

Annex 3

<http://mdmu.maharashtra.gov.in/pages/State/multidisasterShow.php>

1. INTRODUCTION

The need for a comprehensive Disaster Management Action Plan (DMAP) for the state of Maharashtra, to strengthen and assist district authorities to manage disasters in the state, and to play a supportive and coordinating role, was realised in the wake of the Killari earthquake of September 30, 1993, and a number of disasters such as Mowad floods, industrial accidents at IPCL, and the increased road accidents in the state.

The Government of Maharashtra (GOM) therefore, appointed consultants for the preparation of DMAP at the State level and district level, through a consultative process at inter-departmental as well as district levels.

The state Disaster Management Action Plan (DMAP) has been prepared for its operationalisation by various departments and agencies of the Government of Maharashtra and other Non-Governmental Agencies expected to participate in disaster management. This plan provides for institutional arrangements, roles and responsibilities of the various agencies, interlinks in disaster management and the scope of their activities. An elaborate inventory of resources has also been formalised.

The purpose of preparing this plan is to evolve a system to

- Assess the status of existing resources and facilities available with the various departments and agencies involved in disaster management in the state.
- Assess their adequacies in dealing with a disaster.
- Identify the requirements for institutional strengthening, technological support, upgradation of information systems and data management, for improving the quality of administrative response to disasters at state level.
- make the state DMAP an effective response mechanism as well as a policy and planning tool.

The state DMAP addresses the state's response to demands from the district administration and in extraordinary emergency situations at multi-district levels. It is associated with disasters like road accidents, major fires, earthquakes, floods, cyclones, epidemics and off-site industrial accidents. The present plan is a multi-disaster response plan for the disasters which outlines the institutional framework required for managing such situations.

The state DMAP specifically focusses on the role of various governmental departments and agencies, vis-a-vis the Emergency Operations Centre, in the event of any of the above mentioned disasters. This plan concentrates primarily on the response strategy, whereas there are separate documents which have addressed themselves to the Risk and Vulnerability Analysis and Preparedness and Mitigation Strategies.

1.1 Objectives of the DMAP

Emergency Response Plan (ERP) means a detailed program of action, to control and/or minimize the effects of an emergency, requiring prompt corrective measures beyond normal procedures, to protect human life, minimize injury, optimize loss control and reduce the

exposure of physical assets and the environment. In other words, ERP is the process by which the response to an extraordinary event is galvanised urgently, through an activation of functional components and assignment of responsibilities for each component, to the appropriate individual or agency.

This action plan can function optimally only if a prior study of the risks and vulnerability of the area is undertaken, and the institutional setup responsible for their mitigation and response is understood clearly.

An action plan provides for a uniformity in approach and perception of the various issues at hand thus avoiding undue complications. The plan at the same time provides for the coordination mechanisms for different agencies right from the field level to the central government. Thus it ensures efficiency of the response and enables maintaining certain standards as also optimal utilisation of resources. Above all, an action plan becomes essential for the management of disasters as the very presence of such a plan can boost the morale of the functionaries and keep them in a state of readiness for facing any eventuality. The objective is to provide a quick and effective response in emergency situations.

Although disaster-specific plans are effective and have been prepared by different authorities, there is a growing awareness to opt for multi-disaster response action plan, in order to tackle multi-faceted effects of disaster. The multi-disaster action plan essentially concentrates on the institutional setup and information flow, and provides for hazard-specific responses along with specification of primary agencies that are involved. Such an approach allows flexibility in response at the local level, while still under the direct supervision and control of the state or regional level.

Thus, while there may be multiple agencies and institutions with varied duties and responsibilities, working at the disaster site, they all form the umbrella structure of a central authority under a unified command. It has the advantage of immediate identifiability and fixing of responsibilities in any disaster situation.

While the action plan assumes an element of preparedness on the part of the administrative authority, it also invokes a substantial involvement of NGOs and private initiatives. The Plan envisages community participation as one of the most effective inputs for the management of disasters. Training of community and key social functionaries thus become essential elements for the successful execution of an action plan.

The Action Plan therefore identifies the operational structure and the coordination mechanisms, the roles and responsibilities of various agencies along with the standards of service expected from them, the information and monitoring tools and modes of communication, and the monitoring and evaluation component.

1.2 Policy Statement

A well coordinated and unified response of various state departments and agencies, appropriate to the demands of the district administration in the management of disasters, will minimise the hardships and improve the process of recovery. This calls for a well-defined plan and procedures, which will allow developing appropriate policies and systematic mobilisation of resources, both at state level and through central and multi-lateral agencies.

Although the containment of disasters will basically be at the district level, the process of confidence building and self reliance at the district level, can best be promoted through a timely, supportive and well-thought-of interventions by the state.

In addition to Disaster Preparedness and Mitigation Strategies as in the case of floods, the results of disaster-specific response strategies, adopted so far by the state administration have demonstrated their efficiency. However, un-anticipated disasters have claimed disproportionate toll, as such specific response strategies did not have adequate flexibility to respond to situational demands. Prompted by such a situation it is expected that a multi-disaster response strategy may offer a better option.

A Disaster Management Plan is backed by continuous preparedness. Only a sustained effort at preparedness can make a disaster management plan effective.

2. INSTITUTIONAL ARRANGEMENTS

Under this multi-disaster action plan,

- All disaster specific mechanisms would come under a single umbrella
- Allowing for attending to all kinds of disasters.

The existing arrangements therefore will be strengthened by defining this administrative arrangement. This arrangement proposes

- Chief Secretary as the team leader
 - supported by the Relief Commissioner through
 - the Branch arrangements at the Emergency Operations Centre (EOC).

The objective is to have a simplified and uncluttered system of response in a disaster situation.

2.1 Emergency Operations Centre

The Emergency Operations Centre will be the hub of activity in a disaster situation. This is however, not to underestimate its normal time activities. The EOC, the key organizational structure, is flexible to expand when demands increase, and contract when the situation slows down. There is no one best way to organize an EOC. The primary function of an EOC is to implement the Disaster Management Action Plan which includes :

- Coordination
- Policy-making
- Operations management
- Information gathering and record keeping.
- Public information
- Resource management.

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

The EOC under the normal circumstances will work under the supervision of Relief Commissioner. It is the nerve centre to support, co-ordinate and monitor the disaster

management activities at the district level. In a disaster situation, the EOC will come under the direct control of Chief Secretary or any other person designated by the Chief Secretary as Chief of Operations.

2.1.1 Normal time activity of the EOC

The normal-time activities of EOC through the office of the Relief Commissioner are very crucial for its efficiency of response in a disaster situation. These activities are primarily the responsibility of Relief Commissioner's office which will be maintaining the EOC.

The GOM has set up a Disaster Management Centre in Yashwantrao Chavan Academy of Development Administration, Pune. This centre has a permanent faculty, and facilities of documentation and data base management. This centre will assist the EOC on a regular basis in the discharge of its normal time activities.

The normal time activity of the EOC through the office of the Relief Commissioner will be to

- Ensure through appropriate statutory instruments that
 - District Disaster Management Action Plan (DDMAP) is operationalised
 - Standard Operating Procedures for various departments are operationalised
- Ensure that all districts continue to update DDMAP on a regular basis
- Encourage districts to prepare area-specific plans prone to specific disasters
- Receive reports on preparedness from the district control room as per the directives every six months. Based on these, the EOC will prepare a summary report for the consideration of the Chief Secretary
- Setup study groups and task force for specific vulnerability studies and submit the reports to Chief Secretary
- Identify and interact with central laboratories, research institutions such as MERI, IIT, BARC, within the state, and NGOs for ongoing collaborations, to evolve mitigation strategies
- Serve as a data bank to all line departments and the planning department with respect to risks and vulnerabilities, and ensure that due consideration is given to mitigation strategies in the planning process
- Receive appropriate proposals on preparedness, risk reduction and mitigation measures, from various state departments/agencies and place the same for consideration of the Chief Secretary
- Convey policy guidelines and changes, if any, in the legal and official procedures, eligibility criteria, with respect to relief and compensation
- Upgrade and update state DMAP according to changing scenarios in the state
- Dissemination of state DMAP to other departments of the GOM and state level agencies
- Update data bank
- Monitor preparedness measures undertaken at the district levels, including simulation exercises undertaken by various departments
- Monitor the training imparted to state level officials, private sector and NGOs by YASHADA.
- Organise post-disaster evaluation and update state DMAP accordingly
- Prepare an actions-taken report for Chief Secretary
- Receive reports and documents on district level disaster events, and submit the same to Chief Secretary, Revenue Minister and Chief Minister
- Warning and communication systems, and other equipments in the control room are in working condition.

- Inform district control room about the changes, if any, in legal and official procedures, with respect to loss of life, injuries, livestock, crop, houses, to be adopted (death certificates, identification procedures, etc.).

2.1.2 Warning or Occurrence of Disaster

On the receipt of warning or alert from any such agency which is competent to issue such a warning, or on the basis of reports from Divisional Commissioner/District Collector of the occurrence of a disaster, all community preparedness measures including counter-disaster measures will be put into operation. The Chief Secretary/Relief Commissioner will assume the role of the Chief of Operations for Disaster Management.

It is assumed that the district administration would be one of the key organisations for issuing warnings and alerts. Additionally, the following agencies competent for issuing warning or alert are given below.

Disaster	Agencies
Earthquakes	IMD, MERI, BARC
Floods	Meteorological Department, Irrigation Department
Cyclones	IMD
Epidemics	Public Health Department
Road Accidents	Police
Industrial and Chemical Accidents	Industry, MARG, Police, DISH, BARC, AERB
Fires	Fire Brigade, Police

The occurrence of the disaster will be communicated to

- Governor, Chief Minister, Home Minister, State Cabinet, Guardian Minister of the district, and non-officials namely MPs and MLAs from the affected district.
- PMO, Cabinet Secretary, Secretary, Home and Defence
- Secretary, Agriculture, and Joint Secretary, NDM, Ministry of Agriculture, GOI
- Maharashtra-Gujarat Area Command : HQ, Mumbai

The occurrence of the disaster would essentially bring into force the following :

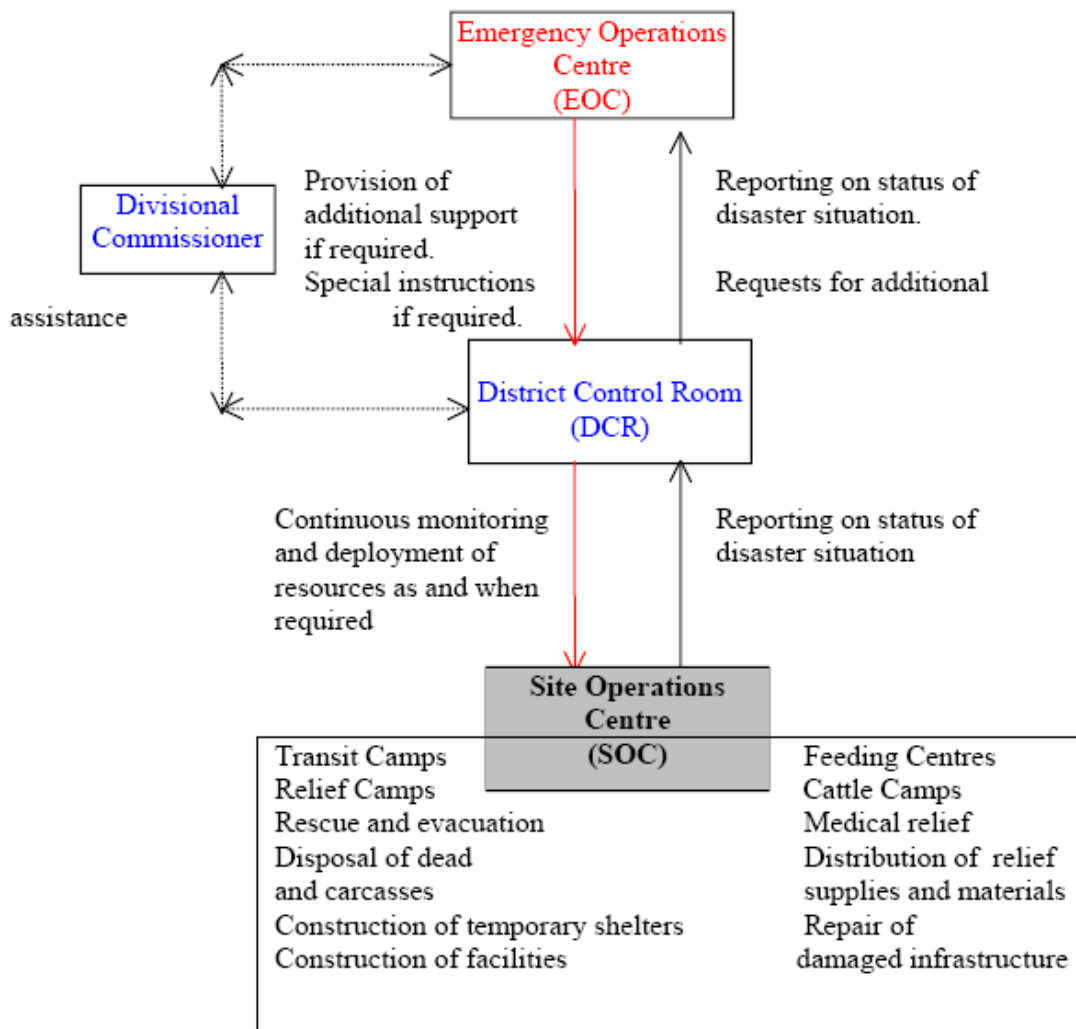
- The Emergency Operations Centre will be put on full alert and expanded to include Branch arrangements, with responsibilities for specific tasks, depending on the nature of disaster and extent of its impact. The number of branches to be activated will be decided by the Chief of Operations
- All Branch Officers and Nodal Officers will work under the overall supervision and administrative control of the Chief of Operations. All the decisions taken in the EOC have to be approved by the Chief of Operations.
- Immediate access to the disaster site

- An on-going VSAT, wireless communication and hotline contact with the Divisional Commissioner, and Collector/s of the affected district/s will be activated.

The EOC in its expanded form will continue to operate as long as the need for emergency relief and operations continue and the long-term plans for rehabilitation are finalised. For managing long-term rehabilitation programmes, such as construction of houses, as in Latur earthquake, the responsibilities will be that of respective line departments. This will enable EOC to attend to other disaster situations, if the need be.

ORGANISATION OF EMERGENCY OPERATIONS CENTRE

Flow of Information between EOC, DCR and SOC during disaster conditions



2.2 Emergency Operations Centre Components (On occurrence of disaster, Branch functions in EOC at Mantralaya)

Chief of Operations

- Establishing priorities
- Spelling out policy guidelines, if necessary
- Coordinate the services of
 - Defence, State Reserve Police, Central Reserve Police Force, Home Guards, Coast Guards, Central Industrial Security Force
 - Fire Brigade, Civil Defence
 - Telecommunications, Railways, Civil Aviation, Port Trust, Food Corporation of India,
 - TV, Radio, Mass Media
 - Maharashtra State Electricity Board, Maharashtra Water Supply and Sewage Board, Maharashtra State Road Transport Corporation, Public Works Department, BEST for Mumbai
 - Indian Meteorological Department, Maharashtra Earthquake Research Institute, BARC
- Coordinate with national and international aid agencies.
- Enlist services of GOI/GOM laboratories and expert institutions for specialised services

Branch	Functions
Operations Branch (In-charge from Revenue Department)	<p>A. Planning Support for Response Action for</p> <ul style="list-style-type: none"> • Emergency supplies of water and cooked food • Rescue and evacuation • Salvage operations • Disposal of dead • Transit camps (in accordance with standards laid down) • Inform the district control room about sanctions for various relief items. <p>B. Implement procurement/purchase/hire/requisition plans of materials which are not available at the district level.</p> <p>C. Establishing communication links with</p> <ul style="list-style-type: none"> • Appropriate central government departments, agencies and institutions, such as railways, defence services, IMD • Police, fire brigade, PWD, MSEB, Irrigation, MWSSB, and all other state departments • Private donors. <p>D. Reporting</p> <ul style="list-style-type: none"> • Receive Preliminary Information Report as given by the Collector • Identify specific items for follow-up actions through the office of the Chief Secretary • Receive all informations and additional information demanded by Chief Secretary, from district control room.

	<ul style="list-style-type: none"> • Report to Chief Secretary on deployment and reinforcements of staff and resources. <p>E. General</p> <ul style="list-style-type: none"> • Inform district control room about the changes, if any, in legal and official procedures, eligibility criteria with respect to relief and compensation, for loss of life, injuries, livestock, crop, houses, required to be adopted • Maintenance of duty records.
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Services Branch (In-charge from Revenue Department)	<p>A. Assess search and rescue requirements as per information from the district control room and take necessary actions</p> <p>B. Direct, supervise and provide assistance wherever necessary for the following</p> <ul style="list-style-type: none"> • Relief camps (in accordance with standards laid down) • Cattle camps • Relief supplies to relief camps or to Site Operation Centre • Supplies of fodder and cattle-feed to cattle camps • Supply of seeds, agriculture inputs and services to Site Operations Centre • Law and order (e.g., prevent looting and theft) <p>C. Ensure adequate material resources at the disposal of the District Disaster Manager (Collector)</p> <p>D. Coordinate NGO activities through necessary support to ensure community participation</p> <ul style="list-style-type: none"> • Identification and coordination with NGOs for relief activities • Identification of NGOs to serve on committees, task force • Set-up a coordination group representing different NGOs • Assigning well-defined area of operations • Assigning specific response functions to specialised NGOs • Reporting upon procurement and disbursement of relief materials received through government and non-government channels.
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<p>Infrastructure Branch</p> <p>(In-charge from PWD/Irrigation /MSEB)</p>	<p>A. Coordinate with respective departments for restoration of damaged infrastructures, like</p> <ul style="list-style-type: none"> • Roads • Power • Water • Telephones • Public buildings • Bridges • Wharves • Canals. <p>B. Coordinate with respective departments for construction of facilities like</p> <ul style="list-style-type: none"> • Shelters with sanitation and recreation facilities • Provision of hand-pumps and borewells • Temporary structures for storage • Educational facilities • Medical facilities • Postal facility • Helipads.
<p>Logistics Branch</p> <p>(In-charge from Revenue Department)</p>	<ul style="list-style-type: none"> • Respond to reinforcement needs including manpower and deployment of inter-departmental and inter-district resources as per information received from the district control room • Ensuring receipt, safe storage, and transport of relief supplies and materials from airport, railways and handling of the required formalities • Direct supplies distributed by NGOs and other organisations including private donors to district control room • Ensure proper maintenance of vehicles and equipments at the Emergency Operations Centre.

<p>Health Branch</p> <p>(In-charge from Public Health Department)</p>	<p>A. Organise mobile medical teams of specialists from within the state (and outside if the need arises) for immediate response</p> <p>B. Coordinate with adjoining districts on request from district control room for supply of</p>
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	<ul style="list-style-type: none"> • Medical relief for the injured • Number of ambulances required and locate hospitals where they could be sent, (public and private) • Medical equipment and medicines required • Special information required regarding treatment as for epidemics etc. • Blood. <p>C. Monitor</p> <ul style="list-style-type: none"> • Treatment of the injured and sick • Disposal of dead bodies • Disposal of carcasses • Preventive medicine and anti-epidemic actions • Reports on food, water supplies, sanitation and disposal of waste and coordinate the services of investigation laboratories, for support services at district level. <p>D. Ensure supervision of maintenance of standards in</p> <ul style="list-style-type: none"> • Transit and relief camps for cooking arrangements, sanitation, water supply, disposal of waste, water stagnation and health services. • Communities for storage of rations, sanitation, water supply, disposal of waste, water stagnation and health services.
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Communication and Information Management Branch (DGIPR)	<p>A. Set-up a media centre in DGIPR's office to organise sharing of information with radio, television channels, print media and community</p> <p>B. Monitor disaster warnings and weather conditions in coordination with and on the advice of</p> <ul style="list-style-type: none"> • IMD • Irrigation • MERI, BARC • Industries. <p>C. General</p> <ul style="list-style-type: none"> • Send Out-Messages on behalf of Chief Secretary/Relief Commissioner and maintain In-Message, Out-Message Register • Collect and process information received from District Control room and any other information as may be required by Chief Secretary
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	<ul style="list-style-type: none"> • Serve as data bank, required for policy making, in disaster situations. <p>D. Make all the information contained in state DMAP readily available</p> <ul style="list-style-type: none"> • Planning Information required including maps incorporated in DDMAP • Disaster site map and indications of the extent, to which other areas may be affected, etc. • Information regarding approach, alternate routes, water sources, layout of essential services which may be affected, etc.
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Resources Branch (In-charge from Revenue Department)	<p>A. Manage disbursement of Relief Funds</p> <p>B. Collect and Collate records from district control room on</p> <ul style="list-style-type: none"> • Receipt of all relief materials • Issue of all relief materials • All expenses incurred on administration and disaster management. • All gratuitous relief • All relief given. <p>C. All payments of approved expenses, dues, claims, daily wages to staff.</p>
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Branch arrangements provide for division of tasks, information gathering and record keeping. Each Branch officer is accountable to the Chief of Operations for specific functions. Each Branch should have a Branch Officer of the rank of Deputy Secretary or Joint Secretary.

The Branch Officers for Operations, Services, Logistics, and Resources will be drawn from Mantralaya from the Revenue Department; for Health Branch, Branch Officer will be drawn from the Public Health Department; for Infrastructure Branch, from the Public Works Department/Irrigation/MSEB and for Communication and Information Management Branch, the DGIPR will officiate.

The capacity of various Branches to coordinate amongst themselves, and with the field units will ultimately decide the quality of response. Such function of coordination is contingent upon the EOC's resources to effectively keep a track on communications received, and the decisions taken. Pro forma for "In and Out Messages and Register" are given in Annexure I and II.

2.3 Facilities/Amenities Provided in the EOC

2.3.1.1 Room

The Emergency Operations Centre has

- Adequate space for a large workstation
- Various Branches during disaster situations.

There is a conference room adjacent to the control room.

The EOC is equipped with

- Necessary furniture and storewells for keeping

- Files of messages
- Stationery
- Other office equipment.

- Action Plans

- Maps

- List of key contact persons during emergencies.

[Are accessible with clear labels, and not under lock and key].

Important phone numbers, which are frequently required, would be displayed on the wall so that they could be seen easily, while other phone numbers, names and addresses etc., are maintained on the computer, to facilitate easy retrieval and cross-referencing.

Some provision is made for

- First-aid and other basic medical relief for the staff
- An adjoining toilet
- A rest room with adequate facilities and
- A lunch room.

[This would be required especially during disaster, when staff may have to be on duty for long hours at a stretch].



I. Control Room (Main Message Room)

[The existing police wireless system in the control room at Mantralaya continues to function in the reorganised EOC].

In addition, the following facilities are available in the control room

- Telephones
- Intercom units for contact within Mantralaya

- VSAT connection to the divisional commissioner and collector
- Hotline to
 - Police Control Rooms
 - BMC Control Room
- Networking of Computers
- One PC with printer
- Mobiles and Pagers (where necessary)
- Photocopying machine
- Television unit and major newspapers to be monitored for news.

During disaster, hotlines from control room to be connected to

- Divisional Commissioner/s of the affected district/s
- District Collector/s of the affected district/s
- Superintendent of Police of the affected district/s



Separate tables are provided for each communication instruments such as

- VSAT
- Telephones
- Fax
- Computer
- Printer
- Typewriter
- NIC terminal and
- Civil wireless within BMC area.

The phones, i.e. intercom, STD phone, EPBX extension, hotline etc., would be of different colours, and with distinct rings if possible, to enable them to be distinguished from each other. An emergency light, fire extinguishers, and a generator for the computer and fax machine would also be provided in the control room.

Branch Units

Each of the seven branches would have

- An independent phone with STD facility
- Intercom units for contact within Mantralaya for all Branch Officers/Nodal Officers.
- Hotline for all Nodal officers to be connected to their respective departments/agencies.
- Office space for central secretarial facility has been clearly identified.

[These telephones with STD facilities will be installed in EOC and kept in working condition under lock and key during normal circumstances].

[As a backup arrangement, in case of damage to the EOC, District Control Room for Mumbai will act as state EOC. Planning for DCR in Mumbai would consider this eventuality and plan accordingly.]

2.3.2 Transport

Provision would be made for a car with wireless communication to be assigned to EOC during normal times. Additional vehicles will be requisitioned, as per the requirements, during the emergency.

2.3.3 Staffing requirements for control room

Three categories of staff are being suggested for the control room: Regular, Staff -on-call and Staff on Disaster Duty.

2.3.3.1 Regular Staff

The regular staff will be posted permanently in the control room and will be responsible for manning the Control Room on a 24-hour basis. The regular staff recommended would include the following:

- Branch Officer - Control Room

A Deputy Secretary in Mantralaya from the Relief Commissioner's Office will function as the Branch Officer - Control Room. He will be in charge of the day-to-day operation of the control room during official working hours. He will be assisted by Deputy Secretaries from Mantralaya in rotation during non-working hours.

- EDP Manager

EDP Manager will be a technical person thoroughly conversant with computer technology. He will be responsible for the maintenance of the LAN and network, and also information processing and data management.

- Computer Operator

The person holding this position will provide all secretarial assistance to the control room. The person should be computer literate and should be able to operate database systems.

- Communication operators (for 24 hours)



The communication operator will attend to wireless set in the control room.

- Driver cum Messenger/Attendant (for 24 hours)

Drivers will be required for the vehicle attached to the control room and kept on stand-by duty. These drivers should also be trained to operate the wireless fitted in the vehicle attached to the control room.

2.3.3.2 Staff-on-call

Staff-on-call will be available for immediate duty in case of a disaster. Two Deputy Secretaries will make up the Staff -on-call. During a disaster, these officers should always be available "on call." Preferably, these deputy secretaries should have their residence in the vicinity of Mantralaya. The staff-on-call should be appointed in rotation from some identified departments. The rotation period could be of at least a month, to ensure some degree of continuity.

2.3.3.3 Staff on Disaster Duty

Staff on Disaster Duty will be additional staff, who are required to shoulder additional responsibility in case of a disaster. These additional staff will be of "reserve nature" and may be drawn from various departments, who are also experienced in control room and EOC operations. All Deputy Secretaries will have to familiarise themselves with the functioning of control room and EOC branches. Nodal Officers, who are likely to be drawn from various departments and agencies, will have to be provided orientation through training programmes to be organised by YASHADA. These staff will be responsible for managing the Branch arrangements mentioned earlier. Central facility for secretarial assistance will be made available to all branch officers during the emergency period.

2.3.4 Services and facilities to be provided by the EOC

- The EOC will have to monitor continuously the preparedness and the response capacity of each district as per the details given in the Document on "Mitigation Strategy". A constant review of the district situation will imply making provisions of such services and facilities, under the government as well as the private sponsorship, at the district level so that these can be mobilised at a very short notice.



- It will be difficult for the EOC to maintain an inventory of all the resources at the state level. Therefore, identification of agencies and institutions, for locating inventory items for specialised services becomes an important function of the EOC. EOC will also ensure the availability of the inventory items as and when required.

- For instance, speed boats for rescue operations can be located with Irrigation department, Navy, Coast guards at different locations. The EOC/District Control Room can press these boats from the nearest locations into relief operations during emergencies. It will be useful if the state agencies such as Irrigation Department in consultation with other agencies like Coast Guard, have a special plan for locating these facilities.

- Similarly, civil hospitals can be equipped for trauma care with mobile trauma vans and CT Scan facilities, so that each district will be in a position to handle such emergencies, and the mobile trauma vans can be mobilised from few adjoining districts at a short notice during disaster.

2.4 Coordination between EOC and District Control Room

The need for coordination in disaster management between different levels of government, is based on the necessity for having a unified command, and coordinated action by all the agencies. The objective is to ensure that state action is organized in a disaster situation to:

- Effectively and efficiently meet needs
- Avoid waste and-duplication of effort
- Ensure that resources are distributed equitably and to areas of greatest need.

Priorities must be clearly defined and understood by all agencies. This is mainly done at the state level, while preparing the standard operating procedures for each department, during the disaster cycle. Effective coordination is largely dependent upon an effective data collection, processing and reporting machinery.

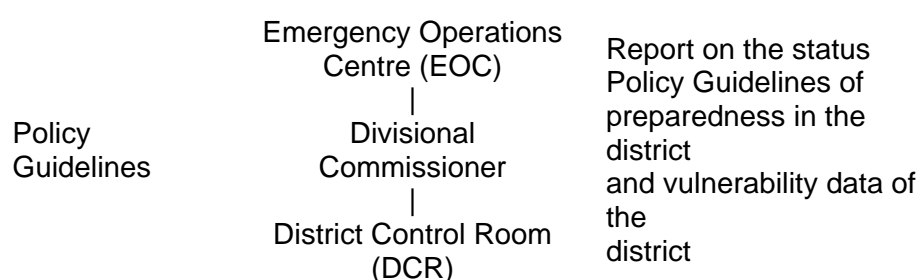
The link of the DCR with the EOC will be through:

- Hotlines
- VSAT
- Telephones
- Police wireless network
- fax
- NICNET.

The flow of information between EOC and DCR may be described under two scenarios viz., During Disaster and under Normal Conditions. Figure 2 and 3 show the channels for information between these set-ups under the above two scenarios.



Flow of Information between EOC, DCR during normal conditions



[Flow of Information between EOC, DCR and SOC during disaster conditions - \(pdf\)](#)

2.5 Multi-district Disasters

In case of disasters which have an impact on more than one district in a division, the role of the Divisional Commissioner comes into prominence. The Commissioner's responsibilities shall include exercising general supervision over the work of preparation of contingency plan undertaken by the Collectors in his Division, and also on the relief and rehabilitation operations in those districts.

At the Divisional Commissioner's level all the state departments and agencies have a regional head. It is very practical for the Divisional Commissioner to seek the support of these regional heads towards the commitment of regional resources to a disaster situation.

For a disaster in more than one district (within or across the division), the role of Divisional Commissioner is to:

- Provide a unified command through inter-district control room
- Ensure need-based resource allocations amongst districts
- Seek the support of regional heads of line departments for relief
- Direct and coordinate in response to requirements from district control room the services of

- MSRTC
- State Government departments
- SRP, CRPF, Home Guards, Coast Guards, CPWD, CISF
- Fire Brigade, Civil Defence
- Telecommunications.

- Maintain a close liaison with the EOC
- Seek policy guidelines, if necessary
- Mobilise services of Central/State government laboratories and recognised research centres for specialised services.

In such a situation, the Divisional Commissioner will act

- As the Additional Relief Commissioner for the disaster area,
- His powers will be analogous to that of Relief Commissioner in the EOC



- Will access funds from the state government for this purpose
- Will be assisted by Deputy Commissioner, Revenue, in discharge of disaster management functions, as is the normal practice.
- Will receive the support of other Deputy Commissioners and Assistant Commissioners and Line Department Heads.

[The district control rooms would continue to function in their respective districts and perform all the functions as per the DDMAP].

2.6 Non-governmental organisations (NGOs) and Voluntary Agencies

The non-governmental organisations and voluntary agencies play an important role in disaster management, and provide valuable resources and expert manpower. Their capacity to reach out to community groups, and their sensitivity to local traditions of the community give them added advantage, during the disaster situation. Some of the agencies, both from within and outside state, have evolved technical expertise and capabilities, which can be brought into managing typical issues. These organisations enjoy a fair degree of autonomy and flexibility and hence can respond to changing needs immediately.

During post-disaster phase, in the process of rehabilitation, therefore, efforts would be made to enlist partnership of some of the NGOs with relevant expertise, to assist the district administration. However, the choice and extent of their participation would be clearly defined, in order to avoid administrative confusion or undermining of coordination structure at the district level. Involvement of District Collectors in evolving partnership with such NGOs will be one of the tasks to be managed by Services Branch of the EOC.

The specific areas where the NGOs can be involved are:

- As a resource group
- Well-defined area of operations such as

- emergency first-aid
 - blood banks
 - management of Feeding Centres, Transit Camps, Relief Camps
 - construction of temporary shelters
 - trauma Care
 - community Counselling and Mental Health Services
 - recreational Services
 - legal Aid
 - educational Programmes
 - services for Vulnerable Groups (handicapped, destitutes, orphans, widows, separated families)
- As part of confidence building measures, managing Information Centres and acting as rumour control centres
 - Assist beneficiaries towards optimal utilisation of government assistance and compensation
 - Reconstruction
 - Social and economic rehabilitation which includes
 - Restoration of the community's asset base
 - Resuscitation of livelihood
 - Restoration of social units through processes such as adoption, foster-care, remarriage etc.



2.7 Community Participation

The DDMAP expects the district administration to enlist community participation in the entire disaster cycle. The EOC, therefore, is expected to ensure and monitor the nature of community participation sought at the disaster site. Identification of agencies to monitor and evaluate various aspects of community participation, and their impact on efficiency in operations, and in the recovery process is one of the responsibilities of EOC during post-disaster evaluation.

It is important to note that, the so-called “victims” are not all that helpless, and offer a tremendous manpower resource and ingenuity to overcome the crises. The participation of communities and their representatives would reduce the pressures on administration. Further, every attempt to enlist community support and participation will reassure the community about the administration's intent and seriousness about managing the disaster.

Community participation can be ensured by

- Identifying opinion and position leaders in the community, and voicing administration's confidence in their capabilities to undertake the tasks.
- Consultations and dialogues expressly indicating the need for assistance, would encourage the community and its leaders to come forward.
- Regular feedback meetings and an open book approach to demonstrate transparency.
- Involving community in decision making at local levels.

The major areas of community participation would include:

- During Evacuation

- Community leaders and community based organisations (CBOs) can assist in maintenance of security and law and order during evacuation.

- For emergency evacuations , the families can be encouraged to take along water, food, clothing and emergency supplies to last at least three days.

- Encourage families to assemble disaster supplies kit.

- Encourage people to keep fuel in their cars as petrol pumps may be closed during emergencies.

- Ensuring that electricity, gas and water at main switches and valves, are shut off before evacuation.

- With respect to livestock, community assistance can be sought to set the livestock free before evacuation.

- During the Disaster

- Seek the help of community leaders in containing panic, orderly movement towards community shelters (safe zones) and on other preventive steps to avoid injuries and accidents.

- During Relief and Rehabilitation

It is necessary to ensure that members of the community are continuously engaged in some sort of helping activity to draw them out of their depression.

Community assistance to relief authorities at the site to

- Organise cultural and recreational activities in order to protect the mental health and sustain the ethical and moral values.

- Encourage self-help

- Organise skill training

- Locate and identify the dead, disposal of dead bodies, disposal of carcasses and disposal of damaged food stocks

- Contribute labour (loading, unloading, distribution, temporary constructions, salvage and restoration of water supplies, food distribution centres, relief camps, cattle camps etc.)

- Update records of damages and losses

- Maintain law and order

- Maintain standards in sanitation and disposal of waste.

3. RESPONSE STRUCTURE

Disaster results from the impact of the occurrence of hazard on people, man-made structures, components and systems which are weak and incapable of resisting the forces unleashed.

“Sociologically, a disaster is a event, located in time and space, that produces the conditions whereby the continuity of the structure and processes of social units becomes problematic.”
(Russell R. Dynes, 1980. Participation in Social and Political Activities, San Francisco, Jossey-Bass Publishers.)

Disasters threaten sustainable economic development worldwide. In the past twenty years, earthquakes, floods, tropical storms, droughts road accidents, fires and other calamities have killed around three million people and inflicted injury, disease, homelessness, and misery on one billion others, and caused damage worth billions of dollars.

Disasters destroy decades of human effort and investments, thereby placing new demands on society for reconstruction and rehabilitation. The developing countries where two thirds of the world’s population live, suffer the most debilitating consequences due to disasters.

Observing the Asian scenario, one comes to a conclusion that India has moderately high risks of facing natural events which may result in disasters. The risk of such events is quite high for floods or droughts and it is moderate for earthquakes or cyclones. However, considering the heavy damages earthquakes and cyclones inflict on the society, one has to be concerned about not only the degree of risk but also the magnitude of impact of the event.

A multi-disaster response structure on the occurrence of disaster has been diagrammatically represented below.



[Response Structure at State Level on occurrence of disaster](#)

3.1 Emergency Contact Persons

3.1.1 State Government Officials

Designation	Phone Number		Mantralaya Extension no	Other contact no (mobile)
	Office	Residential		
Chief Secretary	2025042	2023851	3444	PA:3597 Fax : 2028594
Additional Chief Secretary	2885144	2828134	3479	
Water Supply	2025357	2850595	3510	
Agriculture & ADF	2025113	2024807	3290	
General Adm. Deptt.	2029959	2026715	3487	
Home				
Relief Commissioner				
Secretary, Revenue	2024588	4951836	3486	PA: 3635

				Fax : 2850919
Secretary, Home	2029959	2026715	3487	PA : 3757 Fax : 2854646
Secretary, Health	2026579	2022916	3224	
Secretary, Medical Education	2026233	4152371	3304	PA : 3832 Fax : 2028612
Secretary, Finance	2029721	2047271	3489	PA : 3252 Fax : 2020717
Secretary, Irrigation	2023109	4974377	3480	PA : 3917 Fax : 2023213
Secretary, Public Works	2024800	4945043	3282	PA : 3324 Fax : 2023141
Secretary, Urban Development	2021444	2025047	3557	PA : 3244
Secretary, Housing	2023036	4952837	3475	PA : 3425 Fax : 2025939
Secretary, Agriculture	2025357	2850595	3510	PA : 3930 Fax : 2024916
Secretary, Food and Civil Supplies	2024851	2022080	3584	PA : 3372 Fax : 2025449
Secretary, Forest	2023363	2026089	3488	PA : 3220 Fax : 2023623
Secretary, Water Supply	2885144	2828134	3479	PA : 3962
Secretary, Industries	2025393	2871852	3500	PA : 3566
Secretary, Labour	2027433	2835913	3629	PA : 3789 Fax : 2824446
DGIPR	2027956			
Municipal Commissioner, BMC	2620251 2620525	4937290	3109	

3.1.2 State Level Organisations



Designation	Phone Number		Other contact no (mobile)
	Office	Residential	
Director General, Police	2026672 2620111/427	2021185	Fax : 3649055
Transport Commissioner	3084621		
Director of Health Services	2621006		

	2620292		
Managing Director, MSRTC			
Director, MPCB	2671356		
Director, Industrial Safety and Health			
Home Guards			

3.1.3 Monitoring Agencies

Designation	Phone Number		Other contact no (mobile)
	Office	Residential	
Director, Meteorology Department	2151606/ 0431 0405		Fax :2160824
Director, MERI	0253-512764 511628		
Director, BARC	5564716 5511910	3633356	

[Top](#) [Get DMP](#)

3.1.4 NGOs at State Level

Designation	Phone Number		Other contact no (mobile)
	Office	Residential	
Indian Red Cross	2611446		Fax:022-2670738
Ramkrishna Mission	6549581/9681 5391/1144/1180		Fax:6544346
Swami Narayan Trust	4411825 4143953 4142016		Fax:4141074
Bharat Sevashram	7826539		
CARE India, (Maharashtra), Mumbai	8368484		
CASA	3089896 3085872		Fax:3085400
CARITAS	040-3744395		Fax:040-293290

3.1.5 Contact Persons from Central Government

Designation	Phone Number		Other contact no (mobile)
	Office	Residential	
Cabinet Secretary	3016696		Fax : 3012095 3013623
Secretary, Home	3011989		Fax : 3015750 3017763
Secretary, Defence	3012380		Fax : 3386004
Secretary, Agriculture			
Maharashtra Gujarat, Area Command HQ, Mumbai			
Western Army Command, Pune	670660	672060	Fax:0212/670660
Western Naval Command, Mumbai			Fax:2660932
Western Air Command, Jodhpur			
Central Railway	2624555 2621551 Ext : 4000		Fax: 2017361
Western Railway			
Mumbai Port Trust	2618011		Fax:2611011
Airport Authority of India, Mumbai	8349890 8324769		
Department of Telecommunications	3719898		Fax:3782344
Doordarshan Kendra, Delhi	3387786 3710133 6218620		Fax:3382704 3715144
All India Radio, Delhi	3710300 3714061		Fax:3711956

3.2 Earthquakes

3.2.1 Nature and Occurrence

Earthquakes can occur anywhere. They may occur in an area not known to have experienced previous activity and may suggest a temporary increase of risk of the hazard in the area. Or they may occur in areas which have a previous history of subterranean sounds and seismic activities.

The impact of earthquakes differs for urban and rural areas, primarily because of the nature of infrastructure, quality of housing and occupational differences. In rural areas, it is primarily the housing and physical structures (including irrigation infrastructure) which may suffer extensive damage, without necessarily destroying the crops.

In urban areas, in addition to housing and physical infrastructures, it may also disturb the service infrastructure such as water supply, sewage, telephones, electricity, piped gas supply etc., which are essentially underground installations and hence exposed to direct impact.

Maharashtra and adjoining regions are prone to earthquakes of moderate magnitude as can be seen from the experience of several years. Based on the earthquakes occurred so far in the state and considering the seismicity pattern, a rezoning has been proposed by MERI for the state of Maharashtra.

During the 33 years of 1963 to 1996, the Koyna region has faced 98,309 earthquakes, out of which 75 were above magnitude of 4 (Richter scale) and seven were above magnitude of 5 (Richter scale).

Earthquake risk assessment is all the more difficult in the Maharashtra state because of lack of seismic instrumentation in large parts of the state. Maharashtra is no doubt the most seismically instrumented state in India, with 52 seismic risk observatories set up in the state. However almost all this instrumentation is concentrated in some pockets.

3.2.2 Possible Impacts

- Effects on Individual

- Loss of Life
- Injuries demanding surgical needs
- Family disruption.

Specific demands raised or required

- Orthopaedic surgery and fractures needing treatment
- Individuals trapped under debris need to be located and rescued, which calls for not only earth moving equipments, but the services of sniffer dogs.
- Expertise of fire brigade and defence services may be essential in the rescue operations.
- In case of separation of family members information counters would play an important role.
- In case of family disruption resulting from death of major earner, economic rehabilitation of the family may have to be planned as a long-term strategy.
- Loss of life, property and livestock may require damage assessment procedures to avoid litigations and delays in gratuitous relief and compensation.

- Damage caused

- Houses
- Personal belongings
- Livestock.

Specific demands raised or required

- Partially damaged houses needs technical inspection – to decide the habitation worthiness and the extent of repairs required.
- Certain partially damaged houses may require demolition.
- As far as possible, reconstruction should take place on the same sites to avoid delays, secure cultural continuity and avoid costly land purchase. In extreme situations, new sites for resettlement may have to be identified when removal of rubble and debris is non-viable.
- Salvaging personal belongings from the debris needs clearance from technical personnel to ensure safety of persons engaged.
- As far as possible, family members only should be permitted to salvage their individual family belongings.

- Damage to infrastructure resulting in disruption of services

- Buildings
- Dams
- Bridges
- Road surface and rail lines
- Power stations
- Piped gas
- Water pipelines and water tanks
- Sewer lines
- Underground cables.

Specific demands raised or required

- Care needs to be taken to ensure that all electrical supplies to damaged area are disconnected promptly by MSEB.
- Underground cables need thorough inspection before power is restored.
- Breaches or cracks in the dam need Irrigation Department to secure the breaches or grouting the cracks.
- In case of damage to bridges, relief operations may require temporary bridges which can be put up with the assistance of army.

- Certain roads needing resurfacing will need immediate action from PWD.
- MWSSB in consultation with health authorities should restore existing water supply with

necessary repairs. This may call for replacement of pipelines or arrangements for storage in portable PVC water tanks.

- In some cases, restoration of existing water supply may be time-consuming and therefore water tankers may have to be pressed into service.
- Identification of nearby water sources and checking the potability of the same may also be required.
- Damage to sewer lines is one of the most ticklish issue. Alternate arrangements by way of temporary latrines may have to be constructed.
- Piped gas supply should be immediately terminated in the affected area to avoid secondary consequences such as fires. If necessary, and feasible, gas cylinders should be supplied till the gas line is checked thoroughly and restored.
- Extensive damage to residential buildings, resulting in disruption of telecommunication facilities requires provision of public telephones (PCO) to facilitate communication.
- Damage to hospital, school buildings and other public facilities may disrupt the services. In such a case restoration of services through temporary arrangements is the first priority.
- PWD may have to take repairs or reconstruction of such public facilities on a priority basis.

- Environmental Effects

- Alteration in river and stream flow
- Liquefaction.

Specific demands raised or required

- Areas indicating signs of liquefaction should be declared out of bounds and strict vigil should be kept by police to prohibit trespassing.
- Foundations of the building in the area prone to liquefaction need technical assessment.
- Alteration in river and stream flow, particularly when it covers a settlement, demands immediate evacuation and relief till such time as the areas for new settlement identified and rehabilitation works can be executed.



- Economic and Social consequences

- Loss or disruption of livelihood
- Disruption of market and loss in production
- Migration
- Disruption of social structure including breakdown of social order and organisations
- Law and order problem
- Psychological after-effects such as individual trauma and depression.

Specific demands raised or required

In addition to immediate relief requirements for effective and early recovery process, checking migration

- Restoration of production units, and employment avenues
- Provision of individual counselling and community counselling
- Reconstruction of social structures and organisation of community, require a professional intervention, which can best come from non-governmental organisations. Voluntary agencies will have to be invited or co-opted for relief activities to ensure this aspect.
- For combating depression, engage people in all possible activities related to relief and rehabilitation through a deliberate strategy of community participation.
- Secondary effects
 - Fires
 - Rains
 - Landslides.



Specific demands raised or required

- Fires result from earthquake because of damage to infrastructure such as power supply and piped gas supply.
- Immediate service of fire brigade is essential to check further damage.
- Immediate discontinuation of both power and gas would restrict the possibility of occurrence to a large extent.
- Rains following earthquakes disrupt rescue and relief operations. Rescue and relief teams therefore must prepare themselves in anticipation and get community cooperation to overcome such difficulties.
- Rains also have implication for storage of food, fuel for cooking (firewood or coal) and fodder for the cattle. Protective structures becomes, therefore essential for the storage of all relief materials. Plastic materials and water-proof containers are required.
- Damage to road access due to landslides needs immediate clearing and PWD would keep itself prepared for such an eventuality.
- Settlements on the hill-slope prone to landslides need to be shifted to safer places.

3.3 Floods

3.3.1 Nature and Occurrence

Floods occur with warning, while flash floods occur with very little warning. This impacts the type of operations for these two similar hazards. For flash floods the operational priority is to warn the public and keep them out of the onset of the flood, while floods provide for a significant time to protect property as well as human life through diking operations.

Floods occur when water covers an area that is normally dry. River flooding takes place when flow in the river exceeds the capacity of the main channel, leaves its banks, and flows on to the floodplain.

Floods may develop suddenly (within minutes to a few hours following the triggering event) or take weeks to unfold. The faster a flood develops, the less warning time is available and the greater is the difficulty, for an organised response to reduce the impact. Frequently, floods happen so suddenly, that individuals have to respond on their own. Longer-cresting floods will provide longer lead times. Consequently, more accurate forecasts can provide valuable information to officials, so that effective response is possible.



Flash floods are precipitations, which occur within a very short period of time (up to 12 hours) after the event which caused them. They are frequently perceived as killer walls of water thundering down a mountain canyon, destroying everything in their path. Although a flash flood may sometimes form a wall of water, most do not. A second misconception is that they always occur in flat terrain; the truth is, mountains, hilly areas, and flat land are all at risk. Consequently, flash floods occur in urban and rural areas, in small rivers, streams, and very large rivers.

Floods in urban areas can also occur during monsoons due to faulty planning, choking of drainage systems and unplanned growth of settlements.

Flood prone areas in India are demarcated as either blue or red lines depending on the frequency of occurrence. Blue lines are those areas where floods can occur once every five years, whereas red lines are areas where floods can occur once every hundred years.

3.3.2 Possible Impacts

- Effects on Individual

- Loss of Life
- Injuries demanding medical attention
- Water-borne infection.

Specific demands raised or required

- In most cases, orthopaedic surgery, fractures, cuts and bruises need immediate attention.
- Cases of water-borne infection need medication.
- Mass immunisation, when necessary, to protect individuals from water-borne diseases.
- Marooned individuals, including those trapped on tree-tops and building terraces need to be located and rescued which calls for boats, or at times helicopter services.
- Alternatively, when large sections of community are marooned, instead of evacuation, it may be necessary to organise dispatch of relief supplies to marooned locations. This creates a special need for transport facility.
- Expertise of fire brigade and defence services (Navy, Coast Guards) may be essential in the rescue operations.

- Impact at family level

- Separated families
- Missing persons
- Family disorganisation.

Specific demands raised or required

- In case of separation of family members, information counters would play an important role.
- In case of family disruption, resulting from death of major earner, economic rehabilitation of the family may have to be planned as a long-term strategy.
- Loss of life, property and livestock may require damage assessment procedures to avoid litigations and delays in gratuitous relief and compensation.

- Damage caused

- Houses
- Personal belongings
- Livestock
- Crops and plantations
- Land.

Specific demands raised or required

- Partially damaged houses needs technical inspection, to decide the habitation-worthiness and the extent of repairs required.
- Certain partially damaged houses may require demolition.
- As far as possible, reconstruction should take place on the same sites to avoid delays, secure cultural continuity and avoid costly land purchase. In extreme situations, new sites for resettlement may have to be identified when removal of rubble and debris is non-viable.
- Salvaging personal belongings from the debris needs clearance from technical personnel to ensure safety of persons engaged.
- As far as possible, family members only should be permitted to salvage their individual family belongings.
- Damage to crops, plantations or agriculture land will need a long-term intervention.

- Damage to infrastructure and disruption of services

- Buildings
- Godowns and storages

- Dams
- Bridges
- Road surface and rail lines
- Power stations
- Water pipelines and water tanks
- Sewer lines
- Underground cables
- Ports and jetties
- Communication lines
- Gas pipelines.

Specific demands raised or required

- Care needs to be taken to ensure that all electrical supplies to damaged area are disconnected promptly by MSEB.
- Underground cables need thorough inspection before power is restored.
- Damage to electric poles and transmission lines needs restoration.
- Breaches or cracks in the dam need Irrigation Department to secure the breaches or grout the cracks.
- In case of damage to bridges, relief operations may require temporary bridges which can be put up with the assistance of army.
- Certain roads requiring resurfacing, will need immediate action from PWD.
- Roads blocked due to uprooting of trees and electric poles may need to be cleared on a priority basis.
- MWSSB in consultation with health authorities should restore existing water supply with necessary repairs. This may call for replacement of pipelines or arrangements for storage in portable PVC water tanks.
- In some cases, restoration of existing water supply may be time-consuming and therefore water tankers may have to be pressed into service.
- Identification of nearby water sources and checking the potability of the same may also be required.
- Damage or choking of sewer lines is one of the most ticklish issues. Alternate arrangements by way of temporary latrines may have to be constructed.
- Piped gas supply should be immediately terminated in the affected area to avoid secondary consequences. If necessary, and feasible, gas cylinders should be supplied till the gas line is checked thoroughly and restored.
- Extensive damage to residential buildings, resulting in disruption of telecommunication facilities, requires provision of public telephones (PCO) to facilitate communication.
- Damage to hospital, school buildings and other public facilities may disrupt the services. In such a case restoration of services through temporary arrangements is the first priority.

- PWD may have to take repairs or reconstruction of such public facilities on a priority basis.
- Disposal of damaged foodgrains is one of the major steps and needs community cooperation.
- Provision for distribution of cooked food or dry rations may have to be made.

- Environmental Effects

- Soil erosion
- Silting
- Water pollution
- Denudation of land
- Increase in salinity.



Specific demands raised or required

- Silting in residential areas and buildings is one of the major problems requiring extensive community involvement.
- NGOs have demonstrated a tremendous capacity to mobilise community participation in desilting operations for re-occupancy of the residences and also the wells providing drinking water.
- Agriculture department may have to undertake soil-testing and propose appropriate measures for restoration of agriculture land.

- Economic and Social consequences

- Loss or disruption of livelihood
- Disruption of market and Loss in production
- Migration
- Disruption of social structure including breakdown of social order
- and community organisations
- Law and order problem
- Psychological after-effects like depression, trauma etc.

Specific demands raised or required

In addition to immediate relief requirements for effective and early recovery process and checking migration

- Restoration of production units, and employment avenues
- Provision of individual counselling and community counselling
- Reconstruction of social structures and organisation of community, requires a professional intervention, which can come best from non-governmental organisations Voluntary agencies will have to be invited or co-opted for relief activities to ensure this aspect.

- For combating depression, engage people in all possible activities related to relief and rehabilitation through a deliberate strategy of community participation.

- Secondary effects

- Epidemics
- Landslides.



Specific demands raised or required

- Rescue and relief teams must be alert to the possibility of outbreak of epidemics and therefore ensure standards of services with respect to storage, cooking, and handling of food materials as also disposal of waste in relief camps, medical centres and feeding centres.

- Water-quality monitoring mechanisms will have to be set-up to prevent outbreak of epidemics.

- Rains also have implication for storage of food, fuel for cooking (firewood or coal) and fodder for the cattle. Protective structures therefore for the storage of all relief material becomes essential. Plastic materials and water-proof containers are required.

- Damage to road access due to landslides needs immediate clearing and PWD has to keep itself prepared for such an eventuality.

- Settlements on the hill-slope prone to landslides need to be shifted to safer places.

3.4 Cyclones

3.4.1 Nature and Occurrence

A cyclone is a violent natural phenomenon occurring in the atmospheric blanket enveloping our earth. In the tropics it occurs as a vast violent whirl, 150 to 300 kilometers across, 102 to 117 kilometers high, spiraling around the center and progressing along the surface of the sea, covering 300 to 500 kilometers a day. Wind speeds rise very high near the center (eye) of the cyclone upto 160 kilometers per hour or more.

Three major devastating effects associated with cyclones are storm surges, gale winds and very heavy rain. The pressure systems are classified as:

- Cyclonic storm (61-85 kilometers per hour)
- Severe cyclonic storm (86-115 kilometers per hour)
- Severe cyclonic storms with core of hurricane winds (equal to or exceeding 116 kilometers per hour).



Once a cyclone is formed, it will continue to move and expand, until it passes over land or over an area where the sea is cooler. Little is known about what makes these storms move and change direction, other than that they are affected by the high altitude winds and

rotation of the earth. So far, scientists have found it difficult to predict the movement of the cyclone, making this hazard one of the most dangerous.

The coastal areas are very much risk prone to cyclones. Maharashtra has a coastal belt of over 720 kilometers between Gujarat to Goa. Thus the Konkan region including Mumbai becomes prone to the risk of cyclones. There are 386 marine fishing villages / hamlets with 17,918 boats engaged in fishing in this coastal belt.

In the Arabian Sea, during the period 1890-1995, 207 depressions/cyclonic storm/severe cyclonic storm have been recorded but only 19 systems have affected Maharashtra - Goa coast.

Mumbai is a coastal city which has faced many threats of cyclones in recent times. It has faced peripheral impact in 1982, 1988 and October 1996, and has been hit on two occasions by cyclones (1948 and June, 1996). It indicates that the city is prone to cyclones.

3.4.2 Possible Impacts

- Effects on Individual

- Loss of Life
- Injuries demanding surgical needs
- Family disorganisation.

Specific demands raised or required

- In most cases, orthopaedic surgery, fractures, cuts and bruises need immediate attention.
- Mass immunisation, when necessary, to protect individuals from water-borne diseases.
- Marooned individuals, including those trapped on tree-tops and building terraces (in case of tidal wave) need to be located and rescued, which calls for boats, or at times helicopter services.
- Alternatively, when large sections of community are marooned, instead of evacuation, it may be necessary to organise dispatch of relief supplies to marooned locations. This creates a special need for transport facility.
- Expertise of fire brigade and defence services (Navy, Coast Guards) may be essential in the rescue operations.



- Damage caused

[Cyclones may be accompanied by heavy rains, or at times tidal waves].

- Houses
- Personal belongings
- Livestock
- Crops and plantations
- Forests.

Specific demands raised or required

- Partially damaged houses need technical inspection, to decide the habitation-worthiness and the extent of repairs required.
- Certain partially damaged houses may require demolition.
- As far as possible, reconstruction should take place on the same sites to avoid delays, secure cultural continuity and avoid costly land purchase. In extreme situations, new sites for resettlement may have to be identified when removal of rubble and debris is non-viable.
- Salvaging personal belongings from the debris needs clearance from technical personnel to ensure safety of persons engaged.
- As far as possible, family members only should be permitted to salvage their individual family belongings.
- Damage to infrastructure and disruption in services
 - Buildings
 - Godowns and storages
 - Dams
 - Bridges
 - Road Surface and rail lines
 - Power stations and power lines
 - water tanks
 - Ports and jetties
 - Communication lines
 - Railway signals.



Specific demands raised or required

- Care needs to be taken to ensure that all electrical supplies to damaged area are disconnected promptly by MSEB.
- Overhead lines need thorough inspection before power is restored.
- Breaches or cracks in the dam need Irrigation Department to secure the breaches or grout the cracks.
- In case of damage to bridges, relief operations may require temporary bridges which can be put with the assistance of army.
- Certain roads requiring resurfacing will need immediate action from PWD.
- MWSSB in consultation with health authorities should restore existing water supply with necessary repairs. This may call for replacement of pipelines or arrangements for storage in portable PVC water tanks.
- In some cases, restoration of existing water supply may be time-consuming, therefore, water tankers may have to be pressed into service.

- Identification of nearby water sources and checking the potability of the same may also be required.
- Choking of sewer lines is one of the most ticklish issue. Immediate arrangements for clearing the sewer lines is necessary.
- Piped gas supply should be immediately terminated in the affected area to avoid secondary consequences. If necessary, and feasible gas cylinders should be supplied till the gas line is checked thoroughly and restored.
- Extensive damage to residential buildings resulting in disruption of telecommunication facilities requires provision of public telephones (PCO) to facilitate communication.



- Damage to hospital, school buildings and other public facilities may disrupt the services. In such a case restoration of services through temporary arrangements is the first priority.
- PWD may have to take repairs or reconstruction of such public facilities on a priority basis.
- Disposal of damaged foodgrains is one of the major steps and needs community cooperation.
- Provision for distribution of cooked food or dry rations may have to be made.
- Rains also have implication for storage of food, fuel for cooking (firewood or coal) and fodder for the cattle. Protective structures, therefore, for the storage of all relief material becomes essential. Plastic materials and water-proof containers are required.

• Environmental Effects

- Soil erosion
- Silting
- Water pollution
- Increase in salinity.

Specific demands raised or required

- Silting in residential areas and buildings is one of the major problems requiring extensive community involvement.
- NGOs have demonstrated a tremendous capacity to mobilise community participation in desilting operations for re-occupancy of the residences and also the wells providing drinking water.
- Agriculture department may have to undertake soil-testing and propose appropriate measures for restoration of agriculture land.



• Economic and Social consequences

- Loss of livelihood
- Disruption of market and loss in production

- Disruption of social structure including breakdown of social order and community organisations
- Migration
- Law and order problem
- Psychological after-effects.

Specific demands raised or required

In addition to immediate relief requirements, for effective and early recovery process and checking migration

- Restoration of production units and employment avenues
- Provision of individual counselling and community counselling
- Reconstruction of social structures and organisation of community requires a professional intervention, which can come best, from non-governmental organisations Voluntary agencies will have to be invited or co-opted for relief activities to ensure this aspect.
- For combating depression, engage people in all possible activities related to relief and rehabilitation, through a deliberate strategy of community participation.
- Secondary effects
 - Epidemics
 - Landslides.



Specific demands raised or required

- Rescue and relief teams must be alert to the possibility of outbreak of epidemics and therefore ensure standards of services with respect to storage, cooking, and handling of food materials as also disposal of waste in relief camps, medical centres and feeding centres.
- Water-quality monitoring mechanisms will have to be set-up to prevent outbreak of epidemics.
- Damage to road access due to landslides needs immediate clearing and PWD has to keep itself prepared for such an eventuality.
- Settlements on the hill-slope prone to landslides need to be shifted to safer places.

3.5 Epidemics

3.5.1 Nature and Occurrence

With the view of detecting epidemics at the earliest, an epidemiological cell has been established under the Jt. Director of Health Services (Pune). The following epidemics are monitored in Maharashtra :-

- Cholera
- Gastroenteritis

- Acute diarrhoea / dysentery
- Infective hepatitis
- Encephalitis
- Poliomyelitis
- Typhoid.



In addition to the above, the following outbreaks are also monitored

- Food poisoning
- Viral fever
- Meningitis
- Dengue fever.

In the state of Maharashtra, Public Health Department monitors epidemics through daily epidemic report, weekly health condition report and monthly report. High incidence of water borne diseases, such as gastroenteritis, cholera, dysentery, infective hepatitis, polio etc., has been observed in the state. This is mostly due to high contamination of drinking water which can be due to heavy rains, leakage in the pipeline, unsatisfactory sanitary conditions, improper disinfection of water etc.

The main districts in Maharashtra affected by malaria are Dhule, Jalgaon, Buldhana, Yeotmal. Chandrapur and Gadchiroli, the last being the most severely affected. The Annual Parasite Index (API) for Maharashtra state in 1988 stood at 1.2 and has been fluctuating from 0.7 to 1.4 in the previous years.

3.5.2 Possible Impacts

- Effects on Individual
 - Loss of life
 - Diseases needing epidemiological treatment

Specific demands raised or required

- Mass immunisation, when necessary, to protect individuals.
- In some cases, existing water supply may be contaminated and therefore water tankers may have to be pressed into service.
- Identification of nearby water sources and checking the potability of the same may also be required.
- Rescue and relief teams must be alert to the possibility of spread of epidemics and therefore ensure standards of services with respect to storage, cooking, and handling of food materials as also disposal of waste in relief camps, medical centres and feeding centres.
- Water-quality monitoring mechanisms will have to be set-up to prevent spread of epidemics.



- In case of vector-borne diseases, the exact vector and related control methods will have to be followed.
- Life-saving drugs including saline will be required in large quantities.
- Disposable kits for treatment of affected people and arrangements for proper disposal of these.
- Personal protection kits for medical personnel and volunteers assisting in treatment of patients.
- Arrangements for disposal of personal belongings and other solid waste materials.
- Monitoring arrangements including testing facilities with the help of laboratories and hospitals.
- Economic and social consequences
 - Migration
 - Evacuation
 - Law and order problem
 - Psychological after-effects especially isolation.



Specific demands raised or required

In addition to immediate medical relief requirements for effective and early recovery process and checking migration

- restoration of potable water supply
- provision of
 - quarantine of infected cases at family and hospital level
 - programme of immunisation
 - water quality monitoring
 - pathological testing laboratories
 - individual counselling
 - family counselling.
- Involvement of NGOs in mobilising community efforts for control of epidemics by ensuring standards of environmental sanitation, disposal of waste and personal hygiene.

3.6 Road Accidents

3.6.1 Nature and Occurrence

Roads in India have an annual fatal accident rate of about 2.65 deaths per 1000 registered vehicles with the figure for Maharashtra state being 1.87.

The State of Maharashtra has 72,000 km of national, state and major district roads vs. 376,000 km nationally. There are 107 accident prone spots on national highways serving the State and 50 on Maharashtra state highways. On an average in Maharashtra, 134 road accidents reportedly take place every day, leading to 81 persons being injured and 15 persons losing their lives.

Data on road accidents reportedly indicate that 70% of road accidents arise from driver failure. Apart from this factor, the generic reasons are

- poor road conditions
- mixed traffic
- poor vehicle maintenance
- mechanical failures
- poor driving habits
- lack of safety belts and helmets
- poor emergency services
- absence of pedestrian amenities and



Some of the most risk-prone roads are the ghat roads. Hazardous substance transport also poses a major accident risk. These accidents constitute 0.4-0.6% of the total road accidents that occurred in the state. The four most important highways which have a high traffic density both with respect to transport of passengers and hazardous / non-hazardous goods and which have a high incidence of accidents are :

NH 8 (Mumbai-Ahmedabad), NH 4 (Mumbai-Pune-Bangalore) and NH 3 (Mumbai-Agra), NH-17 (Mumbai-Goa).

3.6.2 Possible Impacts

• Effects on Individuals

- Loss of life
- Trauma care
- Burns
- Injuries demanding surgical treatment
- Poisoning or exposure to toxic material.

Specific demands raised or required

- In most cases, orthopaedic surgery and fractures need immediate attention.
- Individuals trapped in/under the vehicles, need to be rescued, which at times calls for metal cutting devices.
- Expertise of fire brigade and defence services may be essential when the accident involves vehicles carrying hazardous chemicals, toxic materials or explosives.
- Divers may be required, if the accident involves a vehicle falling off a bridge into water.
- The police may require to cordon off the area.
- Chemical accidents may generate a demand for treatment for burns and exposure to

poisonous substances, which may mean a specialised service not generally available along the highways.



- Nature of injuries may demand immediate transfer of injured to centres offering trauma care.

- Loss of life, property and goods may require damage assessment procedures to avoid litigations, delays in gratuitous relief and compensation including insurance.

- Damage caused

- Vehicles

- Goods.

Specific demands raised or required

- Salvaging the goods from the accident site needs clearance from technical personnel to ensure safety of persons engaged.

- Environmental Effects

- Air pollution, if vehicle, carrying hazardous chemicals are involved

- Disruption of services

- Road network

- Traffic.

Specific demands raised or required

- The spills from vehicles carrying hazardous materials may require stoppage of traffic and cleaning of road surface. Various materials are recommended depending on the nature of spill. Also, specialised agencies may have to be called for undertaking spill cleaning operations.

- Diversion of traffic resulting from such accidents may require traffic control, to give information at various entry points also located far away (which need quick identification) from the site of accident, so as to avoid inconvenience to the travellers.

- Special cranes may be required for clearing the accident site.

- Economic and social consequences

- Law and order problem



Specific demands raised or required

- Security and protection of goods and materials in the vehicles involved in the accident. The details of goods need to be officially recorded.

- Secondary Effects

- Fires

- Gas leak affecting settlements near the accident site.

Specific demands raised or required

- It may be necessary to inform the settlements around, to take necessary precautionary measures, if the accident involves leakage of toxic gases.

- It may be advisable to send a team of medical personnel from poison centres, to visit the settlements around the accident site, when toxic leak is reported.

3.7 Fires

3.7.1 Nature and Occurrence

Maharashtra is one of the states which does not have a State Fire Service. Presently, all fire stations are under the jurisdiction of the respective municipalities. There are 233 Municipal Councils and 13 Municipal Corporations in Maharashtra state. Of these, fire tenders are maintained in 96 councils and 12 corporations.

Fires could be caused by

- explosions
- chemical reactions
- short circuiting in the electrical system etc.

These occurrences could be due to carelessness, inadequate safety precautions or intentional arson and sabotage. The risk due to fire hazards could vary depending upon the level of preparedness of the emergency services, chiefly, fire and medical services.

The data on the number of fire calls attended by the fire services in the state is published every five years in the form of a Red Book. According to the records published for the period 1987-1991, the number of fire calls attended : 8722 and rescue calls attended : 4836.



A broad definition of the type of locations where potential of fire-hazard exists :-

- storage areas of flammable / explosive material.
- improper practices of storage of cooking fuel such as LPG, kerosene in hotels and restaurants.
- multistoreyed buildings with inadequate fire safety measures
- old buildings with poor internal wiring.

In Mumbai and other cities fire fighters face severe problems due to narrow lanes, congested, overcrowded buildings, old buildings and poor internal wiring.

Since the fire services are under the jurisdiction of respective municipalities, administrative clearance is required for crossing municipal limits.

3.7.2 Possible Impacts

- Effects on Individuals

- Burns
- Injuries demanding surgical treatment
- Loss of life.

Specific demands raised or required

- Serious burn cases may need immediate transport for admission to burn wards in the hospital.
- In many cases, panic behaviour may lead to injuries requiring treatment for orthopaedic surgery and fractures.
- Expertise of fire brigade may be essential in the rescue operations and control of fire particularly when population density is very high.
- In case of separation of family members information counters would play an important role. (This is normally observed in case of fires in large slums)
- In case of family disruption resulting from death of major earner, economic rehabilitation of the family may have to be planned as a long-term strategy.



- Loss of life, property and livestock may require damage assessment procedures to avoid litigations and delays in gratuitous relief and compensation.

- Damage caused

- House
- Personal belongings.

Specific demands raised or required

- Partially damaged houses needs technical inspection, to decide the habitation-worthiness and the extent of repairs required.
- Certain partially damaged houses may require demolition.
- Transit arrangements may have to be identified when the structure needs reconstruction.
- Salvaging personal belongings from the debris needs clearance from technical personnel to ensure safety of persons engaged.

- As far as possible, family members only should be permitted to salvage their individual family belongings.

- Damage to infrastructure and disruption of services

- Buildings
- Overhead lines
- Communication lines.



Specific demands raised or required

- Care needs to be taken to ensure that all electrical supplies to damaged area are disconnected promptly by MSEB officials in the area.
- Underground cables need thorough inspection before power is restored.
- Piped gas supply should be immediately terminated in the affected area to avoid chances of spread.
- Extensive damage to residential buildings resulting in disruption of telecommunication facilities requires provision of public telephones (PCO) to facilitate communication.
- Damage to hospital, school buildings and other public facilities may disrupt the services. In such a case restoration of services through temporary arrangements is the first priority.
- PWD may have to take repairs or reconstruction of such public facilities on a priority basis.
- Some fires may demand traffic control measures including identification of alternate routes and diversion of traffic.
- In congested areas curious onlookers may block movement of rescue and fire workers. The police will need to cordon off the area for smooth operations.
- Economic consequences
 - Loss of livelihood
 - Disruption of market
 - Loss in production.

Specific demands raised or required

In addition to immediate relief requirements for effective and early recovery process,

- Restoration of markets, production units, employment avenues
- Provision of damage assessment.



3.8 Industrial and Chemical Accidents

3.8.1 Nature

The main causes of such accidents are explosions due to electricity, fire works, excessive pressure of steam and air, gas, vapour etc., miscellaneous fires include backfire in boilers. The effects from industrial accidents and hazards such as fire or natural disasters, often lead to loss of human life, property and financial damage and considerable environmental pollution.

3.8.2 Possible Impacts

- Effects on Individual

- Loss of life
- Burns
- Injuries demanding surgical treatment
- Exposure to toxic material.

Specific demands raised or required

- In most cases, orthopaedic surgery and fractures need immediate attention.
- Expertise of fire brigade, mutual aid and response groups (MARG), may be essential.
- The police may require to cordon off the area.
- Chemical accidents may demand treatment for burns and exposure to poisonous substances, which may need a specialised service not generally available with medical practitioners.
- Nature of injuries may require immediate transfer of injured to poison centres.
- Loss of life, property and goods may require damage assessment procedures, to avoid litigations, delays in gratuitous relief and compensation including insurance.
- Areas indicating spread of toxic gases should be declared out of bounds and strict vigil should be kept by police to prohibit trespassing.
- When alteration in wind direction covers a settlement, there is a need for immediate evacuation and relief till an all-clear signal is given.

- Environmental Effects

- water pollution
- air pollution
- effect on vegetation.

Specific demands raised or required

- On a long-term basis monitoring of air, water and soil quality will have to be carried out.
- Disruption of services

- Road network
 - Electricity
 - Water supply
- Economic and social consequences
 - Loss of livelihood
 - Disruption of market
 - Damage to food stocks
 - Loss in production
 - Migration
 - Law and order problem
 - Social and psychological effects.

Specific demands raised or required

In addition to immediate relief requirements for effective and early recovery process and checking migration

- Restoration of production units, employment avenues
- Provision of individual counselling and community counselling
- For combating depression, engage people in all possible activities related to relief and rehabilitation through a deliberate strategy of community participation.



4. DISSEMINATION OF STATE DMAP

For the state DMAP to be effective it must be disseminated at three levels ;

- Central government departments, multilateral agencies (aid agencies), defence services, state level officials
- To the district authorities, government departments, NGOs and other agencies and institutions within the state and
- Through mass media to the general public.

The content of the plan should be explained through well designed and focussed awareness programmes.

The responsibility for dissemination of the plan should be vested with Relief Commissioner, at Mantralaya and carried out by YASHADA, as well as through awareness programmes organised by each of the agencies participating in disaster management. The Relief Commissioner should also involve state-level NGOs in preparing suitable public awareness material to be distributed to the public.

The awareness programmes should be prepared in the local language to ensure widespread dissemination. Media should be extensively used for public awareness programmes. These will include

- Newspapers
- TV

- Local cable networks
- Radio
- Publicity material.



Schools, colleges and other public institutions should be specifically targetted.

In addition to dissemination of literature related to the state DMAP, Relief Commissioner should ensure that disaster response drills are conducted by the district authorities and other agencies on a regular basis, especially in the disaster prone areas to maintain the readiness of communities and departments, as regards operational procedures, personnel and equipment and orderly response. Examples include tests of outdoor warning systems and the Emergency Broadcast System.

4.1 Plan Evaluation

The purpose of evaluation of the state DMAP is to determine

- The adequacy of resources
- Coordination between various agencies
- Community participation
- Partnership with NGOs.

The ease of understanding and using the plan will also be important considerations.

The plan will be updated when shortcomings are observed in

- Organizational structures
- Technological changes render information obsolete
- Response mechanisms during drills or exercises
- Assignments of state agencies.

Adaptation, improvisation and optimisation are corner stones of any planning pertaining to disasters. It must be emphasized that the documents or manuals prepared as disaster management plans have limited purpose. These can at best serve as reminder of tasks and activities.

Individuals and agencies assigned specific responsibilities within this plan will prepare appropriate supporting plans and related standard operating procedures, and periodically review and update alerting procedures and resource listings, and also maintain an acceptable level of preparedness.

4.1.1 Post-Disaster Evaluation

A post-incident evaluation should be done after the completion of relief and rehabilitation activities in order to assess

- the nature of state intervention and support
- adequacy of the organizational structure

- institutional arrangements
- adequacy of operating procedures
- monitoring mechanisms
- information tools
- equipment
- communication system, etc.



The impact of above operations for long-term preventive and mitigation efforts are to be undertaken.

At the community level, evaluation exercises may be undertaken to assess the reactions of the community members at various stages in the disaster management cycle, and to understand their perceptions about disaster response in terms of

- adequacy of training
- alert and warning systems
- control room functions
- communication plans
- security
- containment
- recovery procedures
- monitoring.

4.2 Plan Update

The state DMAP is a “living document” and the Relief Commissioner along with YASHADA will update it every year taking into consideration

- the resource requirements
- updates on human resources
- technology to be used
- coordination issues.

An annual conference for DMAP update will be organised by Relief Commissioner. All concerned departments and agencies would participate and give recommendations on specific issues.

The following guidelines should be adhered to while updating the state DMAP :

- A procedure should be in place to update the plan on a regular basis, to ensure that the items requiring updation are considered and are current.
- When an amendment is made to a plan, the amendment date should be noted on the updated page of the plan.
- A senior official in every agency should be designated, to ensure that all plan-holders are notified of changes as soon as possible. Plan-holders should be requested to verify that they have received the changes.

5. OPERATING PROCEDURE GUIDELINES AND STANDARDS

“Operating Procedure Guidelines and Standards for Monitoring” given in a separate document include procedures for warning, operating procedures for evacuation, comprehensive operating procedures for the departments as well as standards of services and specifications for relief camps, cattle camps, and feeding centres.



5.1 Operating Procedures for Warning

A warning system is essential to indicate the onset of a disaster. This may range from alarms (e.g., for fires) and sirens (e.g., for industrial accidents) to public announcements through radio, television etc. (e.g., for cyclones, floods) and other traditional modes of communication (eg. beating of drums, ringing of bells, hoisting of flags).

In most disaster situations, experience has shown that a loss of life and property could be significantly reduced by preparedness measures and appropriate warning systems. The importance of warning systems, therefore, hardly needs any emphasis. However, the opportunity for warning does not exist in all cases. Indiscriminate warnings may result in non-responsiveness of the people. It is, therefore, necessary that with respect to every disaster, a responsible officer is designated to issue the warnings.

The district administration is the prime agency responsible for issuing disaster warnings. Additional technical agencies authorised to issue warnings have been listed.

5.1.1 Important Elements of Warning

- Communities in disaster prone areas are made aware of the warning systems.
- Alternate warning systems must be kept in readiness in case of technical failures (eg, power failure).
- All available warning systems should be used.
- The warnings should, to the extent possible be clear about the severity, the duration and the areas that may be affected.
- Warnings should be conveyed in a simple, direct and non-technical language to incorporate day-to-day usage patterns.
- The do's and don'ts should be clearly communicated to the community to ensure appropriate responses.
- Warning statements should not evoke curiosity or panic behaviour. This should be in a professional language devoid of emotions.
- Spread of rumours should be controlled.
- All relevant agencies and organisations should be alerted.

- Wherever possible, assistance of community leaders and organised groups should be sought in explaining the threat.
- Once a warning is issued, it should be followed-up by subsequent warnings in order to keep the people informed of the latest situations.
- In the event of a disaster threat passing, an all clear signal must be given.

5.2 Operating Procedures for Evacuation

Disasters by their very nature will be different and may require evacuation of communities. It is important to understand the nature of threat and the procedures to be adopted. All agencies involved in evacuation must have a common understanding of their roles and responsibilities in order to avoid confusion and panic behaviour.

Different situations demand different priorities and hence the responsibility for ordering evacuation is assigned to different agencies.

All evacuations will be ordered only by the Collector, Police, Fire Brigade or by the Industries Security Officer. For appropriate security and law and order evacuation should be undertaken with assistance from community leaders. All evacuations should be reported to Collector or District Superintendent of Police immediately.

The following steps should be taken for evacuation :

- Shelter sites should be within one hour's walk or 3 miles (5 km) of dwellings.
- The evacuation routes should be away from the coast or flood-prone areas.
- Evacuation routes should not include roads likely to be submerged in floods, but may include pathways.
- Ensure proper evacuation by seeking community participation.
- Families should be encouraged to take along water, food, clothing and emergency supplies to last at least three days.
- People should listen to a battery-powered radio and follow local instructions.
- If the danger is a chemical release, then people should be instructed to evacuate immediately.

In case of marooned persons, evacuation must be carried out as soon as possible and the persons transferred to transit camps. If evacuation is not possible within 3 hours of the disaster, marooned people must be provided with water, medicines, first-aid and cooked food. Emergency transport for the seriously injured can be arranged through speed boats or helicopters. A senior medical officer should accompany the rescue team along with required medical kits and ensure priority shifting of those seriously injured or requiring immediate medical attention.



5.3 Operating Procedures for Departments

Operating procedures for different departments include the Preamble, Planning Assumptions, Normal Time Activity, Action Plan Objective in a Disaster Situation, Activities

on Receipt of Warning or Activation of District DMAP (DDMAP), Evacuation, Relief and Rehabilitation – Field Office Priorities and Head Office Priorities. These Operating Procedures are given for the following departments : MSEB, Police, Public Health Department, Irrigation Department, Agriculture Department, Animal Husbandry, MWSSB, Public Works Department, DOT, Railways and AAI.

6. INFORMATION AND MONITORING TOOLS

The institutional framework and the response structure would not be effective unless it is operationalised through information tools and monitoring mechanisms. Such tools define the direction and content of information as also the source. The flow of information calls for accountability and the source provides the authenticity. The Information and Monitoring Tools are given in a different document.

In this context, this section presents information and monitoring tools for agencies during preparedness, alert or warning, activation of plan, damage assessment and relief and recovery stages. The tools are evolved keeping in view the requirements of an effective administrative response, efficiency in decision making, evaluation and assessment of on-going disaster stages and requirements of future preparedness. These tools are also expected to help administration in identification and reaching out to the most vulnerable and devastated groups.

WORKING GROUP ON MAHARASHTRA DISASTER MANAGEMENT ACTION PLAN

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Project Leader, Advisor and Chairman, Committee on Earthquakes	:	Shri Johny Joseph, Secretary and Special Commissioner, Earthquake Rehabilitation, GOM, Mantralaya, Mumbai
Chairman, Committee on Floods and Cyclones	:	Shri R.C. Iyer, Secretary, Agriculture, GOM, Mantralaya, Mumbai
Chairman, Committee on Industrial and Chemical Accidents	:	Shri Vinay Bansal, Secretary, Industry, GOM, Mantralaya, Mumbai
Chairman, Committee on Epidemics	:	Shri R. Tiwari, Secretary, Health, GOM, Mantralaya, Mumbai

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1. OPERATING PROCEDURE GUIDELINES AND STANDARDS

This part on “Operating Procedure Guidelines and Standards for Monitoring” includes :

- Procedures for warning
- Operating Procedures for evacuation
- Comprehensive Operating Procedure Guidelines for the Departments
- . relief and recovery
- . the standards of services
- Checklists for monitoring.
- Monitoring relief and rehabilitation
- . standard arrangements for transit camps
- . relief camps
- . cattle camps
- . feeding centres
- . standards of service.



2. OPERATING PROCEDURE GUIDELINES FOR WARNING

Definition: Alert/ warning indicates the onset of a disaster for which a warning system is essential. This system may range from alarms (e.g., for fires), sirens (e.g., for industrial accidents) to public announcements through radio, television etc. (e.g., for cyclones, floods) and other traditional modes of communication (e.g. beating of drums, ringing of bells, hoisting of flags).

[In most disaster situations, experience has shown that loss of life and property could be significantly reduced due to preparedness measures and appropriate warning systems. The importance of warning systems therefore hardly needs any emphasis. However, not in all cases, the opportunity for warning exists. Indiscriminate warnings may result in non-responsiveness of the people. It is therefore necessary that with respect to every disaster a responsible officer is designated to issue the warnings].

2.1 Agencies authorised to issue warning

The district administration is the prime agency responsible for issuing the disaster warning.

Additionally the technical agencies authorised to issue warning are mentioned below.

Disaster	Agencies
Earthquakes	IMD, MERI, NGRI, GSI
Floods	IMD, Irrigation Department
Cyclones	IMD
Epidemics	Public Health Department
Road Accidents	Police
Industrial and Chemical Accidents	Industry, MARG, Police, BARC
Fires	Fire Brigade, Police

2.2 Important Elements of Warning

The following aspects may be considered for dissemination of warning :

- All warning systems and technologies are maintained in working condition and checked regularly
- Communities in disaster prone areas are made aware of the warning systems.
- Alternate warning systems must be kept in readiness in case of technical failure (e.g., power failure)
- Only the designated agencies/officers will issue the warning.
- All available warning systems should be used

[each warning system has a limited reach and multiple warning systems will help in reinforcement]

- The warning should, to the extent possible, be clear about the severity, the time frame, area that may be affected.
- Warning statements should be conveyed in a simple, direct and non-technical language, and incorporate day-to-day usage patterns.
- The do's and don'ts should be clearly communicated to the community to ensure appropriate responses.
- Warning statements should not evoke curiosity or panic behaviour. This should be in a professional language devoid of emotions.
- Rumour control mechanisms should be activated.
- All relevant agencies and organisations should be alerted.

- Wherever possible, assistance of community leaders and organised groups should be sought in explaining the threat.
- Once a warning is issued, it should be followed-up by subsequent warnings in order to keep the people informed of the latest situations.
- In the event of the disaster threat tiding away, an all clear signal must be given.



3. OPERATING PROCEDURES FOR EVACUATION

It is important to understand the nature of threat and the procedures to be adopted

All agencies involved in evacuation must have a common understanding of their roles and responsibilities in order to avoid confusion and panic behaviour.

Different situations demand different priorities and hence the responsibility for ordering evacuation is assigned to different agencies.

All evacuations will be ordered only by the Collector, Police, Fire Brigade or by the Industries Security Officer.

For appropriate security and law and order evacuation should be undertaken with assistance from community leaders.

All evacuations should be reported to Collector or District Superintendent of Police immediately.

3.1 Factors to be considered for Evacuation

3.1.1 Planning Assumptions

- Amount of time needed for evacuation will depend on the disaster.
- If the event can be monitored, like a cyclone, the GOM could have a day or two to get ready.
- In other disasters, it is mostly emergency evacuation of people .

3.1.2 Factors

- Shelter sites should be within one hour's walk and three miles (5 km) of dwellings.
- The evacuation routes should be away from the coast or flood-prone areas.
- Evacuation routes should not include roads likely to be submerged in flood, but may include pathways.
- Ensure proper evacuation by seeking community participation along the following lines:

.; Evacuation should be undertaken with assistance from community leaders and community based organisations (CBOs) for appropriate security and law and order

.; Care should be taken to see that evacuation routes are not blocked.

.; It is always preferable to encourage the entire family to evacuate together as a unit.

.; In case of inadequate transport or limited time, encourage community for emergency evacuation in the following order :

- " seriously injured and sick
- " children, women and handicapped
- " Old
- " Able-bodied.

[An evacuation plan on a priority basis helps avoid stampede and confusion.]



3.2 Emergency Evacuations

- Families should be encouraged to take along adequate supplies of water, food, clothing and emergency supplies.

- The families should be encouraged to assemble the following disaster supplies kit.

- . Adequate supply of water in closed unbreakable containers
- . Adequate supply of non-perishable packaged food and dry rations
- . A change of clothing and rain gear
- . Blankets and bedsheets, towels
- . Buckets, plates, glasses, mugs made of plastic
- . Soap, toothbrushes, toothpaste
- . A battery-powered radio, torch, lantern, matches
- . Cash and jewellery
- . Personal medicines
- . A list of important family documents including ration card, passport, bank passbook address/telephone book (of relatives), certificates, driving licence, property documents, insurance documents etc.

.; Special items including foods, for infants, elderly or disabled family members.

- Encourage people to keep fuel in their cars as petrol pumps may be closed during emergencies.

- Ask people to shut off electricity, gas and water at main switches and valves before leaving.

- Ask people to listen to a battery-powered radio and follow local instructions.

- If the danger is a chemical release, then people should be instructed to evacuate immediately.

- In other cases, advise people to follow these steps:



- .Wear protective clothing

- . Secure their homes. Close and lock doors and windows.
- . Turn off the main water valve and electricity
- . Leave early enough to avoid being trapped.
- . Follow recommended evacuation routes. Shortcuts may be blocked.
- . Not to move or drive into flooded areas.
- . Stay away from downed power lines.
- . Animals may not be allowed in public shelters.
- . Community should set the livestock free
- . If possible, the community may be advised to carry the livestock along [if the evacuation does not involve transportation by vehicles].

3.3 Evacuation of Marooned Persons

In the case of marooned persons, if necessary

- . evacuation must be carried out within the shortest possible time
- . the marooned persons must be transferred to transit camps.
- . Within the shortest possible time (3 hours of the disaster), marooned people must be provided with
 - . water
 - . medicines
 - . first-aid
 - . cooked food.

[This can continue for 48 hours after the disaster].

- . Emergency transport for the seriously injured by
 - . speed boats
 - . A senior medical officer should accompany the rescue team along with required medical kit and ensure priority for shifting of those seriously injured or requiring immediate medical attention.
 - . Water supplied must be in accordance with acceptable standards of potable water. It is the responsibility of medical officer to check the water quality..
 - . The procedures for tagging as given in the standards should be followed.
[Tagging is a process of prioritising transfer of injured based on first hand assessment of chance of survival by the medical officer on the disaster site. The identification of patients is done by attaching a tag to each patient, usually color coded to indicate a given degree of injury and the priority for evacuation].
 - . For food supplies, the standards as given in the “Standards for Food” should be followed.

4. OPERATING PROCEDURE GUIDELINES AND STANDARDS FOR DEPARTMENTS

4.1 Planning Assumptions

The standards of services have been adopted from internationally accepted norms and have been at times modified to suit local conditions. Although it is difficult to maintain efficient service standards in a disaster, which presents a fluid and confused situation, all efforts should be made to reach as close to these norms as possible. Some of the standards make a lasting impact on the communities whereas others have an immediate impact in the field situation, e.g., lack of adequate space per person in relief camps can lead to mental health issues and the absence of adequate sanitation facilities can lead to epidemics.

The operating procedures developed for each department refer to standards of services to be delivered and the appropriate checklists for field monitoring. Hence, the standards and checklists go hand in hand with the operating procedures for every department.

These departments include MSEB, police, public health, irrigation, agriculture, animal husbandry, MWSSB, PWD, MTNL, railways, and airport authority.

5. OPERATING PROCEDURE GUIDELINES FOR POLICE

5.1 Planning Assumptions

- For effective preparedness, the police department must have a disaster response plan or disaster response procedures clearly defined, in order to avoid confusion, improve efficiency in cost and time.
- Operating procedures for mobilising community participation during various stages of disaster management have been given in section on “Areas of Community Participation”. The department is required to study these and adopt appropriate measures to ensure that community participates substantially.
- Orientation and training for disaster response plan and procedures accompanied by simulated exercises will keep the department prepared for such eventualities. Special skills required during emergency operations need to be imparted to the officials and the staff. Select personnel can be deputed for training as “NODAL OFFICER - Police” and “Officer-in-charge - Police” at the state and district level respectively.
- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be undertaken to improve departmental capacity to respond to a disaster.

5.2 Normal Time Activity

- Assess preparedness level and report the same as per the format to District Control Room every six months
- Maintain a list of disaster prone areas in the district
- Organise training on hazardous chemicals for police officers to facilitate handling of road accidents involving hazardous materials
- Designate an area, within police station to be used as public information centre

Action Plan Objective in a Disaster Situation

- Maintain Law and Order



5.3 Activities On Receipt of Warning or Activation of District DMAP (DMAP)

- Within the affected district/taluka, all available personnel will be made available to the District Disaster Manager. If more personnel are required, then out of station officers or those on leave may be recalled.
- All personnel required for disaster management should work under the overall supervision and guidance of District Disaster Manager/District Magistrate.
- Establish radio communications (and assist in precautionary evacuation activities) with
 - . Emergency operations centre
 - . Divisional commissioner
 - . district control room and
 - . departmental offices within the division.
- All district level officials of the department would be asked to report to the Collector.
- Appoint one officer as “NODAL OFFICER - Police” at the state level
- Appoint one officer as “Officer-in-Charge - Police” at the district level
- The District Collector to provide “Officer-in-Charge - Police” or the field staff as the need be, with all needed authorisations with respect to
 - . Recruiting casual labourers.
 - . Procuring locally needed emergency tools and equipment and needed materials.
 - . Expending funds for emergency needs.
- The “Officer-in-Charge - Police” will ensure that all field staff and other officers submit the necessary reports and statement of expenditure in a format as required by District Collector
- Review and update precautionary measures and procedures and review with staff the precautions that have been taken to protect equipment and the post-disaster procedures to be followed.
- Fill department vehicles with fuel and park them in a protected area.
- Provide guards as needed for supply depots such as cooperative food stores and distribution centres.
- Provide convoys for relief materials.
- Identify anti-social elements and take necessary precautionary measures for confidence building.

5.3.1 Evacuation

All evacuations will be ordered only by the Collector, Police, Fire Brigade or by the Industries Security Officer.

For appropriate security and law and order evacuation should be undertaken with assistance from community leaders.

All evacuations should be reported to Collector or District Superintendent of Police immediately.

For evacuation follow the evacuation procedures as outlines in operating procedures for evacuation.

5.3.2 Relief and Rehabilitation

- Immediately after the disaster, dispatch officers to systematically identify and assist people and communities in life-threatening situations.
- Help identify the seriously injured people, and assist the community in organising emergency transport of seriously injured to medical treatment centres.
- Ensure that the police stations are functioning immediately after the disaster at all required locations, as may be requested by the district control room, and that staff are available for the variety of needs that will be presented.
- Assist and encourage the community in road-clearing operations.
- Identify roads to be made one-way, to be blocked, alternate routes, overall traffic management and patrolling on all highways, and other access roads to disaster site.
- Provide security in transit and relief camps, affected villages, hospitals and medical centres and identify areas to be cordoned off.
- Transport carrying transit passengers (that is, passengers traveling through trains or buses and passing through the district), should be diverted away from the disaster area.
- Provide security arrangements for visiting VVIPs and VIPs.
- Assist district authorities to take necessary action against hoarders, black marketers and those found manipulating relief material.
- In conjunction with other government offices, activate a public information centre to:
 - . respond to personal inquiries about the safety of relatives in the affected areas
 - . compile statistics about affected communities, deaths, complaints and needs
 - . respond to the many specific needs that will be presented
 - . serve as a rumor control centre
 - . Reassure the public.
- Make officers available to inquire into and record deaths, as there is not likely to be time nor personnel available, to carry out standard postmortem procedures.
- Monitor the needs and welfare of people sheltered in relief camps.
- Coordinate with military service personnel in the area.



The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Relief Commissioner. The Relief Commissioner will book this expenditure under Budget Head '2245' and reimburse the amount to police.

5.3.3 Preparedness Checklist for Police

(to be filled in by the Department Head and submitted to the District Collector before May every year.)

Preparedness measures taken	Details/Remarks
The department is familiar with disaster response plan and disaster response procedures are clearly defined.	
Orientation and training for disaster response plan and procedures undertaken.	
Special skills required during emergency operations imparted to the officials and the staff.	
Reviewed and updated Precautionary measures and procedures the precautions to be taken to protect equipment the post-disaster procedures to be followed.	
Adequate warning mechanisms established for evacuation.	
A officer has been designated as Nodal Officer for disaster management.	
Sources of materials required for response operations have been identified.	

Reported By :
Designation
Signature
Date

5.3.4 Checklist for Police

(to be filled in by "Officer-in-Charge" and submitted to district control room and the department head.)



Action Taken	Y/N	Details/Remarks
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Radio communications established with Emergency operations centre Divisional commissioner District control room Other police headquarters within the division.		
An officer appointed as "OFFICER-IN-CHARGE - Police"		
Police stations are functioning immediately after the disaster at all required locations as requested by the district control room.		
Anti-social elements identified Precautionary measures for confidence building taken.		
Community assisted in organising emergency transport of seriously injured to medical treatment centres.		
Community assisted in road-clearing operations.		
Overall traffic management and patrolling on all highways and other access roads to disaster site being carried out.		
The following roads have been identified To be made one-way To be blocked Alternative routes.		
Transport carrying transit passengers (that is, passengers travelling through trains or buses and passing through the district), are diverted away from the disaster area.		
Security being provided in Transit camps Feeding centres Relief camps		

Cattle camps		
Affected areas		
Hospitals and medical centres.		
Areas to be cordoned off identified.		
Guards provided for supply depots such as cooperative food stores and distribution centres.		
Security arrangements provided for visiting VVIPs and VIPs.		
District authorities assisted for taking necessary action against hoarders, black marketers and those found manipulating relief material.		
A public information centre activated.		
Officers made available to inquire into and record of deaths.		
Coordination with military service personnel in the area being carried out.		

Inspected By :
Designation:
Signature :
Date:



6. OPERATING PROCEDURE GUIDELINES FOR PUBLIC HEALTH DEPARTMENT

6.1 Planning Assumptions

- There is no substitute for maintaining standards of services and regular maintenance during normal times. This affects the response of the department to any disaster situation.
- Operating procedures for mobilising community participation during various stages of disaster management have been given in section on “Areas of Community Participation”. The department is required to study these and adopt appropriate measures to ensure that community participates substantially.
- For effective preparedness, the department must have a disaster response plan or disaster response procedures clearly defined in order to avoid confusion, improve efficiency in cost and time.
- Ensure that every hospital follows “The Guide to Health Management in Disasters”. The plan should be specifically developed for the facilities, equipment and staff of that particular hospital.

- Orientation and training for disaster response plan and procedures, accompanied by simulated exercises, will keep the department prepared for such eventualities. Special skills required during disaster situations need to be imparted to the officials and the staff. Coordinate training for treatment of people affected due to hazardous spills. Select personnel can be deputed for training as “NODAL OFFICER - Health Services” and “Officer-in-charge - Health Services” at the state and district level respectively.

- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be undertaken to improve departmental capacity to respond to a disaster.

- Ensure that standby generator exists for every hospital.

- Insure that least one kerosene-powered refrigeration unit exists for vaccines.

Action Plan Objective in a Disaster Situation

- Providing efficient and quick treatment

- Preventing outbreak of epidemics.

6.2 Normal Time Activity

- Assess preparedness level and report the same as per the format to district control room every six months.

- Ensure that hospital staff are aware of which hospital rooms/ buildings are damage- proof.

- In the case of hospitals located in proximity to industrial areas obtain chemical data sheets from various industries.

6.3 Activities on Receipt of Warning or Activation of District DMAP (DDMAP)

- Within the affected district/taluka, all available personnel will be made available to the District Disaster Manager. If more personnel are required, then out of station officers or those on leave may be recalled.

- All personnel required for disaster management should work under the overall supervision and guidance of District Disaster Manager.

- Establish radio communications with emergency operations centre, divisional commissioner, district control room and hospitals (including private) within the division.

- Ensure thatl personnel working within the district come under the direction and control of the collector/civil Surgeon.

- Appoint one person as “NODAL-OFFICER – Health Services” at the state level.

- The civil surgeon will act as “Officer-in-Charge - Health Services” at the district level.

- All district level officials of the department would be asked to report to the Collector.

- The district collector to provide “Officer-in-Charge - Health Services” or the field staff as the

need be, with all relevant authorisations with respect to

- .; Recruiting casual labourers.
- .; Procuring locally require emergency tools, equipments and materials.
- .; Expending funds for emergency needs.

- The “Officer-in-Charge -Health Services” will ensure that all field staff and other officers submit the necessary reports and statement of expenditure in a format as required by the collector.

- Review and update precautionary measures and procedures, and review with staff, the precautions that have been taken to protect equipment and the post-disaster procedures to be followed.

- Fill department vehicles with fuel and park them in a protected area.

- Stock emergency medical equipment which may be required after a disaster.

- Determine type of injuries/ illnesses expected and drugs and other medical items required, and accordingly ensure that extra supplies of medical items be obtained quickly.

- Provide information to all hospital staff about the disasters, likely damages and effects, and information about ways to protect life, equipment and property.

- Discharge all ambulatory patients whose release does not pose a health risk to them. If possible, they should be transported to their home areas.

- Non-ambulatory patients should be relocated to the safest areas within the hospital. The safest rooms are likely to be:

- . On ground floor
- . Rooms in the centre of the building away from windows
- . Rooms with concrete ceilings.

- Equipment supplies such as candles, matches, lanterns and extra clothing should be provided for the comfort of the patients.

- Surgical packs should be assembled and sterilised.

- A large enough number should be sterilised to last four to five days.

- The sterilised surgical packs must be stored in protective cabinets to ensure that they do not get wet. Covering the stock with polythene is recommended as an added safety measure.

- All valuable instruments, such as surgical tools, ophthalmoscopes, portable sterilisers, CGS, dental equipments, etc., should be packed in protective coverings and stored rooms considered to be the most damage-proof.

- Protect all immovable equipment, such as x-ray machines, by covering them with tarpaulins or polythene.

- All electrical equipments should be unplugged when disaster warning is received.

- Check the emergency electrical generator to ensure that it is operational and that a buffer stock of fuel exists. If an emergency generator is not available at the hospital, arrange for one on loan.

- All fracture equipment should be readied.

- If surgery is to be performed following the disaster, arrange for emergency supplies of anesthetic gases (usually supplied on a daily basis).

- Check stocks of equipments and drugs which are likely to be most needed after the disaster. These can be categorised generally as:

- Drugs used in treatment of cuts and fractures, such as tetanus toxoid, analgesics and antibiotics .

- Drugs used for the treatment of diarrhoea, water-borne diseases and flu (including oral rehydrating supplies).

- Drugs required to treat burns and fight infections.

- Drugs needed for detoxication including breathing equipments.

- Assess the level of medical supplies in stock, including:

- Fissure materials

- Surgical dressings

- Splints

- Plaster rolls

- Disposable needles and syringes

- Local antiseptics.

- Request central warehouse immediate despatch of supplies likely to be needed, to hospitals, on an emergency priority basis.

- Fill hospital water storage tanks and encourage water savings. If no storage tanks exist, water for drinking should be drawn in clean containers and protected.

- Prepare an area of the hospital for receiving large number of casualties.

- Develop emergency admission procedures (with adequate record keeping) .

- Orient field staff with DDMAP, standards of services, procedures including tagging.



- Hospital administrators should

- Establish work schedules to ensure that adequate staff are available for in-patient needs.

- Organise in-house emergency medical teams to ensure that adequate staff are available at all times to handle emergency casualties.

- Set up teams of doctors, nurses and dressers for visiting disaster sites.

6.3.1 Evacuation

All evacuations will be ordered only by the Collector, Police, Fire Brigade, Health Department or by the Industries Security Officer.

For appropriate security and law and order evacuation should be undertaken with assistance from community leaders.

All evacuations should be reported to Collector or District Superintendent of Police immediately.

For evacuation follow the evacuation procedures as outlined in “Operating Procedures for Evacuation” and “Areas for Community Participation - Evacuation”

For Marooned Persons

A senior medical officer will ensure that water supplied is in accordance with acceptable standards of potable water and is packed under appropriate conditions and containers.

A senior medical officer should accompany the rescue team along with required medical kit and ensure priority for shifting of those seriously injured or requiring immediate medical attention (the procedure for tagging as given in the Annexure should be followed).

6.3.2 Relief and Rehabilitation

Field Office Priorities

- Transport should be arranged for the transfer of seriously injured patients from villages and peripheral hospitals to general hospitals. If roads are blocked, a method should be established to request helicopter transport.
- Establish health facility and treatment centres at disaster sites.
- The provision of medical services should be coordinated by the district civil surgeon with district control room and SOC.
- Procedures should be clarified between
 - Peripheral hospitals
 - Private hospitals
 - Blood banks
 - General hospitals and
 - Health services established at transit camps, relief camps and affected villages.
- Maintain checkposts and surveillance at each railway junction, ST depots and all entry and exit points from the affected area, especially during the threat or existence of an epidemic.
- An injury and disease monitoring system should be developed to ensure that a full picture of health risks is maintained. Monitoring should be carried out for epidemics, water and food quality and disposal of waste in transit and relief camps, feeding centres and affected villages.
- Plan for emergency accommodations for auxiliary staff from outside the area.
- Information formats and monitoring checklists should be used for programme monitoring and development and for reporting to Emergency Operations Centre. This is in addition to existing reporting system in the department.

- Seek security arrangements from district police authorities to keep curious persons from entering hospital area and to protect staff from hostile actions.
- Establishment of a public information center with a means of communication to assist in providing an organized source of information. The hospital is responsible for keeping the community informed of its potential and limitations in disaster situations.
- The local police, rescue groups, and ambulance teams should be aware of the resources of each hospital.

Head Office Priorities

On the recommendations of the EOC ("NODAL OFFICER-Health Services")/ collector/ district control room/ the Public Health Department will

- Send required medicines, vaccines, drugs, plasters, syringes, etc.
- Arrange for additional blood supply.
- Provide for sending additional medical personnel equipped with food, bedding, tents.
- Send vehicles and any additional medical equipments.

The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Relief Commissioner. The Relief Commissioner will book this expenditure under Budget Head '2245' and reimburse the amount to Public Health Department.

6.4 Standards of Service

6.4.1 Tagging

Tagging is a process of prioritising transfer of injured, based on first hand assessment of the medical officer on the disaster site. It is based on the medical criterion of chance of survival . Decision is made regarding cases which can wait for treatment, these which should be taken to more appropriate medical units, and these which have no chances of surviving. The grouping is based on the benefit that the casualties can expect to derive from medical care, not on the seriousness of the injuries.

Whenever possible, the identification of patients should be accomplished concurrently with triage. This is done by attaching a tag to each patient, usually color-coded to indicate a given degree of injury and the priority for evacuation.

· Red Tag

This tag signifies that the patient has a first priority for evacuation. Red-tagged patients need immediate care and fall into one of the following categories:

- 1) Breathing problems that cannot be treated at the site.
- 2) Cardiac arrest (witnessed).

- 3) Appreciable loss of blood (more than a liter).
- 4) Loss of consciousness.
- 5) Thoracic perforations or deep abdominal injuries.
- 6) Certain serious fractures:
 - a) Pelvis
 - b) Thorax
 - c) Fractures of cervical vertebrae
 - d) Fractures or dislocations in which no pulse can be detected below the site of the fracture or dislocation
 - e) Severe concussion
 - f) Burns (complicated by injury to the air passages).



· Green Tag

Identifies these patients who receive second priority for evacuation. Such patients need care, but the injuries are not life-threatening. They fall into the following categories:

- 1 Second-degree burns covering more than 30 per cent of the body.
- 2 Third-degree burns covering 10 per cent of the body.
- 3 Burns complicated by major lesions to soft tissue or minor fractures.
- 4 Third-degree burns involving such critical areas as hands, feet, or face but with no breathing problems present.
- 5 Moderate loss of blood (500-1,000 cc)
- 6 Dorsal lesions, with or without injury to the spinal column.
- 7 Conscious patients with significant craniocerebral damage (serious enough to cause a subdural hematoma or mental confusion). Such patients will show one of the following signs:
 - a) Secretion of spinal fluid through ear or nose
 - b) Rapid increase in systolic pressure
 - c) Projectile vomiting
 - d) Changes in respiratory frequency
 - e) Pulse below 60 ppm
 - f) Swelling or bruising beneath the eyes
 - g) Anisocoric pupils
 - h) Collapse
 - i) Weak or no motor response
 - j) Weak reaction to sensory stimulation (profound stupor).

· Yellow Tag

Used on patients who are given third priority for evacuation and who fall into the following categories:

Minor Lesions

- 1) Minor fractures (fingers, teeth, etc.).
- 2) Other minor lesions, abrasions, contusions.
- 3) Minor burns:
 - a) Second-degree burns covering less than 15 per cent of the body
 - b) Third-degree burns covering less than 2 per cent of the body surface
 - c) First-degree burns covering less than 20 per cent of the body, excluding hands, feet, and face.

Fatal Injuries

1. Second and third-degree with burns over more than 40 per cent of the body, with death seeming reasonably certain.
2. Second- and third-degree burns over more than 40 per cent of the body, with other major lesions, as well as major fractures, major craniocerebral lesions, thoracic lesions, etc.
3. Cranial lesions with brain tissue exposed and the patient unconscious.
4. Craniocerebral lesions where the patient is unconscious and has major fractures.
5. Lesions of the spinal column with absence of sensitivity and movement.
6. Patient over 60 years old with major lesions.

[It should be noted that the line separating these patients from red-tag casualties is very tenuous. If there are any red-tag patients, this system will have to be followed. If there are none, the yellow-tag patients with apparently fatal injuries become red-tag candidates. The reason is simple: if there are many red-tag patients with a chance to survive and there are yellow-tag patients who apparently cannot be saved because of their injuries, the time spent on the dying wounded could be better spent on the patients with a chance to survive].



· Black Tag

Black tags are placed on the dead, i.e., casualties without a pulse or respiration who have remained in that condition for over 20 minutes, or whose injuries render resuscitation procedures impossible.

Evacuation Procedures under the Following Conditions

1) Casualties not trapped or buried. Evacuate in the following order:

- a) Red-tag casualties
- b) Green-tag casualties
- c) Yellow-tag casualties

2) Casualties trapped or buried. Evacuate in the following order:

- a) Red-tag casualties
- b) Green-tag casualties
- c) Yellow-tag casualties
- d) Black-tag casualties not trapped or buried
- e) Trapped black-tag casualty..

6.4.2 Vector Control Standards

Vector control programmes should be planned so as to cope with two distinct situations:

- The initial phase immediately following the disaster, when control work should concentrate on the destruction, by a physical or chemical process, of vermin on persons, their clothing,

bedding, and other belongings, and on domestic animals. An emergency sanitation team should be available from the beginning for carrying out this disinfestation.

· The period after the disaster subsided, control work should be directed towards proper food, sanitation, safe disposal of wastes, including drainage, and general and personal cleanliness.

Suggested Vector Surveillance Equipment and Supplies

- Collecting bag
- Collecting forms
- Mouth or battery powered aspirators
- Tea strainer
- Flashlight and spare batteries
- Grease pencil
- Memo pad
- Sweep net
- Pencil
- Tweezers
- White enameled dipper
- Keys and other references
- Labels
- CDC light traps (optional)
- Collecting vials
- Aedes aegypti ovitraps (optional)
- Bulb syringe or medicine dropper
- Fly grill
- Mirror



Suggested Rodent Surveillance Equipment and Supplies

- Teaching aids
- Transfer bags
- Plastic bags
- Vials
- Plastic cups
- Alcohol
- Rubber bands
- Forceps
- Scissors
- Insecticide dusting pan
- Snap Traps
- Formaldehyde
- Live traps
- Acute rodenticides
- Gloves
- Anticoagulant rodenticides
- Flashlights and batteries.

6.4.3 Materials and Equipment

In the absence of clear indication from the field, a minimum kit comprising of the following materials and equipments should be carried by the advance party to the disaster site

- 1) Equipment for pediatric intravenous use :- 36
- 2) Tensiometers for children and adults :- 12
- 3) Assorted ferrules :- 2 boxes
- 4) Tracheal cannulae :- 36
- 5) Set of laryngoscopes for infants, children, and adults 1 each
- 6) Endotracheal tubes, No. 7 Murphy :- 36
- 7) Endotracheal tubes, No. 8 :- 36
- 8) Nasogastric probes :- 36
- 9) Oxygen masks, for adults and children :- 2 boxes
- 10) Large scissors for cutting bandages :- 3
- 11) Plastic linings :- 60
- 12) Phonendoscopes :- 15

Sterilization Unit Supplies

- 1) Tracheotomy set :- 6
- 2) Thorachotomy set :- 6
- 3) Venous dissection set :- 6
- 4) Set for small sutures :- 12
- 5) Bottles for drainage of thorax :-10
- 6) Hand scissors, No. 4 :- 6
- 7) Syringes (disposable) x 2 cc :- 60
- 8) Syringes (disposable) x 10 cc :- 90
- 9) Syringes (disposable) x 50 cc :- 60

Ambulance Fleet



The ambulances will carry the following equipment:

- 1) Oxygen, oxygen mask, and manometer.
- 2) Stretchers and blankets.
- 3) Emergency first aid kit.
- 4) Suction equipment.
- 5) Supplies for immobilizing fractures.
- 6) Venoclysis equipment.
- 7) Drugs for emergency use.
- 8) Minimal equipment for resuscitation maneuvers.

Each ambulance should be staffed by at least a physician, a nurse, a stretcher-bearer, and a driver. The medical and paramedical personnel should be experienced in procedures for the management of patients in intensive care units.

Equipment and Supplies required for Vermin control for a population of 10,000

Power sprayers :- 2

Hand-pressured sprayers, capacity 20-30 litres :- 50

Dusters (hand-operated, plunger type) :- 50

Dusters, power-operated :- 2

Space sprayer :- 1

Adequate supply of accessories and spare parts for the above equipment

Insecticides:

DDT, technical powder :- 0.5 tons

DDT, 75 % water wettable :- 1-2 tons

DDT, 10 % powder :- 1 ton

Dieldrin, 0.625-1.25 % emulsifiable concentrate or wettable powder :- 100 kg
 Lindane, 0.5 % emulsifiable concentrate or wettable powder :- 100 kg
 Chlordane, 2 % emulsifiable concentrate or wettable powder :- 100 kg
 Malathion, 1 % emulsifiable concentrate or wettable powder :- 100 kg
 Dichlorvos emulsion :- 100 litres
 Rodenticides, anticoagulant type (warfarin, etc.) :- 1-2 kg
 Rodent traps :- 100
 Screen, for fly control :- 10 rolls
 Garbage cans, capacity 50-100 litres :- 300-500

a* Quantity depends on availability and on distribution points

6.4.4 Preparedness Checklist for Public Health Department
 (to be filled in by the Civil Surgeon and District Health Officer and submitted to the District Collector before May every year)



Preparedness Measures taken	Details/ Remarks
The department is familiar with disaster response plan and disaster response procedures are clearly defined.	
A hospital plan for the facilities, equipment and staff of that particular hospital based on "The Guide to Health Management in Disasters" has been developed.	
Orientation and training for disaster response plan and procedures undertaken. Special skills required during disaster situations are imparted to the officials and the staff.	
Hospital staff are aware of damage-proof hospital rooms/ buildings.	
Reviewed and updated Precautionary measures and procedures. Precautions that have to be taken to protect equipment. the post-disaster procedures to be followed.	
All hospital staff have been informed about the possible disasters in the district, likely damages and effects, and information about ways to protect life, equipment and property.	
An area of the hospital has been identified for receiving large number of casualties.	
Emergency admission procedures with adequate record keeping developed.	
Field staff oriented about DDMAP	

Standards of services	
Procedures for tagging.	
An officer has been designated as Nodal Officer for Disaster Management.	
Sources of materials required for response operations have been identified.	

Reported By :

Designation:

Signature:

Date:



6.4.5 Checklist for Public Health Department

I. Checklist for Hospitals

(to be filled in by the OFFICER-IN-CHARGE and submitted to district control room and the department head)

Actions Taken	Y/N	Details/Remarks
Radio communications established with <ul style="list-style-type: none"> Emergency operations centre, Divisional commissioner, District control room Hospitals Private hospitals 		
The Civil surgeon designated as "OFFICER-IN-CHARGE - Health Services"		
The following emergency medical equipment are stocked <ul style="list-style-type: none"> Drugs used in treatment of cuts and fractures, such as tetanus toxoid, analgesics and antibiotics . Drugs used for the treatment of diarrhoea, water-borne diseases and flu (including oral rehydrating supplies). Drugs required to treat burns and fight infections. Drugs needed for detoxication including 		

breathing equipments.		
Discharge of all ambulatory patients whose release does not pose a health risk to them.		
Non-ambulatory patients relocated within the hospital to safest areas.		
Equipment supplies such as candles, matches, lanterns and extra clothing provided for the comfort of the patients.		
Emergency Generator available.		
Adequate supplies of anesthetic gases for surgery cases available.		
The hospital water storage tanks were filled.		
An area of the hospital designated for receiving large number of casualties.		
Emergency admissions <ul style="list-style-type: none"> Procedures developed. Records maintained. Work schedules to ensure availability of adequate staff. 		
In-house emergency medical teams to ensure that adequate staff available at all times to handle emergency casualties..		
Emergency accommodations provided for, for medical personnel from outside the area.		
Security arrangements made at hospitals.		
Public information center established at the hospital.		
The local police, rescue groups, and ambulance teams were made aware of the resources of each hospital.		

Inspected By :

Designation :

Signature:

Date



II. Checklist for Field Centres

(to be filled in by the OFFICER-IN-CHARGE and submitted to district control room and the department head)

Actions Taken	Y/N	Details/Remarks
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Surgical packs assembled and sterilised.		
Field Staff aware of tagging procedures.		
Emergency admissions <ul style="list-style-type: none"> Procedures developed. Records maintained. Work schedules to ensure that adequate staff is available. 		
Teams of doctors, nurses and dressers for visiting disaster sites set-up.		
Transport for the transfer of seriously injured patients from villages and peripheral hospitals to general hospitals available.		
Health facility and treatment centres established at disaster sites.		
Water quality monitoring done at <ul style="list-style-type: none"> Transit camps. Relief camps. Feeding centres. Sources of water. Affected areas. Epidemic surveillance is being done at <ul style="list-style-type: none"> Transit camps. Relief camps. Affected areas. Feeding centres. 		

Inspected By :
Designation
Signature
Date

III. Casualty Treatment Post at camp sites and affected villages

(to be filled in by "OFFICER-IN-CHARGE-Health Services and submitted to district control room and the department head)

Action	Y/N	Details/Remarks
Liaise with SOC for suitable location		
Finalise suitable location <ul style="list-style-type: none"> Near water supply Clear access / egress routes Communication link with SOC Close to disaster site Suitably protected against weather conditions Sufficient privacy Separate area for relatives and visitors Adequate sanitation facilities for patients Adequate sanitation facilities for staff Adequate sanitation facilities for relatives and visitors. 		
Coordinating hospital Notified		
First Aid facilities available		
Inform Police of location		
Whether Police personnel posted at treatment post		
Request for additional medical assistance sent to <ul style="list-style-type: none"> Civil hospital District control room. 		

Stocks of triage tags are available on hand		
Records kept on <ul style="list-style-type: none"> Names and addresses of casualties (As far as possible) Type of injuries (As far as possible) Whether transferred for further treatment 		
Records communicated to <ul style="list-style-type: none"> Police SOC 		
Information about intentions to close Casualty Treatment Post communicated to <ul style="list-style-type: none"> SOC Police 		

Inspected By :
Designation
Signature
Date :



IV. Report and Checklist on Epidemics for each camp site and affected village

(to be filled in by "OFFICER-IN-CHARGE-Health Services and submitted to district control room and the department head)

Time : _____

Name of the village :

Name of the camp :

An epidemic exists at the location :

An active threat of epidemics does not exist at the location:

Brief description of type of epidemic / affected area / location :

Brief description of assessment of risk of epidemics in affected area / location and reasons thereof :

Services/ disciplines mobilised :

Discipline/Organisation	Notified (Y/N)	Time	Whether Mobilised (Y/N)	Standby (Y/N)	Alert (Y/N)	Contact person with address, phone no.

Compiled By :
Designation
Signature
Date



V. Checklist for epidemic situations

(to be filled in by "OFFICER-IN-CHARGE-Health Services and submitted to district control room and the department head)

Actions Taken	Y/N	Details/Remarks
Warning and Instructions to public issued		
Cordoning off of affected areas recommended		
Logistical support required		
Cordoning off of roads required		
Alternate routes to and from affected areas required		
Alternative communication		
Waste disposal system adequate		
Sterilisation systems adequate		
Life saving drugs adequate		

Facilities for inoculation and vaccination exist		
Supply of inoculation and vaccination exists		
Accommodation for required number exists		
Facilities for special diet exist		
Risk of spread exists		
Isolation of affected persons done		
Facilities for testing water / wastewater for contamination exist		
Facilities for treatment of contaminated water / wastewater exist		
Suitable protection of workers ensured		

Inspected By :
Designation
Signature
Date

7. OPERATING PROCEDURE GUIDELINES FOR MSEB

7.1 Planning Assumption

- There is no substitute for maintaining standards of services and regular maintenance during normal times. This determines the response of the department to any disaster situation.
- Operating procedures for mobilising community participation during various stages of disaster management have been given in section on “Areas of Community Participation” (p. no.). The department is required to study these and adopt appropriate measures to ensure that community participates substantially.
- For effective preparedness, the department must have a disaster response plan or disaster response procedures clearly defined, in order to avoid confusion, improve efficiency in cost and time.
- Orientation and training for disaster response plan and procedures accompanied by simulated exercises, will keep the department prepared for such eventualities. Special skills required during emergency operations need to be imparted to the officials and the staff. Select personnel can be deputed for training as “NODAL OFFICER - Power Supply” and “Officer-in-charge - Power Supply” at the state and district level respectively.
- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be undertaken to improve departmental capacity to respond to a disaster.

7.2 Normal Time Activity

- Assess preparedness level and report the same as per the format to District Control Room

every six months.

- Establish at each sub-station a disaster management tool kit comprising cable cutters, pulley blocks, jungle knives, axes, crowbars, ropes, hacksaws and spanners. Tents for work crews should also be in storage.

Action Plan Objective in a Disaster Situation

- Restore the power supply and ensure uninterrupted power to all vital installation, facilities and sites.

7.3 Activities On Receipt of Warning or Activation of District DMAP (DDMAP)

- Within the affected district/taluka, all available personnel will be made available to the District Disaster Manager. If more personnel are required, then out of station officers or those on leave may be recalled.
- All personnel required for Disaster Management should work under the overall supervision and guidance of District Disaster Manager.
- Establish radio communications with Emergency Operations Centre, divisional Commissioner, district control room and your departmental offices within the division.



- All district level officials of the department would be asked to report to the collector.
- Appoint one officer as “NODAL OFFICER - Power Supply” at the state level.
- Appoint one officer as “Officer-in-Charge - Power Supply” at the district level.
- Review and update precautionary measures and procedures and review with staff the precautions that have been taken to protect equipment and the post-disaster procedures to be followed.
- Assist the state authorities to make arrangements for standby generators in the following public service offices from the time of receipt of alert warning
 - . Hospitals
 - . Water department
 - . Collectorate
 - . Police stations
 - . Telecommunications buildings
 - . Meteorological stations.
- Fill department vehicles with fuel and park them in a protected area.
- The District Collector to provide “Officer-in-Charge - Power Supply” or the field staff as the need be, with all needed authorisations with respect to
 - . Recruiting casual labourers.
 - . Procuring locally needed emergency tools, equipment and materials.
 - . Expending funds for emergency needs.
- The “Officer-in-Charge -Power Supply” will ensure that all field staff and other officers

submit the necessary reports and statement of expenditure in a format as required by district collector

- Check emergency tool kits, assembling any additional equipment needed.
- Immediately undertake inspection from the time of receipt of alert warning of
 - High tension lines
 - Towers
 - Substations
 - Transformers
 - Insulators
 - Poles and
 - Other equipment.
- Review the total extent of the damage to power supply installations by a reconnaissance flight, if possible.

On the recommendations of the collector/district control room/“ Officer-in-Charge - Power Supply” of the department in the district

- Instruct district staff to disconnect the main electricity supply for the affected area
- Dispatch emergency repair gangs equipped with food, bedding, tents, and tools.



7.3.1 Relief and Rehabilitation

Field office priorities

- Hire casual labourers on an emergency basis for clearing of damaged poles and salvage of conductors and insulators.
- Begin repair/reconstruction.
- Assist hospitals in establishing an emergency supply by assembling generators and other emergency equipments, if necessary.
- Establish temporary electricity supplies for other key public facilities, public water systems, etc.
- Establish temporary electricity supplies for transit camps, feeding centres, relief camps and SOC, district control room and on access roads to the same.
- Establish temporary electricity supplies for relief material godowns.
- Compile an itemised assessment of damage, from reports made by various electrical receiving centres and sub-centres.
- Report all activities to the head office.
- Plan for emergency accommodations for staff from outside the area.

Head office priorities

On the recommendations of the EOC (Nodal Officer-Power Supply)/collector/district control room, at the state level, MSEB will

- Send cables, poles, transformers and other needed equipment
- Send vehicles and any additional tools needed.
- Provide additional support as required.

The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Relief Commissioner. The Relief Commissioner will book this expenditure under Budget Head '2245' and reimburse the amount to MSEB.

7.3.2 Preparedness Checklist for MSEB

(to be filled in by the department head and submitted to the district collector before May every year)



Preparedness measures taken	Details/Remarks
The department is familiar with disaster response plan and disaster response procedures are clearly defined.	
Orientation and training for disaster response plan and procedures undertaken.	
Special skills required during emergency operations imparted to the officials and the staff.	
Reviewed and updated <ul style="list-style-type: none"> · Precautionary measures and procedures. <p>The precautions to be taken to protect equipments.</p> <p>The post-disaster procedures to be followed.</p>	
An officer has been designated as Nodal Officer for Disaster Management.	
Sources of materials required for response operations have been identified.	

Reported By :
Designation
Signature
Date

7.3.3 Checklist for MSEB

(to be filled in by the “Officer-in-Charge” and submitted to district control room and the department head)

Actions taken	Y/N	Details/Remarks
Radio communications established with <ul style="list-style-type: none"> Emergency Operations Centre Divisional Commissioner District control room and Departmental offices within the division. 		
An officer appointed as “Officer-in-Charge- Power Supply”		
Standby arrangements for temporary electric supply or generators made for <ul style="list-style-type: none"> Hospitals Water department Collectorate Police stations Telecommunications buildings Meteorological stations Transit camps SOC Feeding centres Relief camps Cattle camps Godowns for storing relief materials Access roads. 		
Each depot provided with disaster management tool kit.		
Inspection, and repairs if needed, carried out for		
High tension lines		
Towers		

Substations		
Transformers		
Insulators		
Poles.		
Clearing of damaged poles carried out.		
Salvage of conductors and insulators done.		
Emergency accommodations undertaken for staff from outside the area.		
An itemised damage assessment carried out		

Inspected By :

Designation

Signature

Date



8. OPERATING PROCEDURE GUIDELINES FOR IRRIGATION DEPARTMENT

8.1 Planning Assumptions

- There is no substitute for maintaining standards of services and regular maintenance during normal times. This affects the response of the department to any disaster situation.
- Operating procedures for mobilising community participation during various stages of disaster management have been given in section on “Areas of Community Participation”. The department is required to study these and adopt appropriate measures to ensure that community participates substantially.
- For effective preparedness, the department must have a disaster response plan or disaster response procedures clearly defined in order to avoid confusion, improve efficiency in cost and time.
- Orientation and training for disaster response plan and procedures accompanied by simulated exercises will keep the department prepared for such eventualities. Special skills required during emergency operations need to be imparted to the officials and the staff. Select personnel can be deputed for training as “NODAL OFFICER - Irrigation” and “Officer-in-charge - Irrigation” at the state and district level respectively.
- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be undertaken to improve departmental capacity to respond to a disaster.

8.2 Normal Time Activity

- Assess preparedness level and report the same as per the format to District Control Room every six months.

- Identify flood prone rivers and areas and activate flood monitoring mechanisms in all flood prone areas from 1st of June every year.
- Water level gauges should be marked on rivers, dams and minor tank structures not having level gauges.

Action Plan Objective in a Disaster Situation

- Monitor flood situation
- Monitor and protect irrigation infrastructure
- Restore damaged infrastructure

8.3 Activities on Receipt of Warning or Activation of District DMAP (DDMAP)

- Within the affected district/taluka, all available personnel will be made available to the District Disaster Manager. If more personnel are required, then out of station officers or those on leave may be recalled.
- All personnel required for Disaster Management should work under the overall supervision and guidance of District Disaster Manager.
- Establish radio communications with Emergency Operations Centre, Divisional commissioner, district control room and your departmental offices within the division
- All personnel working within the district come under the direction and control of the collector.
- All district level officials of the department would be asked to report to the collector.
- Appoint one officer as “NODAL OFFICER - Irrigation” at the state level.
- Appoint one officer as “Officer-in-Charge - Irrigation” attached to district control room.
- The District Collector to provide “Officer-in-Charge - Irrigation” or the field staff as the need be, with all needed authorisations with respect to
 - . Recruiting casual labourers.
 - . Procuring locally needed emergency tools and equipments and materials.
 - . Expending funds for emergency needs.
- The “Officer-in-Charge -Irrigation” will ensure that all field staff and other officers submit necessary reports and statement of expenditure in a format as required by district collector
- Review and update precautionary measures and procedures and review with staff the precautions that have been taken to protect equipment and the post-disaster procedures to be followed.
- Fill department vehicles with fuel and park them in a protected area.
- Organise round the clock inspection and repair of
 - . Bunds of dams
 - . Irrigation channels
 - . Bridges

- . Oulverts
- . Control gates and
- . Overflow channels.

- . Organise round the clock inspection and repair
- . Of pumps
- . Generators
- . Motor equipments and
- . Station buildings.



- . The officer responsible for the tanks of an area should also be designated an emergency officer, knowledgeable about disasters, their effects, and understand well the appropriate emergency procedures.
- . Officers should ensure that all staff are well aware of precautions to be taken to protect their own lives and personal property.
- . Each technical assistant should have instructions and operating procedures for disaster conditions.
- . Irrigation engineers should review with technical assistants emergency actions that are required.
- . Emergency tool kits should be prepared for all technical assistants in disaster prone areas. These tool kits should include:
 - . Ropes
 - . Pulley blocks
 - . Jungle knives
 - . Shovels
 - . Cement in bags
 - . Concrete pans
 - . Gunny bags
 - . Cane baskets.
- . The emergency tool kits with each technical assistant should be checked.
- . The officers on site should ensure that, the level of impounding in the tanks is reduced to create increased capacity, and coordinate the same with officers on other dam sites and the district control room, if heavy rains are expected. The amount of lowering will depend on the rainfall forecast. In case of possibilities of flooding in the downstream, the settlements should be forewarned, and necessary warnings for evacuation should be given, to the adjoining districts and to those districts beyond the state borders.
- . The inlet and outlet to tanks should, be inspected to ensure that waterways are unobstructed by trees or vegetation.
- . Any repairs/under construction activity should be well secured with sandbags, rockfalls, etc.
- . Materials likely to be damaged by rains, such as concrete in bags, electric motors, office records, etc., should be covered with plastic and well secured, even though stored inside.

8.3.1 Relief and Rehabilitation

Field Office Priorities

- Continue round the clock inspection and repair of bunds of dams, irrigation channels, bridges, culverts, control gates, and overflow channels as may be necessary.
- Continue round the clock inspection and repair of pumps, generators, motor equipment and station buildings.
- The officers on site should continue to ensure that, the level of impounding in the tanks is reduced to create increased capacity, and coordinate the same with officers on other dam sites and the district control room, if heavy rains are expected. The amount of lowering will depend on the rainfall forecast. In case of possibilities of flooding in the downstream, the settlements should be forewarned, and necessary warnings for evacuation should be given to the adjoining districts and to those districts beyond the state borders.
- Clearing the inlet and outlet to tanks to ensure that waterways are unobstructed by trees or vegetation on an on-going basis.
- Information formats and monitoring checklists should be used for programme monitoring and development and for reporting to Emergency Operations Centre. This is in addition to existing reporting system in the department.



Head Office Priorities

On the recommendations of the EOC (“NODAL OFFICER-Irrigation”)/Collector/district control room, the Irrigation department will:

- Provide for sending additional support along with food, bedding, tents
- Send vehicles and any additional tools and equipments needed.
- Coordinate with other states about release of water and dissemination of warning

The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Relief Commissioner. The Relief Commissioner will book this expenditure under Budget Head ‘2245’ and reimburse the amount to the Irrigation Department.

8.3.2 Preparedness Checklist for Irrigation Department

(to be filled in by the department head and submitted to the district collector before May every year)

Preparedness measures taken	Details/Remarks
The department is familiar with disaster response plan and disaster response procedures are clearly defined.	
Orientation and training for disaster response plan and procedures undertaken.	
Special skills required during emergency operations imparted to the officials and the staff.	

Reviewed and updated	
Precautionary measures and procedures	
Precautions to be taken to protect equipment	
Post-disaster procedures to be followed.	
Flood monitoring mechanisms can be activated in all flood prone areas from 1 st of June.	
All staff are well aware of precautions to be taken to protect their own lives and personal property.	
Each technical assistant has instructions and knows operating procedures for disaster conditions.	
Methods of monitoring and impounding the levels in the tanks evolved.	
Methods of alerting officers on other dam sites and the district control room, established.	
Mechanisms evolved for	
Forewarning settlements in the downstream.	
Evacuation.	
Coordination with other dam authorities.	
An officer has been designated as Nodal Officer for Disaster Management.	
Sources of materials required for response operations have been identified.	

Reported By :

Designation

Signature

Date



8.3.3 Checklist for Irrigation Department

(to be filled in by the OFFICER-IN-CHARGE and submitted to district control room and the department head)

Action Taken	Y/N	Details/Remarks
Radio communications established with		
Emergency operations centre		

Divisional commissioner		
District control room and		
Departmental offices within the division.		
An officer appointed as “OFFICER-IN-CHARGE - Irrigation”		
Emergency tool kits for all technical assistants prepared.		
Water level gauges on minor tank structures not having level gauges marked.		
Repairs/under construction activity are well secured.		
Round the clock inspection and repair being carried out of		
Bunds of dams		
Irrigation channels		
Bridges		
Culverts		
Control gates, and		
Overflow channels as may be necessary.		
Round the clock inspection and repair being carried out of		
Pumps		
Generators		
Motor equipment and		
Station buildings.		
Level of impounding in the tanks reduced.		
Coordination of this action with other districts is done.		
Inlet and outlet to tanks are cleared.		

Inspected By :
Designation
Signature
Date

DEPARTMENT

9.1 Planning Assumptions

- There is no substitute for maintaining standards of services and regular maintenance during normal times. This affects the response of the department to any disaster situation.
- Operating Procedures for mobilising community participation during various stages of disaster management have been given in section on “Areas of Community Participation”. The department is required to study these and adopt appropriate measures to ensure that community participates substantially.
- For effective preparedness, the department must have a disaster response plan or disaster response procedures clearly defined in order to avoid confusion, improve efficiency in cost and time.
- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be undertaken to improve departmental capacity to respond to a disaster.
- Orientation and training for disaster response plan and procedures will keep the department prepared for such eventualities. Special skills required during disaster situations need to be imparted to the officials and the staff. Select personnel can be deputed for training as “NODAL OFFICER - Agriculture” and “Officer-in-charge - Agriculture” at the state and district level respectively.
- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be communicated to the community to prevent extensive loss of crops and plantations.

Action Plan Objective in a Disaster Situation

- Restore the Agricultural operations (including soil conditions)
- Crop Protection
- Restore agriculture produce market.



9.2 Activities on Receipt of Warning or Activation of District DMAP (DMAP)

- Within the affected district/taluka, all available personnel will be made available to the District Disaster Manager. If more personnel are required, then out of station officers or those on leave may be recalled.
- All personnel required for Disaster Management should work under the overall supervision and guidance of District Disaster Manager.
- Establish communications with divisional commissioner, district control room and agricultural colleges, seed banks, nurseries (private and public) within the division
- Appoint one officer as “NODAL OFFICER – Agriculture” at the state level

- The District Agriculture Officer will act as “Officer-in-Charge - Agriculture”
- The district collector to provide “Officer-in-Charge - Agriculture” or the field staff as the need be, with all needed authorisations with respect to
 - . Recruiting casual labourers.
 - . Procuring locally needed emergency tools and equipment and materials.
 - . Expending funds for emergency needs.
- The “Officer-in-Charge - Agriculture” will ensure that all field staff and other officers submit the necessary reports and statement of expenditure in a format as required by district collector
- Review and update precautionary measures and procedures and review with staff the precautions that have been taken to protect equipment and the post-disaster procedures to be followed.
- Fill department vehicles with fuel and park them in a protected area.
- Check available stocks of equipments and materials which are likely to be most needed after the disaster.
- Stock agricultural equipments which may be required after a disaster
- Determine what damage, pests or diseases may be expected, and what drugs and other insecticide items will be required, in addition to requirements of setting up extension teams for crop protection, and accordingly ensure that extra supplies and materials, be obtained quickly.
- Provide information to all concerned, about disasters, likely damages to crops and plantations, and information about ways to protect the same.
- All valuable equipments and instruments should be packed in protective coverings and stored in room the most damage-proof
- All electrical equipments should be unplugged when disaster warning is received.
- Extension Officers should be assisted to
 - . Establish work schedules to ensure that adequate staff are available
 - . Set up teams of extension personnel and assistants for visiting disaster sites.

9.2.1 Relief and Rehabilitation



- Assess the extent of damage to soil, crop, plantation, micro-irrigation systems and storage facilities and the requirements to salvage or replantation
- Establish contact with soil and water testing laboratories
- Provision of agricultural services should be coordinated with irrigation department, DRDA district control room, SOC's
- Estimate the requirement of

- . Seeds
 - . Fertilisers
 - . Pesticides, and
 - . Labour.
- . Organise transport, storage and distribution of the above with adequate record keeping procedures.
 - . Ensure that adequate conditions through cleaning operations are maintained to avoid water-logging and salinity.
 - . A pests and disease monitoring system should be developed to ensure that a full picture of risks is maintained.
 - . Plan for emergency accommodations for agriculture staff from outside the area.
 - . Information formats and monitoring checklists as given in the section on “Information and Monitoring Tools” should be used for programme monitoring and development and for reporting to district control room. This is in addition to existing reporting system in the department.
 - . Establishment of a public information center with a means of communication, to assist in providing an organized source of information. The department is responsible for keeping the community informed of its potential and limitations in disaster situations.
 - . The NGOs and other relief organisations should be aware of the resources of the department.
 - . Assist farmers to re-establish their contacts with agriculture produce market and ensure that appropriate prices be offered to them.

The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Relief Commissioner. The Relief Commissioner will book this expenditure under Budget Head '2245' and reimburse the amount to the Agriculture Department.

9.2.2 Preparedness Checklist for Agriculture Department
(to be filled in by the department head and submitted to the district collector before May every year)



Preparedness Measures taken	Details/Remarks
The department is familiar with disaster response plan and disaster response procedures are clearly defined.	
Orientation and training for disaster response plan and procedures undertaken.	
Special skills required during emergency operations imparted to the officials and the staff.	
Reviewed and updated	

Precautionary measures and procedures	
Precautions to be taken to protect equipment	
Post-disaster procedures to be followed.	
Information provided to all concerned about the disasters, likely damages to crops and plantations, and information about ways to protect the same.	
The NGOs and other relief organisations are informed about the resources of the department.	
An officer has been designated as Nodal Officer for Disaster Management	
Sources of materials required for response operations have been identified.	

Reported By :
Designation
Signature
Date



9.2.3 Checklist for Agriculture

(to be filled in by the OFFICER-IN-CHARGE and submitted to district control room and the department head)

Action Taken	Y/N	Details/Remarks
Communication link within the division established with Divisional Commissioner District control room Agricultural colleges Seed banks Nurseries (private and public).		
The district agriculture officer designated as "OFFICER-IN-CHARGE - Agriculture".		
Agricultural equipments which may be required stocked.		
Contact established with soil and water testing laboratories.		
Extent of damage assessed for Soil		

Crop		
Plantation		
Micro-irrigation systems and		
Storage facilities		
Requirements for salvage or replantation assessed.		
Information provided to all concerned about the disasters, likely damages to crops and plantations, and information about ways to protect the same.		
Actions coordinated with		
rrigation Department		
DRDA.		
Organised transport, storage and distribution of		
Seeds		
Fertilisers		
Pesticides and		
Labour.		
Cleaning operations carried out to avoid water-logging and salinity.		
Surveillance for pests and diseases being carried out.		
Public information center established.		
NGOs and other relief organisations informed of the resources of the department.		
Farmers assisted to reestablish their contacts with agriculture produce market.		
Adequate facilities provided to field teams.		

Inspected By :
Designation
Signature
Date

10. OPERATING PROCEDURE GUIDELINES FOR ANIMAL HUSBANDRY DEPARTMENT

10.1 Planning Assumptions

- There is no substitute for maintaining standards of services and regular maintenance during normal times. This affects the response of the department to any disaster situation.
- Operating Procedures for mobilising community participation during various stages of disaster management have been given in section on “Areas of Community Participation”. The department is required to study these and adopt appropriate measures to ensure that community participates substantially.
- For effective preparedness, the department must have a disaster response plan or disaster response procedures clearly defined in order to avoid confusion, improve efficiency in cost and time.
- Orientation and training for disaster response plan and procedures accompanied by simulated exercises will keep the department prepared for such eventualities. Special skills required during disaster situations need to be imparted to the officials and the staff. Select personnel can be deputed for training as “NODAL OFFICER - Veterinary Services” and “Officer-in-charge - Veterinary Services” at the state and district level respectively.
- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be undertaken to improve departmental capacity to respond to a disaster.
- Hospital staff be aware of damage - proof hospital rooms/ buildings.
- A standby generator be made available for every hospital.
- At least one kerosene-powered refrigeration unit be made available for storage of drugs.
- Orientation and training for disaster response plan and procedures, accompanied by simulated exercises, will keep the department prepared for such eventualities. Special skills required during disaster situations need to be imparted, to the officials and the staff.
- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be communicated to the community to prevent extensive loss of livestock.

Action Plan Objective in a Disaster Situation

- Treatment of injured cattle
- Protection and care of abandoned/lost cattle.

10.2 Activities on Receipt of Warning or Activation of District DMAP (DMAP)



- Within the affected district/taluka, all available personnel will be made available to the District Disaster Manager. If more personnel are required, then out of station officers or those on leave may be recalled.
- All personnel required for Disaster Management should work under the overall supervision and guidance of District Disaster Manager.

- Establish radio communications with
 - Emergency Operations Centre
 - Divisional Commissioner
 - District control room and
 - Veterinary aid centres and hospitals (including private practitioners) within the division.
- Appoint one officer as “Nodal Officer – Veterinary Services” at the state level.
- The District Animal Husbandry Officer will act as “Officer-in-Charge - Veterinary Services”.
- The district collector to provide “Officer-in-Charge - Veterinary Services” or the field staff as the need be, with all needed authorisations with respect to
 - Recruiting casual labourers.
 - Procuring locally needed emergency tools, equipments and materials.
 - Expending funds for emergency needs.
- The “Officer-in-Charge - Veterinary Services” will ensure that all field staff and other officers submit the necessary reports and statement of expenditure in a format as required by district collector.
- Review and update precautionary measures and procedures and review with staff the precautions that have been taken to protect equipments and the post-disaster procedures to be followed.
- Fill department vehicles with fuel and park them in a protected area.
- Stock emergency medical equipments which may be required after a disaster.
- Determine what injuries/ illnesses may be expected, and what drugs and other medical items will be required, in addition to requirements of setting up cattle camps, and accordingly ensure that extra supplies of medical items and materials be obtained quickly.
- Provide information to all staff of veterinary hospitals and centres about the disasters, likely damages and effects, and information about ways to protect life, equipment and property.
- Surgical packs should be assembled and sterilised.
- Enough stock of surgical packs should be sterilised to last for four to five days.
- The sterilised surgical packs must be stored in protective cabinets to ensure that they do not get wet. Covering the stock with polythene is recommended as an added safety measure.
- All valuable equipments and instruments should be packed in protective coverings and stored in room the most damage-proof
- All electrical equipments should be unplugged when disaster warning is received
- Check the emergency electrical generator, to ensure that it is operational, and that a buffer stock of fuel exists. If an emergency generator is not available at the hospital, arrange for one on loan.
- Arrange for emergency supplies of anesthetic drugs.

- Check stocks of equipments and drugs which are likely to be most needed after the disaster.
- Request from central warehouses, on an emergency priority basis, that those supplies likely to be needed be dispatched to the hospital immediately.
- Fill hospital water storage tanks and encourage water savings. If no storage tanks exist, water for drinking should be drawn in clean containers and protected.



- Prepare an area of the hospital for receiving large number of livestock.
- Develop emergency admission procedures (with adequate record keeping) .
- Cattle camps and hospital administrators should
- Establish work schedules to ensure that adequate staff are available
- Set up teams of veterinary doctors, and assistants for visiting disaster sites.

10.2.1 Relief and Rehabilitation

- Organise transfer of seriously injured livestock from villages to veterinary aid centres wherever possible.
- The provision of medical services should be coordinated by the District Animal Husbandry Officer with district control room, SOC's and cattle camps.
- Establish cattle camps and additional veterinary aid centres at disaster sites and designate an Officer In-charge for the camp.
- Estimate the requirement of water, fodder and animal feed, for cattle camps and organise the same.
- Ensure that adequate sanitary conditions through cleaning operations are maintained in order to avoid outbreak of any epidemic.
- An injury and disease monitoring system should be developed, to ensure that a full picture of risks is maintained.
- Plan for emergency accommodations for veterinary staff from outside the area.
- Information formats and monitoring checklists as given in Annexure should be used for programme monitoring and development and for reporting to Emergency Operations Centre. This is in addition to existing reporting system in the department.
- Establishment of a public information center with a means of communication, to assist in providing an organized source of information. The hospital is responsible for keeping the community informed of its potential and limitations, in disaster situations.
- The local police, and rescue groups should be aware of the resources of each veterinary aid centres and hospital.

The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Relief Commissioner. The Relief Commissioner will book this expenditure under Budget Head '2245' and reimburse the amount to Animal Husbandry Department.



10.3 Standards for Cattle Camps

1. The minimum number of cattle in the cattle camp should be about 100 and the maximum 500.
2. The cattle camps should be located at suitable sites, bearing in mind, that adequate supply of water and shade are most essential for the well being of the cattle.
3. Cattle sheds constructed should not exceed 20 sq.feet per animal. Suitable arrangements for water trough and manger(s) should be made.
4. The feeding centres for cattle should be located in such a manner that
 - . There is adequate supply of drinking water
 - . There is sufficient shade for cattle to rest during the afternoon
 - . They are located as near the rail head as possible
 - . They are conveniently located, not beyond a radius of 8 Km from the affected villages.

The cattle will require 6 Kg per cattle head per day of fodder, and 1 to 1 ½ Kg per cattle head per day, of concentrate like Bago molasses.

Each cattle camp will have a minimum of one camp manager, two labourers and two sweepers.

10.3.1 Preparedness Checklist for Animal Husbandry Department
(to be filled in by the department head and submitted to the district collector before May every year)

Preparedness measures taken	Details/Remarks
The department is familiar with disaster response plan and disaster response procedures are clearly defined.	
Orientation and training for disaster response plan and procedures undertaken.	
Special skills required during emergency operations imparted to the officials and the staff.	
Reviewed and updated	
Precautionary measures and procedures	
The precautions to be taken to protect equipment	
The post-disaster procedures to be followed.	

Hospital staff are aware of which hospital rooms/ buildings are damage-proof.	
All veterinary hospitals and centres staff have been informed about the possible disasters, likely damages and effects, and information about ways to protect life, equipment and property.	
An area of the hospital identified for receiving large number of livestock.	
Emergency admission procedures with adequate record keeping developed .	
An officer has been designated as Nodal Officer for Disaster Management.	
Sources of materials required for response operations have been identified.	

Reported By :
Designation
Signature
Date



10.3.2 Checklist for Field Activities of Animal Husbandry Department

(to be filled in by the OFFICER-IN-CHARGE and submitted to district control room and the department head)

Actions Taken	Y/N	Details/Remarks
Radio communications established with Emergency Operations Centre Divisional Commissioner District control room Veterinary aid centres and Hospitals (including private practitioners) within the division.		
The District Animal Husbandry Officer designated as "OFFICER-IN-CHARGE-Veterinary Services"		
Emergency medical equipments required are stocked.		
All veterinary hospitals and centres staff informed about the disasters, likely damages and effects, and ways to protect life, equipment and property.		
Emergency electrical generator arranged.		
Emergency supplies of anesthetic drugs arranged.		

Hospital water storage tanks filled		
An area of the hospital prepared for receiving large number of livestock.		
Emergency admission procedures developed (with adequate record keeping) .		
Transfer of seriously injured livestock from villages to veterinary aid centres and hospitals organised.		
Established at disaster sites		
Cattle camps		
Additional veterinary aid centres.		
Organised for cattle camps		
Water		
Fodder and		
Animal feed.		
Adequate sanitary conditions maintained		
Cleaning operations being carried out		
Epidemiological surveillance is being undertaken.		
Emergency accommodations available for veterinary staff from outside the area.		
Public information center established.		
The local police, and rescue groups informed of the resources of each veterinary aid centres and hospital.		

Inspected By :

Designation

Signature

Date

11. OPERATING PROCEDURE GUIDELINES FOR MWSSB



11.1 Planning Assumptions

- There is no substitute for maintaining standards of services and regular maintenance during normal times. This affects the response of the department to any disaster situation.
- Operating Procedures for mobilising community participation during various stages of disaster management have been given in section on “Areas of Community Participation”. The department is required to study these and adopt appropriate measures to ensure that

community participates substantially.

- For effective preparedness, the department must have a disaster response plan or disaster response procedures clearly defined in order to avoid confusion, improve efficiency in cost and time.

- Orientation and training for disaster response plan and procedures accompanied by simulated exercises will keep the department prepared for such eventualities. Special skills required during emergency operations need to be imparted to the officials and the staff. Select personnel can be deputed for training as “NODAL OFFICER - Water Supply” and “Officer-in-charge - Water Supply” at the state and district level respectively.

- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be undertaken to improve departmental capacity to respond to a disaster.

Action Plan Objective in a Disaster Situation

- Restoration of water supply to the affected area.

11.2 Activities on Receipt of Warning or Activation of District DMAP (DDMAP)

- Within the affected district/taluka, all available personnel will be made available to the District Disaster Manager. If more personnel are required, then out of station officers or those on leave may be recalled.

- All personnel required for Disaster Management should work under the overall supervision and guidance of District Disaster Manager.

- Establish radio communications with Emergency Operations Centre, divisional commissioner, district control room and your departmental and field offices within the division.

- Appoint one officer as “NODAL OFFICER - Water Supply” at the state level.

- Appoint one officer as “Officer-in-Charge - Water Supply” at the district level.

- The district collector to provide “Officer-in-Charge - Water Supply” or the field staff as the need be, with all needed authorisations with respect to

- ; Recruiting casual labourers.

- ; Procuring locally needed emergency tools and equipment and materials.

- ; Expending funds for emergency needs.

- The “Officer-in-Charge - Water Supply” will ensure that all field staff and other officers submit the necessary reports and statement of expenditure in a format as required by district collector.

- Review and update precautionary measures and procedures and review with staff the precautions that have been taken to protect equipment and the post-disaster procedures to be followed.

- Fill department vehicles with fuel and park them in a protected area.

- Make sure the hospital storage tank is full and the hospital is conserving water.
- Inform people to store an emergency supply of drinking water.



- Organise on the receipt of disaster warning continuous monitoring of

- . Wells
- . Intake structures
- . Pumping stations
- . Buildings above ground
- . Pumping mains and
- . The treatment plant.

- Standby diesel pumps or generators should be installed in damage-proof buildings.
- A standby water supply should be available in the event of damage, saline intrusion or other pollution of the regular supply.
- Establish procedures for the emergency distribution of water if existing supply is disrupted.
- Make provisions to acquire tankers and establish other temporary means of distributing water on an emergency basis.
- Make provisions to acquire containers and storage tanks, required for storing water on an emergency basis.
- Prepare plans for water distribution to all transit and relief camps, affected villages and cattle camps and ensure proper execution of these plans.
- A minimum level of stock should be maintained for emergencies, and should include extra lengths of pipe, connections, joints, hydrants and bleaching powder. Adequate tools should be on hand to carry out emergency repairs.
- Cover pumps and motors with adequate protection (if the building is not disaster-proof) to prevent damage.
- Make sure auxiliary generators and standby engines are in good working order.
- Acquire a buffer stock of fuel for the motors and store in a protected place.
- Establish emergency work gangs for immediate post-disaster repairs.

11.2.1 Relief and Rehabilitation



Field Office Priorities

- Carry out emergency repairs of all damages to water supply systems.
- Assist health authorities to identify appropriate sources of potable water.
- Identify unacceptable water sources and take necessary precautions to ensure that no water is accessed from such sources, either by sealing such arrangements or by posting the

department guards.

- Arrange for alternate water supply and storage in all transit camps, feeding centres, relief camps, cattle camps, and also the affected areas, till normal water supply is restored.
- Ensure that potable water supply is restored as per the standards and procedures laid down in "Standards for Potable Water".
- Plan for emergency accommodations for staff from outside the area.
- Report all activities to the head office.

Head Office Priorities

On the recommendations of the EOC ("NODAL OFFICER-Water Supply")/collector/ district control room/of the department in the district

- Provide for sending additional support along with food, bedding, tents
- Send vehicles and any additional tools and equipments needed.

The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Relief Commissioner. The Relief Commissioner will book this expenditure under Budget Head '2245' and reimburse the amount to MWSSB.

11.3 Standards of Service

11.3.1 Water Supply

Investigation of source

Piped Water

- After any repair on the distribution system, the repaired main should be flushed and disinfected with a chlorine solution of 50 mg/litre for a contact period of 24 hours, after which the main is emptied and flushed again with potable water.
- If the demand for water is urgent, or the repaired main cannot be isolated, the concentration of the disinfecting solution may be increased to 100 mg/litre and the contact period reduced to 1 hour.
- At the end of disinfection operations, but before the main is put back into service, samples should be taken for bacteriological analysis and determination of chlorine residue.
- When a water treatment plant, pumping station, or distribution system is so badly damaged that operation cannot be restored for some time, other methods described in the following paragraphs must be used.

Private systems (open well or tube)

- Water from these sources, with adequate chlorination as necessary, can be connected to a distribution system or hauled to the points of consumption.

Springs and wells (non-private)

- Ground water originating from deep aquifers (such as is obtained from deep wells and certain springs) will be free from contamination if certain simple protective measures are taken.

- When springs are used as a source of water supply for a disaster area, careful attention must be paid to geological formations. Limestone and certain rocks are liable to have holes and cracks, especially after an earthquake, that may lead to the contamination of ground water.

- A sanitary survey of the area surrounding a well site or spring is of utmost importance. This survey, which should be carried out by a qualified professional environmental health worker, should provide information on sources of contamination, geological structures (with particular reference to overlying soil and rock formations), quality and quantity of ground water, direction of flow, etc.

- The well selected as a source of water, should be at least 30 m away from any potential source of contamination, and should be located higher than all such sources. The upper portion of the well must be protected by an external impervious casing, extending at least 3 m below and 30 cm above ground level. The casing should be surrounded by a concrete platform at least 1 m wide, that slopes, to allow drainage away from the well; it should connect to a drain that will carry the spilled water away. The opening for drop pipes should be sealed to prevent outside water from entering the well. The rim of manholes should project at least 8 cm above the surrounding surface, and the manhole cover must overlap this rim.

- Immediately after construction or repair, the well should be disinfected. First the casing or lining should be washed, and scrubbed with strong chlorine solution containing, 100 mg of available chlorine per litre. A stronger solution is then added to produce a concentration of 50-100 mg/litre in the water stored in the well. After adequate agitation, the well water is left to stand for at least 12 hours, then pumped out. The well is then allowed to refill. When the residual chlorine of the water drops below 1 mg/litre the water may be used.

- Most of what is stated above applies also to the location and protection of springs. The following points may be added:

- . The collection installation should be so built as to prevent the entrance of light.
- . The overflow should be so located as to prevent the entrance of surface water at times of heavy rainfall.
- . The manhole cover and gates should be locked.
- . Before using the water, the collection chamber should be disinfected with a chlorine solution.
- . An area within a radius of 50 m around the spring should be fenced off to prevent ground surface contamination.

Surface water



- Surface water should be used as a source of water supply only as a last resort.
- Measures should be taken to protect the watershed from pollution by animals and people.

As it is usually difficult to enforce control regulations, the point of intake for water supply should be located above any tributary carrying grossly contaminated water. The pump intake should be screened and placed so that it will not take in mud from the stream bed or floating debris. The device can be something extremely simple, such as a perforated drum fixed in the middle of the stream.

Treatment

- Water should be tested for the presence of *Escherichia coli* and unsafe concentrations of nitrate as soon as possible. Detection of *E. coli* indicates contamination by human waste and therefore requires immediate protective and corrective measures.
- Monitoring of water quality should be restored or initiated immediately. During the disasters, daily determination of the chlorine residual in public water supplies is sufficient.

Disinfection

- Chlorine and chlorine-liberating compounds are the most common disinfectants. Chlorine compounds for water disinfection are usually available in three forms:
- Chlorinated lime or bleaching powder, which has 25 % by weight of available chlorine when fresh. Its strength should always be checked before use.
- Calcium hypochlorite, a more stable compound, sold under various proprietary names. This compound contains 70 % by weight of available chlorine. If properly stored in tight containers and in a dark cool place, it preserves its chlorine content for a considerable period.
- Sodium hypochlorite, usually sold as a solution of approximately 5 % strength under a variety of proprietary names. Its use in water disinfection is limited to small quantities under special circumstances.

Methods of chlorination

Gas chlorinators

- These machines draw chlorine gas from a cylinder containing liquid chlorine, mix it in water and inject it into the supply pipe. Mobile gas chlorinators are made for field use.

Hypochlorinators

- These are less heavy than gas chlorinators and more adaptable to emergency disinfection. Generally, they use a solution of calcium hypochlorite or chlorinated lime in water and discharge it into a water pipe or reservoir. They can be driven by electric motors or petrol engines and their output can be adjusted.
- Hypochlorinators are small and easy to install. They consist usually of a diaphragm pump and standard accessories, including one or more rubber-lined solution tanks, and a chlorine residual testing set. The usual strength of the solution is 0.1 %, and it seldom rises above 0.5 %.

The Batch Method

- In the absence of chlorinators, water is disinfected by the batch method. This method is more likely to be used in emergencies. It involves applying a predetermined volume of

chlorine solution of known strength to a fixed volume of water by means of some gravity arrangement. The strength of the batch solution should not be more than 0.65 % of chlorine by weight, as this is about the limit of solubility of chlorine at ordinary temperatures. For example, 10 g of ordinary bleaching powder (25 % strength) dissolved in 5 litres of water gives a stock solution of 500 mg/litre. For disinfection of drinking water, one volume of the stock solution added to 100 volumes of water gives a concentration of 5 mg/litre. If after 30 minutes contact the chlorine residual is more than 0.5 mg/litre, this dosage could be reduced.

- After the necessary contact period, excess chlorine can be removed to improve the taste by such chemicals as sulphur dioxide, activated carbon, or sodium thiosulphate. The first two are suitable for permanent installations, whereas sodium thiosulphate is more suitable for use in emergency chlorination. One tablet containing 0.5 g of anhydrous sodium thiosulphate will remove 1 mg/litre of chlorine from 500 litres of water.

Continuous Chlorination

- This method, in which porous containers of calcium hypochlorite or bleaching powder are immersed in water, is used mainly for wells and springs but is also applicable to other types of water supply. A free residual chlorine level of 0.7 mg/litre should be maintained in water, treated for emergency distribution. A slight taste and odour of chlorine after half an hour gives an indication that chlorination is adequate. In flooded areas where the water distribution system is still operating, higher chlorine residuals should be maintained. Occasionally, an unpleasant taste develops from the reaction of chlorine with phenolic or other organic compounds. This taste should be accepted, as it is an indication of safe disinfection.

Coagulation-Disinfection

- Removal of the organic matter greatly lessens the amount of chlorine needed for disinfection. There are many factors that govern the coagulation process. These include:

1. Hydrogen-ion concentration. The optimum pH value for coagulation is the value that provides the best floc formation and settling. The pH value of water changes when coagulants are used and has to be adjusted to its optimum value by the addition of alkalis or acids.

2. Mixing. Coagulants must be thoroughly mixed with the water to give satisfactory results. This may be accomplished by (a) pump action, whereby the coagulant solution is added to the suction pipe of the pump and the pump does the mixing; (b) the drip-bottle method, i.e., hanging a drip-bottle over the discharge pipe or hose of raw water that feeds the tank and letting the coagulant solution drip on to the water jet; or (c) dissolution, i.e., allowing the discharge of raw water to splash on to a basket containing solid coagulant.

3. Coagulant dosage. The amount of coagulant and chemicals required to adjust the pH value of water may be calculated when the pH and the type of alkalinity are known. However, optimum dosage for a given water may be determined approximately using the jar test.

Coagulation-Filtration-Disinfection



- In this method filtration is added to the procedures described above. If temporary reservoirs can be arranged, it is preferable to let the water settle before filtering it. In mobile purification

units, however, the water is filtered through a pressure filter without settling. They usually have a capacity of 4000-7000 litres per hour, and consist essentially of:

- . A centrifugal pump directly coupled to a gasoline engine
- . A filter (pressure, rapid sand filter)
- . A hypochlorinator
- . Chemical solution tanks (one for alum and one for soda ash)
- . A chlorine solution tank
- . Hose adapters
- . Valves (pump suction, inlet, drain, air release, outlet, flow control, etc.) and
- . A tool box. Instructions in the manuals supplied with such units must be followed.

Filtration-Disinfection

. In this method water is mixed with diatomaceous earth, then passed through the filter unit in which filtering partitions (septa) are installed. Mobile purification units using this process have been produced with capacities up to 50,000 litres per hour. They consist essentially of:

- . A centrifugal pump driven by a rope-started gasoline engine
- . A filter (diatomite)
- . A hypochlorinator
- . A slurry feeder and an air compressor
- . A precoat and recirculating tank
- . A chlorine solution tank
- . Hose adapters
- . Valves (pump suction, inlet, drain, outlet, flow control, air release, etc.) and
- . A tool box. Instructions in the manuals supplied with such units must be followed.

Physical protection

. In disaster situations, physical protection of water supplies for use, is a major consideration. In addition to such barriers as walls and fences, guards may be necessary to prevent mobs from overrunning and damaging treatment units, pumping stations, tankers, distribution stations, and temporary collection facilities. Intake structures, wells, and springs should also be protected against misuse. The character and extent of such protection will depend on the local situation.

Ice supply

- . Required ice should be supplied from a commercial manufacturing plant where it is made from safe water and where sanitary regulations are observed.
- . It should be distributed in trucks designed for the purpose, equipped with tools for the safe handling of ice.
- . After drinking water is secured within stricken areas, making water available for domestic uses (such as cleaning and washing) should be considered.



11.3.2 Stockpile of Equipment and Supplies

A tentative list of sanitation equipment and supplies required to satisfy the needs of 10,000 people is given below for guidance. The relief body and governmental departments concerned with relief work in each country should make a rational appraisal of their needs.

The equipment and supplies may be either stockpiled in one place or distributed to several regions with adequate provision for their immediate transfer from one region to another in the event of disaster.

Item	Quantity
For Water supply	
Mobile chlorinator, mounted on truck or trailer, with 2 liquid chlorine cylinders	1
Mobile hypochlorinator, mounted on truck or trailer, with solution tanks, hose and accessories	5
Mobile water purification unit, capacity 200-250 litres/min	4
Mobile workshop or repair unit: including repair and pipe laying tools, fittings, jointing materials, excavation tools, winch, pipe wrenches, valves, hose, welding equipment and materials, boots, working gloves, goggles, etc.	1
Tank trucks for water, capacity 7 m ³	10
Portable elevated storage tanks with supporting elements and accessories, easy to assemble, capacity 10-20 m ³	5-10
Well-driving equipment and well points	2 sets
Hand-operated pumps for water, capacity 15 - 20 litres/min	100
Electric or diesel -driven pumps, capacity 200-250 litres/min	4
Pipes (cast iron, galvanized, asbestos cement), diameter 1.25-10 cm, with valves and fittings	a*
Chlorinated lime (25-30 %), stored in a cool and dry place and renewed every 6 months	10-20 tons
Calcium hypochlorite (60-70 %), in powder or granule form, stored in a cool and dry place and renewed every 2 years	5-10 tons
Alum, ferric chloride, and other chemicals for water treatment	2-5 tons
Masonry tools, complete	2-5 sets
Carpentry tools, complete	2-5 sets
Truck-mounted generators	2

Mobile mud pump	2-5
Sludge pump (non-clogging diaphragm or other type)	2-5
Sludge tank trucks, capacity 7 ml	5
Mobile repair shop with necessary tools and equipment, masks, boots, working gloves, excavation tools, etc.	1 unit
Pipes (cast iron, asbestos cement, concrete), with joining materials and equipment, diameter 10-30 cm	a*
Moulds (iron or wood) for concrete pipes and slabs	10-20 sets
Timber, Bamboo mats, nails, etc.	a*
a* Quantity depends on availability and on distribution points	

11.3.3 The Sanitarian's equipment



Item	Quantity
Work equipment	
Comparator for chlorine residual and pH, together with orthotolidine and pH indicator solutions	1
Thermometer, 0-100° C, with protective casing	1
Tape measure, cloth or metal, 30 m, graduated in m and cm	1
Tape measure, metal, pocket size, 2 m	1
Standard household measuring cup, 500 ml	1
Clip board	1
Flashlight (pocket type) with spare batteries and bulbs	1
Magnifying glass (pocket type), 5x to 20x	1
Collection vials	1 dozen
Felt-tip ink marking pen	1
Pocket compass, with plastic case	1
Plumb rod	1
Spirit level	1
Mosquito larvae dipper	1
Aspirator with stoppered tubes, for collecting mosquitoes	1
Kit for membrane filter for water testing (complete)	1

Water pressure gauge, positive and negative pressure	1
Hand level	1
Rapid phosphate determination kit	1
Drawing board and instruments	As required

11.3.4 Preparedness Checklist for MWSSB

(to be filled in by the department head and submitted to the district collector before May every year)

Preparedness Measures Taken	Details/Remarks
The department is familiar with disaster response plan and disaster response procedures are clearly defined	
Orientation and training for disaster response plan and procedures undertaken	
Special skills required during emergency operations imparted to the officials and the staff.	
Reviewed and updated	
Precautionary measures and procedures	
the precautions to be taken to protect equipment	
the post-disaster procedures to be followed.	
Adequate warning mechanisms for informing people to store an emergency supply of drinking water have been developed.	
Procedures established for the emergency distribution of water if existing supply is disrupted.	
An officer has been designated as Nodal Officer for Disaster Management	
Sources of materials required for response operations have been identified.	

Reported By :

Designation

Signature

Date



11.3.5 Checklist for MWSSB

(to be filled in by the OFFICER-IN-CHARGE and submitted to district control room and the department head)

Actions Taken	Y/N	Details/ Remarks
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Radio communications established with Emergency Operations Centre Divisional Commissioner District control room Departmental and field offices within the division.		
One officer appointed as "OFFICER-IN-CHARGE - Water Supply".		
Ensured that the hospital storage tank is full and the hospital is conserving water.		
Informed people to store emergency supply of drinking water.		
Continuous monitoring carried out for Wells Intake structures Pumping stations Buildings above ground Pumping mains and The treatment plant.		
Standby diesel pumps or generators installed in damage-proof buildings.		
Provision for standby water supply made.		



[Get DMP](#)

Procedures were established for the emergency distribution of water if existing supply was disrupted.		
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Actions Taken	Y/N	Details/ Remarks
Provisions to acquire tankers and establishing other temporary means of distributing water on an emergency basis carried out.		
Provisions to acquire containers and storage tanks required for storing water on an emergency basis carried out.		

Water distributed to		
All transit camps		
Relief camps		
Affected villages		
Cattle camps.		
Buffer stock of fuel for the motors acquired		
Emergency repairs of damages to water supply systems carried out.		
Appropriate sources of potable water identified.		
Unacceptable water sources identified		
Necessary precautions taken to see that no water is accessed from such sources.		
Alternate water supply arranged in		
Feeding centres		
All transit camps		
Relief camps		
Cattle camps, and		
The affected areas.		
Drinking water supply is disinfected as per the standards and procedures laid down.		
Emergency accommodations for staff from outside the area provided.		

Inspected By :
Designation
Signature
Date

12. OPERATING PROCEDURE GUIDELINES FOR PWD



12.1 Planning Assumptions

· There is no substitute for maintaining standards of services and regular maintenance during normal times. This affects the response of the department to any disaster situation.

- Operating procedures for mobilising community participation during various stages of disaster management have been given in section on “Areas of Community Participation”. The department is required to study these and adopt appropriate measures to ensure that community participates substantially.
- For effective preparedness, the department must have a disaster response plan or disaster response procedures clearly defined in order to avoid confusion, improve efficiency in cost and time.
- Orientation and training for disaster response plan and procedures accompanied by simulated exercises will keep the department prepared for such eventualities. Special skills required during emergency operations need to be imparted to the officials and the staff. Select personnel can be deputed for training as “NODAL OFFICER - PWD” and “Officer-in-charge - PWD” at the state and district level respectively.
- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be undertaken to improve departmental capacity to respond to a disaster.

Action Plan Objective in a Disaster Situation

- Restoration of roads to their normal condition
- Repair/reconstruction of public utilities and buildings.

12.2 Activities on Receipt of Warning or Activation of District DMAP (DDMAP)

- Within the affected district/taluka, all available personnel will be made available to the District Disaster Manager. If more personnel are required, then out of station officers or those on leave may be recalled.
- All personnel required for Disaster Management should work under the overall supervision and guidance of District Disaster Manager.
- Establish radio communications with Emergency Operations Centre, divisional commissioner, district control room and your departmental offices within the division.
- All district level officials of the department would be asked to report to the collector.
- Appoint one officer as “NODAL OFFICER - PWD” at the state level.
- Appoint one officer as “Officer-in-Charge – PWD” at the district level.
- The district collector to provide “Officer-in-Charge - PWD” or the field staff as the need be, with all needed authorisations with respect to
 - Recruiting casual labourers.
 - Procuring locally needed emergency tools and equipment and materials.
 - Expending funds for emergency needs.
- The “Officer-in-Charge -PWD” will ensure that all field staff and other officers submit the necessary reports and statement of expenditure in a format as required by District Collector.

- The “Officer-in-Charge -PWD” will be responsible for mobilising staff and volunteers to clear the roads in his section, should a disaster strike.

- The “NODAL OFFICER-PWD” should be familiar with pre-disaster precautions and post-disaster procedures for road clearing and for defining safe evacuation routes where necessary.

- All officers (technical officers) should be notified and should meet the staff to review emergency procedures.

- Review and update precautionary measures and procedures, and review with staff the precautions that have been taken to protect equipment, and the post-disaster procedures to be followed.



- Vehicles should be inspected, fuel tanks filled and batteries and electrical wiring covered as necessary.

- Extra transport vehicles should be dispatched from headquarters and stationed at safe strategic spots along routes likely to be affected.

- Heavy equipments, such as front-end loaders, should be moved to areas likely to be damaged and secured in a safe place.

- Inspect all roads, road bridges by a bridge engineer, including underwater inspection of foundations and piers. A full check should be made on all concrete and steelworks.

- Inspect all buildings and structures of the state government (including hospital buildings) by a senior engineer and identify structures which are endangered by the impending disaster.

- Emergency tool kits should be assembled for each division, and should include:

1. Crosscut saws
2. Axes
3. Power chain saw with extra fuel, oil
4. Sharpening files
5. Chains and tightening wrenches
6. Pulley block with chain and rope.

- The designation of routes strategic to evacuation and relief should be identified and marked, in close coordination with police and district control room.

- Establish a priority listing of roads which will be opened first. Among the most important are the roads to hospitals and main trunk routes.

- Give priority attention to urgent repair works that need to be undertaken in disaster affected areas.

- Work under construction should be secured with ropes, sandbags, and covered with tarpaulins if necessary.

- Emergency inspection by mechanical engineer of all plant and equipment in the district workshops.

- If people are evacuating an area, the evacuation routes should be checked and people assisted.

- Identify locations for setting up transit and relief camps, feeding centres and quantity of construction materials and inform DCR accordingly.

12.2.1 Relief and Rehabilitation

- All work teams should be issued two-way communication link.

- Provide a work team carrying emergency tool kits, depending on the nature of the disaster, essential equipments such as

- ; Towing vehicles

- ; Earth moving equipments

- ; Cranes etc.

- Each unit should mobilise a farm tractor with chain, cables and a buffer stock of fuel.

- Adequate road signs should be installed to guide and assist the drivers.

- Begin clearing roads. Assemble casual labourers to work with experienced staff and divide into workgangs.

- Coordinate with Building and Construction Department of Zilla Parishad

- Mobilise community assistance for road clearing by contacting community organisations.

- Undertake cleaning of ditches, grass cutting, burning or removal of debris, and the cutting of dangerous trees along the roadside in the affected area through maintenance engineer's staff.

- Undertake repair of all paved and unpaved road surfaces including edge metalling, pothole patching and any failure of surface, foundations in the affected areas by maintenance engineer's staff and keep monitoring their conditions.



- Undertake construction of temporary roads to serve as access to temporary transit and relief camps, and medical facilities for disaster victims.

- As per the decisions of the district control room, undertake construction of temporary structures required, for organising relief work and construction of relief camps, feeding centres, medical facilities, cattle camps and SOC/s.

- An up-to-date report of all damage and repairs should be kept in the district office report book and communicate the same to the district control room.

- If possible, a review of the extent of damage (by helicopter) should be arranged for the field Officer-in-Charge, in order to dispatch most efficiently road clearing crews, and determine the equipments needed.

The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Relief Commissioner. The Relief Commissioner will book this expenditure under Budget Head '2245' and reimburse the amount to PWD.

12.3 Standards for Relief Camps

12.3.1 Tent Camps

· The layout of the site should meet the following specifications:

1. 3-4 hectares of land/1000 persons
2. Roads of 10 meters width
3. Minimum distance between edge of roads and tents of 2 mtrs
4. Minimum distance between tents of 8 meters
5. Minimum floor area/tent of 3 square meters per person.

· Water distribution in camp sites should consist of

1. Minimum capacity of tanks of 200 liters
2. Minimum capacity/capita of 15 liters/day
3. Maximum distance of tanks from farthest tent of 100 meters.

· Solid waste disposal containers in tent camps should be

1. Waterproof
2. Insect-proof and
3. Rodent-proof
4. The waste should be covered tightly with a plastic or metallic lid
5. The final disposal should be by incineration or by burial.

· The capacities of solid waste units should be, 1 litre/4-8 tents; or 50-100 liters/25-50 persons.

· Excreta and liquid waste should be disposed in bore-holed or deep trench latrines in tent camps. Specifications for these are:

1. 30-50 meters from tents
2. 1 seat provided/10 persons.
3. Modified soakage pits should be used for waste water by replacing layers of earth and small pebbles with layers of straw, grass or small twigs. The straw needs to be removed on a daily basis and burned.
4. Washing should take place with an ablution bench that is:

- . 3 meters in length
- . Double-sided
- . 2/100 persons.



12.3.2 Buildings

Buildings used to accommodate victims during relief should provide the following:

1. Minimum floor area of 3.5 sq.meters/person
2. Minimum air space of 10 sq.meters/person
3. Minimum air circulation of 30 cubic meters/person/hour and
4. There should be separate washing blocks for men and women.
5. Washing facilities to be provided are:
 - 1 hand basin/10 persons or

- 1 wash bench of 4-5 meters/100 persons and 1 shower head/50 persons in temperate climates
- 1 shower head/30 persons in hot climates.

6. Toilet accommodations in buildings housing displaced persons, should meet these requirements:

- 1 seat/25 women and
- 1 seat plus 1 urinal/35 men
- Maximum distance from building of 50 meters.

7. Refuse containers are to be plastic or metallic and should have closed lids. To be provided are:

- 1 container of 50-100 liters capacity/25-50 persons.

12.3.3 Preparedness Checklist for PWD

(to be filled in by the department head and submitted to the district collector before May every year)

Preparedness Measures taken	Details/Remarks
The department is familiar with disaster response plan and disaster response procedures are clearly defined	
Orientation and training for disaster response plan and procedures undertaken	
Special skills required during emergency operations imparted to the officials and the staff.	
Reviewed and updated	
Precautionary measures and procedures	
The precautions to be taken to protect equipment	
The post-disaster procedures to be followed.	
All officers are familiar with pre-disaster precautions and post-disaster procedures for road clearing and for defining safe evacuation routes where necessary.	
An officer has been designated as Nodal Officer for Disaster Management	
Sources of materials required for response operations have been identified.	

Reported By :
 Designation
 Signature
 Date

12.3.4 Checklist for Public Works Department

(to be filled in by OFFICER-IN-CHARGE and submitted to district control room and the department head)

Action Taken	Y/N	Details/Remarks
Radio communications established with Emergency Operations Centre Divisional Commissioner District control room and Departmental offices within the division.		
An officer appointed as "OFFICER-IN-CHARGE - PWD"		
Extra transport vehicles dispatched from headquarters		
Work under construction secured		
Heavy equipment, such as front-end loaders, have been secured		
All work teams issued two-way communication link.		
Inspection and emergency repairs, if necessary, carried out for all Roads, Road bridges Underwater inspection of foundations and piers. Concrete and steelworks.		
Inspection and emergency repairs, if necessary, carried out for all buildings and structures of the state government (including hospital buildings)		
Emergency inspection by mechanical engineer of all plant and equipment in the District workshops carried out.		
Emergency tool kits assembled for each division		
Routes strategic to evacuation and relief marked		
Adequate road signs installed to guide and assist the drivers.		
Priority listing made for which roads to be opened first.		

Essential equipments such as Towing vehicles Earth moving equipments Cranes etc. made available.		
Begin clearing roads.		
Community assistance mobilised for road clearing.		
The following activities were undertaken Cleaning of ditches Grass cutting Burning or removal of debris and Cutting of dangerous trees along the roadside in the affected area.		
The following repair works were undertaken for All paved and unpaved road surfaces Pothole patching and Any failure of surface foundations in the affected areas.		
Construction work undertaken for temporary roads to serve as access to Temporary transit camps Relief camps Medical centres.		
Construction work undertaken for temporary structures required for organising relief work such as Relief camps Feeding centres Medical facilities Cattle camps and SOC/s.		
An up-to-date report of all damage and repairs kept in the district office report book.		

Inspected By :

Designation

Signature

Date

13.1 Planning Assumptions

- There is no substitute for maintaining standards of services and regular maintenance during normal times. This affects the response of the department to any disaster situation.
- Operating Procedures for mobilising community participation during various stages of disaster management have been given in section on “Areas of Community Participation”. The department is required to study these and adopt appropriate measures to ensure that community participates substantially.
- For effective preparedness, the department must have a disaster response plan or disaster response procedures clearly defined in order to avoid confusion, improve efficiency in cost and time.
- Orientation and training for disaster response plan and procedures accompanied by simulated exercises will keep the department prepared for such eventualities. Special skills required during emergency operations need to be imparted to the officials and the staff.
- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be undertaken to improve departmental capacity to respond to a disaster.

Action Plan Objective in a Disaster Situation

- Restoration of communication lines.

13.2 Activities on Receipt of Warning or Activation of District DMAP (DDMAP)

- Establish radio communications with Emergency Operations Centre, divisional commissioner, district control room and your departmental offices within the division.
- All personnel required for Disaster Management should work under the overall supervision and guidance of District Disaster Manager.
- Appoint one officer as “NODAL OFFICER - Communication” at the state level.
- Appoint one officer as “Officer-in-Charge - Communication” at the district level.
- The district collector to provide “Officer-in-Charge - Communication” or the field staff as the need be, with all needed authorisations with respect to
 - Recruiting casual labourers.
 - Procuring locally needed emergency tools and equipment and materials.
 - Expending funds for emergency needs.
- The “Officer-in-Charge - Communication” will ensure that all field staff and other officers submit the necessary reports and statement of expenditure in a format as required by the district collector
- Review and update precautionary measures and procedures, and review with staff the precautions that have been taken to protect equipments, and the post-disaster procedures to be followed.

- Ensure that all staff are aware of recommended precautions to protect life and personal property.
- Fill department vehicles with fuel and park them in a protected area.
- Inspect and repair all
 - Radio masts
 - Anchorages
 - Foundations and cables
 - Poles
 - Overhead circuits.
- Upgrade outside equipment to withstand wind speeds and other adverse weather conditions.
- Designate at each exchange a member of staff (such as an inspector) as a disaster officer.
- He must live in the area, be instructed in the likely effects of a disaster, and should be knowledgeable about necessary precautions and post-disaster procedures.
- House all electrical and switching equipment in damage-proof buildings.
- Store batteries clear of areas likely to be affected.
- All storage batteries should be charged fully during an alert, for use in the post disaster period, when the electricity supply is not likely to be available.
- Establish an emergency tool kit at each exchange, including:
 - a. cable cutters
 - b. Cutting pliers
 - c. Spanners
 - d. Ropes
 - e. Ratchet tension
 - f. Crosscut saws
 - g. Pulley blocks with rope
 - h. Hand gloves
- Check emergency tool kits and assemble any additional equipment needed.
- Provide at least two tarpaulins in every building with radio equipment, teleprinter equipment, and manual and auto-exchanges.
- Install standby generators in all exchange buildings for the recharging of batteries.
- Secure all outside equipment to the extent possible.
- Arrange for the transport of additional vehicles for inspectors.
- Assemble equipment and emergency stocks of materials likely to be necessary for

restoration of services.

- Arrange emergency standby cable for dispatch to the affected area immediately after the disaster.
- Remove fuses from the lines and disconnect the power supplies to equipment in disaster areas, if necessary.



13.2.1 Relief and Rehabilitation

Field priorities

- Give priority and concentrate on repairs and normalisation of communication in disaster areas.
- Identify the public services within the affected community for which communication links are most vital, and establish a temporary service, if feasible.
- Carry out an assessment of overall damage, listing specifically:
 - Overhead route damage (in miles/kilometers).
 - Cable damage (in yards/meters).
 - Specific equipment damaged.
- Establish a temporary communication facility, wherever necessary through mobile exchanges, on priority for use by
 - District control room
 - Non-officials (MLAs, MPs, Mayors, and ZP Presidents)
 - Transit, and relief camps
 - Cattle camps
 - Medical centres
 - Site operations centre and
 - Temporary establishment of all government and non-government agencies engaged in relief activities.
- Establish a temporary communication facility for use by the public
- Identify requirements, including:
 - Manpower needed
 - Vehicles needed
 - Materials and equipments needed.
- Begin restoration by removing and salvaging wires and poles from the roadways through recruited casual labourers.
- Establish a secure storage area for incoming equipments and salvaged materials.
- Carry out temporary building repairs for new equipments.
- Report all activities to head office

Head Office priorities

- Dispatch standby technical work groups to the affected area, ensuring that they take with them adequate food, bedding, tents, and tools.
- Dispatch additional vehicles, emergency equipment, and stocks for restoration of the affected area.
- Provide authorisations needed by staff, to effectively carry out emergency reconstruction.

The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Relief Commissioner. The Relief Commissioner will book this expenditure under Budget Head '2245' and reimburse the amount to DOT.



13.2.2 Preparedness Checklist for Telecommunications

(to be filled in by the department head and submitted to the district collector before May every year)

Preparedness Measures Taken	Y/N	Details/Remarks
The department is familiar with disaster response plan and disaster response procedures are clearly defined.		
Orientation and training for disaster response plan and procedures undertaken. Special skills required during emergency operations imparted to the officials and the staff.		
Reviewed and updated Precautionary measures and procedures Precautions to be taken to protect equipments Post-disaster procedures to be followed.		
All staff are aware of recommended precautions to protect life and personal property.		
An officer has been designated as Nodal Officer for Disaster Management.		
Sources of materials required for response operations have been identified.		

Reported By :

Designation

Signature

Date

14. OPERATING PROCEDURE GUIDELINES FOR RAILWAYS

14.1 Planning Assumptions



- For effective preparedness, the department must have a disaster response plan or disaster response procedures, clearly defined, in order to avoid confusion, improve efficiency in cost and time.
- Operating procedures for mobilising community participation during various stages of disaster management have been given in section on “Areas of Community Participation”. The department is required to study these and adopt appropriate measures to ensure that community participates substantially.
- Orientation and training for disaster response plan and procedures accompanied by simulated exercises will keep the department prepared for such eventualities. Special skills required during emergency operations need to be imparted to the officials and the staff.
- To the extent possible, preventive measures as recommended in the preparedness and mitigation document of DMAP, should be undertaken to improve departmental capacity to respond to a disaster.

Action Plan Objective in a Disaster Situation

- Restoration of rail lines
- Ensuring smooth rail movement for passenger and relief materials.

14.2 Activities on Receipt of Warning or Activation of District DMAP (DDMAP)

- Establish radio communications with Emergency Operations Centre, divisional commissioner, district control room and your departmental offices within the division.
- Appoint one officer as “NODAL OFFICER-Railways” at the state level.
- Appoint one officer as “Officer-in-Charge -Railways” at the district level.
- The district collector to provide “Officer-in-Charge -Railways” or the field staff as the need be, with all needed authorisations with respect to
 - . Recruiting casual labourers.
 - . Procuring locally needed emergency tools and equipments and materials.
 - . Expending funds for emergency needs.
- The “Officer-in-Charge -Railways” will ensure that all field staff and other officers submit the necessary reports and statement of expenditure in a format as required by the district collector
- Review and update precautionary measures and procedures, and review with staff the precautions that have been taken to protect equipments, and the post-disaster procedures to be followed.
- Officers should ensure that all staff are well aware of precautions to be taken to protect their own lives and personal property.

- Fill department vehicles with fuel and park them in a protected area.
- Plans should be finalised for sending auxiliary staff and repairmen into the affected areas to assist local staff.
- Maintenance and repairmen should be instructed to assemble and check repair equipments.  [Get DMP](#) 
- Contingency plans should be established for providing food and emergency shelter for local staff, and for auxiliary staff being sent into the affected area.
- Rail schedules should be revised and special trains brought into the area to assist the increased volume of traffic.
- A schedule, for the departure of the last trains prior to the disaster, should be developed by station masters and posted.
- An evaluation of the number and location of sidings and passing places should be carried out, to ensure that an increased number of trains can operate in an emergency situation.
- Emergency train operating procedures, such as the pilot working system, should be developed. All staff should be well trained to implement the emergency systems.
- Within the emergency operating framework, emergency procedures should be developed to provide the stationmasters with authority, to dispatch or hold trains, and take other emergency decisions in a disaster threatening situation.
- Systems should be developed for increasing the ability to carry increased number of passengers in an emergency situation.
- If halting or termination of passenger trains is intended, arrangements for alternate means of transport and availability of adequate food supplies must be ensured.
- Arrange for transport to the affected area
 - Tractor-shovel
 - Tripper, and
 - Auxiliary jeeps.
- All new construction and repair activities should be halted, and the work secured, as far as possible with sandbags, tarpaulins, etc.
- Polythene should be acquired for the protection of freight and equipments.
- All perishable and breakable items should be loaded into goods wagons and padlocked.
- For any coaches remaining in the area, shutters should be pulled down and doors closed.
- Reserve stocks of fuel should be checked.
- Inspection of all railroad bridges, by a bridge engineer including an underwater survey of foundations, piers and abutments. A full check on all concrete and steelworks should be included, and any repairs needed should be promptly carried out.

- Continuous regular weeding, cleaning of ditches and the burning and removal of debris should be carried out by the maintenance engineer's staff .

- Continuous inspection and repair by maintenance engineer of all

- . Railroad track
- . Ballasting,
- . Cess damage
- . Fish plates and
- . Holding down bolts.



14.2.1 Relief and Rehabilitation

- Emergency repairs of rail lines, if affected, must be carried out.
- A system for priority transport of relief goods and personnel must be developed.
- Relief goods may be considered for exemption from freight charges.
- Railway stations, particularly terminal and junction stations, should be equipped with emergency communication equipments.
- Every work gang should have tools which will be needed in an emergency. This should include crosscut saws, axes and rope. Each district tree - cutters gang should have a chain saw.
- Raincoats, caps and gumboots should be made available to workgangs in an emergency.

The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Relief Commissioner. The Relief Commissioner will book this expenditure under Budget Head '2245' and reimburse the amount to Railways.

15. OPERATING PROCEDURE GUIDELINES FOR AAI

15.1 Planning Assumptions

- For effective preparedness, the department must have a disaster response plan or disaster response procedures, clearly defined, in order to avoid confusion, improve efficiency in cost and time.
- Operating Procedures for mobilising community participation during various stages of disaster management have been given in section on "Areas of Community Participation". The department is required to study these and adopt appropriate measures to ensure that community participates substantially.
- Orientation and training for disaster response plan and procedures accompanied by simulated exercises will keep the department prepared for such eventualities. Special skills required during emergency operations need to be imparted to the officials and the staff.
- To the extent possible, preventive measures as recommended in the preparedness and

mitigation document of DMAP, should be undertaken to improve departmental capacity to respond to a disaster.



Action Plan Objective in a Disaster Situation

- Restoration of runways
- Ensuring smooth transport of passengers and relief materials.

15.2 Activities on Receipt of Warning or Activation of District DMAP (DDMAP)

- Airport officials in the district should coordinate with the district collector with regard to specific requirements of the disaster situation.
- Establish radio communications with Emergency Operations Centre, divisional commissioner, district control room and with other airports with respect to disaster situation.
- The district collector will provide all needed authorisations and reimbursements with respect to
 - Recruiting casual labourers.
 - Procuring locally needed emergency tools and equipment and materials.
 - Expending funds for emergency needs.
- Review and update precautionary measures and procedures, and review with staff the precautions that have been taken to protect equipment, and the post-disaster procedures to be followed and also the capacity for storage of cargo, resulting from possible disasters.
- Review and update flight schedules, and take other measures, and review with staff the effects of the additional passenger/flight pressures, and handling of cargo, that may be required for relief and rehabilitation.
- Inspect
 - Runways
 - Drainage systems inside the airport perimeter
 - Culverts
 - Ditches
 - Wind walls and
 - Foundations.
- Inspect and repair all buildings, stores, hangars, fuel dumps, with special attention to the disaster consequences.
- Inspect the radio tower and communications equipments, including lightening rods.
- Remove all serviceable aircrafts from the disaster area.
- Unless the hangar has been certified to be safe, it may be safer to move remaining airplanes from the hangar to outside tie-downs.
- Securely anchor all unserviceable aircrafts to holding-down bolts, if safe hangar space is

not available.

- Auxiliary equipments such as pumps, wagons, etc. should be moved indoors.
- All radio and weather instruments should be stored in a damage- proof room.
- Wind direction indicators should be removed.

· The amount of aviation fuel should be checked and auxiliary fuel stocks brought in.



- Contingency plans should be prepared for post-disaster use of the airport, including:
 - . Need for emergency control tower equipment.
 - . Need for emergency control tower staff.
 - . Need for emergency linemen for fueling.
 - . Emergency fuel supplies.
 - . Temporary storage facilities.
- The auxiliary electrical supply system, if available, should be checked.
- Large glass windows should be taped to prevent the shattering of glass.

15.2.1 Relief and Rehabilitation

- Provide priority clearance arrangements for relief supplies
- Provide priority travel facility to relief personnel.

The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Relief Commissioner. The Relief Commissioner will book this expenditure under Budget Head '2245' and reimburse the amount to AAI.

16. STANDARDS FOR RELIEF WORK, TRANSIT AND RELIEF CAMPS AND FEEDING CENTRES.

16.1 Standards for Food

16.1.1 For Marooned Persons

- A senior medical officer should accompany the rescue team along with required medical kit, and ensure priority of shifting seriously injured, or those requiring immediate medical attention. The procedure for tagging should be followed.
- Provision for both infants and adults must be included in the food supplies.
- Only non-perishable, ready to eat, and long-lasting food items should be included.

- Food must be packed in small packets for individual use.
- Drinking water should be packed in one litre bottles/plastic bags.
- Air-dropping should be done from minimum height with ropes and hooks to ensure that supplies reach the people with minimum damage.
- As far as possible, supplies should be dropped from stationary helicopters, and not when they are on the move.
- Use of boats should be preferred over helicopters, for supplies to marooned people.

16.1.2 Storage

- Keep food in the driest and coolest spot in the store - a dark area if possible.
- Keep food covered at all times.
- Wherever necessary, store food items in plastic bags and keep in tight containers to prevent from moisture.
- Open food boxes and cans carefully, so that they can be closed tightly after each use.
- Store packages susceptible to pests, like open packages of sugar, in screw-top jars or airtight cans.
- Store wheat, rice, dal and edible oil in sealed containers.
- Store powdered milk in packed cans for long term storage.
- Keep salt and spices air-tight in their original packages.
- Inspect all items daily, to make sure that the stocks are in good condition, and that there are no signs of degradation.
- Post guards at warehouses and supply depots, to prevent looting.
- Stimulate community action, to clear roads to warehouses and stores.
- Separate the damaged stocks from other stocks, to protect from odour and damage.
- Maintain food stock condition register, and report to appropriate authorities.
- Arrange for immediate disposal of all unusable food items.
- Maintain prompt transport schedules for delivery of perishable food stocks.
- Store kerosene and other combustible items, including pest control chemicals, in a separate room, away from food stores.

16.1.3 Cooking

- Food should be cooked using firewood, or a charcoal grill or kerosene stove, preferably outdoors.

- Canned foods should be heated in a different container and not in the supply can.
- Follow the checklists for feeding centres supplying cooked food, to ensure food sanitation.

16.1.4 Standard for assessment

Staff Required Number for
 1000 persons 2000 persons
 Cooks Food preparation 2 3
 Assistants 4 6
 Kitchen helpers 10 15
 Servers Food distribution 6 10
 Queue controllers 4 6
 Hygiene (washing up/garbage disposal) 4 6
 Total 30 46

16.2 Standards for Potable Water

- Warn people, of the hazard, of drinking contaminated water. Such sources should be identified and informed to the people.
- Sources located in the vicinity of sewage outfalls, chemical plants, solid waste disposal fields, abandoned mines, and other hazardous places should be considered suspect
- Malodorous, highly coloured, or highly polluted water should be avoided.
- Water suspected of contamination by human or chemical waste should not be used until it has undergone laboratory analysis.
- Wells which have been contaminated by disaster should be emptied immediately.
- It is important that all debris in the wells, such as leaves, sticks, silt and mud, etc. be removed after the water is pumped or dipped out.
- Topical chlorinated lime (TCL) or bleaching powder, should be added to all wells to avoid further contamination.
- The post-disaster emphasis for the provision of drinking water, should be on the restoration of local water sources, rather than on transporting water from outside the area.

16.2.1 Requirements

Minimum water requirements for drinking, cooking, and basic cleanliness are

- (1) Field hospitals and first aid stations: 40-60 litres per person per day.
 - (2) Mass feeding centres: 20-30 litres per person per day.
 - (3) Temporary shelters and camps: 15-20 litres per person per day.
 - (4) During Evacuation - 6 litres per person per day.
- [With no restrictions, use of water may approach 100 litres per person per day].

16.2.2 Storage



- Emergency storage of water can be improvised in plastic containers, with capacity up to 10 m3. Polyethylene containers erected in pits, dug to size, can provide upto 50 m3 storage

capacity. If the purpose of storage is only to provide contact time after chlorination, the minimum capacity should be such as to secure contact for at least 30 minutes. The total storage capacity for water distribution should be equal to the amount required for 12-24 hours. Elevated tanks can be set up within a short time by using drums, iron sheeting, or asbestos-cement tanks. Wooden poles, timber, or iron tubing can be used for the supports. In many countries, elevated storage tanks are manufactured in standard sizes with all parts prefabricated. They can be transported and erected rapidly.

- In long-term relief camps, all reservoirs should be covered, primarily, for protection from sunlight and consequent growth of algae, which produce tastes in water, and secondarily; for protection from birds, insects, and dust. The roof may be made of asbestos-cement sheets or corrugated iron sheets. An overflow pipe should be provided, care being taken that the overflow water should not endanger the foundations. The inlet pipe will normally discharge at the top of the reservoir and be fitted with a float valve. The outlet pipe should be about 5 cm above the bottom of the tank. A small drain pipe should be installed flush with the bottom of the tank, and a manhole on the roof is necessary to permit cleaning, inspection and repair. The openings of vent pipes should be screened to keep out insects and small birds.

16.2.3 Distribution

- In most disasters, water is distributed from tankers, which may be provided by fire brigades, the army, dairies, beverage plants, or other sources. Each family may be issued with a water container, made of plastic or galvanized iron. A tanker with a storage tank (or tanks) at the site should be able to provide water for 1000 persons. Environmental health workers are responsible for seeing that the tankers are filled from acceptable sources in a hygienic manner and chlorinated under their supervision.

- If there is a municipal distribution system within reasonable distance, it may be possible to extend this to a temporary camp, by means of light and quick-coupling steel or plastic pipes. In long-term camps, distribution pipes may be laid to feed water points.

- Water points usually have two or more taps, and one tap should be provided for every 100 persons. No shelter should be more than 100 m away from a water point.

16.3 Standards for Feeding Centres

- The location and layout of field centres for mass feeding should be selected and arranged in consultation with sanitation officers.

- Only potable water may be used in feeding premises. Where there is no piped supply, water must be transported, stored, and handled in a sanitary manner.

- Sufficient number of basins, each with soap, nail brush and a clean towel, must be provided exclusively for the use of food handlers.

- Separate washing place must be provided for washing all sorts of eating and cooking utensils.

- Before washing, any grease or food scraps on the utensils should be scraped into a refuse bin.

- Washed utensils should be disinfected by immersing in boiling water for 5 minutes.

- An alternative method of disinfecting washed utensils is, to immerse them in a sterilizing solution, preferably hot, of either chlorine (100 mg/litre for 30 seconds) or quaternary

ammonium compounds (200 mg/litre for 2 min).

- Wiping the utensils dry is unnecessary and undesirable.
- The baskets or trays being laid down for drying utensils must be in a dust-free place.
- Arrangements should be provided for washing all fruits and vegetables before cooking. The serving of raw vegetables and soft-skinned fruits should be forbidden.
- In special diet cases the vegetables and fruits must be thoroughly washed, immersed in a chlorine solution (100 mg/litre for 3 min), and rinsed until the smell of chlorine disappears.



- Sanitation facility for the staff should be provided close to the mass feeding centre with adequate standards.
- Liquid wastes from kitchens should be disposed of by sanitary methods, such as a soakage pit or covered cesspool. A strainer must always be provided and properly maintained to prevent choking.
- Solid wastes from kitchens must be deposited immediately in garbage bins. No filled bins should remain in preparation and cooking areas, without being tightly covered, and should be removed outside for collection and disposal, after every cooking session.
- Basins, tables, chopping blocks, and all other furniture and equipments must be kept as clean as possible when in use, and thoroughly cleaned after each meal.
- Only food that is to be used the same day may be kept in the kitchen. Food not in the process of preparation or cooking, or which has already been prepared, must be kept in fly-proof containers.
- Where refrigeration facilities are non-existent or inadequate, perishable foods should be bought on a daily basis and cooked and served as soon as possible.
- No non-vegetarian food should be made available through feeding centres.
- Supplies of powdered milk, biscuits and other food items for infants must be arranged.
- Left-over food shouldn't be used/served for next meal.
- Condensed or powdered milk must be reconstituted with potable water only, and under the best possible sanitary conditions. If natural milk is available for infants and hospital patients, it must be boiled before use.
- An adequate supply of detergents, disinfectants, brushes, cloths, brooms, and other housekeeping necessities must be provided to kitchen staff.
- Disposable (bio-degradable) plates, cups, etc. may be used in mass feeding centres and especially when disaster victims are on the march.
- Common drinking cups must not be tolerated.

16.4 Standards for Environmental Health Measures

16.4.1 During Search, Rescue and Evacuation

- There are very few sanitary measures that can be taken while people are being moved to transit or relief camps, and the journey should therefore be as short as possible. They should be told to take along as much food, water, and clothing as they will need.
- The relief or welfare authorities should be advised that, during this transitional period, only unperishable foods which do not require cooking should be distributed.
- It is very difficult to ensure sanitary excreta disposal while people are on the march, and not much can be done about refuse collection.
- At rest points, however, sanitation squads should bury excreta and solid wastes in holes or trenches at least 60 cm deep. After use, the hole or trench should be filled in with the excavated earth and trampled on.
- It may also be necessary to control body vermin by the application of insecticides.



16.4.2 Solid Waste disposal in the camps or in affected villages

16.4.2.1 Excreta disposal

Unsatisfactory disposal of excreta is common immediately after natural disasters. The measures applicable depend on the nature of the existing facilities.

1. Cities and towns with sewerage systems

- When a disaster occurs, sewerage and sewage treatment installations in cities and towns may be put out of service.
- Generally, any repairs made to sewer lines during the emergency should be of a permanent nature. However, temporary repairs may be necessary where a sewer line or manhole must be replaced quickly, to restore traffic on a main street. Asbestos-cement pipes, wooden conduits or some other type of quick-coupling pipes should be used to expedite emergency repairs.

2. Temporary shelters and camps

Depending on the time that temporary shelters or camps are expected to be in use, excreta disposal installations of different types, and varying service life, must be provided. The area must be adequately lighted and the approach road clearly demarcated. The most suitable types are:

- (a) Shallow trench latrines
- (b) Deep-trench latrines
- (c) Pit privies
- (d) Borehole latrines
- (e) Aqua (or septic) privies
- (f) Urinals; and
- (g) Mobile latrines.

As far as possible people must be discouraged from open defecation.

16.4.2.2 Community Latrines

- Attempts should be made to provide communal latrines with water, so that cleaning is practicable.
- Five seats should be provided for every 100 persons, in separate blocks for men and women.
- Latrines should be located downhill from any water source, and at least 15 m away from it.
- Where the groundwater is used for drinking or other purposes, the bottom of the latrine should be at least 1.5 m above the ground-water table. In the presence of limestone formations and fissured rocks, additional precautions are necessary to protect sources of water supply.
- The site should be dry, well drained, and above flood level; the immediate surroundings of latrines should be cleared of all vegetation, wastes and debris.

Various types of excreta disposal installation are described briefly below:



16.4.2.3 Shallow trench latrine

- This is simply a trench dug with ordinary tools (picks and shovels). The trench is 30 cm wide and 90 -150 cm deep.
- Its length depends on the number of users: 3-3.5 m are necessary for every 100 people.
- Separate trenches should be provided for men and women.
- The earth from the trench should be piled up at the side. Shovels should be left at the site, and people should be instructed to cover faeces with earth each time they use the latrine. However, these instructions may not be carried out, and it will be necessary for the sanitation squad to complete the work, twice a day, to keep the fly population and odour under control.
- It may be necessary to place lumber or boards along the sides of the trench, to provide for footing and to prevent the walls from caving in.
- Privacy may be secured by the use of brush, canvas, wood, or sheet-metal fencing.
- Water should be provided.
- The shallow trench is a rudimentary arrangement for a short period (up to one week). When the trench is filled to 30 cm below ground level, it must be covered with earth, heaped above ground level and compacted. If necessary, a new trench must be dug. Before a trench is abandoned, sanitation personnel should see that it is properly filled in.

16.4.2.4 Deep trench latrine

- This type of latrine is intended for camps of longer duration, from a few weeks to a few months.

- The trench is 1.8-2.5 m deep and 75-90 cm wide. The top of the trench is covered by a fly-proof floor.
- A squatting hole is provided.
- A superstructure is built for privacy and protection.
- Other requirements are the same as for shallow trenches.

16.4.2.5 Bore-hole latrine

- In estuaries and places where the subsoil does not contain rock, this type of latrine offers a fast solution for excreta disposal in disasters.
- Mass production of concrete slabs for the latrine floor may be undertaken on the site.

16.4.2.6 Aqua (or septic) privy

- This type of privy consists essentially of a watertight tank (filled with water) in which excreta are discharged, stored and digested.
- It has been used with success in some long-term camps as a communal latrine.
- Aqua privies take rather a long time to construct, and are not recommended during disasters, except, perhaps, for field hospitals, first-aid stations, and mass feeding centres.



16.4.2.7 Urinals

- These may be provided in communal blocks of latrines for men to reduce the number of seats needed.
- One urinal space for 25 males is recommended.
- Odour from urinals can be kept under control by applying chlorine solution.

16.4.2.8 Mobile latrines

- Mobile latrines are tanks mounted on a truck or a rail wagon; they are used in post-disaster situations.
- They are necessary in disaster areas where the ground-water table is high.
- Sanitation personnel are responsible for supervising the proper disposal of the tank contents and the washing, and disinfection of tanks after each emptying.

16.4.3 Miscellaneous installations

In temporary shelters and camps, communal facilities for maintaining personal cleanliness should be provided. These may include showers, washrooms, laundries, and disinfection and disinfection rooms. They will help to prevent skin diseases and infestations, that lead to vector-borne diseases. Disinfection rooms are necessary for preventing the spread of infectious diseases. Proper operation and maintenance of these services depend on

constant supervision by sanitation personnel.

16.4.3.1 Baths and showers

- One bath should be provided for every 100 persons.
- Over-all consumption of water for bathing should be calculated on the basis of 30-35 litres per person per week.
- For both hygienic and economic reasons, proper arrangements should be made for the disposal of waste water from baths.
- People should be discouraged from using ponds, and stagnated water for baths for both sanitary and safety reasons.

16.4.3.2 Laundries

- In temporary encampments people may be expected to wash their clothes in plastic or iron tubs.
- One washing stand for every 100 persons is recommended.
- Proper drainage and soap traps should be provided for the waste water.

16.4.3.3 Disinfection and disinfection

- Methods used in disinfection and disinfection involve the use of chemical agents such as sulfur dioxide, phenol, and carbolic acid. Some of these agents are dangerous, and should only be used under expert supervision.



16.4.3.4 Waste disposal

Waste disposal should be in a shallow, all purpose trench of the following dimensions:

- 10 centimeters deep X 45 centimeters wide X 3 meters long/1000 persons.

16.5 Facilities for Relief Workers

16.5.1 Sleeping and cooking equipments for a team of 5 relief workers

Tent :- 1
Blankets :- 5
Camp beds :- 5
Bed sheets :- 5
Sleeping bags :- 5
Pillows with spare covers :- 5
Kerosene or gas stove :- 1
Kerosene lantern :- 1
Flashlights (with spare batteries) :- 5
Rubber boots :- 5 pairs
Felt-covered water bottles :- 5
Cooking utensils (assorted) :- 1 set

Eating utensils (assorted) :- 1 set
Detergents, soap, water disinfecting tablets, etc. :- As required
Bath unit :- 1
Water containers (plastic or metal), capacity 10-20 litres :- 2
Kerosene containers (plastic or metal), capacity 10-20 litres :- 2
Camp chairs :- 5
Camp tables :- 2

16.6 Checklists for Transit Camps, Relief camps and Feeding Centres.

16.6.1 Checklist for each Transit Camp (to be inspected by Camp Officer and sent to SOC)

Action	Y/N	Details/Remarks
Location approved / conveyed to District Control Room Police Control		
Accommodation should provide for the following Protection against adverse weather conditions Treatment for minor ailments and minor injuries Control over access and egress evacuation routes. Equipped with a mobile PA system Update on disaster situation Drinking water Food arrangements Adequate lighting arrangements Sanitation facilities Easy accessibility for transport to and from the SOC. Facilities for storage of bulk belongings of evacuees Facilities for accommodation of cattle and pets		
Police personnel provided		
Information desk available		

Inspected By :
 Designation
 Signature
 Date

16.6.2 Checklist for Feeding Centre
 (to be filled in by site manager, SOC and submitted to district control room and the department head)

Action	Y/N	Details/Remarks
Managed By : Government Voluntary relief organisations Red Cross Salvation Army Meals on Wheels Religious organisations.		
Location approved by district control room		
Protection against adverse weather conditions		
Person In-charge designated for Overall In-charge of feeding centre Shifts(supervisor) Kitchen Stores / stock control Food distribution Hygiene and sanitation.		
Care and comfort and transport of volunteers		
Adequate arrangements made for Crowd control Police protection Food resources		

Storage of rations appropriate for control of insects and rodents in stores		
Infant foods		
Milk distribution centres		
Fire control measures		
Cleaning of premises where food is handled		
Area for eating on-site		
Drinking water		
Cleaning of utensils		
Disposal of leftovers		
Disposal of waste water		
Kitchen equipments		
Cooking		
Utensils		
Detergents, disinfectants, brushes, cloths, brooms, and other housekeeping necessities.		

Inspected By :
 Designation
 Signature
 Date

16.6.3 Checklist for Relief Camps and transit camps of more than three days duration
(to be inspected by camp officer and sent to SOC)

Action	Y/N	Details/Remarks
Location approved /conveyed to district control room		
Protection against adverse weather conditions		
Whether the site has adequate building/s		
Site has adequate space for building temporary shelters		
Separation of groups necessary		
Separation of sexes necessary		

Is there sufficient slope for drainage during rains		
Managed by Government Voluntary relief organisations NGOs Religious organisations International relief organisations		
Person In-charge designated for Officer In-charge of Relief Camp Shifts(supervisor) Kitchen Stores / stock control Relief distribution Hygiene and sanitation		
Adequate arrangements made for Telephone lines and other communication links Easy accessibility for transport to and from SOC Facilities for storage of bulk belongings of evacuees Access points Exit points Fire fighting Crowd control Feeding centre (refer to checklist) Medical facility Potable water Water for other purposes		

Food storage		
Storage of relief materials		
Lighting		
Recreation space		
Educational facility		
Counselling facility		
Sanitation blocks		
Disposal of waste water		
Disposal of waste		
Police desk		
Arrangements for staff and volunteers		
Tents, bedding, etc.		
Transport		
Rest and recreation facility		
Space for office work		
Personal kits		
Sanitation blocks.		
Records or register for		
Expenses on administration and management		
Cash and credit vouchers		
Issue of relief tickets		
Issue of gratuitous relief		
Cash disbursements		
Issue of relief materials		
Issue of rations		
Receipt of relief materials		

Receipt of cash		
Receipt of rations		
Inventory of valuables with families		
Missing persons		
Persons requiring special assistance		
Births and deaths		
New arrivals		
Departures		
Inventory of non-consumables (dead stock register).		

Inspected By :
Designation
Signature
Date



1. INFORMATION AND MONITORING TOOLS

The institutional framework and the response structure would not be effective unless it is operationalised through information tools and monitoring mechanisms. Such tools define the direction and the content of information as also the source. The flow of information brings in the dimension of accountability and the source provides the authenticity.

It is in this context that this section presents information and monitoring tools for agencies during three main stages of the disaster cycle viz., pre-disaster, during disaster and post disaster.

- The pre-disaster stage includes activities related to preparedness, warning and evacuation
- The during disaster stage encompasses activities related to Activation of the plan and evacuation
- The post-disaster stage includes damage assessment, relief and recovery, and providing feedback for preparedness for a disaster, thereby completing the cycle.

It must be noted at this stage that these stages are fairly amorphous and many times may occur simultaneously. Disaster detection, information gathering and action decisions are the first steps in responding to a disaster. All these steps may occur over a short or protracted time period depending on the circumstances and magnitude of the disaster. The plan identifies the responsibility of the personnel having local level authority to evaluate the situation, assess the magnitude of the problem and activate DDMAP.

2. PREPAREDNESS FORMATS

The district control room will receive reports on preparedness from the relevant district level departments and other departments, as given in the Operating Procedure Guidelines for the Departments. The Collector will also forward Flood Preparedness Measures Format 1 to the Relief commissioner and Divisional Commissioner.

Format 1: Preparedness Status Checklist for floods

The checklist to be completed and sent to Relief Commissioner by every district collector two weeks before the onset of monsoon every year.

[With respect to floods, a regular mechanism to inform on the preparedness status to SCR is expected. The checklist given below can be used on a regular basis for reporting the preparedness and the same can also be used on the receipt of warning to monitor the administrative preparedness].

S.No	Action Taken	Y/N	Remarks
1	Flood Prone Rivers and areas identified by irrigation authorities		
2	Flood Gauges are in working condition		
3	Warning stages on each river are identified		
4	Arrangements for flood warnings • Through AIR and TV • through Public address systems • For local emergency communication system • For review of flood warning system • For Flash Flood warning		

Inspected By :

Date :

Signature :

3. ALERT / WARNING FORMATS

The existing warning system with respect to cyclones and floods has been sufficiently standardised. The format for cyclone warning and a sample warning for cyclone over land is given here for ready reference.

Format 2: CYCLONE WARNING BULLETIN

Severe Cyclone Warning bulletin No.1 issued by Area Cyclone Warning Centre, Bombay at 1330 hours IST of 5th Nov.AAA Severe Cyclone Warning for Goa, Ratnagiri, Sindhudurg, Raigad districts AAA Severe cyclone located within half a degree of Latitude Eleven decimal zero north and Longitude Seventy decimal zero degree east about 450 kilometers Southwest

(Direction) of Goa at 0830 hrs IST AAA Likely intensify further and move in Northeast direction and expected to strike coast near between Goa and Ratnagiri by Monday the 6th November evening AAA G ales reaching 150 kilometers per hour uprooting trees, damaging pucca houses and disrupting communications likely Goa Ratnagiri, Sindhudurg Raigad districts from Saturday 5th November night. Widespread rain with scattered heavy to very heavy falls likely commence in Goa, Ratnagiri districts from Saturday 6th November early morning. Tidal waves 2.0 meters above normal tide likely inundate coastal areas of Goa , Ratnagiri districts while issuing coast.

Format 3: SAMPLE MESSAGES FOR CYCLONES OVER LAND

SPECIAL WARNING FOR CYCLONE OVER LAND AREA MESSAGE NO. AAA ISSUED BY _____ AT _____ HRS AAA CYCLONIC STORM LIES CENTRE AT HRS _____ (DATE) LAT/LONG _____ KM DIRECTION (KNOWN STATION) AAA LIKELY INTENSIFY/WEAKEN/REMAIN UNCHANGED AND MOVE _____ DIRECTION AAA IN ASSOCIATION WITH ABOVE SYSTEM STRONG WINDS FROM _____ (DIRECTION) SPEED REACHING _____ KM,/HOUR LIKELY AFFECT _____ DISTRICTS COMMENCING FROM TIME _____ DATE AAA HEAVY/VERY HEAVY RAIN LIKELY _____ DISTRICTS COMMENCING FROM _____ TIME DATE AAA DAMAGE LIKELY TO BE CAUSED DUE TO STRONG WINDS AND HEAVY RAIN FALL MAY BE MENTIONED DISTRICTWISE.

4. PRELIMINARY REPORTS

The Collector will send the Preliminary Report and Action Taken Report within 48 hours of the event to the Chief Secretary/Relief Commissioner and Emergency Operations Centre with a copy marked to the Divisional Commissioner. After that daily reports on the losses and relief activities will be given.

Format 4 : Preliminary Report On The Disaster
To Be Sent By The Collector or RDC Immediately On The Receipt Of Report Of The Occurrence Of The Disaster Event to Emergency Operations Centre and Divisional Commissioner



Details	Remarks
Name of the district :	
Nature of disaster event :	
Estimates of number of villages/towns affected :	
Overall assessment of impact : <ul style="list-style-type: none"> • Estimated persons affected : • Estimated Loss of Lives : • Estimated Number of Injury : • Estimated Loss of crops : • Estimated Loss of houses : • Estimated Loss of livestock : 	

Damage to infrastructure : • Road Transport (Y/N) • Power Supply (Y/N) • Water supply (Y/N) • Telecommunication (Y/N) • Irrigation systems (Y/N)	
Immediate requirements : • Assistance for Search and Rescue (Y/N) • Food (Y/N) • Clothing (Y/N) • Water (Y/N) • Medical Assistance (Y/N) • Ambulances (Y/N) • Fire Brigades (Y/N) • Police (Y/N) • Transport (Y/N) • Manpower (Y/N)	

Name :
 Designation :
 Date :
 Signature :



Format 5: Actions Taken Report On The Disaster
 To Be Sent By The Collector or RDC Immediately On The Receipt Of Report Of The
 Occurrence Of The Disaster Event to Emergency Operations Centre and Divisional
 Commissioner

Actions Taken :	Remarks
• Evacuation of vulnerable population completed/underway _____	
• Transit shelters provided to evacuees (Y/N)	
Location of evacuees :	
Supplies of the following Arranged : • Food (Y/N) • Fuel (Y/N) • Water (Y/N) • Lighting (Y/N) • Medicine (Y/N)	
Established Contact with : • Superintendent of Police (Y/N) • Fire Brigade (Y/N) • Civil Surgeon (Y/N) • Defence Services (Y/N) • Railways (Y/N) • Taluka Headquarters (Y/N) • Divisional Commissioner (Y/N)	

<ul style="list-style-type: none"> • Superintendent Engineer (Irrigation) • Public Works Department (Y/N) • R.T.O (Y/N) • Mutual Aid and Response Group 	
Other Action taken :	

Name :
 Designation :
 Date :
 Signature :

Format 6: Daily Report to be sent by Collector to EOC



Information and description of the onset of disaster			Information and description of relief activities			Additional Requirements	Quantity	Amount
Loss	Number	Amount	Relief given	Quantity	Amount			
Deaths Injured Destitute Families Destitute Persons			Food Clothing Cash Materials Temporary Shelters					
Houses Collapsed Houses Partially Damaged			Water Supply and storage					
Damage to Public Buildings			Inoculation Done					
Cattle Lost			Supply of medicines					
			Restoration of damaged infrastructure					
Total			Total					

Format 7: Daily Resource Requirement Pro forma for relief
 (for items to be procured through EOC)

Name of the District : _____ Nature of Disaster : _____

Item	Number/Quantity	Cost

Name :
Designation :
Date : Signature :



5. DAMAGE ASSESSMENT

Formats for reporting on various losses such as loss of life, injuries, property, livestock, crops and plantations, have been evolved to monitor on a day to day basis the impact of the disaster.

Effort has also been made to capture the damage done to infrastructure. It is assumed that all these information would give a fairly good account of not just the losses but the requirements for relief and recovery as also the compensation.

Damage Assessment Reports will be submitted after the relief activities are over.

Format 8: Report on Details on loss of life and injuries
in Village/Town _____
due to disaster _____

S.No	Name of the victim	Age	Sex	Cause of the injury/death	Date and time of incident
					Total

Name :
Designation :
Date :
Signature :



Name of the Village/Town : _____
Nature of Disaster : _____

Name :
Designation :
Signature :
Date :

Name of the Village/town : _____
Nature of Disaster : _____

Name :
Designation :
Date :
Signature :

Format 11: Loss Assessment Pro forma for Public Utilities

Format 12: Loss Assessment Pro forma for Houses

Format 13: Damage Assessment Pro forma for Infrastructure and Services

Name of the Village/Town : _____

Nature of Disaster : _____

Infrastructure	Nature of damage			Approximate loss	Possibility of immediate restoration with temporary repairs (Y/N) with remarks	Needs immediate repairs/restoration (remarks)
	Partial damage	Total damage	Non-functional	(in rupees)		
1	2	3	4	5	6	7
Water supply						
Power Supply						
Road Transport						
Health Services						
Rail Transport						
Bridges						
Ports/Jetties						
Air services						
Telecommunication						
Post and Telegraph						
Education						
Dams						
Irrigation Infrastructure						
Sewer infrastructure						

Name :

Designation :

Date :

Signature :

[Format 14: Statement of Total Damage - \(pdf\)](#)

in the District _____ due to the disaster event _____

Name :
Designation :
Date :
Signature :

Format 15: Statement of Total expenditure on payment of relief

District : _____
Nature of disaster : _____
Duration of disaster : _____

Nature of compensation	Number of beneficiaries	Amount spent
Loss of life		
Permanently incapacitated		
Temporary Injured		
Loss of crop		
Loss of plantation		
Loss of cattle		
Loss of other livestock		
Fully destroyed house		
Partially damaged house		
Loss of tools of trade/business		
Total		

Total
Name :
Designation :
Date :
Signature :

6. MONITORING RELIEF

For effective monitoring of the relief camps and cattle camps, information formats have been developed, which can be used for review of the situation at the local level as well as for keeping the authorities informed.

Surveillance reports on various specified diseases, water disinfection report and hospital reports on casualties is required to be sent.

Format 16: District level Information on Camp sites

(for all transit and relief camp sites to be filled in by District Collector and forwarded to Emergency Operations Centre)

Name of the district _____ Number of camp sites _____

As on / /97

S.NO	Name of the camp site	Managed By	Number of households	Number of persons in the household in the camp (including head of household)	
				Adults	Children
				M	M
				F	F
	Total				

Name :
Signature
Date



Format 17: District Level Information on Cattle Camp sites

(for all cattle camp sites to be filled in by District Collector and forwarded to Emergency Operations Centre)

Name of the district _____

Total number of cattle camp sites _____

As on / /97

Name of cattle camp site	Managed by	Number of livestock				
		Cows	Buffaloes	Bullocks	Goats and Sheep	Others

1	2	3	4	5	6	7
Total						

Name and Designation of Camp Officer :

Signature

Date

Health Department Reports

Format 18: Statement on status of epidemics and public Health activities undertaken in transit and relief camps and affected villages during the period

Nature of disaster :

Name of District

Name of village/campsite

Name of epidemic

Number of people affected

Number of deaths

Compiled By :

Designation :

Signature :

Date :

Health Department Reports

Format 19: Information on the deceased
(to be filled in for each deceased person)

Name of the Village /Town : _____

Nature of Disaster : _____

1. Identification No :

2. Name and address of the deceased :

3. Age :

4. Sex :
5. Occupation :
6. Caste :
7. Annual Family Income :
8. Whether residing in Maharashtra for more than 15 years :
9. Day, date and Time when the body was recovered :
10. Location where the body was found :
11. Identified by:
12. Panchnama Done : (Y/N)
13. Postmortem done : (Y/N)
14. Transferred to Mortuary : (Y/N)
15. Handed Over to relatives : (Y/N)
(Name and address of the relative to be recorded)
16. Disposed of as unclaimed : (Y/N)
17. Report sent to police (Y/N)

Name :
Designation :
Date :
Signature :



Health Department Reports

Format 20: Information on the injured

Name of the Village : _____
Nature of Disaster : _____

1. Identification No :
2. Name and address of the injured :
3. Occupation :
4. Caste :

5. Age :
6. Sex
7. Annual Family Income :
8. Whether residing in Maharashtra for more than 15 years :
9. Day, date and Time when reported :
10. Location where the injured reported :
11. Nature of injury or complaint :
12. First Aid Given at OPD : (Y/N)
13. Admitted as Indoor patient : (Y/N)
14. Admission No :
15. Date and time of admission :
16. Date and time of discharge :
17. Transferred to other hospital :
(Name and address of the hospital to be recorded)

Name :
Designation :
Signature :
Date :



Health Department Reports

Format 21: Compiled Report on treatment in hospitals
(to be compiled by DCR and sent to EOC)

Name of the district

Nature of disaster:

Period from / /97 to / /97

S.No	Name of hospital/medical centre	Number of patients given treatment	Number of patients received "on	Number of patients admitted	Number of patients treated	Number of patients discharged during	Number of patients transferred for	Number of patients expired
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