

Coastal Disaster Management Plan
- For local self-government

prepared by

Masters of Public Health 2004-2005

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Coastal Disaster Management Plan

Foreword

The MPH students of Achutha Menon Centre for Health Science Studies, SCTIMST visited two areas that had been affected by the Tsunami in order to understand the public health effects of such a disaster and contribute their skills in relief work. Two sites, Colechel, Kottelkadu and Kizhe Manakkudy in Kanyakumari District of Tamil Nadu State and Alappad in Karunagapally in Kollam district of Kerala State were visited to assess the nature of relief operations that are required during such disasters.

The result of this visit is this report that has been developed by the 18 students of the MPH 2004-2005 batch under the guidance of the faculty Dr.Biju Soman, Dr.Manju N Nair and others of the Achutha Menon Centre for Health Science Studies. During disasters of such kind, it seems un-natural that we view sites and human population only as objects of a learning experience. However, should the public health fraternity not help communities to learn from this experience and be better prepared to meet with such disasters in future they would be failing in their responsibilities as public health experts. Hence, AMCHSS, SCTIMST has used this opportunity to learn from this experience to develop a Coastal Disaster Management Plan for implementation in units of local self-government.

They have chosen to concentrate on this unit of administration to work with, as it is evident that the process of healing and rebuilding is usually started by those affected themselves. Others can facilitate the process by bringing in skills and materials that are needed but the core work is usually done at the local level by those who know the places, the people and their needs best. It is in this context that developing and implementing a disaster management plan for units of local self government will facilitate the preparedness of any community to deal with disasters.

I commend the faculty and students for developing this plan and recommend that it be forwarded to concerned authorities so that it can be reviewed and utilised.

Date:

Signature:

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Director, SCTIMST

Coastal Disaster Management Plan – for units of local self-government

India is a country prone to natural disasters of all kinds and we have had our share of manmade disasters, yet each time a disaster strikes we are caught unprepared which leads to a lot of unnecessary lives lost and unprecedented economic and social consequences. The recent Tsunami has shaken up the entire Globe and severely affected mainly the coastal South East Asian countries. This devastating experience has made us realize that there is a need to have Preparedness for such disasters. The Preparedness needs Planning, Coordination and putting the various Systems in place to prevent losses. This could be possible if we have an in-depth plan to deal with the situation. This is an attempt to put forth the important aspects of the Coastal Disaster Management Plan. The components of the plan are divided into three aspects:

1. Pre Disaster Management Plan (Disaster Preparedness)
2. Disaster Management Plan (II Phases, Immediate and Intermediate)
3. Post Disaster Management Plan (Reconstruction and Rehabilitation)

1. PRE DISASTER MANAGEMENT PLAN¹

Perspective of the plan

This plan is formulated from point of view of Providers considering the issues of affected. The Issues of importance considered while preparing the DM plan are as follows:

- a) **Mental preparation** of the provider and the community to face disaster of any nature.
- b) **Logistic** arrangement to meet the immediate and long term needs of the affected areas.
- c) **Communication** for mobility through road & other routes, Telecommunication for passing information and carrying out other relief measures. It is noticed that very often during the calamities the transport system on ground, Telecommunication, and Electricity are disrupted. In such situations we need to have alternate arrangements for Rescue operation and Support systems.
- d) **Law & Order:** It is experienced that whenever there is damage to the property there are incidences of theft and sexual abuse and hence for safeguarding the life, human dignity, property, Law & Order needs to be maintained by Enforcing Authorities like Police, Army etc.
- e) **Policies** for compensation, employment and rehabilitation to next of kin: The procedure followed for compensation, injured and death of individuals and damage to the property involves great amount of paper work and delay. Therefore, every effort has to be taken to minimize the delay in form of the paper work.

¹ www.ndmindia.nic.in
<http://www.ndmindia.nic.in/Mitigation/index.htm>
<http://www.idrn.gov.in/>
http://www.emergency-management.net/tsunami_04.htm

- f) **Gender equity** issues.
- g) Immediate **Response and rescue operation** procedures

Activities That Need To Be Included In The Plan

- a) Assessment of available resources like Inventory of manpower - medical, paramedical, military, paramilitary, police, NGOs, CBO s, trusts etc
- b) Resources- Funds, Vehicles, ambulances, Hearse, Mobile clinics,
- c) Stocks of lifesaving drugs, food material, rescue materials and temporary accommodation, tents etc
- d) Emergency Rescue Kits:
- e) Support that needs be provided to the district administration for having an emergency kit with some essential equipments like a boat, portable power generator, early warning equipments, tents, power saw, cranes etc. to meet the emergency need at the time of natural.
- f) Resource Inventory database: Support will be provided to each state to have a web enabled resource inventory for mobilization of resources and volunteers for emergency. IT facilitators will support the state government for development of a resource database, which will be updated regularly by the nodal agency.
- g) Plan reflecting the available strength and possibility of deployment of the staff and various other physical resources should be available with the Heads of Departments and nodal agencies².

1.1. Training & Capacity Building³

The manpower needs training to respond to calamities in professional way, avoiding haste during such situations. For Rescue and relief operations to Police, fire, Health and Youth from School, College and community volunteers the appropriate training needs to be imparted. Special training to Health staff in issues related to DM needs to included in their regular work. Engineering staff have to be trained for sustaining and rebuilding (both temporary & long-term), communication, infrastructure & other facilities etc. Civil Society represented by local NGOs, CBOs, Self help groups should be called upon to facilitate training in their own field of expertise e.g. Rehabilitation, Child welfare, Women. At the local level, support will include disaster management in school curriculum and schedule to drills in disaster prevention and response for schools. Promoting partnerships with academic institutions and private sector in development. of disaster risk management plans. Development of training manuals in Disaster Management for District, Block, Gram Panchayat, Villages and Wards for each State in vernacular languages. Capacity building activities for all stakeholders including civil society organizations in the rescue, relief and restoration in disaster situations, and the use of equipment involved. District multi-hazard preparedness and mitigation plans integrating Block, ULB, Gram Panchayat, Village and Ward plans that would involve vulnerability mapping, risk assessment and analysis, hazard

² UNDP / UNDRO, Disaster Management Training Programme (DMTP). **An Overview of Disaster Management**, 2nd Edition. Chapter 6, pages no. 53-90.

³ R.S. Stephenson, PhD **Disaster Assessment**, 2nd Edition, United Nations Development Programme with Office of the United Nations Disaster Program

zoning, resource inventory, response structure, etc. Mock Drills to ensure that the staff are well-prepared & geared up to face the situation.

1.2. Identification Of Line Of Command, Coordination And Networking

For an effective implementation of rescue and relief operation, the authority and responsibility to each functionary has to be clearly defined to avoid duplication and ambiguity. Appointing & designating Nodal officers at the Gram Panchayat, Block and District level. Each Nodal officer will have details of officer I/c of each dept for coordinating work specifically assigned to them within their geographic work area with the level of communication clearly defined.

A vertical line of command for implementing the activity is required. To undertake activities the command should be top to the bottom. The Bottom-up for Information flow from community to the authorities in government and Top-Down for the flow of resources, support service, technical skills and expertise. Supervision and Monitoring of all functions related to rescue & relief activities needs planning. Networking with various stakeholders with the help of community leaders, NGOs, CBOs, local self-help groups, religious and other charitable organizations are required for undertaking co-coordinated activities. Need for creativity, flexibility and multiple partnerships in Planning and implementation of this Programme are crucial factors.

Formulation of Disaster Mgt Committees (DMC) & DM Teams Manuals for training and orientation of Disaster Management Teams [DMT] at all levels in dissemination of accurate warning, search and rescue operations, first aid, water & sanitation, shelter management, counseling and damage assessment for early response and recovery, proper utilization and better coordination of relief materials. Identification and establishment of working networks of nodal agencies and partners at different levels for implementation of the programme. Formations of committees to look at gender mainstreaming. Management Committees [DMC], which would include all concerned Government Departments/functionaries, Senior Citizens, National Cadet Corps (NCC), National Social Service (NSS), Nehru Yuva Kendra Sangatan (NYKS), Zilla Sainik Board, elected members (PRIs), NGOs, Community Based Organizations (CBOs) and other civil society response groups. Each DMC would have equal representation of women, and at community level, would include schoolteachers, disabled persons, village volunteers and members of isolated hamlets. Coordination & implementation with Departments like Health, Police, Judiciary, PWD, Metrological labs, scientific bodies for smooth response to the crisis.

1.3. Geographical Information System (GIS) and Warning Signals⁴

To have updated information on various aspects of disaster and disaster control development of Inventory of resources at all levels is necessary. The use of GIS to project the resources on the maps for immediate decision-making. Installation of Information Technology (IT) based early warning systems in the District Disaster Management Information Centres (control rooms) for dissemination of accurate and user-friendly warnings. Geographical Mapping

⁴ See photos in Appendix II

Coastal Disaster Management Plan

of areas for various aspects of the topography like nature of land, water resources etc. The other specific features of the areas, like past experiences of land sliding, hurricane, cyclone etc. The appropriate mapping and local database of vulnerable areas through soil erosion, flooding, excess of rains, low lying localities to ensure prompt and coordinated Rescue and relief measures. Ensuring appropriate functioning of facilities through civic amenities like water supply system, reservoirs, rivers, lakes, sewage system, hospitals, blood banks, trauma units of Government, private, charitable institutions and others. Details of availability of Resources & Infrastructure about Private, Corporate Hospitals & other amenities needs to be collected and documented and frequently updated. Identifying the shelters for rescued people like Schools, Town Halls for accommodation. These information should be made available to the concerned departments of various levels.

Awareness generation and education, training and capacity development for mitigation and better preparedness in-terms of disaster risk management and recovery at community, district and state levels, and strengthening of state and district disaster management information centers for accurate and timely dissemination of warning. The Authorities should be in constant touch with Scientific National & International agencies working on various Disaster issues e.g. earthquake, cyclone, prompt communication of warning signals to the communities in vulnerable areas should be made available, in place & functional. Surveillance data-based on Meteorological, Geological. Epidemiological surveillance data the immediate analysis, interpretation and warning signals must be passed on promptly.

1.4. Standard Operating Procedures(SOPs)

To have scientific, ethical and uniform measures for treating and taking care of victims of calamities. The Vulnerability and risk indexing of the area and people should be done & standard reporting format needs to be created. Standards for rescue Operation, life saving measures like protocols for undertaking activities by different categories of functionaries like Police, Volunteers, Fire officials should be clearly defined and the modalities of undertaking activities should be specified for minimizing the time and efficient delivery of services. Treatment and prevention of diseases which may arise due to insanitation, water contamination and immediate impact of the calamities like Injuries, fractures etc. Epidemic control, sanitation measures for prevention of communicable diseases like cholera, malaria, typhoid which are usually a common aftermath of such calamities. The level of care and transfer of cases needs to be planned. The cases which require primary care and attention should be treated at the local levels and serious cases which require immediate Medical or Surgical Intervention should be sent to the Secondary and Tertiary Institutions according to the needs. Such referrals protocols will ensure minimum delay and burden on the Health care system. SOP for disposal of dead bodies is of importance. The decision regarding the disposal of dead bodies should be taken immediately in consultation with the Coroners and Local Health authorities.

1.5. Gender Equity In Disaster Preparedness

Development of disaster management plans at district, block, municipality, gram panchayat, village and ward levels. Women and disabled persons, socially marginalized

sections and others are an integral part of the preparation of the plan. Sensitization of all stakeholders, including women representatives and PRIs on the need for disaster risk management and mitigation. Formulation of local area specific awareness campaigns and strategies for implementation for disaster risk management in the selected districts like the hazard specific “Do’s and Don’ts”, checklist for preventive measures and so on. Vulnerability mapping and risk assessment needs to be done in all the multi-hazard prone districts. There should be a special emphasis on vulnerability and risk of women, disabled persons and children, to help in formulating gender equitable and sustainable community plans for disaster preparedness. The support to districts would include emergency kits like mobile control rooms, boats, tents, and others. Training of masons and engineers to upgrade their skills in the construction of cost effective disaster resistant houses and in retrofitting features. Women construction workers would be encouraged to train as masons, and training sessions would ensure women’s participation.

1.5. The Preparedness Plan

- a) To support management of disasters, national plans and strategies should be established to set out goals and objectives for preparedness and response activities.
- b) A contingency or preparedness plan describes the means to address a disaster within a specific time frame and details the mechanisms for operations planning at the onset of a potential disaster.
- c) Preparedness preparations (agency roles, emergency evacuation procedures, search and rescue, shelters, disaster control centers, medical facilities, relief assistance, etc.)
- d) Public information program should be in place.
- e) Recovery and reconstruction resources and mechanisms are to be in order.
- f) Disaster assessment plan should be in place.
- g) Agreements and linkages with other regions and countries for information & support should be in place.
- h) Pilot testing & distribution of the plan should be done before hand.
- i) Frequent disasters lead to erosion of development gains and restricted options for the disaster victims.
- j) Physical safety especially that of the vulnerable groups are routinely threatened by hazards.

Disaster risk management is essentially a development problem. The key element of this programme is establishing linkages between the Government and civil society response plans and capacity building of Government institutions and the local self-governments in disaster mitigation, preparedness and recovery. Panchayati Raj and Urban Planning Institutions at all levels in the selected districts would be directly involved in the planning process to ensure sustainability of these initiatives. A wide representation of women is envisaged in this project during the planning process. Self help groups of women in the programme areas would be directly involved in the disaster risk management programme. On the basis of the Vulnerability Atlas prepared by Building Materials Promotion and Technology Council (BMPTC), Government of India, and other Local Organizations the programme components would include the following:

- o Development of state and district disaster management plans.

- Development of disaster risk management and response plans at Village/ Ward,
- Gram Panchayat, Block/Urban Local Body levels.
- Awareness campaigns on disaster mitigation and preparedness for each programme
- Resource Mobilization Strategy – Resources in the form of Finance from National, International Agencies and other Charitable Organizations needs to be through proper channels. Other resources like technical expertise, equipments in the form of simple to sophisticated material needs to be allotted according to the priority.
- Risk reduction factored in rapid disaster recovery.
- Disaster mitigated and development gains protected.
- Disaster risk considerations mainstreamed into development.

1.6.1. Formation Of Disaster Management /Team/ Committees:

Disaster Management Teams (DMT) should be formed at different levels to carry out the activities during emergency for sustainable recovery from disaster such as State, District, Municipality, Block, Gram Panchayat, Community and Ward. DMT at village/ward level would comprise of a group of 10-12 people in task-based groups such as Early Warning (EW), Search and Rescue Operation (SRO), First Aid & Water & Sanitation (FAWA), Shelter Management (SM), Trauma Counseling (TC) and Damage Assessment (DA) groups. Similarly, DMT at Gram Panchayat, Municipal and Block level may be formed with the involvement of people's representatives, members from local administrative system like local police, Medical Officer, Junior Engineer from Rural Water Supply and Sanitation, Veterinary Assistance Surgeon, Inspectors, Revenue Inspector, Block Development Officers (BDO) and others. At the District level, the team may include District Collector (DC / DM), Superintendent of Police (SP), Chief of District Fire Services, Chief District Medical Officer (CDMO), District Public Relation Officer (DPRO), Executive Engineers of Irrigation, Roads and Buildings, District Civil Supply Officer, representative of the NGOs/CBOs, Civil Defence and others. **The team will work under the direct supervision of District Collector.**

1.6.2. Training/ Capacity Building:

The Nodal agency shall organize the Training of Trainers (TOT) at state, district and block levels to enhance the capacity of disaster management committees and prepare a core team to trainers and training. Training shall be a continuous process on disaster risk management programme. The trained cadre will facilitate the process of contingency plan development at different levels. Selected village volunteers will be provided with three modular training programmes to develop the village contingency plans. One or two volunteers will be selected by the PRIs/ CBOs/ NGOs from their own locality, based on their past experiences on relief and rehabilitation activities for facilitating the process at village and Gram Panchayat levels. Emphasis will be given to women volunteers in development of village disaster management activities. Specialized training shall be organized at different levels for the disaster management team members for enhancement of skills to effectively carry out their responsibilities such as warning dissemination and search teams.

1.6.3. Development Of Disaster Risk Management Plan:

The trained volunteers, Government functionaries, CBOs/NGOs and PRIs will facilitate the process of development of Contingency Plan [CP] based on the vulnerability of the areas and available resources and form the DMT as per the need at village / ward, Gram Panchayat and Blocks disaster risk management plan respectively. Palli Sabha, Gram Sabha and Panchayat Samitis needs to approve all the plans respectively to make it as a part of the ongoing programme. The District Disaster Management Committees will develop district multi-hazard risk management plan. The plan will be based on the compilation of all 'Block / Taluka disaster management plans' and it will be approved by the Zillah Parishad. Based on the disaster preparedness and response plan there will be mock drills before disaster seasons to find out the feasibility of the plan and to ensure greater role clarity of the key players. It will also ensure the availability and functional condition of equipments and resources. The Demonstration Unit which is the construction of demonstration unit on disaster resistant and cost effective technology in housing sector would be done through trained masons and engineers for wider dissemination and adoption of the technology in selected districts, which enable the communities to adopt disaster-resistant.

1.6.4. Strengthening District Disaster Management Information Centres:

Necessary support will be provided in terms of equipments like advance communication equipments such as computer with internet facilities, HAM radios, Satellite phones, FAX etc to the district control room and training to the functionaries to handle the equipments during emergency. Thus there will be well-equipped control room at state and district levels to disseminate accurate warning for advance action. These control rooms will also provide platform for the coordination. The location of the Control room is equally important and should be safe guarded from the commonly occurring disasters.

1.6.5. Vulnerability And Risk Indexing And Report:

Benchmarking of vulnerability and risk should be attempted through national level research on the subject. Vulnerability and Risk Index shall evolve through a consultative process. These vulnerability reports once completed can be used for zonation of various parts in keeping with levels and types of vulnerability.

1.6.6. Sustainability:

Village disaster preparedness and response plans needs to be approved by the Palli Sabha / Village meeting / assembly to make it a public document. It will establish linkages with the existing development programmes to reduce the vulnerability of the areas. Similarly, the Gram Panchayat disaster management plans will be the compilation of all village plans, which will be approved by the Gram Sabha, and Panchayat will endeavor to support mitigation plans under the annual development plans. The Gram Panchayat mitigation plan will be reflected in the Panchayat Samiti plan and Panchayat Samiti plan in the Zillah Parishad plan. This will be an ongoing process at all levels and District mitigation plan would be a sub-set of district annual development plan. Disaster preparedness and mitigation planning will be an integral part of all developmental planning process. Specifically, the following will be the measurable indicators of success of the programme:

Coastal Disaster Management Plan

Typical contents of a disaster plan may include:

- a) A policy statement
- b) The Legislative authority for the design and implementation of the disaster plan.
- c) Objectives of the plans and conditions under which it will come into force.
- d) Assessment of community disaster risks.
- e) Disaster scenarios based on past experiences and present risks.
- f) Roles and relationships with each level of government especially emergency related bodies.
- g) Organization chart of lines of authority.
- h) List of names, addresses, telephone tree and fax numbers, and email addresses of all relevant agencies and their heads and deputies.
- i) Operations of warning systems.
- j) Preparedness preparations (agency roles, emergency evacuation procedures, search and rescue, shelters, disaster control centers, medical facilities, relief assistance, etc.)
- k) Communications arrangements and telecommunications equipment and procedures.
- l) Public information program.
- m) Recovery and reconstruction resources and mechanisms.
- n) Disaster assessment plan.
- o) Agreements and linkages with other regions and countries.
- p) Testing and evaluation of the plan.
- q) Revision and distribution of the plan.

Myths and realities of disasters (PAHO)

Myth 1- foreign medical volunteers with any medical background are needed.

Reality- Only medical personnel with skills not available in the local area may be needed. Local population almost always covers the immediate life saving needs.

Myth 2- any kind of international assistance is needed and is needed now!

Reality- Wait till genuine needs are assessed.

Myth 3- Epidemics and plagues are inevitable after every disaster.

Reality- Epidemics do not occur spontaneously after a disaster.

Myth 4- Disasters bring out the worst in human behaviours (e.g.-looting, rioting)

Reality- Most people respond generously & spontaneously.

Myth 5- the affected population is too shocked and helpless to take responsibility for its own survival.

Reality- contrary to this, people do find strength to deal with the emergency.

Myth 6- Disasters are random killers

Reality- they strike at the most vulnerable

Myth 7- Clothing is always needed by the victims of disaster⁵.

Reality- Used clothing is almost never needed. It is culturally inappropriate

Myth 8- Things are back to normal within a few weeks.

Reality- The effects of disaster last a long time

⁵ See photos in Appendix II

2. POST DISASTER PHASE

This phase is divided into two sections, the immediate and the intermediate phase.

2.1. IMMEDIATE PHASE

In the **immediate phase**, the following are the priorities:

- a. Search and rescue
- b. Medical Care
- c. Relief measures
- d. Prevent Secondary disasters.

For effective implementation of these steps a thorough pre disaster preparation is vital. The Local community is almost always the first group to contact the disaster affected area and thus the success of rescue efforts depends on the community's capacity to handle the situation. Well-trained community volunteers, NCC, Scout and Guides, Fire fighting force, are of great value. Rescue equipments like earthmovers, cranes, drills, cutters and trained mechanics should support these. Adequate transportation vehicles should be in place to evacuate the affected to safe places/ hospitals or relief camps. Access to and from the affected area should be restored or created as early as possible for speedy transportation of victims to hospitals. Triage (classification of affected according to the severity of injuries) can be done at the site only if trained volunteers are available. Any impending secondary threats like a wall collapse, sliding land masses, mountains/rocks, aftershocks, tidal waves, live electric lines etc should be kept in mind while undertaking the rescue measures. Rescue workers, if trained in life saving resuscitation techniques, can minimize the mortality to a great extend.

Adequate and timely medical aid is very crucial in minimizing the impact of any disaster. All the medical and paramedical personnel and institutions in the area should be involved in the efforts. Proper identification and tagging of fatal casualties triage of the injured, immediate life saving resuscitation, special care to the women and children, and proper coordination of the activities are important.

Medical aid posts can be established as close to the site as possible and referral transportation undertaken if needed. Higher centres can be alerted in advance when critically injured ones are referred. Extra Care should be taken to control outbreak of infectious diseases in the camps/hospitals since large number of people are likely to move in and out for many days after an incident of mass casualty. Expert help can be sought in case it is not available in the locality. Care should also be taken to prevent rumours regarding fatality of the disaster, as in some occasions, highly inflated figures spreads panic. Like the disaster relief camps, the medical aid centres also should have coordinating teams with a **proper line of command** with direct communication links with the District Disaster management Team so that any insufficiencies can be rectified immediately.

Coastal Disaster Management Plan

Relief measures have to be established as soon as possible. Adequate nutrition, safe drinking water, sanitary measures, proper disposal of excreta and wastes, ensuring minimum clothing and blankets if the climate demands etc should be priority during the relief efforts. Pregnant and lactating mothers, menstruating women and disabled people need special attention. Relief camps can be established in places like schools, community halls, makeshift shelters, unused parts of hospital buildings, etc.

Every camp should have a coordinator and also block level and district level coordinators. All relief contributions should be channelised through the coordinator only. Gearing up of the relief machinery should not be delayed even for a single hour since the amount of distress, both physical and psychological, are tremendous among the affected. A careful **epidemic surveillance** even in the relief camps need to be set up under the supervision of public health experts. **Counselling** sessions in the camps can mitigate the impact of the disasters to a great extent. Financial compensations, though very minimum in the initial stage, can also reduce the helplessness felt by many in the immediate days.

Prevention of secondary disasters also is equally important. Injuries resulting from secondary threats are totally preventable if sufficient care is taken. Collapsing buildings, landslides, live electric lines etc need special attention, both for the affected and also the rescuers. Precautions against all types of infectious diseases in the hospitals, relief camps and the disaster sites are crucial to the success of an effective disaster management program. Early disposal of the dead bodies and carcasses, disinfection of the area by appropriate measures, proper use of protective measures by all involved in care of the affected, vector control measures, and immunization of the high risk groups etc are also required. Public health experts can contribute greatly in these endeavours.

2.1.1. Relief Operations

The relief operations usually comprises of the following activities, and almost simultaneously. It involves a large number of people both trained and untrained. These activities if well planned can minimize the mortality and help to return to normalcy at the earliest.

Coastal Disaster Management Plan

- a) Search and rescue.
- b) Emergency medical response.
- c) Food safety.
- d) Water and environmental sanitation.
- e) Temporary shelter.
- f) Removal of dead bodies and carcasses.
- g) Essential debris removal.
- h) Epidemic control.
- i) Cash doles.
- j) Household kits.
- k) NGO co-ordination.
- l) Media management.
- m) Restoration of electricity.
- n) Restoration of telephone & communication.
- o) Restoration of roads and transportation.
- p) Management of funds and relief.

The first step following a disaster will be alerting the appropriate staff members listed in the disaster telephone tree and name a meeting place. It usually starts at the local level and information has to reach both the higher authorities and those below. It should be ensured that Emergency coordinator contacts disaster action team leaders at various levels. The appropriate institutional offices of risk management- DMA should be contacted immediately. The nodal person should identify a disaster command post, with telephones, desks, and supplies needed for directing the recovery effort – Control Room. The steps to contain damage like sending the alert response to appropriate authority, TV, Radio mass media. The teams for search and rescue mission should be given appropriate orders to leave immediately. The next step would be to evacuate people affected or likely to be affected. The hospital, medical and nursing staff should be informed and teams dispatched to the site of disaster. Medical plans for improvised first aid posts and emergency hospitals have to be arranged. Ask for help if necessary.

Rescue work should not be called off unless the last survivor is also rescued. Many incidents of delayed rescue of people have been reported in the past. Sophisticated life detecting equipments can be used during these days. Immediate restoration of the partially damaged structures can be undertaken so that an early rehabilitation can be done. Reconstruction of vital infrastructures like electricity, water supply, communications, roads and bridges, schools and hospitals if affected, should be done as early as possible so that the community life is put back to normal. Technical expertise for these measures can be obtained from the far and near agencies including the Armed forces.

2.1.2. Rapid Assessment

An **emergency rapid assessment** should be conducted and the initial decision should be made on whether assistance is needed, whether local capacity is adequate or external resources are required. Priorities for intervention should be established and an

intervention strategy identified according to the situation. Necessary resources should be identified. Base-line data should be collected to facilitate monitoring. Information should be collected for fund-raising and advocacy work.

2.1. 3. Search And Rescue Operation

The main aim of the rescue team would be to minimize death and injury in a disaster. This may need all related departments like the Electricity, Fire, Police, PWD, and R&B. It is important to coordinate with the Commanding authority before the activity starts, during the activity and at the end of the day. A great part of the activity may involve the fire brigade teams trained in rescue operations and also the local community. Usually before the Government reaches the location of disaster the local community would be the first to start the rescue operations. When trained rescue teams are not available- Army should be brought to assist. The rescue operations would need special equipments like Helicopters, boats, JCB, Dumpers, Earth movers, Cranes, Gas cutting machine, Generators, Special drilling machines and many others. This would require trained operators and staff⁶.

2.1.4. Temporary Shelter⁷

When existing building are not available use tents, plastic sheets or local materials- such as palm thatch in a secure location above the water level. Emergency shelter (tents) can be obtained from neighboring areas, states, and countries. There should be ample space for the people to be sheltered and for all necessary public facilities like toilets, roads. To facilitate the management and control of epidemic of diseases camps should hold not more than 10,000-12,000 people should be subdivided into independent units of not more than 1000 people.

Drainage ditches should be dug around the tents or other shelter and along the sides of the road. Surface of the roads should be disinfected. The temporary shelter should be arranged in rows of 10-12 on both sides of the road for easy accessibility.

2.1.5. Cash Doles And Household Kits

An immediate cash dole amount following the Government disaster norms should be given to the affected people. Basic household kit for each family like utensils, mats, blanket, tents, bucket and mugs, kerosene stove, toilet soap & others should be distributed. Clothes should be distributed as and when relief supplies reach the local authorities.

2.1.6. Environment And Health Management In Emergencies⁸

⁶ See photographs in Appendix II

⁷ See photos in Appendix II

⁸ **Epidemiological Response to Disaster Settings**– Dept of Health and Family Welfare, GOG-WHO; Training Programme for Health Officials: “Environment health management in emergencies”: 85-105.

Coastal Disaster Management Plan

The major issues in the environment and health management are the following:

- a) Drinking water supply.
- b) Human excreta disposal.
- c) Food safety.
- d) Vector control.
- e) Solid waste management.
- f) Waste water disposal.
- g) Hygiene promotion.

a) Water Supply⁹:

When dealing with water supply remember the following:

1. Needs.
2. Microbiological water quality.
3. Water disinfection.
4. Palatability of water.
5. Quality and quantity of water(See Appendix I)
6. Access and equity.
7. Water collection and storage.
8. Communal washing and bathing facilities.

b) Food Supply¹⁰:

To ensure adequate and clean food for the inhabitants certain measures should be taken in the relief camps. Cooked food and raw materials should be obtained from a reliable supplier, covered properly and stored in closed containers to prevent contamination. Hand washing need to be practiced before handling food and the eating utensils disinfected either with boiling water or chlorine solution. It is also advisable to control conditions of transport and storage of food. During the preparation of food utmost care should be taken so that it won't become a source of epidemic. Hence it is better to observe certain golden rules while preparing food like cook raw food thoroughly, eat cooked food immediately, prepare food for only one meal, reheat cooked food thoroughly, avoid contact between raw and cooked food, choose processed food for safety, wash hands repeatedly, keep all food preparation premises meticulously clean, store cooked food well (protect from flies, rodents and other animals) and use safe water for cooking.

c) Solid Waste Management¹¹ And Human Excreta Disposal¹²:

In relief camps biological and medical wastes should be properly disposed to avoid environmental hazards. Domestic refuse is removed from the settlement or buried before it becomes a nuisance or a health risk. There should be refuse pits, bins or specific areas with daily collection system and there should be no dwelling within 15 meters of a

⁹ See photos in Appendix II

¹⁰ **Environmental health in emergencies and disasters**- WHO; "Food safety": 148-158.

¹¹ See photos in Appendix II

¹² **Environmental health in emergencies and disasters**- WHO; "Sanitation": 127-137.

refuse container. Design, construct and operate incinerator with deep ash pit within the boundaries. Final disposal of solid waste should be carried out in such a place and in a way as to avoid creating health and environment problems.

Construction of toilets should be done with all concerns to ensure utilization. Toilets should not be more than 50meters from dwelling or not more than 1-minute walk. Toilets should be segregated by sex and set-up with proper lighting, hand wash facilities and kept clean enough to invite use and not to present health hazard. Latrines and soak pits should be at least 30 meters from the source of water.

d) Vector Control¹³:

Disasters give rise to an increase in the vector population, usually insects or rodents. Malaria is one of the five leading causes of mortality in emergency situations followed by Plague, Diarrhea, and Typhoid. In an emergency, in order of priority, the vector borne disease control measures should be followed after diagnosis and treatment of the victims, personal protection measures should be promoted in addition to maintaining clean environment and vector control measures like spraying should be undertaken.

2.1.7 Mass Causality Management¹⁴

Immediate management of a disaster involves search, rescue and first aid of the victims. First aid should be given for all cases of drowning or near drowning in fresh and saline water. Injuries like cuts, abrasions and fractures should be timely attended to. Arrangements should be done for transportation of patients to nearby hospitals. This could be made easy by triage at the disaster site and at hospitals. To maintain identity of the victims tagging should be done which describes the name, age, sex, and place of origin, triage category, diagnosis, and initial treatment of the victims. In the hospitals, simple therapeutic procedures should be given. Whenever possible facilities for post trauma counseling should be arranged.

2.1.8. Reproductive and Child Health in Emergency Situations¹⁵

During disasters women and children are made more vulnerable not only by the disaster in itself but also by the behavior of the rescue force. Priority should be given for RCH care both in the relief camps as well as the hospitals catering to the victims.

¹³ **Epidemiological Response to Disaster Settings**– Dept of Health and Family Welfare, GOG-WHO; Training Programme for Health Officials: “Environment health management in emergencies”: 85-105.

¹⁴ **Epidemiological Response to Disaster Settings**– Dept of Health and Family Welfare, GOG-WHO; Training Programme for Health Officials: “Mass Casualty Management”: 131-133.

¹⁵ **Epidemiological Response to Disaster Settings**– Dept of Health and Family Welfare, GOG-WHO; Training Programme for Health Officials: “Reproductive and Child Health in Emergencies”: 106-117.

The priority groups of women would include:

- a) Complicated pregnancy,
- b) Pregnant women close to their date of delivery,
- c) Pregnant women with injury,
- d) Women who have given birth before a month or less of the disaster and
- e) Women who have suffered from sexual violence during that period.

And the priority groups of children include:

- a) Those who are injured,
- b) Very sick,
- c) Less than one year and
- d) Motherless children below 5 years.

Facilities should be made to provide Emergency Obstetrics Care, safe deliveries, abortion services and care of women with menstrual disorders and cases of sexual violence. There should also be facilities for First aid and resuscitation, Triage, shifting of the victims to more organized centers and attending to specific needs to adolescent health care including sexual abuse and violence.

2.1.9. Epidemic Control¹⁶

The five most common causes of death in emergencies and disasters would be diarrhoea, acute respiratory infection, measles, malnutrition and, in endemic zones- malaria. All except malnutrition are communicable diseases directly related to environmental health conditions, and malnutrition could be greatly exacerbated by communicable disease.

Disaster-affected people are particularly vulnerable to communicable diseases the disaster and its immediate consequences reduce resistance to disease because of malnutrition, stress, fatigue and when post-disaster living conditions are unsanitary. Other hazards could leave standing water, pollution of water or interruptions in drinking-water supplies. High winds, coastal storms, mudslides and even earthquakes would all result in standing water.

Public-health surveillance would mean the collection, analysis and dissemination of health information to enable appropriate actions that need to be taken. It is important that the designated Public health surveillance officer with the health staff should start the disease surveillance to prevent epidemics. The suspected disease outbreaks, indicated by information from a health surveillance system, should be rapidly investigated using standards protocols for assessment. The two main strategies for controlling outbreaks of communicable disease are to reduce the number of cases through preventive activities and to reduce mortality due to the disease through early case detection and effective treatment. These measures should be put into place rapidly, and should not be delayed while waiting for laboratory confirmation of the disease in question. Mass immunization is a priority in emergency

¹⁶ **Environmental health in emergencies and disasters-** WHO; “Control of communicable disease and prevention of endemic”: 168-173.

situations, where people are displaced, there is disruption of normal services, over crowded, where there is widespread malnutrition, regardless of whether a single case of measles has been reported or not. One confirmed case of cholera should prompt all diarrhea cases to be treated as cholera.

A coordinated work by the health workers, sanitary workers and water and food supply systems can prevent the outbreak of communicable disease in the relief camps as well as in the community. Community health workers, as well as the personnel of temporary relief centers and hospitals, should be alert to attend to patients presenting with any of a list of diseases including typhoid or paratyphoid fever, cholera, typhus, plague, encephalitis or meningitis, as well as to excessive numbers of poisonings (including food poisoning) or cases of malaria. Histories should be taken from these patients, contacts identified, and the source of the disease isolated. Surveillance of public-health problems may be possible to some extent even under the worst conditions of large-scale population movement. Existing reporting systems can be extended to create an area-wide surveillance system that covers priority diseases, including serious water- and sanitation-related epidemic diseases.

2.1.10. Mortuary Services¹⁷

A call for volunteers to carry out search and rescue work should be communicated through the mass media and by contacts with the existing local community organizations. Volunteers involved in search and rescue activities including disposal of the dead should ideally be members of an existing community organization. If it does not exist, community members should form an ad hoc organization. This will help representatives of the organization to establish a disciplined system that relies on group cohesion, which will facilitate communications. The professional rescue workers should liaise with the elected representatives of such volunteer groups.

Proximity to the dead is deeply disturbing, as are the odours eventually produced by bodies. Dead bodies should therefore be buried or cremated without delay according to custom, or placed as soon as possible in mortuaries, to which the general population should not have access; here they are exposed solely for purposes of identification by family or friends, and, eventually, for the determination of the cause of death by medical experts. It must be carried out carefully to help families and loved ones deal with their loss. Early identification of corpses helps to preserve the mental health of the bereaved. Anxiety and uncertainty are replaced by grief, and the process of acceptance of death begins. Prompt identification and disposal ensure that families and friends are not exposed to the offensive by-products of bodily decay.

Burial in individual graves is the method of choice, unless the number of dead is excessively large, or climatic or other constraints make this impossible. Individual graves¹⁸ can be dug manually, providing work, a sense of purpose, and a ritual element for the community affected by the disaster. If the number is too large, or circumstances demand it, trenches can be dug by mechanical means and bodies placed in them head to foot to save space.

¹⁷ **Environmental health in emergencies and disasters**- WHO; "Mortuary services and handling of dead": 198-201.

¹⁸ See photographs in Appendix II

2.1.11. Logistics

Managing the logistics is the fundamental of any relief work which includes Restoration of Electricity / supply of Generators and Kerosene, telephone communications, plastic sheets for garbage disposal, for temporary housing etc.

Ensuring essential drugs supplies can help the health workers and alleviate lost of suffering. Restoration of transport system, for the heavy vehicle, ambulances. food and water transportation is also vital. This creates the lifeline for the affected areas. When all the communications channels are broken down the use of emergency communication systems like ham radio and wireless communication are useful also the

a) Human Resource¹⁹:

Relief work requires staff trained in logistics, communications, administration, nutrition, health, water supply and sanitation, specialized teams for search and rescue, emergency medicine and the disposal of dead and debris. Professional staff-medical experts, health workers, ham radio operators, heavy vehicle operators, drivers, engineers etc. are required for the relief work. Many of the volunteers could be new to the work, so proper briefing would be essential before the start of work. The arrangements for a place to stay, transport, work shift, plan for their exit should be made in advance for the volunteers .

A coordinating team should be skilled in coordinating and integrating inputs from many sources and should be able to formulate appropriate policies based on the information received about hazards and vulnerability. Coordinators are also necessary at lower levels of government, including Municipalities and Towns. Take care to thank them for their services so as to help keep up the moral of the manpower for next emergency situation.

b) NGO Coordination:

Coordinating the activities of NGOs are vital during emergency situation which can either make things easy or difficult for the government. The Authorities should delegate an officer to coordinate with the NGO working for the disaster. They should be allocated activities according to their priority, strength and geographic area of their activity. A daily coordination meeting should be conducted to receive the feedback. Care should be taken to avoid duplication of activity in the same area.

NGOs should be clarified clearly their role and role of other governmental and non-governmental agencies and what the Governments want from them. Interagency conflicts should be settled in the daily meetings.

c) Media Management:

Managing media is also one of the vital components of disaster management. It helps in providing correct information to the community and control panic and rumors. Also media can be a source of information about areas not visited by health professionals. For

¹⁹ Environmental health in emergencies and disasters- WHO; "Human resources": 216-220.

this it's ideal to put one media expert (mass communication expert) to interact with media. Daily dissemination of information at a pre fixed time is essential to control the medial chaos. The message should be clear, crisp and as far as possible put it in writing. Weaknesses or criticism of situation management or other agencies should not be included. Only report clear organization policy, on issues related to the flood or refer to the office for clarification, do not speculate.

2.2. INTERMEDIATE PHASE:

Once the immediate phase is passed, the stress should be on the following aspects:

- a. Continue rescue search
- b. Restore infrastructure
- c. Reconstruct vital structures in the area.
- d. Start Rehabilitatory works.
- e. Draw up long term plans and also exit strategy.

Rehabilitation of the affected can be a challenge for many region/country. It has to cover physical, financial, social and psychological aspects of the affected population. Local resources alone might not be sufficient for this stage and hence a coordinated plans at the State and Central level is needed. These activities can be part of the Post disaster phase plans, which should also draw up plans for exit of the various stakeholders from the scene.

Periodic Reviews: Introspection at every stage can bring about improvements and thus, the Disaster management plans need periodic reviews, both during a disaster as well as during the interdisaster preparedness phase. All components can be reviewed and mock drills can help in maintaining the confidence levels.

3. REHABILITATION AND RESTORATION PHASE²⁰

Any disaster is not an end by itself. It is the beginning of new learning and fresh beginnings. **Reconstruction and Rehabilitation** of the affected place and people is the most daunting task during this phase. All efforts should be directed towards an early return to normalcy of the affected. During this phase it is also needed to prepare for any future threats. The Disaster preparedness plans has to be reviewed and periodically updated. Thus it is a continuum of action. **Local capacity building measures** should form an integral part of any disaster preparedness for the best outcome.

Prevention:

Many of the natural disasters are predictable, like the Cyclone, Floods, but in most situations like earthquakes and tsunamis, it strikes from the blue. The effects are worst on the most vulnerable, the women and the children. An early warning system, wherever possible should be installed and the information conveyed to the people in right time. People should also be made aware of the danger signals during the impending disasters. Simple protective measures like taking shelters underneath a doorframe or strong furniture during an earthquake, or

²⁰ [http://www.paho.org/english/topicslist.htm# Disasters and Humanitarian Assistance](http://www.paho.org/english/topicslist.htm#Disasters%20and%20Humanitarian%20Assistance)
Rehabilitation

holding on to trees during cyclones or tsunamis are also helpful to minimize the mortality. Construction of strong sea walls with adequate height, planting trees along the costal region, strict regulation of constructions along the costal line, etc will help reduce the casualty in case of costal disasters. Construction of houses in the Seismic zones needs special technology. Destruction of the ecosystem in such areas is now drawing attention of experts. All these need consideration under a war footing, for success during disasters. The main task in the post disaster phase is to rebuild, from rubble to reconstruction.

3.1. Impact Of Disaster

Post disaster task should be carried out as soon as possible, in parallel with emergency relief and rescue work. The rapid response team formed in advance would be dispatched to visit the site for a detailed estimation of the damage. The problems commonly encountered will be a rapid depletion of resources, because services required are far in excess of a normal situation. Reintegration of the survivors into society, taking care of orphans and handling their health and social needs is of paramount importance.

3.2. Disaster Management Authority²¹

The State disaster management authority is the main player in relief and rehabilitation. The chain of command has to be strictly followed to avoid chaos and confusion.

The functions of the SDMA are mentioned:

- a) Central planning, coordinating and monitoring body for post-disaster
- b) reconstruction and rehabilitation.
- c) Formulation of policy for disaster management.
- d) Promotion of awareness about possible epidemics.
- e) To continue search and rescue operations.
- f) Disposal of unclaimed bodies.
- g) Take possession of unclaimed property in the disaster area.
- h) Demolish unsafe structures
- i) Removal of debris
- j) Construction of temporary bridges for transportation of relief materials.
- k) Restrict entry of unauthorized persons so that the relief and rescue work would not be hampered.
- l) Immediate release of available resources for a speedy rehabilitation.

²¹ www.gsdma.org
<http://www.gsdma.org/pdf/eq.pdf>

Level	Person in charge
State	Relief commissioner
District	District collector
Taluk	Tehsildar
Village	Village Administrative Authority.

3.3. Social Rehabilitation

The houses are usually in various stages of destruction. Resettlement of the victims in their previous habitat will start by clearing the debris, then repair and reconstruction. Funds received are directed towards establishing the basic needs of life and also capacity building of the affected population to reduce dependency. For example, these could take the form of income generation schemes, soft loans, small-scale industries, and establishment of schools, orphanages, and initiation of community insurance programs.

3.4. Health Rehabilitation

Routine immunization, should be continued along with the national health programs. A strong disease surveillance system is invaluable especially because of the imminent threat of outbreaks. Health needs could be in the form of:

Physical –fractures, amputation, paralysis, myalgias, which need long term care.

Mental health- Problems commonly encountered are:

Children: bed wetting, withdrawal, regression, delinquency, fighting.

Adults: nightmares, insecurity, alcohol and drug abuse, psychosis

It is important for support groups, NGOs, religious leaders and health workers to identify early signs.

3.5. Reconstruction

Compensation is given according to the area damaged and the revenue department would assess this. Relocation planning should be executed with the help of the village head. Existing hazards have to be noted and applied in reconstruction to avoid damage in future disaster. Town planning rules have to be strictly followed. Property insurance in the most vulnerable areas of the population should be considered, according to the hazard map of the area.

KEY POINTS

In view of the latest experience, and also from our own field visit observations; we would like to make the following recommendations for an effective disaster management.

1. Get prepared to face any disaster anywhere at any time. The local community is the first to reach the spot and hence a community capacity building program should be chalked out and implemented.
2. Necessary training manual and trainers should be utilized for such programs.
3. Disaster Management Teams should be constituted at all levels from village upwards and kept tuned for immediate use. (For guidelines, ref. UNDP DRMP.)
4. Co-ordination committees should also be in place at all levels with heads of the Local Self Governments as its Chairman and Heads of Administration as its implementing Officers.
5. Inventory of resources, Manpower, Technical, technological, financial and material, should be kept updated at each level.
6. Make each disaster situation, an opportunity to learn and improve.
7. Health workers and other members of the SDMA should leave behind their religious identity and work in unison for the broader cause of mitigating the severity of the disaster.

APPENDIX I

KEY PARAMETERS FOR QUANTITY

The ideal requirements to maintain the quantity of supply of water should be as follows:

About 15-20 litres of water per person per day in temporary shelters and camps with at least one water point for 250 people. The maximum distance from any shelter to the nearest water source is 500 meters. About 40-60 litres of water for every individual would be required at a field hospital. And about 20-30 litres of water would be required for every individual in mass feeding centres. About 35 litres of water would be required for every individual in washing installations.

KEY PARAMETERS FOR QUALITY

There should not be more than 10 coliform bacterias per 100 ml at the point of delivery of water for supplies. Ideally, there should be 0 coliform bacteria in the water that is supplied for drinking. Chlorination would be the most readily available and widely used chemical disinfectant for water supply. Boiling is an effective but might be impractical at times. Proper distribution of the water is essential. Where ever possible regular microbiological check should be performed. Chloroscopes should be provided at all centres of shelter and water distribution. A short briefing on the steps for chlorination and using the chloroscope should be given to those volunteers who are involved in such activities.

APPENDIX II

Vector Control



Safe water



Coastal Disaster Management Plan

Warning Signs



This was a warning sign- the Sea **receded** before the Tsunami.

Temporary Shelters



Coastal Disaster Management Plan

Individual Cremation Options



Rescue and debris removal operations



Coastal Disaster Management Plan

Waste disposal mechanisms and unused clothes

