case of second scenario, without entering into correctness of warning or percentage of possibilities of Tsunami occurrence or possibilities of its striking coastal area of the state, the

state administration has to respond immediately and to arrange all precautionary measures for Tsunami emergency response and relief. Some of the measures are identified and given in para 5.2. The administration has to be on high alert stage unless and until the possibilities of Tsunami striking coastal area of the state is over or de-warned. In this case if the Tsunami waves strike the coastal area then the response measures as identified in 1st scenario will have to be taken.

In view of the above emergency response measures has been identified and given below in two sets.

1. Response measures when occurrence of Tsunami generating earthquake under Indian/Arabian Sea is reported.
2. Response measures when Tsunami waves hit coastal area of the state without any warning.

5.2 Emergency response measures when occurrence of Tsunami generating earthquake under the ocean is reported.

The possibility of potential occurrence of Tsunamis may be reported by the India Meteorological Department (IMD) to the Commissioner of Relief by the fastest means. The state administration will have hardly one-hour time to evacuate the people to safer places and for taking other precautionary measures. In view of this, State EOC should be activated under the command of Incident commander at once with its full strength. All task forces should be activated without any delay. The Public Information unit of the EOC should take immediate steps to disseminate the information to public through appropriate means of media. The State Crisis Management Groups Meeting (SCGM) under the Chairmanship of the Chief Secretary should be convened at the earliest. Decisions and course of action decided by the crises management group are to be followed strictly and departmental plans and SOPs are to be activated accordingly. All instructions and directions received from incident commander are required to be implemented by all who are engaged in disaster management work without any delay.

I. Information and reporting: -

- The state EOC should be activated with its full strength for emergency response on receipt of information about occurrence of the tsunami generating earthquake under the ocean and tsunamis are likely to hit Gujarat coast.

(a.) The Dy. Director/Mamlatdar whoever is in change of the EOC should report information about Tsunami generating earthquake to the following at once without any delay:

(1) Commissioner of Relief & Director of Relief
(2) Principal Secretary (Revenue)
(3) Chief Executive Officer, Gujarat State Disaster Management Authority
(4) Chief Secretary of the State
(5) Members of Crisis Management Group
(6) Hon. Chief minister
(7) Hon. Revenue Minister
(8) National Disaster Management Authority, GoI.
(9) All concerned District Collectors as well as Control Rooms of the concerned district.
(10) Ministers and Secretaries of all line departments

(b.) Activate alternative communication equipments i.e. satellite phones, HF/VHF sets, Ham radio, VSAT in state EOC.

(c.) Instruct all collectors to activate District control room at full strength.

(d.) Instruct all regular staff and duty officers to report in state EOC with the members of their Task Forces.

(e.) Instruct and alert all heads of departments of the key line departments to activate their departmental plan and SOPs.

(f.) Alert all response teams in the state for deployment.

(g.) Remain in constant touch with control rooms at National & District Level.

II. Establishment of lines of Communication and essential service to facilitate emergency response

1. Establish communication links with ERCs, ERUs, and Search & Rescue Teams in all Municipal Corporations.
2. Establish communication links with District and Taluka Control Rooms and alert them for quick actions.

III. Management of EOC and Emergency Response

1. COR to take over full command of state EOC.
2. Activate all operation task forces.
3. Hold first brief meeting with leaders of task forces and entrust them their tasks.
4. Arrange dissemination of information through Radio, TV, Cable Network sending of SMS and all other means of communication about occurrence of earthquake, which possibly can generate Tsunami waves and the information about coasts which are likely to be hit by Tsunami waves.

5. Ensure that Tsunami information is disseminated to all who are at danger.
6. Convene emergency meeting of state Crises Management Group.
7. Inform all concerned about decisions, policies, special delegation of powers and course of action decide by C.M.G.
8. Impose restriction on all transport activities heading towards coastal area. Instruct all concerned authorities by fastest means of communication. People may be requested not to enter areas likely to be affected.
9. Instructions may be issued for cordoning the likely affected area.
10. Instruct all state government officers and employees in the state to report to their respective head for emergency duties.
11. Alert Search & Rescue and Emergency Medical Response teams of the state for emergency response.
12. Identify the location & area where S & R Teams to be deployed.
13. Contact BISAG, NRSA, ISRO and NDMA for aerial/satellite imaginaries.
14. Arrangements with armed forces for help regarding;
    a) Air lifting of ill, physically disabled and aged persons to safer places.
    b) Dissemination of information
    c) In case of a disaster
        (i) Help in emergency search and rescue work
        (ii) Help in emergency relief operation
        (iii) Help in providing emergency medical relief
        (iv) Help in quick aerial survey
        (v) Help in maintaining law & order in affected areas
        (vi) Help in air lifting of seriously injured person.
15. All concerned collectors of coastal area and secretaries of the line departments to:
    (a) Make arrangements for immediate evacuation of people from coastal areas to safer places.
    (b) Ensure evacuation of fisherman and salt workers.
    (c) Ensure safety of tourists on visit to beaches along the coastline.
    (d) Open evacuation centers.
    (e) Make necessary arrangements at evacuation Centers.
    (f) Cordoning off coastal areas for restricting entry from outside by rail or road.
    (g) Ensure that all critical activities in likely affected area are shutdown.
    (h) Ensure that ill, disable and old persons, if necessary, is air lifted to a safer place.
    (i) Ensure law and order is maintained in areas likely to be affected.
    (j) Ensure that necessary arrangement is made for suspending power supply at appropriate time.
    (k) Ensure that the schools and colleges are closed in areas likely to be affected
    (l) Ensure dissemination of information to remote areas by local means.

(m) Ensure that the help lines are opened and effectively managed for public information, guidance and rumor control.

(n) Ensure that the information to public and media is released.

(o) Ensure timely reporting of situation at state level.

16. Following teams may be mobilized along with their equipments to the identified nearest points of areas likely to be affected;
    (a) Search and rescue teams for emergency response.
    (b) Quick medical response teams
    (c) Debris clearance teams
    (d) Dead body disposal teams
    (e) Mobile emergency communication teams
    (f) Mobile water supply restoration teams.
    (g) Mobile power restoration teams.
    (h) Mobile R&B teams for road clearance
    (i) Mobile communication restoration teams
    (j) Quick assessment teams
    (k) Need assessment teams.
17. Make transport arrangement for mobilization of all emergency response teams.
18. Make arrangements for logistic support to all emergency response teams.
19. Make necessary arrangements for supplying logistic support to all who are engaged in disaster management work.
20. Health Department to activate their Departmental Disaster Management Plan and departmental SOPs for Management of casualties;
    (a) Emergency Medical Response.
    (b) Hospital Management Plan in emergency for;
        (i) Hospital / Dispensaries in urban & rural areas
        (ii) Taluka & District Hospital
        (iii) Regional and State Hospitals
    (c) Animal Husbandry Department to activate their DDM Plan and departmental SOPs in respect of cattle management during the disaster.
21. Alert the District Collectors of not affected districts to be prepared for providing;
    (a) Additional manpower
    (b) Additional resources
        (i) Machinery & Equipment
        (ii) Relief materials etc. to the districts likely to be affected.
22. Assess the situation and depute state level senior officers to districts likely to be affected for helping the district administration.

IV. Emergency Relief Management (Shelter, Food, Clothing etc.)

1. Ensure Relief Management to provide shelter, food, clothing etc. to the victims in case of disaster.
   (a) Establishment of Temporary shelter for evacuees.
   (b) Ensuring provision of essential services as under:
      - Arrangement for food, clothing, blanket/bedding, drinking water, milk for infants, sanitation and hygiene, lighting arrangements and essential medicines for the sick.
      - Deployment of mobile hospitals in affected areas for treatment of victims.
   (c) Arrangement for providing transports facility to send dead bodies of non-locals to their natives. The administration should also ensure Law and Order during shifting of the dead bodies.
   (d) Ensure establishment of communication link between the affected people and their relatives outside.
2. (A) Inform agencies to be ready and prepare for assisting the disaster management task ahead to state:
      (1) Public sector agencies
      (2) Private sector agencies
      (3) NGOs
      (4) CBOs
      (5) Volunteer Organizations
      (6) Red Cross, Lions Club etc.
      (7) UN Agencies
      (8) International Organizations

   (B) Set up separate special desks for coordination with the above agencies including agencies from other states and abroad.
3. Procurement of additional requirement of essential and critical items at state level.
4. Procurement of additional requirement of Machineries and equipment.
5. Request for help if any needed to MHA/National Disaster Management Authority
6. Make necessary arrangements for public information guidance, police inquiries, public opinion and rumor control. Open (1) information cell and (2) help lines at state level.

V. Review of situation and reporting

1. Once again establish contact with IMD, BISAG, NRSA, ISRO and the defense ministry of GOI for aerial / satellites imageries of the latest Tsunami activity.
2. Review and monitor the situation:
      (a) Evacuation from coastal areas.
      (b) Positioning of Search and Rescue Teams.
      (c) Positioning of mobile communication units.
      (d) Positioning of quick medical response teams.

(e) Mobilization of restoration teams of respective departments.
(f) Help being received from armed forces.
(g) Dissemination of information.
(h) All preparedness measures taken by various authorities.

3. Collection of information from the field.
4. Issue instructions and orders according to situation.
5. Keep in touch with National, District and Taluka Control Rooms.
6. Send situation report to MHA at appropriate time.
7. A note may be sent to Government for declaring Disaster under the GSDMA-2003.
8. Release information at appropriate time to media and public regarding response measures organized by the Government.
9. Continue as above till the possibilities of striking Tsunami to coastal areas is over or Tsunami strikes the coastal areas.
10. If Tsunami is not generated or does not strike the coastal areas of the state and the possibilities are over then, after due and careful consideration de-warn and demobilize Tsunami Emergency Relief Operations.
11. If reports regarding striking of Tsunamis are received then follow the steps identified and listed below.

5.2. A STEPS TO BE TAKEN WHEN STRIKING OF TSUNAMI REPORTED

I State EOC should:

- Record the reports in detail with time, source of reports etc and treat this as zero hour.
- Inform the following about reports received by the E.O.C.

1. Commissioner of Relief
2. Principal Secretary (Revenue Dept.)
3. CEO, GSDMA
4. Hon. Minister (Disaster Management)
5. Chief Secretary
6. Hon. Chief Minister
7. All Ministers
8. All Secretaries
9. All Heads of Departments
10. NDMA Control Room
11. Other Members of Crisis Management Group

- Arrange dissemination of information about occurrence of Tsunami to Media & Public

- Establish communication link with affected districts by activating alternate communication equipments i.e. Satellite Phones, HF/VHF Sets, Ham Radio, V Set etc., in State/District EOC and Taluka Control Rooms.
- Verify authenticity of the incident from agencies like IMD, ISR etc and also from District/Taluka Control Rooms, Police and Fire Brigade Control Rooms.

II. Emergency Response:

- Establish link with all ERC, ERU and other emergency response teams and alert them.
- Identify the area where emergency response teams to be deployed.
- Arrange immediate Mobilization and deployment of following units to the identified affected areas.
  - (a) Mobile Emergency Communication unit.
  - (b) ERU's and ERC's Search & Rescue teams.
  - (c) S & R Teams of Fire Brigade.
  - (d) Other S&R Teams.
  - (e) Quick Medical Response Teams.
  - (f) Quick Damage & Loss Assessment Teams.
  - (g) Quick Need Assessment Teams.
  - (h) Road Clearance Teams.
  - (i) Teams for disposal of human dead bodies.
  - (j) Teams for disposal of carcass.
  - (k) Teams for debris clearance.
  - (l) Law & Order maintaining forces.
- Assess the condition of Road, Rail and Air communication link for quick mobilization of Emergency Teams, equipments and other resources to affected areas and take follow up actions.
- R & B Department to make immediate necessary arrangements for debris clearance to facilitate the response measures.
- Conduct aerial survey of affected areas and prepare need assessment report.
- If necessary additional assistance may be asked for emergency response from GoI-NDMA.
- Assess the situation of affected areas and depute -
  - (a) Senior state level officers
  - (b) Additional manpower from unaffected districts.
- Ensure that the media management cell is established for public information, guidance and rumor control out side the E.O.C. preferably in the office of Director of Information.

- Hold review meeting with duty officers to assess situation twice a day in the morning and evening.
- Assess the situation and take appropriate action to accelerate the Search & Rescue Operation.
- Prepare situation report and circulate it twice a day in the morning and evening.
- Prepare and release press note twice a day in the morning and evening.
- Maintain constant touch with National/District and Taluka EOC.
- Establish information centers at the arrival and departure points especially at the Airports, Railway Stations and Interstate Bus terminus.
- If necessary, arrange mobilization of the emergency Search & Rescue Teams by Air.
- Alert terms for distribution of emergency relief.
- Teams for restoration of infrastructure facilities like electricity, water, Road, Rail etc. may be.
- Contact with BISAG, NRSA, ISRO and NDMA for aerial/satellite imageries of the affected area.
- All Government departments, concerned authorities and agencies have to activate their departmental plan and SOPs.
- Transport activities (Rail & Roads) heading towards affected areas diverted.
- Immediate actions have been taken for safety of fisherman, salt workers and tourist on a visit to beaches in affected area.

III. Search and Rescue:

- The State E.O.C., concerned Departments & the Collectors of the affected districts:

(a) To ensure and open access routes and manage traffic for mobilization of equipments, machinery and volunteers to affected area.

(b) To ensure and evacuate victims to safer areas including fisherman and salt workers.

(c) To ensure and open evacuation & relief centers according to needs.

(d) To ensure and maintain record of persons/victims admitted at temporary shelters.

(e) To Ensure that the necessary arrangements at evacuation/relief centers is made and sufficient provision of food, water, blankets, medicines etc. is done. Ensure that the sufficient stock of such material is available at or near the relief centers.

(f) To ensure and make necessary security arrangements of the persons engaged in Search and Rescue, Relief Centers and Relief Materials.

(g) To ensure that law and Order is maintained in the affected areas.

(h) To ensure and arrange for cordoning off the affected areas and setting up of check posts to control entry and exit.

(i) To ensure that the Ambulance Vans, Dead body Vans are available at the site of search and rescue.
(j) Ensure power supply is suspended immediately in affected area if not suspended so far.
(k) Ensure that all other critical activities are shut down in affected area if not shutdown so far.
(l) If needed airlifting may be arranged for injured and old age persons.
(m) Ensure information center near affected areas to provide guidance to volunteers and aid agencies is opened.
(n) Ensure that the help lines and help centers are opened.
(o) Ensure help of Armed forces are organized in planned manner.
(p) Ensure timely submission of situation report
(q) Ensure that the information to media is timely released.

- Ensure suitable transportation arrangements have been made for mobilization of quick response teams to the affected areas.
- All Government Departments and Collectors have to provide necessary logistics support to the persons engaged in rescue and relief operation.
- Armed force may be mobilized for rendering assistance in ;
  (a) Dissemination of information
  (b) Emergency Search & Rescue Operation
  (c) Providing Emergency Medical Assistance
  (d) Emergency Relief distribution
  (e) Quick aerial survey of affected area.
  (f) Airlifting of seriously injured persons.
  (g) Maintaining law & order in affected area.

IV Medical Assistance:

- Health Department
  (a) To establish camp hospitals near affected areas.
  (b) To make transportation arrangement to shift seriously injured persons to nearest:
    (1) Taluka and District Hospitals.
    (2) Regional and State Hospitals.
  (c) Ensure that the Hospitals are well prepared to deal with seriously injured persons.
  (d) To ensure that the required medical assistance and medicines are provided at evacuation/relief centers and necessary record is maintained.
- Information center for injured persons is established.
- Animal & Husbandry Department to provide medical care to cattle.

V. Disposal of Dead Bodies:

- Ensure Disposal of dead bodies:
  (a) Photographs.
  (b) Post Mortem where ever necessary and possible.
  (c) Identification.
  (d) Handling over dead bodies to relatives.

(e) Dead body vans for transportation of dead bodies.

(f) Enhancement of powers of DM/SDMS for waiving of post mortem of dead bodies.

(g) Disposal of unclaimed and unidentified dead bodies.

- Animal & Husbandry Departments:

  Disposal of animal carcass with the help of local bodies

- Maintenance of record and information database.

VI. Restoration of essential services:

- Ensure that the essential services of affected areas have been restored or alternative arrangement is made:

  (a) Power

  (b) Water

  (c) Telecommunication

  (d) Roads

  (e) Bridges etc.

- Ensure that the essential services if damaged should be restored to state EOC state headquarter, AIR, Doordarshan, and other Government Buildings on priority basis.

VII. Emergency Relief

1. Prepare quick need assessment report for planning of relief operation
2. Deploy teams for emergency relief
3. Ensure that the relief assistance received from the outside is centrally received, stored and sent for distribution to affected areas according to their need and accounts are maintained.
4. Establish relief co-ordination center at the airport, railway station, district and taluka places etc.
5. Mobilize relief materials i.e. tents, food materials, water, essential medicines, and blankets to affected districts on the basis of need assessment.
6. Private/public sector agencies in the state may be requested and mobilized to assist in emergency relief operation.
7. Co-ordinate with S&R Teams and teams engaged in relief operation and provide then back up support.
8. District collectors to establish relief co-ordination center and godowns near affected area and to provide full security as well.
9. Ensure that the separate task force is set up for NGO Co-ordination.

10. Instruct to set up Co-ordination centers at the Resident Commissioners officer in Delhi and other Metro Cities as well.
11. Establish help lines for facilitating communication between the victims and their relatives residing outside.
12. Arrange for procurement of additional relief material required for relief operation on the bases of need assessment.
13. Request may be made for additional assistance from GoI, NDMA
14. Mobilize additional relief material required for relief operation.

VII. Miscellaneous.

1. Review and follow-up of all necessary arrangements made for Emergency Response & Relief operation in affected area so far.
2. Maintain constant touch with National & Districts EOCs.
3. Ensure maintenance of record timely reporting and information management.

5.3 Response Measures when Tsunami waves strike the costal area without any warning.

The state EOC receives the message/report on occurrence of Tsunami striking the Tsunami waves to the coastal area from I.M.D. or district or any other source it should be reported to the COR by the fastest means. The E.O.C. should be activated at full strength immediately. At the same time EOC has to verify the authenticity of the reports and should inform real situation to concerned authorities. The State Government may by notification published in the official gazette and in any one or more others paper having wide circulation in the area declare such area to be disaster affected area under GSDMA Act (Section 32(2) (a)).

I. Information and reporting:

The State EOC should be activated with full strength for emergency response on the occurrence of Tsunami disaster. The State EOC should report the occurrence of Tsunami disaster to:

1. Commissioner of Relief/ Director of Relief
2. Principal Secretary (Revenue Dept.)
3. CEO, GSDMA
4. Minister Disaster Management
5. Chief Secretary
6. Hon. Chief Minister

7. All Ministers,
8. All Secretaries
9. All Heads of Departments
10. NDMA Control Room
11. Other Members of Crisis Management Group

State E.O.C. should: -

1. Establish communication link by activating alternate communication equipments i.e. Satellite Phones, HF/VHF Sets, Ham Radio, V Set etc., in State/District EOC and Taluka Control Room.
2. Establish link with all ERC, ERU and other emergency response teams as mentioned below in item IV and alert them for deployment.
3. Verify authenticity of the incident from agencies like IMD, ISR etc and also from District/Taluka Control Rooms, Police and Fire Brigade Control Rooms.
4. Instruct all Collectors to activate District Control Room at full strength.
5. Inform all regular staff and duty officers to report E.O.C. immediately with the members of Task Force.
6. Remain in constant touch with control rooms at national district and taluka level.
7. Alert state search and rescue machinery for emergency response including all Municipal Commissioner and Fire Brigade.
8. Inform all Secretaries of the State Departments to be available in EOC immediately.
9. Alert all heads of department of key line department.

II. Emergency Response and E.O.C. Management on occurrence of Tsunami:

1. PS (Revenue Dept.)/Commissioner of Relief to take over charge of EOC
2. Ensure that the
   (a) Duty Officers of line departments are present in EOC
   (b) Secretaries and Heads of all line departments available in EOC
   (c) Both regular and emergency staff of EOC is available in the State EOC
3. Hold meeting with Duty Officers and others available in state EOC and pass on necessary instructions to be followed by them immediately.

4. Inform the members of CMG about venue and time of first meeting to assess the situation and decide the course of action to be adopted by the state Government
5. Circulate decisions, Policies, Special delegation of powers and course of action decided by CMG to all concerned.
6. Inform all departments and Collectors to activate their Disaster Management Plan and S.O.P.
7. Assess the condition of Road, Rail and Air communication link for quick mobilization of Emergency Teams equipments and other resources to affected areas and take follow up actions.
8. Assess and identify the area where S&R Teams to deployed.
9. Mobilize all emergency response teams to affected area.
10. Conduct aerial survey of affected areas and prepare need assessment report for emergency response.
11. Make necessary arrangements with Armed Forces & request may be made for rendering assistance in;
    (a) Dissemination of information
    (b) Emergency Search & Rescue Operation
    (c) Providing Emergency Medical Assistance
    (d) Emergency Relief distribution
    (e) Quick aerial survey of affected areas.
    (f) Airlifting of seriously injured persons.
    (g) Maintaining law & order in affected areas if necessary.
12. R & B Department to make immediate necessary arrangements for debris clearance to facilitate the response measures.
13. Contact BISAG, NRSA, ISRO and NDMA for aerial/satellite imageries of the affected area.
14. If necessary additional assistance for emergency response may be asked from GoI, NDMA.
15. If necessary depute:
    (a) Senior state level officers.
    (b) Additional manpower from other districts, which are not affected.

16. Contact private/public sector agencies in the state to assist in emergency rescue and relief operation.
17. Ensure through general Administrative department that all Government employees report for emergency duties.
18. Ensure that the media management cell is established for public information, guidance and rumor control.
19. Review and assess the situation and co-ordinate emergency response teams in affected area at regular interval.
20. Hold meeting of duty officers and review the situation regularly.
21. Maintain constant touch with National/District and Taluka E.O.C.
22. Prepare:
    (a) Situation Report
    (b) Press note and media release

Circulate and release it twice a day in the morning and evening.

(Preparation of situation report and release of press note should be done twice in a day in morning and evening. Press note should be released to press and media by the Information department/public information unit at any suitable place near to state EOC. Such place should be pre-identified)

III. Restoration of lines of communication and essential services to facilitate emergency response.

1. Restoration of communication links to affected area.
2. Restoration of power and electricity
3. Supply of safe drinking water
4. Restoration of life line infrastructure

IV. Search & Rescue:

1. Identify the area where S & R Teams to be deployed
2. Co-ordinate with S&R Teams for their quick deployment in identified area.
3. Ensure quick mobilization and deployment of emergency response units to affected area.
   (a) Mobile Emergency Communication unit
   (b) ERU's and ERC's Search & Rescue teams including S&R Teams of Fire Brigade in Municipal Corporation.

(c) Other S&R Teams.

(d) Quick Medical Response Teams.

(e) Quick Damage & Loss Assessment Teams.

(f) Quick Need Assessment Teams.

(g) Road Clearance Teams.

(h) Teams for restoration of infrastructure facilities like electricity, water, Road, Rail etc.

(i) Teams for disposal of dead bodies.

(j) Teams for carcass disposal.

(k) Teams for debris clearance.

(l) Law & Order maintaining forces.

4. Ensure quick transportation of S&R Teams to affected areas.

5. If necessary, arrange mobilization of the emergency Search & Rescue Teams by Air.

6. The Department of Roads and Building to clear access routes and debris inside the affected area to facilitate search and rescue operation.

7. Specialized equipments required for S&R Teams in affected area to be mobilized.

8. The Secretary of Line Departments and the Collectors to:

(a) Ensure power supply is suspended immediately in affected area

(b) Ensure that all other critical activities are shut down in affected area.

(c) Open access routes and manage traffic for mobilization of equipments, machinery and volunteers to affected area.

(d) Evacuate victims to safer area.

(e) Take immediate action for safety of fisherman, salt workers and tourist on a visit to beach in affected area.

(f) If needed airlifting may be arranged for injured and old age persons.

(g) Open evacuation centers according to need

(h) Maintain record of persons/victims admitted at shelter

(i) Make necessary arrangements at evacuation centers and to ensure that sufficient provision of food, baby food, clothing, water, blankets, medicines, sanitation facilities, lightings etc. is made available to victims.

(j) Ensure security arrangements at evacuation shelter.

(k) Ensure security arrangements of the persons engaged in Search and Rescue, Relief Centers and Relief Materials.

(l) Provide necessary logistic support to the persons engaged in S&R and other emergency response duties.

(m) Ensure that the Law and Order is maintained in the affected area. Security to Government and private property is provided.

(n) Ensure cordoning of the affected area and setting up of check posts to control entry and exit to affected area.

(o) Ensure information center near affected area to provide guidance to volunteers and aid agencies is opened.

(p) Ensure that the help lines and help centers are opened.

(q) Ensure help of Armed forces is obtained wherever required and organized it in planned manner.

V. Medical Assistance:

(a) Arrange and ensure speedy treatment of casualties.

(b) To setup field hospitals, Mobile Hospitals in affected area.

(c) To provide transportation facilities like Ambulance Van etc. at the site of S&R for immediate transportation of seriously injured persons.

(d) If required seriously injured persons are air lifted to state hospitals.

(e) Ensure that the State/Regional/District Hospitals are well prepared to deal with seriously injured persons.

(f) Ensure that the medical assistance and medicines are provided at evacuation center also.

(g) Ensure that the necessary record regarding medical assistance is kept and maintained giving following details:

a. Name, Age, Address injury and other details of injured.

b. Time and date of admission.

c. Treatment provided.

d. Time and date of discharge.

e. If referred to other hospital give details.

f. Other necessary details.

(h) Ensure that the information center regarding persons injured and treated is established.

(i) To ensure that the Ambulance Vans, Dead body Vans available at the site of search and rescue.

(j) Animal Husbandry Department to provide medical care to cattle.

VI. Disposal of dead bodies.

1. Arrange for disposal of dead bodies
   - (a) Photographs
   - (b) Post Mortem, if possible (In recent Tsunami in T.N. Government did mass burials without waiting for relatives as the dead bodies may rot and create epidemics.
   - (c) Identification
   - (d) Handling over dead bodies to relatives
   - (e) Dead body vans for transportation of dead bodies
   - (f) Enhancement of powers of DM/SDMS for waiving of post mortem of dead bodies
   - (g) Disposal of unclaimed and unidentified dead bodies with the help of pre-identified NGOs and other agencies.
   - (h) Maintenance of record and information data base
   - (i) Disposal of animal carcass by animal & husbandry Department with the help of local bodies.

VII. Emergency Relief (Shelter, Food, Clothing etc)

1. Establishment of Temporary shelters.
2. Ensuring provision of essential services at the temporary shelters as under.
   - ➢ Arrangement for:
     - (a) Food
     - (b) Drinking Water
     - (c) Baby Food
     - (d) Clothing
     - (e) Blankets
     - (f) Bedding
     - (g) Sanitation and hygiene
     - (h) Medical care
     - (i) Lighting
     - (j) Registration & Record keeping
     - (k) Arrangements for providing information of the victims sheltered at the center

3. Animal & Husbandry Depts. to make necessary arrangements for cattle
   (a) Shelter
   (b) Fodder
   (c) Water
   (d) Medical care
4. Deployment of mobile hospitals in affected areas for treatment of victims.
5. Providing counseling services to the victims and their relatives.
6. Arrangements for providing transport facility to send dead bodies of non-locals to their natives. The administration should ensure Law and Order during shifting of the dead bodies.
7. Ensure establishment of communication link between the affected people and their relatives outside.
8. Establish relief co-ordination center at the airport, railway station, district and taluka places etc.
9. Ensure that the relief assistance received from the outside is centrally received, stored and send for distribution to affected areas according to their need and accounts are maintained.
10. Mobilize relief materials i.e. tents, food materials, water, essential medicines, blankets etc. to affected districts.
11. Instruct district collectors to establish relief co-ordination center and godowns near affected area and provide full security as well.
12. Provide back up support to S&R and Relief Teams in the field.
13. Arrange for dealing with complain to regarding missing persons and initiate search in shelters, hospitals and police records.
14. Hold review meeting with duty officers twice a day.
15. Co-ordinate with S&R and Relief Teams and provide them back up support
16. Prepare situation report and circulate
17. Prepare and release press note

VIII. Restoration of essential services.

1. Restore essential services of affected area:
   Short Term
   a. Power
   b. Water

c. Telecommunication

Medium Term

d. Roads

e. Bridges etc.

2. Ensure that the essential services if damaged should be restored to state EOC state headquarter, AIR, Doordarshan, and other Government buildings on priority basis.

IX. Miscellaneous

1. Review and follow-up of all necessary arrangements made for Emergency Response and Relief in affected area so far.

2. Maintain constant touch with

   (a) National EOC
   (b) District EOC
   (c) Taluka EOC

3. Ensure maintenance of record, timely reporting and full proof information arrangements

5.4. EMERGENCY RESPONSE MEASURES WHEN OCCURRENCE OF TSUNAMI GENERATING EARTHQUAKE UNDER THE OCEAN IS REPORTED.

Task and Responsibilities of different stake holders during Emergency Response Phase.

Time Frame	Sr. No.	Task	Responsibilities
0 to (-) 60 Minutes	I.	Information and reporting: -	
	1.	Report the occurrence of Tsunami generating earthquake to	1. Deputy Director / Mamlatdar 2. In-charge of state EOC
		(1) Commissioner of Relief & Director of Relief	
		(2) Principal Secretary (Revenue)	
		(3) Chief Executive Officer, Gujarat State Disaster Management Authority	
		(4) Chief Secretary of the State	
		(5) Members of Crisis Management Group	
		(6) Hon. Chief Minister	
		(7) Hon. Revenue Minister	
		(8) National Disaster Management Authority, GoI.	
		(9) All concerned District Collectors as well as Control Rooms of the concerned district.	
		(10) Ministers and Secretaries of all line departments	
	2.	Activate alternative communication equipments i.e. satellite phones, HF/VHF sets, Ham radio, VSAT in state EOC.	Dy. Director / Mamlatdar (In Charge of EOC)
	3.	Instruct all Collectors to activate District Control Room at full strength.	Dy. Director / Mamlatdar (In Charge of EOC)
	4.	Instruct all regular staff and duty officers to report in state EOC with the members of their Task Forces.	Dy. Director / Mamlatdar (In Charge of EOC)
	5.	Instruct and alert all heads of departments of the key line departments to activate their departmental plan and SOPs.	Dy. Director / Mamlatdar (In Charge of EOC)
	6.	Alert all response teams in the state for deployment.	Dy. Director / Mamlatdar (In Charge of EOC)

Time Frame	Sr. No.	Task	Responsibilities
	7.	Remain in constant touch with control rooms at National & District Level.	Dy. Director / Mamlatdar (In Charge of EOC)
	II.	**Establishment of lines of Communication and essential service to facilitate emergency response**	
	1.	Establish communication links with ERCs, ERUs, and Search & Rescue Teams in all Municipal Corporations.	Dy. Director / Mamlatdar (In Charge of EOC), Communication Task Force of EOC
	2.	Establish communication links with District and Taluka Control Rooms and alert them for quick actions.	Dy. Director / Mamlatdar (In Charge of EOC), Communication Task Force of EOC
0 to (-) 50 Minutes	**III.**	**Management of EOC and Emergency Response**	
	1.	Take over full command of state EOC.	Commissioner of Relief
	2.	Activate all operation task forces.	Commissioner of Relief/ DOR
	3.	Hold first brief meeting with leaders of task forces and entrust them their tasks.	PS, (Revenue) Dept/ Commissioner of Relief
	4.	Arrange dissemination of information through Radio, TV, Cable Network sending of SMS and all other means of communication about occurrence of earthquake, which possibly can generate Tsunami waves and the information about coasts which are likely to be hit by Tsunami waves.	Commissioner of Relief /Public Information Unit and Operation Section of EOC
	5.	Ensure that Tsunami information is disseminated to all who are at danger.	Commissioner of Relief/Director of Relief
	6.	Convene emergency meeting of state Crises Management Group.	Commissioner of Relief
	7.	Inform all concerned about decisions, policies, special delegation of powers and course of action decided by C.M.G.	Commissioner of Relief, Administration Section of EOC
	8.	Impose restriction on all transport activities heading towards coastal areas. Instruct all concerned authorities by fastest means of communication. People may be requested not to enter areas likely to be affected.	Secretary Transport (Home Dept.), Communication Unit of EOC
	9.	Instructions may be issued for cordoning the likely affected areas.	Home Dept., Law and Order Section of EOC

Time Frame	Sr. No.	Task	Responsibilities
	10.	Instruct all state government officers and employees in the state to report to their respective Head for emergency duties.	General Administration Dept., Admin. Section of EOC
	11.	Alert Search & Rescue and Emergency Medical Response teams of the state for emergency response.	Commissioner of Relief, Operation Section of EOC
	12.	Identify the location & area where S & R Teams to be deployed.	Commissioner of Relief, Operation Section of EOC
	13.	Contact BISAG, NRSA, ISRO and NDMA for aerial/satellite.	Science & Technology Dept. & Planning Section of EOC
	14.	Arrangements with armed forces for help regarding;	Commissioner of Relief, Home Dept. Law & Order Section of State EOC
		a) Air lifting of ill, physically disabled and aged persons to safer places.	
		b) Dissemination of information	
		c) In case of a disaster	
		(i) Help in emergency search and rescue work	
		(ii) Help in emergency relief operation	
		(iii) Help in providing emergency medical relief	
		(iv) Help in quick aerial survey	
		(v) Help in maintaining law & order in affected areas	
		(vi) Help in air lifting of seriously injured person.	
	15.	All concerned Collectors of coastal area and Secretaries of the Line Departments to:	Commissioner of Relief/Director of Relief and Operation Section of EOC
		(p) Make arrangements for immediate evacuation of people from coastal areas to safer places.	Revenue Dept., Transport Dept. and Concerned Collectors
		(q) Ensure evacuation of fishermen and salt workers.	Ports & Fisheries Dept., Revenue Dept.
		(r) Ensure safety of tourists on visit to beaches along the coastline.	Ports & Fisheries Dept., Tourism Corporation Dept., Revenue Dept.
		(s) Open evacuation centers.	Revenue Dept., Collectors, Concerned Collectors
		(t) Make necessary arrangements at evacuation Centers.	Concerned Collectors and Line Dept.

Time Frame	Sr. No.	Task	Responsibilities
		(u) Cordoning off coastal areas for restricting entry from outside by rail or road.	Home Dept., Collectors, Law & Order Section of EOC
		(v) Ensure that all critical activities in likely affected area are shutdown.	Line Dept., Like GEB, Industries etc., and Collectors
		(w) Ensure that ill, disable and old persons, if necessary, is air lifted to a safer place.	Concerned Collectors, Revenue Dept., & Home Dept.
		(x) Ensure law and order is maintained in areas likely to be affected.	Home Dept., Collectors, Law and Order Section of EOC
		(y) Ensure that necessary arrangement is made for suspending power supply at appropriate time.	GEB, Power & Energy Dept., & Concerned Collectors
		(z) Ensure that the schools and colleges are closed in areas likely to be affected	Education Dept.
		(aa) Ensure dissemination of information to remote areas by local means.	Collectors, Information and Public Relation Dept., P.I. Unit of EOC
		(bb) Ensure that help lines are opened and effectively managed for public information, guidance and rumor control.	Information and Public Relation Dept., P.I. Unit of EOC and Concerned Collectors
		(cc) Ensure that the information to public and media is released.	Information and Public Relation Dept., P.I. Unit of EOC and Concerned Collectors
		(dd) Ensure timely reporting of situation at state level.	Collectors, Line Dept and State EOC
	16.	Following teams may be mobilized along with their equipments to the identified nearest points of areas likely to be affected;	Commissioner of Relief/Director of Relief, Operation Section of EOC
		(a) Search and rescue teams for emergency response.	Municipal Commissioners and Fire Brigades
		(b) Quick medical response teams	Health Dept.
		(c) Debris clearance teams	R&B Dept.
		(d) Dead body disposal teams	Revenue Dept., Home Dept., Local Bodies, NGO's etc.

Time Frame	Sr. No.	Task	Responsibilities
		(e) Mobile emergency communication teams	Science & Technology Dept.
		(f) Mobile water supply restoration teams.	G.W.S.S. Board
		(g) Mobile power restoration teams.	Energy & Power Dept., GEB
		(h) Mobile R&B teams for road clearance	R&B and Local Bodies
		(i) Mobile communication restoration teams	Science & Tech. Dept., BSNL and Communication Task Force of EOC
		(j) Quick assessment teams	Collectors, Revenue Dept., All Line Dept. & Damage & Loss Ass. Unit of Operation Section in EOC
		(k) Need assessment teams.	Planning Section of EOC, All Concerned Collectors
	17.	Make transport arrangement for mobilization of all emergency response teams.	Transport Dept. (Home Dept.), Commissioner of Relief and Planning Section, Transportation Unit in EOC
	18.	Make arrangements for logistic support to all emergency response teams.	Concerned Collectors, Line Dept. and Logistics Unit (Planning Section) of EOC
	19.	Make necessary arrangements for supplying logistic support to all who are engaged in Disaster Management work.	Concerned Collectors, Line Dept. and Logistics Unit (Planning Section) of EOC
	20.	Health Department to activate their Departmental Disaster Management Plan and Departmental SOPs for Management of casualties;	Health Dept., Health & Medical Care Unit (Operation Section) of EOC, Animal Husbandry Dept. and A.H. Task Force of EOC
		(d) Emergency Medical Response.	Health Dept. and Public Health Task Force of EOC
		(e) Hospital Management Plan in emergency for;	Health Dept. and Public Health Task Force of EOC
		(i) Hospital / Dispensaries in urban & rural areas	Health Dept. and Public Health Task Force of EOC
		(ii) Taluka & District Hospital	Health Dept. and Public Health Task Force of EOC
		(iii) Regional and State Hospitals	Health Dept. and Public Health Task Force of EOC

Time Frame	Sr. No.	Task	Responsibilities
		(f) Animal Husbandry Department to activate their DDM Plan and departmental SOPs in respect of cattle management during the disaster.	Animal Husbandry Dept. and A.H. Task Force of EOC
	21.	Alert the District Collectors of not affected districts to be prepared for providing;	General Administration Dept., Commissioner of Relief/Director of Relief, Collectors of Not affected districts, Need Assessment, Admin & Relief Task Force Unit of EOC
		(c) Additional manpower	
		(d) Additional resources	
		(i) Machinery & Equipment	
		(ii) Relief materials etc. to the districts likely to be affected.	
	22.	Assess the situation and depute state level senior officers to districts likely to be affected for helping the district administration.	General Administration Dept., Commissioner of Relief/Director of Relief
0 to (-) 15 Minutes	IV.	**Emergency Relief Management (Shelter, Food, Clothing etc.)**	
	1.	Ensure Relief Management to provide shelter, food, clothing etc. to the victims in case of disaster.	Commissioner of Relief/Director of Relief/Relief Task Force of EOC
		(e) Establishment of Temporary shelter for evacuees.	Revenue Dept., R&B Dept. & Other Line Depts., Relief Management Task Force
		(f) Ensuring provision of essential services as under:	
		Arrangement for – Food, – Clothing, – Blanket/bedding, – Milk for infants, – Drinking water, – Sanitation and hygiene, – Lighting – Medicines and Health Care. – Deployment of mobile hospitals in affected areas for treatment of victims.	Civil Supply Dept., Revenue Dept. & Concerned Collectors, Relief Management Task Force Water Supply Dept. & Board GWSSB and Local Bodies GEB, Power Dept., Local Bodies Health Dept., Public Health Task Force of EOC

Time Frame	Sr. No.	Task	Responsibilities
		(g) Arrangement for providing transports facility to send dead bodies of non-locals to their natives. The administration should also ensure Law and Order during shifting of the dead bodies.	Revenue Dept., Home Dept., Health Dept., Local Bodies and Transport Dept. and Operation Section of EOC.
		(h) Ensure establishment of communication link between the affected people and their relatives outside.	Information & Public Relation Dept., Revenue Dept., P.I. Unit of EOC
	2.	(A) Inform agencies to be ready and prepare for assisting the disaster management task ahead to state:	Commissioner of Relief/Director of Relief, Operation Task Force, Logistic Task Force, Planning Section of EOC
		(1) Public sector agencies	
		(2) Private sector agencies	
		(3) NGOs	
		(4) CBOs	
		(5) Volunteer Organizations	
		(6) Red Cross, Lions Club etc.	
		(7) UN Agencies	
		(8) International Organizations	
		(B) Set up separate special desks for coordination with the above agencies including agencies from other states and abroad.	Commissioner of Relief/Director of Relief, Planning Section of EOC
	3.	Procurement of additional requirement of essential and critical items at state level.	Commissioner of Relief, CSPO and Line Depts., Procurement Section of EOC
	4.	Procurement of additional requirement of Machineries and equipment.	Commissioner of Relief, CSPO and Line Depts., Procurement Section of EOC
	5.	Request for help if any needed to MHA/National Disaster Management Authority	Commissioner of Relief, Planning Section of EOC
	6.	Make necessary arrangements for public information guidance, police inquiries, public opinion and rumor control. Open (1) information cell and (2) help lines at state level.	Information & Public Relation Dept., P.I. Unit of EOC
	V.	**Review of situation and reporting**	
	1.	Once again establish contact with IMD, BISAG, NRSA, ISRO and the defense ministry of GOI for aerial / satellites imageries of the latest Tsunami activity.	Science & Tech. Dept., Operation Section, Communication Task Force of EOC

Time Frame	Sr. No.	Task	Responsibilities
	2.	Review and monitor the situation:	Commissioner of Relief/Director of Relief and Respective Units of EOC
		(a) Evacuation from coastal areas.	
		(b) Positioning of Search and Rescue Teams.	
		(c) Positioning of mobile communication units.	
		(d) Positioning of quick medical response teams.	
		(e) Mobilization of restoration teams of respective departments.	
		(f) Help being received from armed forces.	
		(g) Dissemination of information.	
		(h) All preparedness measures taken by various authorities.	
	3.	Collection of information from the field.	Director of Relief/Dy.Director EOC and Information Management Task Force of EOC
	4.	Issue instructions and orders according to situation.	Commissioner of Relief
	5.	Keep in touch with National, District and Taluka Control Rooms.	Commissioner of Relief/Director of Relief/ Dy. Director EOC and Communication Task Force of EOC
	6.	Send situation report to Ministry of Home Affairs (MHA) at appropriate time.	Commissioner of Relief/Director of Relief, Dy. Director EOC
	7.	A note may be sent to Government for declaring Disaster under the GSDMA Act-2003.	Commissioner of Relief/Director of Relief
	8.	Release information at appropriate time to media and public regarding response measures organized by the Government.	Commissioner of Relief, P.I. Unit of EOC
	9.	Continue as above till the possibilities of striking Tsunami at coastal areas is over or Tsunami strikes the coastal areas.	Commissioner of Relief/Director of Relief & Respective Units of EOC
	10.	If Tsunami is not generated or does not strike the coastal areas of the state and the possibilities are over then, after due and careful consideration de-warn and demobilize Tsunami Emergency Relief Operations.	Commissioner of Relief/Director of Relief & Respective Units of EOC

Time Frame	Sr. No.	Task	Responsibilities
	11.	If reports regarding striking of Tsunamis are received then follow the steps identified and listed below.	Commissioner of Relief/Director of Relief & Respective Units of EOC
		STEPS TO BE TAKEN WHEN STRIKING OF TSUNAMI REPORTED	
0 Hours	I.	**State EOC should:**	
	1.	Record the reports in detail with time, source of reports etc and treat this as zero hour.	In Charge of EOC i.e. Dy. Director/Mamalatdar.
0 + 10 Minutes	2.	Inform the following about reports received by the E.O.C. 1. Commissioner of Relief 2. Principal Secretary (Revenue Dept.) 3. CEO, GSDMA 4. Hon. Minister (Disaster Management) 5. Chief Secretary 6. Hon. Chief Minister 7. All Ministers 8. All Secretaries 9. All Heads of Departments 10. NDMA Control Room 11. Other Members of Crisis Management Group	In charge of EOC i.e. Dy. Director/Mamalatdar.
0 + 30 Minutes	3.	Arrange dissemination of information about occurrence of Tsunami to Media & Public	Director of Relief, P.I. Unit and Communication Unit of EOC
	4.	Establish communication link with affected districts by activating alternate communication equipments i.e. Satellite Phones, HF/VHF Sets, Ham Radio, V Set etc., in State/District EOC and Taluka Control Rooms.	Director of Relief, P.I. Unit and Communication Unit of EOC
	5.	Verify authenticity of the incident from agencies like IMD, ISR etc and also from District/Taluka Control Rooms, Police and Fire Brigade Control Rooms.	P.I. Unit/Communication Unit of EOC
	6.	Establish link with all ERC, ERU and other emergency response teams and alert them.	P.I. Unit/Communication Unit of EOC
	7.	Identify the area where emergency response teams to be deployed.	Commissioner of Relief/Director of Relief & Operation Section of EOC

Time Frame	Sr. No.	Task	Responsibilities
	8.	Assess the condition of Road, Rail and Air communication link for quick mobilization of Emergency Teams, equipments and other resources to affected areas and take follow up actions.	Commissioner of Relief/Director of Relief, Transportation Section of EOC
	9.	R & B Department to make immediate necessary arrangements for debris clearance to facilitate response measures.	R&B Dept., Public Works Task Force
0 + 1 Hours	10.	Immediate Mobilization and deployment of following units to the identified affected areas.	Commissioner of Relief/Director of Relief & Operation Section of EOC Concerned Collectors, Municipal Commissioners & Line Depts.
		(a) Mobile Emergency Communication unit.	Communication Task Force
		(b) ERU's and ERC's Search & Rescue teams,	Search & Rescue Task Force
		(c) S & R Teams of Fire Brigade.	Search & Rescue Task Force
		(d) Other S&R Teams.	Search & Rescue Task Force
		(e) Quick Medical Response Teams.	Public Health Task Force
		(f) Quick Damage & Loss Assessment Teams.	Damage and Loss Assessment Task Force
		(g) Quick Need Assessment Teams.	Need Assessment Task Force of Planning Section
		(h) Road Clearance Teams.	Public Works Task Force
		(i) Teams for disposal of dead bodies.	Public Health Task Force
		(j) Teams for disposal of carcass.	A.H. Task Force
		(k) Teams for debris clearance.	Public Works Task Force
		(l) Law & Order maintaining forces.	Law & Order Section of EOC
	11.	If necessary, arrange mobilization of the emergency Search & Rescue Teams by Air.	Commissioner of Relief/Operation Section /Transportation Section of EOC
	12.	The State E.O.C., concerned Departments & the Collectors of the affected districts:	Commissioner of Relief, Director of Relief, Operation Section of EOC, Concerned Collectors, Line Depts.
		(a) To ensure and open access routes and manage traffic for mobilization of equipments, machinery and volunteers to affected areas.	R&B , Transport Dept.
		(b) To ensure and evacuate victims to safer areas including fishermen and salt workers.	Revenue Dept., Transport Dept.

Time Frame	Sr. No.	Task	Responsibilities
		(c) To ensure and open evacuation & relief centers according to needs.	Revenue Dept., Collectors
		(d) To ensure and maintain record of persons/victims admitted at temporary shelters.	Revenue Dept., Collectors .
		(e) To Ensure that the necessary arrangements at evacuation/relief centers is made and sufficient provision of a. Food, b. Water, c. Blankets/Clothing d. Medicines e. Lighting f. Sanitation and hygiene etc g. This dropping of day food packets and water pouches in affected area.	Revenue Dept., Civil Supply Dept., Collectors, Water Supply Dept., Health Dept., GEB, Power & Energy Dept., GWSSB & Local Authorities
		(f) To ensure and make necessary security arrangements of the persons engaged in Search and Rescue, Relief Centers and Relief Materials.	
		(g) To ensure that law and Order is maintained in the affected areas.	
		(h) To ensure and arrange for cordoning off the affected areas and setting up of check posts to control entry and exit.	
		(i) To ensure that the Ambulance Vans & Dead body Vans are available at the site of search and rescue.	
		(j) Ensure power supply is suspended immediately in affected areas if not suspended so far.	
		(k) Ensure that all other critical activities are shut down in affected areas if not shutdown so far.	
		(l) If needed, airlifting may be arranged for injured and old age persons.	
		(m) Ensure information center near affected areas to provide guidance to volunteers and aid agencies is opened.	
		(n) Ensure that help lines and help centers are opened.	
		(o) Ensure help of Armed forces are organized in planned manner.	Commissioner of Relief/Collectors
		(p) Ensure timely submission of situation report	Commissioner of Relief/Director of Relief
		(q) Ensure that the information to media is timely released.	Information & Public Relation Dept., P,I, Unit of EOC

Time Frame	Sr. No.	Task	Responsibilities
	13.	Health Department	Health Dept.
		(a) To establish camp hospitals near affected areas.	
		(b) To make transportation arrangement to shift seriously injured persons to nearest - (1) Camp Hospitals (2) Taluka and District Hospitals. (3) Regional and State Hospitals.	
		(c) Ensure that the Hospitals are well prepared to deal with seriously injured persons.	
		(d) To ensure that the required medical assistance and medicines are provided to the victims at site as well as at evacuation/relief centers in the affected area and necessary record is maintained.	
	14.	Ensure suitable transportation arrangements have been made for mobilization of quick response teams to the affected areas.	Transport Dept.
	15.	All Government Departments and Collectors have to provide necessary logistics support to the persons engaged in rescue and relief operation.	Commissioner of Relief/Logistic Unit, Line Depts., Collectors
	16.	Immediate actions to be taken for safety of fishermen, salt workers and tourists on a visit to beaches in affected areas.	Ports & Fisheries Dept., Tourism Dept.
	17.	All Government departments, concerned authorities and agencies have to activate their departmental plan and SOPs.	Line Dept.
0 + 6 Hours	18.	Conduct aerial survey of affected areas and prepare need assessment report.	Commissioner of Relief/Director of Relief, Transportation Task Force, Need Assessment Task Force of Planning Section of EOC
	19.	Contact with BISAG, NRSA, ISRO and NDMA for aerial/satellite imageries of the affected areas.	Science & Tech. Dept., Planning Section of EOC
	20.	Armed force may be mobilized for rendering assistance in ;	Commissioner of Relief/Operation Section of EOC
		(a) Dissemination of information	
		(b) Emergency Search & Rescue Operation	
		(c) Providing Emergency Medical Assistance	
		(d) Emergency Relief distribution	
		(e) Quick aerial survey of affected area.	
		(f) Airlifting of seriously injured persons.	
		(g) Maintaining law & order in affected area.	

Time Frame	Sr. No.	Task	Responsibilities
	21.	Transport activities (Rail & Road) heading towards affected areas diverted.	Transport Dept.
0 + 12 Hours	22.	Hold review meeting with duty officers to assess situation twice a day in the morning and evening.	Commissioner of Relief
	23.	Prepare situation report and circulate it twice a day in the morning and evening.	Director of Relief and Respective Section of EOC
	24.	If necessary, additional assistance may be asked for emergency response from GoI-NDMA.	Commissioner of Relief/Director of Relief, Planning Section of EOC
	25.	Assess the situation of affected areas and depute -	Commissioner of Relief/Director of Relief, Administration Section, Human Resource Task Force
		(a) Senior state level officers	
		(b) Additional manpower from unaffected districts.	
	26.	Prepare quick need assessment report for planning of relief operation	Commissioner of Relief/Director of Relief, Collectors/ Line Depts.
	27.	Alert teams for distribution of emergency relief.	Director of Relief/ Relief Management Unit of EOC
	28.	Prepare and release press note twice a day in the morning and evening.	Information & Public Relation Dept., Commissioner of Relief/ P.I. Unit of EOC
		(A) If situation demands arrange for air dropping of dry food packets and drinking water pouches in the affected area.	Relief Task Force of State EOC, Concerned Collectors, Civil Supply Dept., Revenue Dept., Home Dept., Logistic and Transportation Task Force of State EOC
0 + 24 Hours	29.	Assess the situation and take appropriate action to accelerate the Search & Rescue Operation.	Commissioner of Relief/Operation Section of EOC
	30.	Alert teams for restoration of infrastructure facilities like electricity, water, Road, Rail etc. may be, arranged.	1. Power & Energy Dept. 2. Water Supply Dept. 3. R&B Dept. etc. & Respective Section of EOC

Time Frame	Sr. No.	Task	Responsibilities
	31.	Ensure that media management cell is established for public information, guidance and rumor control out side the E.O.C. preferably in the office of Director of Information.	Information & Public Relation Dept., P.I. Unit of EOC
	32.	Establish information centers at the arrival and departure points especially at the Airports, Railway Stations and Interstate Bus terminus.	Information & Public Relation Dept., P.I. Unit of EOC
	33.	Information center for injured persons is established.	Information & Public Relation Dept., P.I. Unit of EOC
	34.	Animal & Husbandry Department to provide medical to cattle.	Animal Husbandry Dept.
	35.	Deploy teams for emergency relief distribution.	Revenue Dept./Collectors and Relief Management unit of EOC
	36.	Ensure that the relief assistance received from the outside is centrally received, stored and sent for distribution to affected areas according to their need and accounts are maintained.	Commissioner of Relief/Director of Relief, Civil Supply Dept., Relief Management Unit of EOC
0 + 36 Hours	37.	Ensure Disposal of dead bodies:	Revenue Dept., Collectors, Home Dept., Health Dept., Local Authorities
		(a) Photographs.	
		(b) Post Mortem where ever necessary and possible.	
		(c) Identification.	
		(d) Handling over dead bodies to relatives.	
		(e) Dead body vans for transportation of dead bodies.	
		(f) Enhancement of powers of DM/SDMS for waiving of post mortem of dead bodies.	
		(g) Disposal of unclaimed and unidentified dead bodies.	
	38.	Animal & Husbandry Departments: Disposal of animal carcass with the help of local bodies	Animal Husbandry Dept., Local Authorities
0 + 48 Hours	39.	Maintain constant touch with National/District and Taluka EOC.	Director of Relief., Dy. Director EOC
	40.	Ensure that the essential services of affected areas have been restored or alternative arrangement is made:	
		(a) Power	Power & Energy Dept
		(b) Water	GWSSB

Time Frame	Sr. No.	Task	Responsibilities
		(c) Telecommunication	Science & Tech Dept./Telecommunication Dept./Communication Unit of EOC
		(d) Roads	R&B Dept.
		(e) Bridges etc.	R&B Dept.
	41.	Ensure that the essential services if damaged should be restored to state EOC state headquarter, AIR, Doordarshan, and other Government Buildings on priority basis.	R&B Dept. and Other Line Dept.
	42.	Establish relief co-ordination center at the airport, railway station, district and taluka places etc.	Commissioner of Relief/Director of Relief, Civil Supply Dept., Relief Management Unit of EOC
	43.	Mobilize relief materials i.e. tents, food materials, water, essential medicines, blankets to affected districts on the basis of need assessment.	Commissioner of Relief/Director of Relief, Civil Supply Dept., Relief Management Unit of EOC
	44.	Private/public sector agencies in the state may be requested and mobilized to assist in emergency relief operation.	Commissioner of Relief/Director of Relief, Civil Supply Dept., Relief Management Unit of EOC
	45.	District collectors to establish relief co-ordination center and godowns near affected area and to provide full security as well.	Revenue Dept./Civil Supply Dept., Relief Management Unit of EOC, Home Dept.
	46.	Co-ordinate with S&R Teams and teams engaged in relief operation and provide them back up support.	Commissioner of Relief/Director of Relief, Collectors, Municipal Commissioners, Line Depts. and Respective Units of EOC
	47.	Ensure that the separate task force is set up for NGO Co-ordination.	Commissioner of Relief/Director of Relief
	48.	Establish help lines for facilitating communication between the victims and their relatives residing outside.	Information and Public Relation Dept., P.I. Unit of EOC
0 + 72 Hours	49.	Set up Co-ordination centers at the Resident Commissioners officer in Delhi and other Metro Cities as well.	Commissioner of Relief

Time Frame	Sr. No.	Task	Responsibilities
	50.	Arrange for procurement of additional relief material required for relief operation on the basis of need assessment.	COR/DOR/CSPO/ Planning and Other Respective Section of EOC
	51.	Request may be made for additional assistance from GoI, NDMA	COR
	52.	Mobilize additional relief material required for relief operation.	COR/DOR/Relief Management Section of EOC
	53.	Review and follow-up all necessary arrangements made for Emergency Response & Relief in affected area so far.	COR/DOR
	54.	Maintain constant touch with State & Districts EOCs.	COR/DOR/Dy. Director EOC
	55.	Ensure maintenance of record, timely reporting and information management.	DOR/Information Management Section of EOC
	56.	Maintenance of record and information database.	Line Depts., Collectors & Information Management Unit of EOC

5.5 RESPONSE MEASURES WHEN TSUNAMI WAVES STRIKE THE COSTAL AREA WITHOUT ANY WARNING.

Time Frame	Sr. No.	Task	Responsibilities
0 Hours	1.	The State EOC should be activated with full strength for emergency response on the occurrence of Tsunami disaster.	Dy. Director EOC/Mamalatdar EOC/ In-Charge of EOC
0 + 10 Minutes	2.	The State EOC should report the occurrence of Tsunami disaster to:	Dy. Director EOC/Mamalatdar EOC/In-Charge of EOC
		1. Commissioner of Relief/ Director of Relief	
		2. Principal Secretary (Revenue Dept.)	
		3. CEO, GSDMA	
		4. Minister Disaster Management	
		5. Chief Secretary	
		6. Hon.Chief Minister	
		7. All Ministers,	
		8. All Secretaries	
		9. All Heads of Departments	
		10. NDMA Control Room	
		11. Other Members of Crisis Management Group	

Time Frame	Sr. No.	Task	Responsibilities
0 + 20 Minutes	3.	Establish communication link by activating alternate communication equipments i.e. Satellite Phones, HF/VHF Sets, Ham Radio, V Set etc., in State/District EOC and Taluka Control Room.	Dy. Director/ Mamalatdar/ Communication Task Force EOC
	4.	Establish link with all ERC, ERU and other emergency response teams as mentioned below in item IV and alert them for deployment.	Dy. Director/ Mamalatdar/ Communication Task Force EOC
	5.	Verify authenticity of the incident from agencies like IMD, ISR etc and also from District/Taluka Control Rooms, Police and Fire Brigade Control Rooms.	Dy. Director/ Mamalatdar/ Communication Task Force EOC
	6.	Instruct all Collectors to activate District Control Room at full strength.	Dy. Director/ Mamalatdar/ Communication Task Force EOC
	7.	Inform all regular staff and duty officers to report E.O.C. immediately with the members of Task Force.	Dy. Director /Mamalatdar/ Admin Section EOC
	8.	Remain in constant touch with control rooms at State district and Taluka level.	Dy. Director/ Mamalatdar/ Communication Task Force of EOC
	9.	Alert state search and rescue machinery for emergency response including all Municipal Commissioner and Fire Brigade.	Dy. Director/ Mamalatdar/ Communication Task Force of EOC
	10.	Inform all Secretaries of the State Departments to be available in EOC immediately.	Dy. Director/ Mamalatdar/ Communication Task Force of EOC
	11.	Alert all heads of department of key line department.	Dy. Director/ Mamalatdar/ Communication Task Force of EOC

Time Frame	Sr. No.	Task	Responsibilities
0 + 30 Minutes	12.	Take over charge of EOC	Commissioner of Relief
	13.	Ensure that the	
		(a) Duty Officers of line departments are present in EOC	Admin. Section of EOC
		(b) Secretaries and Heads of all line departments available in EOC	Admin. Section of EOC
		(c) Both regular and emergency staff of EOC is available in the State EOC	Admin. Section of EOC
	14.	Hold meeting with Duty Officers and others available in state EOC and pass on necessary instructions to be followed by them immediately.	Incident Commander
	15.	Arrange dissemination of information about occurrence of Tsunami disaster, CMG meeting and steps taken by the state administration and do's and don'ts to be followed by the people.	COR/DOR, PI Unit of EOC, and Information and Public Relation Dept.
	16.	Inform the members of CMG about venue and time of first meeting & convene the meeting to assess the situation and decide the course of action to be adopted by the state Government	Commissioner of Relief
0 + 1 Hours	17.	Circulate decisions, Policies, Special delegation of powers and course of action decided by CMG to all concerned.	Commissioner of Relief
	18.	Inform all departments and Collectors to activate their Disaster Management Plan and departmental S.O.P. to counter the Tsunami Disaster.	COR/DOR, Operation Section of EOC
	19.	Assess the condition of Road, Rail and Air communication link for quick mobilization of Emergency Teams equipments and other resources to affected areas and take follow up actions.	COR/DOR, Transport Section of EOC
	20.	Assess and identify the area where S&R Teams to deployed.	COR/DOR, Operation Section of EOC
	21.	Arrange to conduct aerial survey of affected areas and prepare need assessment report for emergency response.	COR/DOR, Planning & Assessment Unit of EOC

Time Frame	Sr. No.	Task	Responsibilities
	22.	Co-ordinate with S&R Teams for their quick deployment in identified area.	COR, Operation Section, Search & Rescue Task Force of EOC
	23.	The Department of Roads and Building to clear access routes and debris inside the affected area to facilitate search and rescue operation.	R&B Dept., Public Works Task Force
	24.	Specialized equipments required for S&R Teams in affected area to be mobilized.	Logistic Section, Operation Section
0 + 3 Hours	25.	Mobilize and ensure quick deployment of all emergency response teams to affected area. (a) Mobile Emergency Communication unit (b) ERU's and ERC's Search & Rescue teams including S&R Teams of Fire Brigade in Municipal Corporation. (c) Other S&R Teams. (d) Quick Medical Response Teams. (e) Quick Damage & Loss Assessment Teams. (f) Quick Need Assessment Teams. (g) Road Clearance Teams. (h) Teams for restoration of infrastructure facilities like electricity, water, Road, Rail etc. (i) Teams for disposal of dead bodies. (j) Teams for carcass disposal. (k) Teams for debris clearance. (l) Law & Order maintaining forces.	COR/DOR, Operation Section of EOC
	26.	Ensure quick transportation of S&R Teams to affected areas.	Operation Section, Transportation Unit
	27.	If necessary, arrange mobilization of the emergency Search & Rescue Teams by Air.	Operation Section, Transportation Unit
	28.	Restoration of lines of communication and essential services to facilitate emergency response. (a) Restoration of communication links to affected area. (b) Restoration of power and electricity (c) Supply of safe drinking water (d) Restoration of life line infrastructure	Telecommunication Task Force Power Task Force GEB Water Supply Task Force GWSSB Public Works Task Force, Line Departments

Time Frame	Sr. No.	Task	Responsibilities
	29.	The Secretary of Line Departments and the Collectors to:	
		(a) Ensure power supply is suspended immediately in affected area	Industries Dept., Power Dept., Power Task Force, Collectors
		(b) Ensure that all other critical activities are shut down in affected area.	Operation Section, Industries Dept., Power Dept.
		(c) Open access routes and manage traffic for mobilization of equipments, machinery and volunteers to affected area.	R&B Dept., Public Works Task Force
		(d) Evacuate victims to safer area.	Revenue Dept., Transport Dept., Collectors, Operation Section
		(e) Take immediate action for safety of fisherman, salt workers and tourist on a visit to beach in affected area.	Ports & Fisheries Dept., Industries Dept., Tourism Dept., Collectors, Operation Task Force
		(f) If needed airlifting may be arranged for injured and old age persons.	Revenue Dept., Transport Dept., Collectors Operation Section., Transportation Section
		(g) Open evacuation centers according to need	Revenue Dept., Collectors, Operation Section
		(h) Maintain record of persons/victims admitted at shelter	Revenue Dept., Collectors, Operation Section

Time Frame	Sr. No.	Task	Responsibilities
		(i) Make necessary arrangements at evacuation centers and to ensure that sufficient provision & Made for 1. Food, 2. Baby food, 3. Clothing's, 4. Blankets & Beddings, 5. Water, 6. Lightings 7. Medicines & health care, 8. Sanitation & hygiene facilities	Revenue Dept., Collectors Revenue Dept., Civil Supply Dept., Operation Section of EOC, Collectors and Line Departments. GWSSB/Water Supply, Task Force/Local Authority, Power Dept., Power Task Force, Health Dept., P.H. & Sanitation Task Force
		(j) Ensure security arrangements at evacuation shelter.	Law & Order Section, Home Dept., Collectors
		(k) Ensure security arrangements of the persons engaged in Search and Rescue, Relief Centers and Relief Materials.	Law & Order Section, Home Dept., Collectors
		(l) Provide necessary logistic support to the persons engaged in S&R and other emergency response duties.	Logistic Section/ Line Dept., Revenue Dept., Civil Supply Dept., Collectors.
		(m) Ensure that the Law and Order is maintained in the affected area. Security to Government and private property is provided.	Law & Order Section, Home Dept., Collectors.
		(n) Ensure cordoning of the affected area and setting up of check posts to control entry and exit to affected area.	Law & Order Section, Home Dept., Collectors.
		(o) Ensure information center near affected area to provide guidance to volunteers and aid agencies is opened.	P.I. Unit of EOC., Information & Public Relation Dept., Collectors
		(p) Ensure that the help lines and help centers are opened.	P.I. Unit of EOC., Information & Public Relation Dept., Collectors

Time Frame	Sr. No.	Task	Responsibilities
		(q) Ensure help of Armed forces is obtained wherever required and organized it in planned manner.	P.I. Unit of EOC., Information & Public Relation Dept., Collectors
	30.	**Health Department to :** Arrange and ensure speedy treatment of casualties.	Health Dept., Public Health Task Force
	31.	Setup field hospitals, Mobile Hospitals in affected area.	Health Dept., Public Health Task Force
	32.	Provide transportation facilities like Ambulance Van etc. at the site of S&R for immediate transportation of seriously injured persons.	Health Dept., Public Health Task Force
	33.	If required seriously injured persons are air lifted to state hospitals.	Health Dept., Public Health Task Force
	34.	Ensure that the State/Regional/District Hospitals are well prepared to deal with seriously injured persons.	Health Dept., Public Health Task Force
	35.	Ensure that the medical assistance and medicines are provided at evacuation center also.	Health Dept., Public Health Task Force
	36.	Ensure that the necessary record regarding medical assistance is kept and maintained giving following details:	Health Dept., Public Health Task Force
		a. Name, Age, Address injury and other details of injured.	
		b. Time and date of admission.	
		c. Treatment provided.	
		d. Time and date of discharge.	
		e. If referred to other hospital give details.	
		f. Other necessary details.	
	37.	Ensure that the information center regarding persons injured and treated is established.	Health Dept., Public Health Task Force

Time Frame	Sr. No.	Task	Responsibilities
	38.	To ensure that the Ambulance Vans, Dead body Vans available at the site of search and rescue.	Health Dept., Public Health Task Force
	39.	**Animal Husbandry Department to :** Provide medical care and fodder for cattle.	Animal Husbandry Dept., Task Force
0 + 6 Hours	40.	Contact BISAG, NRSA, ISRO and NDMA for aerial/satellite imageries of the affected area.	Science & Tech. Dept., COR/DOR, Operation Section of EOC
	41.	Make necessary arrangements with Armed Forces & request may be made for rendering assistance in;	COR, Home Dept., Law & Order Section of EOC
		(a) Dissemination of information	
		(b) Emergency Search & Rescue Operation	
		(c) Providing Emergency Medical Assistance	
		(d) Emergency Relief distribution	
		(e) Quick aerial survey of affected areas.	
		(f) Airlifting of seriously injured persons.	
		(g) Maintaining law & order in affected areas if necessary.	
	42.	If necessary additional assistance for emergency response may be asked from GoI, NDMA.	Commissioner of Relief
0 + 12 Hours	43.	Hold meeting of duty officers and review the situation regularly.	Commissioner of Relief
	44.	Prepare:	
		(a) Situation Report	Information Management Unit of EOC

Time Frame	Sr. No.	Task	Responsibilities
		(b) Press note and media release Circulate and release it twice a day in the morning and evening. (Preparation of situation report and release of press note should be done twice in a day in morning and evening. Press note should be released to press and media by the Information department/public information unit at any suitable place near to state EOC. Such place should be pre-identified)	COR/DOR/P.I. Unit, Information & Public Relation Dept.
	45.	Contact private/public sector agencies in the state to assist in emergency rescue and relief operation.	COR/DOR, Planning Section of EOC
	46.	Ensure through general Administrative department that all Government employees report for emergency duties.	Admin. Section of EOC
	47.	If necessary arrange for air dropping of dry food packets and drinking water pouches in affected area.	Relief Task Force, Transportation Task Force, Civil Supply Dept. and Collectors
0 + 24 Hours	48.	Ensure that the media management cell is established for public information, guidance and rumor control.	P.I. Unit , Information & Public Relation Dept.
	49.	Review and assess the situation and cc-ordinate emergency response teams in affected area at regular interval.	COR/DOR, Operation Section of EOC
	50.	Establishment of Temporary shelters.	Revenue Dept., R&B Dept., Shelter Task Force, Collectors & Other Line Depts.
	51.	Ensuring provision of essential services at the temporary shelters as under.	
		➢ Arrangement for:	
		(a) Food	Revenue Dept, /Civil Supply Dept.
		(b) Baby Food	Revenue Dept./Civil Supply Dept.

Time Frame	Sr. No.	Task	Responsibilities
		(c) Clothing	Revenue Dept./Civil Supply Dept.
		(d) Blankets	Revenue Dept./Civil Supply Dept.
		(e) Bedding	Revenue Dept./Civil Supply Dept.
		(f) Drinking Water	Water Supply Dept
		(g) Sanitation and hygiene	GWSSB/Local Authority, Public Health
		(h) Medical care	Health Dept.
		(i) Lighting	Power Dept.
		(j) Registration & Record keeping	Revenue Dept.
		(k) Arrangements for providing information of the victims sheltered at the center	Revenue Dept.
	52.	Animal & Husbandry Depts. to make necessary arrangements for cattle	Animal Husbandry Dept.,
		(a) Shelter	Animal Husbandry Task Force, Local Authorities.
		(b) Fodder	
		(c) Water	
		(d) Medical care	
	53.	Arrange for disposal of human dead bodies	Revenue Dept., Home Dept.,
		(a) Photographs	

Time Frame	Sr. No.	Task	Responsibilities
		(b) Post Mortem, if possible (In recent Tsunami in T.N. Government did mass burials without waiting for relatives as the dead bodies may rot and create epidemics.	Health Dept., Local Authorities, Operation Section, NGOs etc.
		(c) Identification	
		(d) Handling over dead bodies to relatives	
		(e) Dead body vans for transportation of dead bodies	
		(f) Enhancement of powers of DM/SDMS for waiving of post mortem of dead bodies	
		(g) Disposal of unclaimed and unidentified dead bodies with the help of pre-identified NGOs and other agencies.	
		(h) Maintenance of record and information data base	
	54.	Animal Husbandry Department to take up work of /Disposal of animal carcass with the help of local bodies.	Animal Husbandry Task Force Animal Husbandry Dept.
	55.	Providing counseling services to the victims and their relatives.	Health Dept.
	56.	Arrangements for providing transport facility to send dead bodies of non-locals to their natives. The administration should ensure Law and Order during shifting of the dead bodies.	Revenue Dept, Collectors, Transport Dept., Home Dept.
	57.	Ensure establishment of communication link between the affected people and their relatives outside.	Revenue Dept., Information & Public Relation Dept., Collectors
0 + 48 Hours	58.	Establish relief co-ordination center at the airport, railway station, district and taluka places etc.	Revenue Dept., Civil Supply Dept., Operation Task Force

Time Frame	Sr. No.	Task	Responsibilities
	59.	If necessary depute:	General Administration Dept., Admin. Section of EOC
		(a) Senior state level officers.	
		(b) Additional manpower from other districts, which are not affected.	
	60.	Ensure that the relief assistance received from the outside is centrally received, stored and send for distribution to affected areas according to their need and accounts are maintained.	Revenue Dept., Civil Supply Dept., Operation Task Force
	61.	Mobilize relief materials i.e. tents, food materials, water, essential medicines, blankets etc. to affected districts.	Revenue Dept., Civil Supply Dept., Operation Task Force
	62.	Instruct district collectors to establish relief co-ordination center and godowns near affected area and provide full security as well.	Revenue Dept., Civil Supply Dept., Operation Task Force
	63.	Co-ordinate and provide back up support to S&R and Relief Teams in the field.	Commissioner of Relief/Collectors, Operation Section, Line Depts.
0 + 72 Hours	64.	Arrange for dealing with complain to regarding missing persons and initiate search in shelters, hospitals and police records.	Revenue Dept., Home Dept., Collectors., Local Authorities
	65.	Restore essential services of affected area:	Power Task Force, Power Dept.
		a. Power	Water Task Force & Water Supply Dept.
		b. Water	Science & Technology Dept., Telecommunication Task Force

Time Frame	Sr. No.	Task	Responsibilities
		c. Telecommunication	R&B Dept., Public Works, Transport Dept.
		d. Roads	R&B Dept., Public Works, Transport Dept.
		e. Bridges etc.	Information & Public Relation Dept., P.I. Unit
	66.	Ensure that the essential services if damaged should be restored to state EOC state headquarter, AIR, Doordarshan, and other Government buildings on priority basis.	
	67.	Review and follow-up of all necessary arrangements made for Emergency Response and Relief in affected area so far.	COR/DOR
	68.	Maintain constant touch with	DOR, Dy. Director EOC
		(a) National EOC	
		(b) District EOC	
		(c) Taluka EOC	
	69.	Ensure maintenance of record, timely reporting and full proof information arrangements	Information Management Section, Documentation Unit
	70	Ensure proper accounting of stock and materials	Financial Section of EOC
	71.	Arrange for additional procurement of material, machinery and equipment etc as per need assessment and actual requirement in the field.	Need Assessment Section and Financial Section of EOC

Chapter VI: Plan for Tsunami Relief and Recovery

6.1 Relief Measures

(A) Short-term relief measures

(1) Provide temporary shelter to affected people

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

(3) Continue to provide essential services to the affected people.

- food,
- water,
- clothing,
- sanitation
- medical assistance
- power

The COR Secretaries of Line Departments and concerned Collectors to ensure the following in the relief camps:-

- Special emphasis on Hygiene and sanitation aspects should be given in relief camp sites. (Health Dept.)
- Separate area should be earmarked within the relief camp for storage of relief materials. (Civil Supply & R & B Dept.)
- Adequate manpower and transport facilities for the camp site. (Transport Department)
- Arrangements to be made for trauma management. (Health Department)
- Mobile medical units to be sent to remote areas with a view to provide medical assistance to the victims/injured. (Health Dept.)
- Information centre should be established by the administration. (I. & B. Department)

(B) Interim Relief Measures

- Arrangements to be made for quick identification and maintenance of the records of disposal of dead bodies in the affected areas. (Home, Revenue, Health Dept., Local Authorities)
- Arrangements to be made to record the complaints of all persons reported missing. Follow up action in terms of verification of the report also needs to be made. (Home Dept.)
- District Magistrates and sub-divisional magistrates to be empowered to exempt the requirement of identification and post-mortem in case of mass casualties. Revenue Dept may depute additional sub-divisional magistrates to expedite disposal of the dead bodies. (Revenue & Home Dept.)

- Unclaimed/unidentified dead bodies to be disposed off with the help of pre identified voluntary Agencies at the earliest after keeping their records. (Home, Revenue, Health Dept. & Local Bodies)
- Additional manpower to be deployed in the affected areas for supplementing the efforts of the local administration. (GAD)
- Separate Cell to be established at state/district/Taluka level to coordinate with the NGOs and outside donor/aid agencies. (Revenue Dept.)
- Regular meetings of the different stakeholders/departments should be organized at state level for sharing of information, developing strategies for relief operations. (Commissioner of Relief & Collectors at District Level)
- Information & Public Relation Dept to coordinate with the media to play a positive role in disseminating appropriate information to public and the government in order to facilitate the speedy recovery. (I. & B. Dept.)

(C) Assessment of Damage/Loss and Relief needs :-

- The Commissioner of Relief to issue instructions to the district collectors to provide 'the need assessment' report. The Commissioner of Relief should consolidate the same and to prepare "states need assessment report".
- The Commissioner of Relief to issue instructions to the District Collectors to provide the damage and loss assessment report. The Commissioner of Relief to consolidate the same and to prepare "state's damage and loss assessment report" which will be useful in planning and implementing the relief operation after the disaster for the victims of the disaster.
- Adequate manpower, vehicles, stationery etc should be provided to supplement the efforts for need/loss assessment. (Commissioner of Relief & Revenue Dept.)
- The relief need assessment report should be provided by the Collectors. (Commissioner of Relief & Collectors)
- The damage assessment Performa is also attached in the annexure. (COR & Collectors)
- Identification and demolition of dangerous structures in the affected areas to minimize further loss of life and injuries. (R & B Dept., Revenue Dept and Local Bodies)
- Arrangements for debris removal and its appropriate disposal. (R & B Dept.)
- Arrangements for distribution of gratuitous relief and cash doles. (Revenue Dept., Panchayat & Rural Housing Dept., UD&UHD Dept. and Collectors)
- Arrangements to be made for survey of human loss and distribution of ex-gratia relief to the families of deceased persons. (Revenue Dept.)

- Teams to be formed and dispatched to the affected areas for detailed assessment of houses and property damage assessment. (Revenue Dept and Local authorities)
- As reconstruction of houses will take a long period, arrangements to be made to provide interim shelters to the affected. (Revenue Dept and Line Departments like Water Supply Dept., GEB, R & B Dept. etc)
    - ➢ Identification of the site for interim shelter
    - ➢ Allocation of areas to affected families
    - ➢ Providing appropriate shelters to the affected families
    - ➢ Providing essential services as under in the interim shelter sites.
        - Water
        - Transportation
        - Power
        - Road
        - Drainage/Sanitation
        - School
        - PDS Shops
        - Health
        - Protection
    - ➢ Distribution of shelter materials to individual families.

6.2 Long Term Reconstruction & Rehabilitation (Recovery)

Response, which covers the urgent actions, is basically a short-term expediency. Recovery follows response and is more general and long-term in nature. Response is covered under the orders of the Government, which gives freedom of action to the Officials and Recovery does not have this flexibility. Recovery covers restoration, reconstruction and long-term community rehabilitation. It is cornplex, extensive and can generate a number of problems.

As in the case of planning for the disasters, information once again plays an important role for proper recovery actions to be initiated. The sources of information are:

- Information from the response operations will give a lot of inputs for the recovery plans and these could be obtained from –
    - Damage surveys and need assessment survey (to be done as post-disaster activity)
    - After action reports by team leaders/departments.
    - Information available with the control rooms
    - Reports from the NGOs (they should be requested to give copy of their reports sent to their higher Headquarters).
    - Reports of the International Aid agencies.
    - Information from the Media

- Reports of the Nodal Officers covering the disaster.
- Post-disaster Review
- Development programme of the region or area.

Based on the data collated from the above sources a list of activities required for recovery can be prepared and prioritized. The needs will fall under the following categories:

- Resettlement of displaced persons in new settlements. (Revenue Dept.)
- Maintenance of interim shelters till new settlements is ready for occupations. (Revenue and other Line Depts.)
- Resettlement of orphaned children and widows. (Woman & Child Welfare Dept.)
- Restoration of public utilities. (Concerned Line Depts.)
  - (1) Power
  - (2) Telecommunications
  - (3) Road/Surface Transport Rail/Airbase etc.
  - (4) Dams.
  - (5) Government & Community Buildings
  - (6) Water Supply
  - (7) Hospitals
  - (8) Schools/Colleges.
- Rehabilitation of persons incapacitated due to serious injuries. (Revenue Dept., Social Welfare Dept.)
- Provision of assistance for construction of houses with appropriate technology and based on traditional design. (Revenue, Finance & R & B Dept.)
- Government may decide depending upon the need for following:
  - a. Provision of construction material at concession rate or free.
  - b. Provision of employment.
  - c. Rehabilitation of Artisans.
  - d. Counseling for victims suffering from Post Traumatic Stress Disorder.

i) **Rehabilitation (Housing Sector)** : (Revenue , Finance, R & B and Other Line Depts)

(1) Continuance of rendering essential services in interim shelter sites till new settlements are ready for occupation.

(2) Formulation and announcement of Housing Packages for both rural and urban areas.

(3) The components of packages for reconstruction as well as for retrofitting should clearly specify the provisions, which will be made available under each package.

(4) Rehabilitation should emphasize on *In Situ* rehabilitation with minimum relocation and no secondary displacement. The recycling of debris should be considered in reconstruction process.

(5) In case of relocation, the site selection should conform to the parameters as mentioned in Gujarat State Rehabilitation & Reconstruction Policy given in the annexure. Necessary lifeline and utility infrastructure to be provided in the relocated sites.

(6) Material Banks to be set up if needed at identified location in order to make available construction materials at affordable prices and for promotion of technology.

(7) Necessary technical support for Tsunami resistant construction should be provided by the concerned departments.

ii) **Livelihood Rehabilitation:** (Concerned Line Dept.)

In order to start economic activity in the affected area livelihood rehabilitation needs to be given maximum attention by the all concerned departments.

Formulation and announcement of packages for revival of following sectors:

- Rural and cottage industries
- Agriculture
- Handicraft
- Industries

iii) **Social Rehabilitation :** (Concerned Line Departments)

Packages should be announced for –

- Handicaps and paraplegic patients
- Orphan
- Widows
- Old/Destitute
- Women

iv) **Infrastructure Rehabilitation :** (Concerned Line Departments)

Time bound programmes to be prepared and implemented for the following infrastructure in respect of repairing, partial replacement, retrofitting and reconstruction.

- Power
- Water Supply
- Public Buildings
- Roads & Bridges
- Dams and Irrigation

v) **Rehabilitation of social infrastructure:** (Concerned Line Departments)

- Package for retrofitting and rehabilitation of educational building and infrastructure to be announced by the concerned department.

- Package for retrofitting and rehabilitation of Health infrastructure should be announced by the concerned departments.
- Health Department should take following measures.
    - IEC campaign for public awareness to control epidemics, communicable diseases
    - Psychological support programme.

vi) **Capacity Building Measures:** (Gujarat State Disaster Management Authority and I & B Dept.)

In order to build capacity for Long-term preparedness and mitigation, activities like IEC programmes, trainings, Research etc should be initiated by the Government departments as well as by the GSDMA.

6.3 Roles and Responsibilities of stakeholders in post disaster relief operation:

SN	Task	Department/Agency/Responsible
1.	Provide temporary shelters to evacuated persons.	Revenue, R & B, Panchayat and UD & UHD Dept.
2.	Providing essential facilities : (a) Food (b) Water (c) Clothing, Beds etc (d) Sanitation (e) Medicine and Health Care (f) Animal Health Care (g) Power	 (a) Revenue and Civil Supply Dept. and Collectors (b) Revenue and Water Supply Board and Collectors (c) Revenue and Civil Supply Dept and Collectors (d) GWSSB, Local Bodies and Health Dept. (e) Health Dept. (f) Animal Husbandry Dept. (g) GEB
3.	Storage facilities at the shelter site for relief materials.	Revenue, R & B, Civil supplies Dept.
4.	Provide transport service to shelter site	Revenue & Transport Dept.
5.	Conduct survey of families for distribution of cash- doles	Revenue, and Panchayat and UD & UHD Dept.
6.	Arrangements for complain regarding missing persons and follow-up.	Home Dept. and Revenue Depts.
7.	Initiate the process of detail Loss/damage Assessment	Revenue, R & B and other Line Dept
8.	Conduct survey and demolition of unsafe buildings	Revenue, R & B, and local authorities
9.	Arrangements for removal of debris	Revenue, R & B and local authorities
10.	Relief to the families of deceased persons.	Revenue, UD & UHD and Panchayat Depts
11.	Dissemination of information through media and public announcement	I & B, Revenue and Home Dept.
12.	Prepare and dispatch daily situation report to all concerned.	COR
13.	Review and reassessment of operations.	COR
14.	Providing relief assistance till normalcy is restored. - Food - Water - Sanitation - Health assistance - Shelter	Revenue & Civil Supplies Water Supply Health and UD & UHD Health Revenue and R & B
15.	Re-establish the PDS system	Civil Supplies

SN	Task	Department/Agency/Responsible
16.	Medical assistance in the affected areas for victims, including health surveillance.	Health & Medical Dept
17.	Ensure provision of relief materials to inaccessible remote areas.	Revenue and Civil Supplies
18.	Issue certification of death	Revenue, Home & Health dept
19.	Respond to increased demand from Collectors for logistics	Revenue, Civil Supplies and Other Line Dept.
20.	Monitor conditions of relief material stocks and facilities	Revenue, Civil Supplies
21.	Distribution of Cash doles in relief period	Revenue Dept., Collectors, Panchayat & R. H. Dept., UD&UHD Dept.
22.	Arrangements for receiving, storing and dispatching relief materials at Air-Port	Revenue Dept., COR and Civil Supply Dept.
23.	Maintaining record regarding receipt, distribution and stocking of relief materials	Revenue Dept., COR and Civil Supply Dept.
24.	Dissemination of information regarding relief operation	Revenue Dept., Information & Public Relation Dept.
25.	Separate Task Force for Co-ordination with NGO's and other donors	Revenue Dept. and COR
26.	Management of VIP visits	Revenue Dept., Protocol Division of GAD

6.4 Roles and Responsibilities of stake holders in post disaster reconstruction and rehabilitation (recovery):

SN	Task	Department/Agency/Responsible
1.	Regular meetings of different stakeholders & Depts. to assess situation & relief needs to plan for rehabilitation and recovery.	COR
2.	Arrange psychological counseling for victims	Health, NGO Community Groups.
3.	Provide interim shelters to victims.	Revenue and R & B
4.	Provide essential services to people in interim shelter sites and the rural areas.	Revenue, Civil Supplies, Health, education, R & B, Water Supply and Other Line Dept.
5.	Distribution of interim / long term compensation packages to victims.	Revenue, R & B, Civil Supplies and Other Line Dept.
6.	Identification of sites for Material Banks and opening of material banks.	Revenue, Civil supplies Dept
7.	Identification of sites if resettlement is to be done at new sites.	Revenue, R & B, UD & UHD Dept. and Panchayat Dept.
8.	Planning and allotment of sites	Revenue, R & B, UD & UHD
9.	Technical support for new Tsunami resistance construction	Revenue, R & B, UD & UHD, Panchayat Depts. and GSDMA
10.	Retrofitting of old construction	Revenue, R & B and GSDMA. and local authorities
11.	Restoration of communication links and essential infrastructure	Revenue Dept, Telecommunication Dept, R & B, Irrigation, water supply power GEB, Health, Education
12.	Co-ordination meetings with stakeholders and government departments, NGOs to formulate reconstruction and rehabilitation strategy to include – o Orphan children and widows o Old and destitute o Handicapped and permanent disabled persons	Revenue, R & B, social Justice & empowerment, women & Child Welfare Depts, COR and GSDMA,
13.	Packages for social rehabilitation	Revenue Dept, Social Welfare Dept. and other Line Dept.
14.	Formulation of livelihood rehabilitation	RDD, Agriculture, Cottage Industries, Industries & Mines, Co-operative Dept, Labour & Employment Dept
15.	Packages for livelihood rehabilitation	RDD, Agriculture, Cottage Industries, Industries & Mines, Co-operative Dept, Labour & Employment Dept

S N	Task	Department/Agency/Responsible
16.	Prepare detailed reconstruction plan on the basis of inputs from different sources.	Revenue, COR, GSDMA and R & B
17.	Speedy disposal of insurance claims.	Revenue, & Finance Depts.
18.	Establishment of technology promotion centres and material banks to provide construction material at affordable rates	Revenue, R & B, GSDMA, Civil Supplies, Finance Dept, GAD
19.	Plan for inspection of damaged infrastructure and demolish unsafe buildings if necessary.	Revenue, R & B, UD & UHD
20.	Organize IEC campaign to promote Tsunami resistance technologies, construction guidelines and encourage community participation.	GSDMA and I. & B. Dept.

Chapter VII : Budget for Plan and its Testing, Activation & Review

7.1 Budgetary Allocations:

The expenditure for Emergency Response & Relief activities is currently being met from CRF. All depts. must make adequate financial allocations to integrate risk reduction, mitigation and preparedness measures in their annual budget. The actual utilization of the budgetary allocation for Tsunami (disaster) Management must be reflected in their annual disaster management report.

7.2 Testing of the Plan

The Commissioner of Relief shall prepare, review and update state level emergency plans as provided for in the GSDMA Act (section 22 (1) (C)). He shall also ensure that disaster management drills and rehearsals are carried out periodically;

While finalizing the plan the following aspects need to be considered by the COR every year:

i) Critical analysis of the outcome of exercises & mock drills as part of plan testing.

ii) Incorporation of necessary addition or deletion of steps in the plan as they emerge from the plan testing.

The test will provide additional information regarding any further steps that may need to be included and the plan may be modified accordingly. The plan must be thoroughly tested and evaluated on a regular basis, at least twice in a year. The plan testing should be organized on the first Monday in the months of April and October every year.

After plan testing and incorporation of due modification, the final approved plan document to be sent to the following:

(a) Chief Secretary, Government of Gujarat

(b) Chief Executive Officer, Gujarat State Disaster Management Authority

(c) Principal Secretary, Revenue Dept

(d) Commissioner of Relief

(e) Head of all Government Depts.

(f) State EOC

Initially, testing of the plan should be done to include the following:

(g) Testing of checklists

(h) Simulation testing

(i) Parallel testing

(j) Full scale rehearsal

The main objectives of the testing are to:

(i) Determine the feasibility and compatibility of back up facilities and procedures

(ii) Identity areas in the plar ,nat need modification.

(iii) Identify training neeɹs of team managers and members.

(iv) Assess the ability of the organization/department to respond to Tsunami effects.

(v) Generate interest to update the Tsunami management plan.

All departments, which have specific roles and responsibilities in Tsunami disaster management plan, must have a system to ensure that all Class- I Officers of their departments are fully conversant with the details of this plan. All the Class – II and Class - III employees of department must also be generally aware of the departmental role and responsibilities.

7.3 Activation of the Plan

The Tsunami Response structure given in the plan will be activated on the occurrence of a major Tsunami. The commissioner of Relief (COR) will activate all the Departments for emergency response including the State EOC. He will issue instructions to include the following details:

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

End of Emergency Response

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.

7.4 Review / Updation of Plan

The State Tsunami management Plan should be reviewed and updated by COR every year in the month of April-May, based on inputs as under:

(a) Drills and Rehearsals

(b) Recommendations from all Depts in their Annual DM Report

(c) Lessons learnt from Tsunami in other states and countries

(d) Directions from Ministry of Home Affairs, National Disaster Management Authority, Government of India.

7.5 Annual Disaster Management Report

All concerned departments must submit an annual disaster management report to GSDMA and to COR in the month of June every year. The report must include the following:

- Utilization of budgetary allocations in the previous year.
- Budgetary allocations for the current year.
- Level of familiarization of all the employees with the plan in their respective dept.
- Level of preparedness (including training and procurement of resources for DM) in their dept.
- Details of rehearsals/ mock drills carried out in their depts. and lessons learnt.
- Projection of future requirements of their depts. for improved DM.

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 Tsunami Management Plan for further improving the capability to deal with future Tsunamis/other disasters.

List of Annexure

Sr. No.	Annexure Name
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2.	Tsunami that affected India
3.	Multi Hazard Data for West Coast of India
4.	How Tsunami is generated (Figure)
5.	Map of Gujarat Tsunami Hazard Risk Zonation
6.	List of important activities to reduce Tsunami loses
7.	Effects of Tsunami and Design solution
8.	Engineering structures and Flood Management
9.	Do's and Don'ts for Tsunami
10.	List of seismological observatories in Gujarat and their locations
11.	List of trained 1st responders for search & rescue and first aid in Gujarat
12.	Web Site Resource for Tsunami

Annexure-I

SOME HISTORICAL TSUNAMI & DEATH TOLL.

Year	Place	Number of Lives lost
1692	Port Royal, Jamaica	3000
1703	Tsunamis in Honshu, Japan following a large earthquake	5000
1707	38 foot Tsunami, Japan	30,000
1741	Following Volcanic eruptions 30 feet wave in Japan	1400
1753	Combine effect of an earthquake and Tsunami in Lisbon, Portugal	50,000
1783	A Tsunami in Italy .	30,000
1868	Tsunami Chile and Hawaii	More than 25000
1883	Krakatoa Volcanic explosion and Tsunami in Indonesia	36,000
1896	Tsunami Sanrika , Japan	27,000
1933	Tsunami, Sanrika , Japan	3000
1945, 27 Nov.	Tsunami which hit Gujarat (Makran Coast)	-
1946	32 foot high waves in Hilo, Hawaii	159
22 May, 1960	Along the coast of Chile	Approx. 2000 (+ 3000 person missing).
1946	Honshu, Japan Earthquake Spawan Tsunami	2000
1964	195 foot waves engulf Kodiak, Alaska after the Good Friday Earthquake	131
17 Aug. 1976	Philippines	8000
19 Aug. 1977	Indonesia	189
18 July 1979	Indonesia	540
12 Sept. 1979	New Guinea	100
12 Dec. 1979	Columbia	500
26 May 1983	Sea of Japan	Approx. 100
1998	Papua New Guinea	

Annexure-II

TSUNAMI THAT AFFECTED INDIA

Date	Remarks
12 April, 1762	Earthquake in bay of Bengal. Tsunami wave of 1.8 m at Bangladesh coast
19th Aug. 1868	Earthquake Mag. 7.5 in Bay of Bengal.Tsunami run-up 4.0 m at Port Blair
31st Dec. 1881	Earthquake of mag 7.9 in the Bay of Bengal reported tsunami run-up level of 0.76 m at Car Nicobar, 0.3 m at Nagapattinam, 1.22 m at Port Blair
27th Aug. 1883	Karakatoa 1.5 m Tsunami at Madras, 0.6 m at Nagapattainam, 0.2 m at Arden
1884	Earthquake in the western part of the Bay of Bengal Tsunamis at Port Blair, Doublet (mouth of Hoogly River)
26th June 1941	8.1 quake in the Andaman Sea at 12.9^0 N,92.5^o E Tsunamis on the east coast of India with amplitudes from 0.75 to 1.25 m. Some damage from East Coast was reported.
27th November 1945	Mekran Earthquake (Magnitude 8.1). 12 to 15 m wave height in Ormara in Pasi (Makran coast) now in Pakistan. Considerable damage in Makran coast. In Gulf of Cambay of Gujarat wave heights of 11-11.5 meter was estimated. Damage report from Gujarat coast was not available. The estimated height of waves at Mumbai was about 3 meters, boats were taken away from their moorings and causality occurred.
26th December 2004	Earthquake of magnitude 9.3 off north Sumatra coast generated devastating Tsunami waves affecting several countries in South East Asia. In India, Andaman & Nicobar Island, Tamil Nadu, Pondichery, Andhra, Kerala affected about 12400 people lose their lives & 700 injured

Annexure-III

MULTI HAZARD DATA FOR WEST COAST OF INDIA

Name of coastal State	EQ. Hazard	Design Cyclonic Wind (IS:875III) (m/s)	Probable Maximum Storm Surge Heights (m)	Astronomical High Tide above Mean Sea Level (m)	Flood Proneness	Tsunami Prone-ness (m)
Gujarat	V, IV, III	50 & 47	2.5 – 4.0	1.1 –4.1	In 5 coastal districts	10 – 12 (1945 Eq.)
Dadra & Nagar Haveli	III	44	4.0	1.9	-	+
Daman & Diu	III	50 & 44	4.0	1.1	-	+
Maharashtra	IV & III	44 & 39	2.9 –4.2	1.9	-	+
Goa	III & II	39	3.4	1.0	-	+
Karnataka	III & II	39	3.2 – 3.7	0.8	-	+
Kerala	III	39	2.3 –3.5	0.8	In 9 coast Districts	3 – 5
Lakshadweep	III	39	* *	0.5	-	+

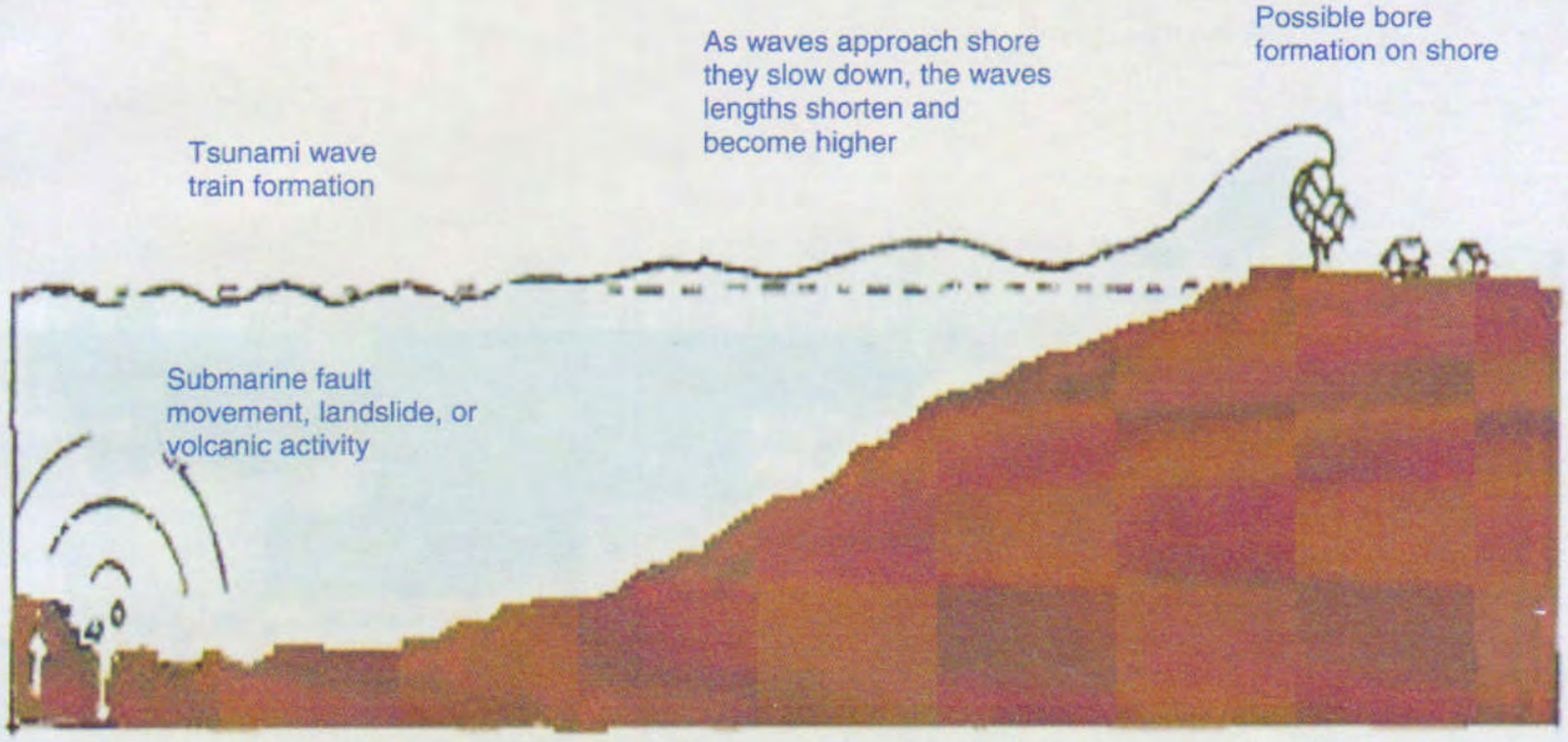
** * Storm surge occurrence of Lakshadweep has not been documented to the extent that a suitable value of Probable Maximum Surge Height can be given for these regions. However, storms originating over these areas are not intense enough to cause significant surges.*

+ To be estimated

Annexure-IV

HOW TSUNAMI IS GENERATED

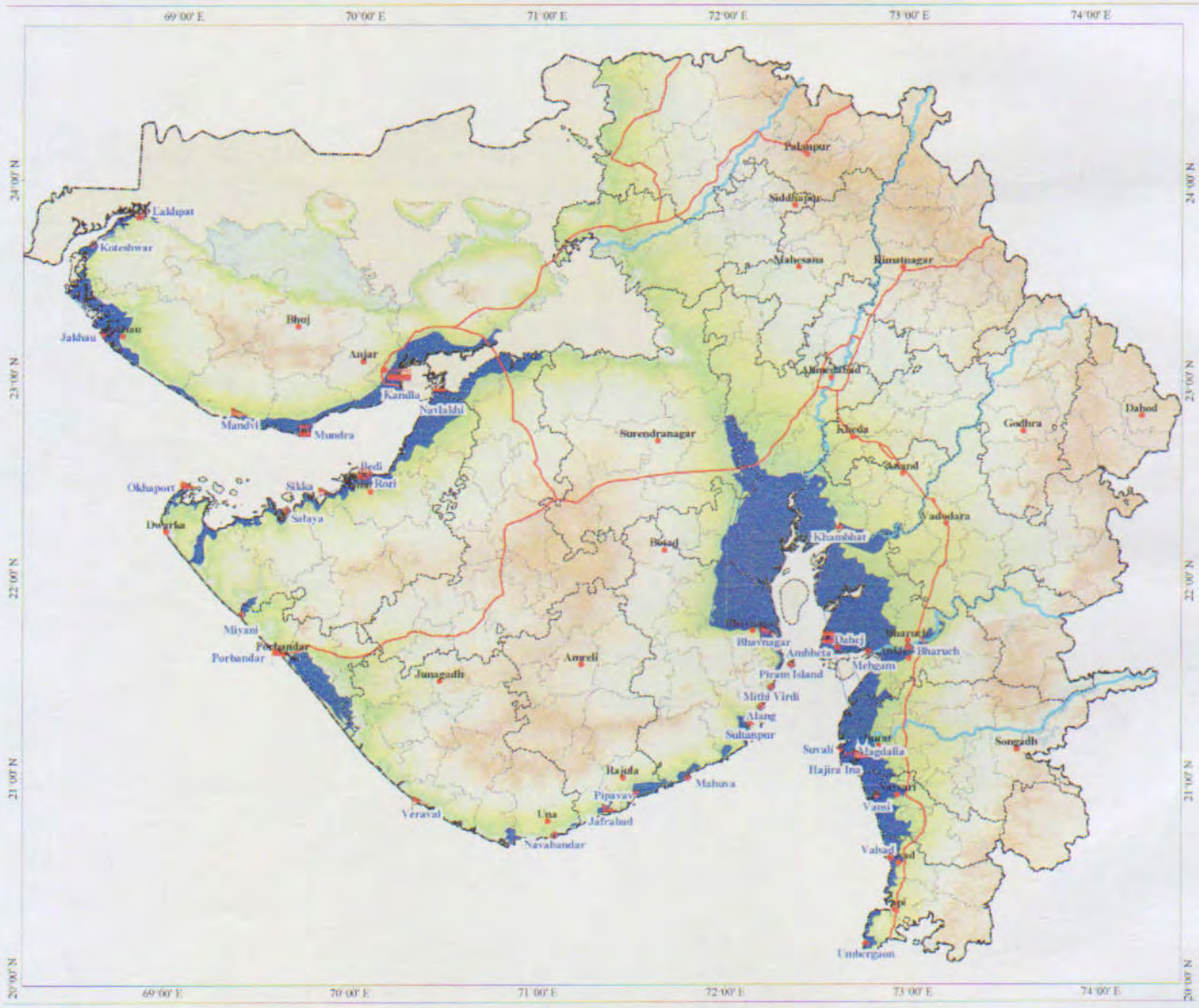
(FIGURE)



Annexure-V

MAP OF GUJARAT STATE TSUNAMI HAZARD RISK ZONATION

Gujarat Tsunami Hazard Risk Zonation : Indicative Inundation based on PMS at Highest High Tide level



GSDMA/TARU

Gujarat Hazard Risk & Vulnerability Assessment Atlas

Annexure-VI

LIST OF ACTIVITIES TO REDUCE TSUNAMI LOSSES

Some of the activities to mitigate the risk of future Tsunami have been identified and listed below:

1	Building Codes	(potential damage due to wave action and flooding)
2.	GIS Mapping	
3.	Land-Use Planning	(taking note of wave action & flooding)
4.	Disaster Planning	(in identified hazard zones)
5.	Emergency Management	
6.	Emergency Personnel Training	(necessary aspects relevant to marine situations)
7.	Rescue and Response (marine situations related to shipping)	(cargo, tourist, inter-islands fishing community, recreational boating)
8.	Insurance Needs	
9.	Community Education	
10.	Simulated Tsunami Exercises	

Although all these activities cannot guarantee that there will be no loss of life or damage to property from future Tsunami but they certainly reduce casualties and property damage. The key factors to reduce potential losses due to Tsunami are AWARENESS and PREPAREDNESS.

Annexure-VII

EFFECT OF TSUNAMI AND DESIGN SOLUTION

EFFECT	DESIGN SOLUTION
Flooded basement	▪ Choose sites at higher elevations
Flooding of lower floors	▪ Raise the buildings above flood elevation
Flooding of mechanical electrical & communication system & equipment	▪ Do not stack or install vital material or equipments on floors or basement lying below tsunami inundation level
Damage to building materials & contents	▪ Protect hazardous material storage facility located in tsunami prone area.
Contamination of affected areas with water borne pollutants	▪ Locate mechanical systems & equipments at higher location in the building ▪ Use corrosion resistant concrete & steel for the portions of the building
Hydrostatic forces (Pressure on walls by variation in water depth on opposite sides	▪ Elevate building above flood level. ▪ Provide adequate openings to allow water to reach equal heights inside & outside of buildings. ▪ Design for static water pressure on walls.
Buoyancy floatation or uplift forces caused by buoyancy	▪ Elevate building to avoid flooding. ▪ Anchor building to foundation to prevent floatation
Saturation of soil causing slope instability and/or loss of bearing capacity	▪ Evaluate bearing capacity & shear strength of soil that support building foundation & embankment slopes under condition of saturation. ▪ Avoid slopes or setbacks from slope that may be destabilized when inundated.

Above solutions are indicative only. Before implementation it is necessary to consult qualified structural Engineer.

Annexure-VIII

ENGINEERING STRUCTURES AND FLOOD MANAGEMENT

- **Engineering Structures**

  As most of the structures along the coast area comprises of fisherman community, which are constructed of light weight materials without any engineering inputs. Therefore there is an urgent need to educate the community about the good construction practices that they should adopt such as:

  - Site selection- Avoid building or living in buildings within several hundred feet of the coastline as these areas are more likely to experience damage from tsunamis.
  - Construct the structure on a higher ground level with respect to mean sea level
  - Elevate coastal homes: Most tsunami waves are less than 3 meters in height. Elevating house will help reduce damage to property from most tsunamis. Structural Columns resist the impact while other walls are expendable. It is important to also take note that adequate measures are also brought into the design to cater from earthquake forces.
  - Construction of water breakers to reduce the velocity of waves.
  - Use of water & corrosion resistant materials for construction.
  - Construction of community hall at higher locations, which can act as shelters at the time of a disaster.

- **Flood Management**

  - Flooding will result from a tsunami. Tsunami waves will flood the coastal areas. Flood mitigation measures could be incorporated. Building barriers or buffers such as special breakwaters or seawalls can be an effective risk reduction measure against gushing waters in case of Tsunami/Storm surge during cyclones.

Annexure-IX

DO'S AND DON'TS FOR TSUNAMI

(This IEC Material should be broadcasted to the people in the Tsunami hazard/vulnerable areas intensively)

I. If you are in an area at risk from tsunamis

- You should find out if your home, school, workplace, or other frequently visited locations are in tsunami hazard areas.
- Know the height of your street above sea level and the distance of your street from the coast or other high-risk waters.

  Evacuation orders may be based on these numbers. Also find out the height above sea level and the distance from the coast of out buildings that house animals, as well as pastures or corrals.
- Plan evacuation routes from your home, school, workplace, or any other place you could be where tsunamis pose a risk.

  If possible, pick areas (30 meters) above sea level or go as far as 3 kilometers inland, away from the coastline. If you cannot get this far, go as high or far as you can. Every meter inland or upward may make a difference. You should be able to reach your safe location on foot within 15 minutes. After a disaster, roads may become impassable or blocked. Be prepared to evacuate by foot if necessary. Footpaths normally lead uphill and inland, while many roads parallel coastlines. Follow posted tsunami evacuation routes; these will lead to safety.
- If your children's school is in an identified inundation zone, find out what the school evacuation plan is.

  Find out if the plan requires you to pick your children up from school or from another location. Telephone lines during a tsunami watch or warning may be overloaded and routes to and from schools may be jammed.
- Practice your evacuation routes.

  Familiarity may save your life. Be able to follow your escape route at night and during inclement weather. Practicing your plan makes the appropriate response more of a reaction, requiring less thinking during an actual emergency situation.
- Use a Weather Radio or stay tuned to a local radio or television station to keep informed of local watches and warnings.

- Talk to your insurance agent.

  Homeowners' policies may not cover flooding from a tsunami. Ask about the Flood Insurance Program.

- Discuss tsunamis with your family.

  Everyone should know what to do in a tsunami situation. Discussing tsunamis ahead of time will help reduce fear and save precious time in an emergency. Review flood safety and preparedness measures with your family.

II. If you are visiting an area at risk from tsunamis

Check with the hotel, motel, or campground operators for tsunami evacuation information and find out what the warning system is for tsunamis. It is important to know designated escape routes before a warning is issued.

III. Protect Your Property

You should avoid building or living in buildings within 200 meters of the high tide coastline.

These areas are more likely to experience damage from tsunamis, strong winds, or coastal storms.

- Make a list of items to bring inside in the event of a tsunami.

  A list will help you remember anything that can be swept away by tsunami water.

- Elevate coastal homes.

  Most tsunami waves are less than 3 meters. Elevating your house will help reduce damage to your property from most tsunamis.

- Take precautions to prevent flooding.
- Have an engineer check your home and advise about ways to make it more resistant to tsunami water.

  There may be ways to divert waves away from your property. Improperly built walls could make your situation worse. Consult with a professional for advice.

  Ensure that any outbuildings, pastures, or corrals are protected in the same way as your home. When installing or changing fence lines, consider placing them in such a way that your animals are able to move to higher ground in the event of a tsunami.

IV. What to Do if You Feel a Strong Coastal Earthquake

If you feel an earthquake that lasts 20 seconds or longer when you are in a coastal area, you should:

- Drop, cover, and hold on:

  You should first protect yourself from the earthquake damages.

- When the shaking stops:
  Gather members of your household and move quickly to higher ground away from the coast. A tsunami may be coming within minutes.

- Avoid downed power lines and stay away from buildings and bridges:

  From which Heavy objects might fall during an aftershock.

V. If you are on land:

Be aware of tsunami facts. This knowledge could save your life! Share this knowledge with your relatives and friends. It could save their lives!

- If you are in school and you hear there is a tsunami warning, you should follow the advice of teachers and other school personnel.

- If you are at home and hear there is a tsunami warning, you should make sure your entire family is aware of the warning. Your family should evacuate your house if you live in a tsunami evacuation zone. Move in an orderly, calm and safe manner to the evacuation site or to any safe place outside your evacuation zone. Follow the advice of local emergency and law enforcement authorities.

- If you are at the beach or near the ocean and you feel the earth shake, move immediately to higher ground, and DO NOT wait for a tsunami warning to be announced. Stay away from rivers and streams that lead to the ocean as you would stay away from the beach and ocean if there is a tsunami. A regional tsunami from a local earthquake could strike some areas before a tsunami warning could be announced.

- Tsunamis generated in distant locations will generally give people enough time to move to higher ground. For locally-generated tsunamis, where you might feel the ground shake, you may only have a few minutes to move to higher ground.

- High, multi-story, reinforced concrete hotels are located in many low-lying coastal areas. The upper floors of these hotels can provide a safe place to find refuge should there be a tsunami warning and you cannot move quickly inland to higher ground.

- Homes and small buildings located in low-lying coastal areas are not designed to withstand tsunami impacts. Do not stay in these structures should there be a tsunami warning.

- Offshore reefs and shallow areas may help break the force of tsunami waves, but large and dangerous wave can still be a threat to coastal residents in these areas.

Staying away from all low-lying areas is the safest advice when there is a tsunami warning.

VI. If you are on a boat:

Since tsunami wave activity is imperceptible in the open ocean, do not return to port if you are at sea and a tsunami warning has been issued for your area. Tsunamis can cause rapid changes in water level and unpredictable dangerous currents in harbors and ports.

If there is time to move your boat or ship from port to deep water (after a tsunami warning has been issued), you should weigh the following considerations:

- Most large harbors and ports are under the control of a harbor authority and/or a vessel traffic system. These authorities direct operations during periods of increased readiness (should a tsunami be expected), including the forced movement of vessels if deemed necessary. Keep in contact with the authorities should a forced movement of vessel be directed.
- Smaller ports may not be under the control of a harbor authority. If you are aware there is a tsunami warning and you have time to move your vessel to deep water, then you may want to do so in an orderly manner, in consideration of other vessels.
- Owners of small boats may find it safest to leave their boat at the pier and physically move to higher ground, particularly in the event of a locally-generated tsunami.
- Concurrent severe weather conditions (rough seas outside of safe harbor) could present a greater hazardous situation to small boats, so physically moving yourself to higher ground may be the only option.
- Damaging wave activity and unpredictable currents can affect harbors for a period of time following the initial tsunami impact on the coast. Contact the harbor authority before returning to port making sure to verify that conditions in the harbor are safe for navigation and berthing.

VII. What to Do After a Tsunami

- You should continue using a Weather Radio or staying tuned to a Coast Guard

  emergency frequency station or a local radio or television station for updated emergency information.

The Tsunami may have damaged roads, bridges, or other places that may be unsafe.

- Check yourself for injuries and get first aid if necessary before helping injured or trapped persons.
- If someone needs to be rescued, call professionals with the right equipment to help

  Many people have been killed or injured trying to rescue others in flooded areas.
- Help people who require special assistance—

  Infants, elderly people, those without transportation, large families who may need additional help in an emergency situation, people with disabilities, and the people who care for them.
- Avoid disaster areas.

  Your presence might hamper rescue and other emergency operations and put you at further risk from the residual effects of floods, such as contaminated water, crumbled roads, landslides, mudflows, and other hazards.
- Use the telephone only for emergency calls.

  Telephone lines are frequently overwhelmed in disaster situations. They need to be clear for emergency calls to get through.
- Stay out of a building if water remains around it.

  Tsunami water, like floodwater, can undermine foundations, causing buildings to sink, floors to crack, or walls to collapse.
- When re-entering buildings or homes, use extreme caution.

  Tsunami-driven floodwater may have damaged buildings where you least expect it. Carefully watch every step you take.
- Wear long pants, a long-sleeved shirt, and sturdy shoes.

  The most common injury following a disaster is cut feet.
- Use battery-powered lanterns or flashlights when examining buildings.

  Battery-powered lighting is the safest and easiest to use, and it does not present a fire hazard for the user, occupants, or building. DO NOT USE CANDLES.
- Examine walls, floors, doors, staircases, and windows to make sure that the building is not in danger of collapsing.
- Inspect foundations for cracks or other damage.

  Cracks and damage to a foundation can render a building uninhabitable.

- Look for fire hazards.

  There may be broken or leaking gas lines, flooded electrical circuits, or submerged furnaces or electrical appliances. Flammable or explosive materials may have come from upstream. Fire is the most frequent hazard following floods.

- Check for gas leaks.

  If you smell gas or hear a blowing or hissing noise, open a window and get everyone outside quickly. Turn off the gas using the outside main valve if you can, and call the gas company from a neighbor's home. If you turn off the gas for any reason, it must be turned back on by a professional.

- Look for electrical system damage.

  If you see sparks or broken or frayed wires, or if you smell burning insulation, turn off the electricity at the main fuse box or circuit breaker. If you have to step in water to get to the fuse box or circuit breaker, call an electrician first for advice. Electrical equipment should be checked and dried before being returned to service.

- Check for damage to sewage and water lines.

  If you suspect sewage lines are damaged, avoid using the toilets and call a plumber. If water pipes are damaged, contact the water company and avoid using water from the tap. You can obtain safe water from undamaged water heaters or by melting ice cubes that were made before the tsunami hit. Turn off the main water valve before draining water from these sources. Use tap water only if local health officials advise it is safe.

- Watch out for wild animals

  Especially poisonous snakes that may have come into buildings with the water. Use a stick to poke through debris. Tsunami floodwater flushes snakes and animals out of their homes.

- Watch for loose plaster, drywall, and ceilings that could fall.

- Take pictures of the damage

  Both of the building and its contents, for insurance claims. Open the windows and doors to help dry the building.

- Shovel mud before it solidifies.

- Check food supplies.

  Any food that has come in contact with floodwater may be contaminated and should be thrown out.

- Expect aftershocks

  If the earthquake was very large (magnitude 8 to 9+ on the Richter scale) and located nearby. Some aftershocks could be as large as magnitude 7+ and capable of generating another tsunami. The number of aftershocks will decrease over the course of several days, weeks, or months depending on how large the main shock was.

- Watch your animals closely.

  Keep all your animals under your direct control. Hazardous materials abound in flooded areas. Your pets may be able to escape from your home or through a broken fence. Pets may become disoriented, particularly because flooding usually affects scent markers that normally allow them to find their homes. The behavior of pets may change dramatically after any disruption, becoming aggressive or defensive, so be aware of their well-being and take measures to protect them from hazards, including displaced wild animals, and to ensure the safety of other people and animals.

Annexure-X

SEISMOLOGICAL OBSERVATORIES IN GUJARAT AND THEIR LOCATIONS

Sr. No.	Place (Gujarat)	Code	Organization	Latitude (N) Deg : Min	Longitude (E) Deg : Min
1	Bhuj	BHJ	IMD	23 : 15.24	69 : 39.24
2	Dharoi	DGA	GERI	24 : 00	72 : 52
3	Ukai	UKA	GERI	21 : 13.75	73 : 35.0
4	Sanjeli	SAN	GERI	23 : 30	73 : 58
5	Bakor	BAK	GERI	23 : 20	73 : 36
6	Catarpur	CHA	GERI	23 : 17	73 : 51
7	Arthuna	ART	GERI	23 : 30	74 : 50
8	Vadodara	VAD	GERI	22 : 20	73 : 10
9	Anklach	ANK	GERI	20 : 31.87	73 : 16.45
10	Manpur	MAN	GERI	20 : 44.50	73 : 23.0
11	Rumla	RUM	GERI	20 : 46.35	73 : 11.05
12	Bhesddhara	BHE	GERI	20 : 28.0	73 : 13.0
13	Kelia	KEL	GERI	20 : 42.0	73 : 16.27
14	Madhuban	MAD	GERI	20 : 11.92	73 : 03.37
15	Hirapura	HIR	GERI	21 : 51.72	73 : 36.30
16	Chatwada	CHT	GERI	21 : 46.77	73 : 25.30
17	Ghatoli	GHA	GERI	21 : 40.40	73 : 33.15
18	Karjan	KAR	GERI	21 : 49.5	73 : 32.0
19	Kevadia Colony	KDV	SSNN	21 : 52.57	73 : 42.0
20	Nanwadi	NAS	SSNN	22 : 01.70	73 : 46.12
21	Jitgarh	JIT	SSNN	21 : 49.53	73 : 33.0
22	Kawant	KAW	SSNN	22 : 05.0	74 : 03.33

Annexure-XI

LIST OF TRAINED FIRST RESPONDERS FOR SEARCH & RESCUE AND FIRST AID IN GUJARAT.

Sr.	Name	Designation	Organisation / Unit
1	Mr. P.S.Parmar	Station officer	AMC Fire
2	Mr. Deepak Gunjal	Station officer	VMC Fire
3	Mrs. Harsha Makwana	Doc. Anesthesia	AMC LG hospital
4	Mr. Ravi Satasia	Doc.	AMC LG hospital
5	Mr. Jayanti Vavadiya	Driver / operator	AMC Fire
6	Mr. Rajesh Goswami	Fireman	AMC Fire
7	Mr. Mehmood Malek	Driver / operator	AMC Fire
8	Mr. Khushalchand Fulia	Fireman	AMC Fire
9	Mr. Bhikha Theba	Fireman	RMC Fire
10	Mr. Gheewala	Doc. Public health	RMC
11	Mr. Kundaliya	PSI (Traffic)	Ahmedabad
12	Mr. B.B. Mitra	Sub-officer	SMC Fire
13	Mr. Ketan Shikari	Fireman	AMC Fire
14	Mr. Narendra Trivedi	Fireman	AMC Fire
15	Mr. Gavarriya Bamaniya	Fireman	BMC Fire
16	Mr. Chauhan Gajendrasinh Shamalsingh	Fireman	AMC
17	Mr. Bhatt Rajesh Jayantbhai	Fireman	AMC
18	Mr. Raval Pankajkumar Babulal	Fireman	AMC
19	Mr. Makwana Ajitkumar Kanjibhai	Fireman	AMC
20	Mr. Chavda Dilipkumar Harubhai	Fireman	AMC
21	Mr. Gadhavi Hitubhai Jashubhai	Fireman	AMC
22	Mr. Nehra Karansinh Shubharam	Driver	AMC
23	Mr. Sandhi Abdulsamad Mahebubhusen	Fireman	AMC
24	Mr. Parmar Vithalji Baghabhai	Sub Officer	SMC
25	Mr. Taparia Hitesh Jashwantsinh	Station Officer	VMC
26	Mr. Kanada Bharat Dahyalal	Fireman	BMC
27	Mr. Nadiyapara Sailesh Ramaniklal	Fireman	RMC
28	Dr. Mukadam Prashant Narhar	Doctor	AMC LG hospital
29	Dr. Bhatia Deepak Rajendraprakesh	Doctor	AMC
30	Mansuri Mohammedmohsin Ahmedbhai	PSI(Traffic)	
31	Dr. Parikh Jayesh	Doctor	AMC
32	Dr. Palkhiwala Bindi	Doctor	AMC
33	Rathaur Vikramsingh M.	Fireman	AMC
34	Desai Vishnubhai I.	Fireman	AMC
35	Mangela Mahadev K.	Fireman	AMC
36	Harijan Bachubhai S.	Fireman	AMC
37	Damor Suresh S.	Driver	AMC
38	Baria Mukesh M.	Driver	AMC
39	Kahar Nalinkumar B.	Fireman	AMC
40	Balospura Abidali N.	Driver	AMC

Sr.	Name	Designation	Organisation / Unit
41	S.K Acharya	Dy CFO	SMC
42	Kanji Velji Dhela	Station Officer	RMC
43	Shardul Zinzuvadia	Fireman	RMC
44	Dr. K.M. Sayani	Doctor	Rajkot Hospital
45	Dr. Ramesh Kachhadia	Doctor	Rajkot "
46	Dr. Jagdish V. Chavda	Doctor	Civil Hospital Sola ,Abd.
47	Dr. Amrut R. Patel	Doctor	Jardol Surat
48	PSI S.M. Saiyed Kazi	PSI (Traffic)	Traffic, Surat
49	Shri M F Dastoor	Dy. Chief Fire Officer	AMC Fire

Annexure-XII

Web Resources on Tsunami

- http://ioc.unesco.org/itsu/ IOC/UNESCO International Coordination group for the Tsunami Warning System in the Pacific (ICG/ITSU), Paris, France
- http://quake.usgs.gov/tsunami/ Tsunamis and Earthquakes, USGS, USA
- www.asc-india.org Amateur Seismic Centre is a comprehensive website carrying details of state wise seism city for the country. This also has extensive reports on various past Earthquakes/Tsunamis.
- http://www.prh.noaa.gov/pr/itic/ International Tsunami Information Center, Honolulu, Hawaii
- http://www.tsunami.org/ Pacific Tsunami Museum site. Includes answers to frequently asked questions, Links, and information related to Pacific Ocean Tsunamis.
- http:/ /en.wikipedia.org/wiki/2004_Indian_Ocean_earthquake
- http://www.geophys.washinngton.edu/tsunami/general/warning.html
- http://www.tsunamiwave.info/
- http://www.prh.noaa.gov/ptwc/aboutptwc.html
- http://www.humboldt.edu/~geodept/earthquakes/tsunami!/tsunami.warning.activity.html
- http://www.bom.gov.au/info/tsunami/tsunami_info.shtml
- http://www.tsunamispecialenvoy.org/
- http://observe.arc.nasa.gov/nasa/exhibits/tsunami/tsun_warning.html
- http://ioc3.unesco.org/indotsunami/capacitubuilding/modeling0511/modelin051_intro.htm
- http://www.oceansatlas.org/servlet/CDSServlet?status=ND0xMjc2MC4xODIwOSY2PWVuJjMzPXdlYi1zaXRlcyYzNz1pbmZv
- Please visit us for disaster management in Gujarat - www.gsdma.org