

STANDARD OPERATING PROCEDURE FOR RESPONDING TO
NATURAL DISASTERS - RURAL DRINKING WATER SUPPLY AND
SANITATION

2011

Department of Drinking Water and Sanitation
Ministry of Rural Development
Government of India

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ACRONYMS

AE	Assistant Engineer
BRC	Block Resource Centre
BIS	Bureau of Indian Standards
BMTPC	Building Materials and Technology Promotion Council
CCDU	Communication Capacity and Development Unit
CSO	Civil Society Organization
CR	Control Room
CE	Chief Engineer
CRF	Calamity Relief Fund
CMP	Crisis Management Group
DDWS	Department of Drinking Water and Sanitation
DM	District Magistrate
DM	Disaster Management
DC	District Collector
DWSM	District Water and Sanitation Mission
DDMA	District Disaster Management Authority
ECC	Emergency Command Centre
ESF	Emergency Support Functions
GSI	Geological Survey of India
IMD	Indian Meteorological Department
IAG	Inter Agency Group
IC	Incident Commander
JE	Junior Engineer
MHA	Ministry of Home Affairs
NIDM	National Institute of Disaster Management
NDMA	National Disaster Management Authority
NDRF	National Disaster Response Fund
NRDWP	National Rural Drinking Water Program
NGO	Non -Governmental Organization
PRED	Panchayat Raj Engineering Department
PHED	Public Health Engineering Department
PRI	Panchayat Raj Institutions
RD	Department of Rural Development
RWSS	Rural Water Supply and Sanitation
SDMA	State Disaster Management Authority
SDRF	State Disaster Response Fund
SDMC	State Disaster Mitigation Committee
SHG	Self Help Groups
SOP	Standard Operating Procedures
SWSM	State Water and Sanitation Mission
ULB	Urban Local Bodies
URS	Unified Response Strategy
UT's	Union Territories
WSSO	Water and Sanitation Support Organization
ZP	Zilla Parishad

1. Introduction

The term "disaster" implies a natural unforeseen calamity which would have a wider impact on human life, property and assets created. "Safe drinking water" is one of the basic needs and without its availability in adequate quality and quantity, there could be serious impacts on human and animal health. Drought could lead to scarcity of water due to depletion of ground water table and / or drying up of surface water sources. It could also lead to failure / damage of pumps due to increased suction head. Disasters like flood, tsunami, avalanche, landslide, and hailstorm could result in wash-off/ damage of water supply assets created, thus resulting in disruption of supply of safe drinking water. Therefore in any type of disaster, proper management of drinking water supply to the affected people on an "immediate basis" is an essential requirement. Maintaining environmental sanitation and individual hygiene are also equally important to reduce/eliminate chances of disease prevalence / outbreak of epidemics.

SCOPE

- i) This standard operating procedure will include all functions pertaining to disaster prevention, institutional mechanism, preparedness, early warning, relief, recovery and rehabilitation.
- ii) This standard operating procedure will apply to RWSS Department/ PHED / PRED/ Sanitation departments / Board dealing with rural water supply and sanitation for natural disasters that the State is prone to.
- iii) It shall not be applicable to nuclear, biological and chemical disasters.

OBJECTIVES

The objective of the SOP document is to minimize the loss of lives and social, private and community assets because of natural disasters:

- i) By providing efficient systems for cooperation and collaboration among all the departments/agencies of the Governments at all levels including State / district administration and NGOs.
- ii) Building capacities of communities and line departments at national/state/district/ village levels in effective preparedness, response & relief.
- iii) To ensure quick and effective response during disasters to minimize casualties and enable quick recovery, restoration and rehabilitation of water and sanitation facilities without delay.

This manual is prepared in order to assist everyone in the rural water and sanitation department and SWSM, DWSM, NGOs and the community, whether at the national, state, district or at other levels. It also indicates actions that need to be taken in collaboration with other departments at various levels. This document explains, for each category of staff, exactly what they are responsible for, and what steps they should take before, during and after a disaster.

These are standard guidelines for staff at all levels so that they may take action immediately.

2. National Level

2.1) Institutional Mechanism

At the National level, the Ministry of Home Affairs / Ministry of Agriculture (only for drought, pest attack and hailstorm) are the nodal ministries for management of disasters in the country.

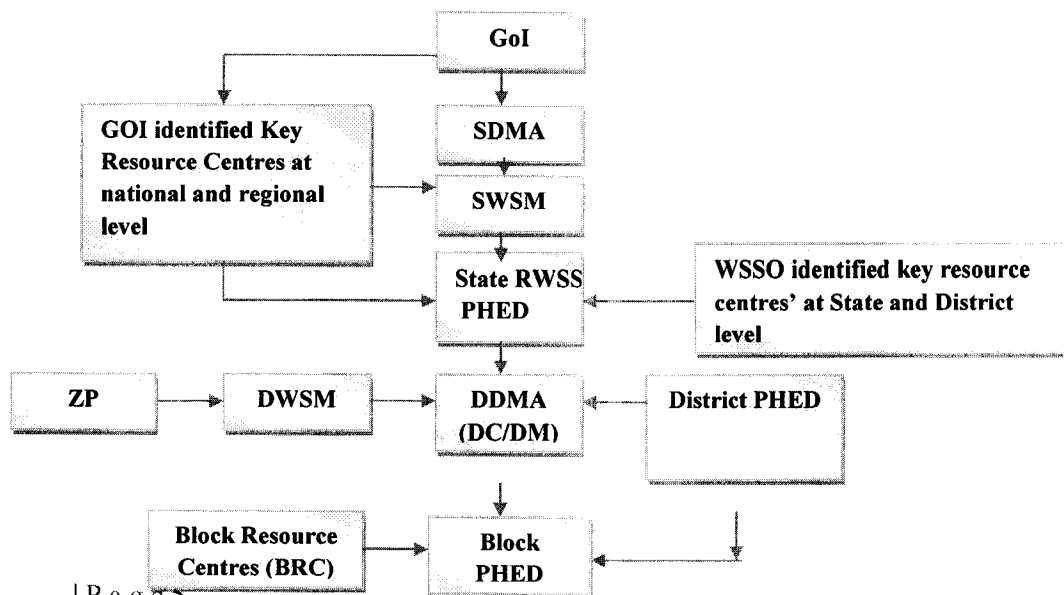
The Department of Drinking Water & Sanitation (DDWS) will be responsible for providing technical and financial support to State RWSS/PHED/Board while responding to natural calamities for restoration of damaged water supply and sanitation systems. Upon receipt of a memorandum from the State Governments seeking additional Central assistance in the wake of any calamity and of the constitution of Inter-Ministerial Central Teams, DDWS will depute an officer who is competent to understand the situation and can join the Central team for conducting damage assessment. Subsequently he/she will de-brief the nodal Ministry and DDWS of any relief assistance required under the NDRF/NERDWP norms to the State. On the recommendations of Inter Ministerial Group and High Level Committee, funds would be released from NDRF / SDRF for items admissible under NDRF guidelines and from 5% NRDWP Calamities fund for items not admissible under NDRF.

Key responsibilities of DDWS

Coordination Mechanism

- ✓ DDWS will participate in all technical coordination and linkages with State rural development departments, SDMA's, NGOs, international agencies etc.
- ✓ At National level, DDWS in coordination with concerned national and international agencies will inform departmental contingency / preparedness plans to concerned nodal officers in NDMA to avoid minimizing overlap and duplication of efforts and improve coordination.
- ✓ All agencies involved in emergency relief and disaster management activities will have to operate within the framework laid down in disaster management policy and other related laws, codes and government notifications in force and guidelines issued from time to time.

Organ gram of existing PHED/RD structure



State Resource Analysis:

Indian Disaster Resource Network [IDRN State database]:

A web-enabled centralized database for the IDRN is operational. IDRN is a decision-making tool for Government administrators and crisis managers to coordinate effective emergency response operations in the shortest possible time. The network will enable quick access to resources to minimize response time in emergencies. The system gives the location of specific equipments/specialist resources as well as the controlling authority for that resource so that it can be mobilized for response in the shortest possible time. The database will be made available at the district, state and national levels and will be used for all emergencies and day-to-day operations.

2.2) Preparedness

The most important component of preparedness is planning for all hazards. The plans have to be linked with those of other support departments, and also at various levels. Experience has shown that destruction from natural hazards can be minimized by the presence of a well functioning warning system, combined with preparedness on the part of the vulnerable community. A community that is prepared to face disasters receives and understands warnings of impending hazards and has taken precautionary and mitigation measures will be able to cope better and resume their normal life sooner.

Hazard analysis:

A detailed analysis of the hazards likely to impact the water and sanitation systems of the state will be carried out by the Public Health Engineering Departments / Water boards in charge of rural drinking water supply and sanitation, in consultation with the experts from the field. Hazard assessment is concerned with the properties of the hazard itself. The vulnerability Atlas of India, developed by Building Materials and Technology Promotion Council (BMTPC), Govt of India, will be used as the baseline for all analyses. The comprehensive hazard assessment of the State prepared by the SDMA

Key departmental preparedness

- ✓ DDWS will technically advice state PHED/RWS departments with equipments / resources used for emergency water and sanitation during response
- ✓ DDWS will identify key institutions / resource centres / ATI's including those run by non-governmental agencies for human resource development and training for the state departments. A detailed plan for capacity building will be prepared.
- ✓ DDWS must have disaster management plans to tackle L3¹ disaster situations.
- ✓ DDWS will maintain a roster of personnel whose services might be required for making assessment of disasters.
- ✓ DDWS will develop manuals on water conservation / recharging as part of preparedness measure.

¹ L3 are disaster situations arise from large scale disasters where districts and sate may not have the capacity to respond adequately and require assistance from central government.

2.3) **Early Warning**

The early warning systems for different disasters should be in place so that the concerned administrative machinery (DDWS) at National level can initiate appropriate actions to minimize loss of life and property. These should give an indication of the level of magnitude of the mobilization required by the responders. The goal of any warning system is to maximize the number of people who take appropriate and timely action for the safety of life and property.

Key departmental responsibilities

- ✓ DDWS will contact various Nodal Agencies at National level mandated for disseminating early warning bulletins.
- ✓ DDWS will depute one officer for monitoring early warning bulletins and scheduling conference calls with States for situation briefing to Secretary DDWS.

2.4) **Response & Relief**

- ✓ DDWS shall monitor the activities of the concerned State Government Department dealing with rural water supply and sanitation.
- ✓ If necessary DDWS will depute Technical experts / Officers to assist State RWS department and also conduct a quick assessment of the situation.
- ✓ Financial assistance from the calamity fund available under 5% NRDWP can be allocated subject to approved procedure as ad-hoc calamity funds immediately in case of major emergency situations.

2.5) **Role of NGO's / UN Organizations**

The strong field presence of many NGOs at the national, state, district and sub-district levels and even extending to remote settlements in hard to reach areas indicate the high credibility and acceptability within the local communities. The strong contact with local community groups like Self Help Group's (SHG's), youth groups, village water and sanitation committees (VWSC) and their participation in the local level implementation of government's flagship programmes contribute significantly at the grass root level.

Key responsibilities at National Level

- ✓ Support DDWS for setting up GO-NGO Inter-agency Coordination platform during non-emergency times to ensure appropriate coordination with key humanitarian actors happens during the times of disaster response.
- ✓ Assist DDWS towards development, piloting, validation and updating of National level water and sanitation contingency and preparedness plans.
- ✓ Support DDWS to standardize norms, designs and standards for emergency water and sanitation during emergency response.
- ✓ Facilitate and support detailed assessment on field driven needs and capacities at National level.
- ✓ Assist DDWS to establish linkages with authorities for GIS monitoring of Water points in states as part of preparedness measure to calamities and provide last mile connectivity for early warning dissemination.

3) State / Union Territories Level

In the aftermath of a disaster, the primary responsibility for undertaking rescue, relief and rehabilitation measures rests with the concerned State / UT governments. As the first step towards a coordinated disaster response mechanism, the State / UTs will have a clear cut organizational structure with the following designated rural water supply & sanitation nodal officers.

3.1) Institutional Mechanism

At the State level, State Water Sanitation Mission (SWSM) under the State Disaster Management Authority (SDMA) and State Executive Committees (SEC) will be the basis for coordination of emergency support relating to drinking water supply and sanitation.

Nodal officers for RWSS in an event of Emergency

Level	Nodal Officer
State / UTs	Secretary in-charge of Rural Drinking Water Supply and Sanitation Department, State Government level. Engineer in Chief / Chief Engineer, at PHED State level.
District	SE/ EE, RWSS / ZP
Block / Panchayat	AEE/AE/ JE, RWSS /ZP

Key duties of SWSM

- ✓ SWSM must support SDMA on overall coordination of emergency water & sanitation response.
- ✓ SWSM shall work under the overall direction of SDMA and in coordination with State Executive Committee convened by Secretary (DM).
- ✓ SWSM shall meet at least once before the expected normal commencement of a flood / drought and thereafter as frequently as may be necessary.
- ✓ WSSO should be entrusted with the task of framing technical guidelines and IEC/HRD strategy for water and sanitation in emergencies.
- ✓ SWSM may set up Disaster Control Room's (DCR's) at the RWSS offices in State, District and other levels and monitor their functioning
- ✓ SWSM must review RWSS needs and strategies for effective emergency response.
- ✓ SWSM must review position of stock and arrangements for procurement of essential supplies.
- ✓ SWSM must monitor responses to the emergency and impact thereof;
- ✓ In case drinking water supply and sanitation are dealt with by two departments, they should work in close consultation with each other.

State Resource Analysis:

Human Resource/expertise analysis:

States will identify the human resources available for disaster management. The institutions for human resource development and training run by the Government and also those run by Non-Governmental Organizations will be identified and a detailed plan for capacity building will be chalked out by the State department, involving all relevant institutions & departments. The State will also maintain a roster of professionals whose services might be required in management of disasters.

3.2) Preparedness

The State must make concerted efforts to put in place a mechanism focused towards preparedness at all levels, for all disasters that the State is vulnerable to. The effort will reduce loss of lives, livelihood and property to the extent possible in the event of a disaster.

At the State level, the Principal Secretary/ Secretary, RWSS Department shall be the State Nodal Officer and shall coordinate the response of the RWSS Department to the disaster. The Engineer-in-Chief/ Chief Engineer, RWSS/PHED shall implement the emergency support functions relating to drinking water supply and sanitation. If sanitation is being looked after by a separate department then the two may work in close consultation with each other.

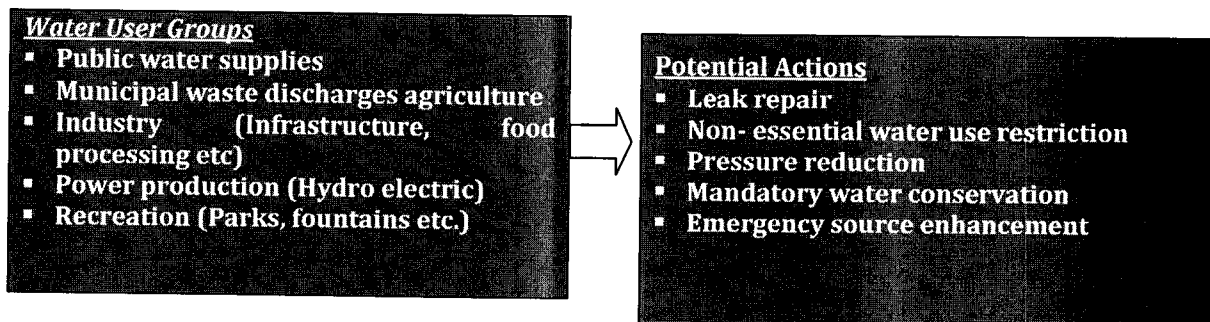
Responsibilities of Secretary, State RWSS / PHED

- ✓ Coordinate vulnerability hazard analysis exercise conducted in districts.
- ✓ Will set-up linkages with WSSO on guidance for framing technical guidelines and IEC/HRD strategy for managing disasters.
- ✓ For Drought, will ensure all necessary steps are taken before 30th June every year for drought preparedness
- ✓ Will ensure that inventory of water supply and sanitation materials and spare parts as may be required by the district Superintending Engineer / Executive Engineer in an event of disaster is made available.
- ✓ Have a roster of RWSS staff to be deployed from other areas to any affected region to cope with the requirements of the affected areas in consultation with EE/SE.
- ✓ Will ensure setting up of central/divisional/sub-divisional/sectional stores for emergency water and sanitation supplies.
- ✓ Will set up monitoring / documentation mechanisms for situation reporting to the SDMA/SEC.
- ✓ Will ensure formulation of state disaster management plan based on vulnerability analysis for each district for the rural drinking water and sanitation sector.
- ✓ Will ensure all relief codes be strengthened to include measures for stockpiling of water disinfection tablets and essential water and sanitation equipments.

These should be maintained at the govt. warehouse for the delivery of safe drinking water during crisis.

- ✓ To avoid delays in proper coordination, the State Secretary, RWSS Department may sign a MoU / Partnership with state IAG (Inter Agency Group) and United Nations for multi-layer coordination during emergencies.

Specific attention to Water User Groups as part of Drought Preparedness



Best practices on Preparedness

Earthquake Preparedness in Gujarat

Hazard Safety Cells:

The Gujarat Government has established a Hazard Safety Cell within the Public Works Department in order to establish competency in hazard resistant design of building and structures as well as restoration and retrofitting of buildings and structures. The Hazard Safety Cell will perform the following functions:

- *Training, acquisition of published books and documents, building codes, guidelines and manuals, documentaries and films on the subject of disasters.*
- *Preparation of checklists for quick review of new designs, to be adopted for buildings and structures to be constructed in the state.*
- *The Cell will act as an advisory cell to the State Govts on different aspects of building safety against the hazards.*

Earthquake Preparedness in Maharashtra

Swayam Shikshan Prayog (SSP), a network of women's groups in Maharashtra, trained women to work in construction jobs and promoted disaster-resistant construction techniques following the Latur earthquake. Together with the Self-Employed Women's Association, the SSP also promoted women's training and employment in the wake of Gujarat earthquake.

"There has been an inspiring saga of the strength and energy of women's groups here. Wherever they have worked, the rate of completion of houses has been very successful. These have strong knowledge about beams, lintel, plinth, brackets, retrofitting and related technical terms. They can say whether a house has been constructed properly. They have designed their own houses with modifications.

Drought Preparedness in Rajasthan

Weather Watch Group (WWG)

Rajasthan has set up a Weather Watch Group under the chairmanship of Relief Secretary having as members, Director (Agriculture), Director (IMD), Hydrologist, Irrigation Department and representative of PHED and Ground Water Department. This group meets on every Monday during the monsoon season to monitor agro climatic parameters and help in providing early warning of drought onset conditions. The system relays early warning of drought conditions so as to take requisite response measures in advance.

3.4) Early Warning

The State must acknowledge the crucial importance of quick dissemination of early warning of impending disasters and every possible measure must be taken to utilize the lead-time provided for preparedness measures. As soon as the warning of an impending calamity is received, the E - in C / Chief Engineer (RWSS/PHED) at the State must alert his counterparts in District and Block levels. The District Collector will alert the block and Village level Disaster Management Committees (DMCs) and Disaster Management Team (DMT) to disseminate the early warning to the community. On the basis of assessment of the severity of the disaster, the E - in C / Chief Engineer (RWSS) shall issue appropriate instructions on actions to be taken including restoration /augmentation of water sources to the SE / Executive Engineers / Assistant Engineers, who will then supervise responses.

At the State level, the Secretary in-charge of RWSS Department shall be the Nodal officer for coordinating the emergency support functions relating to drinking water supply and sanitation under the guidance of SDMA.

The Engineer-in-Chief/ Chief Engineer of RWSS shall implement the decisions taken by the State RWSS Department and the SDMA/ SEC.

Responsibilities of E-in-C / Chief Engineer. (State Nodal Officer. RWSS)

- ✓ Must be in touch with various Nodal Agencies at State/National level mandated for disseminating early warning signals.
- ✓ Must monitor all parameters related to various types of threatening disaster in the State.
- ✓ Upon receipt of weather warnings or reports of actual disaster, she/he must inform the respective District level Member Secretaries (DWSM)
- ✓ Will share all emergency contingency plans with SDMA for effective coordination during emergencies.

Best practices on early warning system

Early Drought Warning in Rajasthan

An early drought warning system exists in the Rajasthan to monitor the behaviour of agro-climatic indicators like rainfall, water reservoir levels and crop condition on a weekly basis from June to September. The early warning system called "Crop weather watch group" which is constituted under the chairmanship of Relief Commissioner and Secretary enables the Govt. to intervene in the months of July-August itself; instead of waiting for an assessment of the damage at the end of the cropping season (October - November).

Drought Early Warning in Gujarat

The Ground Water Department has established 'observation wells' (Piezometers) in different watersheds in the State; measurements are regularly taken every year of the water level in these 'observation wells' both before and at the end of the rainy season. The department is, therefore in a position to render advice as to the areas which are likely to suffer drinking water scarcity in the dry season in a particular year.

Traditional / Local beliefs on Early warning systems for Cyclone/flooding in Assam

- 1. If the moon inclines towards south it implies a forthcoming devastating flood.*
- 2. If the cloud gathers in the south-west direction it indicates a probable storm, if they gather the south-east direction it indicates rain and flood while in the north-west direction it indicates normal rain.*
- 3. There is a species of grass locally known as Torapat. When its new buds emerge out with tints of silt, it indicates onset of a devastating flood.*
- 4. If the moon has a red glow it indicates forthcoming torrential rainfall within three days.*

Best practice on Tsunami Early Warning in TamilNadu

The Government of Tamil Nadu, with assistance from the UN, is implementing a pilot project on strengthening early warning system capacities of the government and the communities. The project is being pilot tested in Cuddalore district with strengthening of communication systems in 55 most vulnerable villages. Along with this, about 1500 people are being trained in these villages in appropriate responses to early warning messages. An early warning training manual has been developed in English and Tamil and is being used in community training programmes to create awareness on early warning systems. After drawing on the lessons of this initiative, the project will be scaled up to cover select coastal areas of the four Tsunami affected states. A study on "Mapping of Early warning systems in Tamil Nadu" has been undertaken and documented. The document intends to help the Government, technical institutes and NGOs in designing need based disaster management programmes in Tamil Nadu.

3.5) Response & relief

At the State level, the Principal Secretary/ Secretary, RWSS Department shall be the State Nodal Officer and shall coordinate the response & relief operations of the RWSS Department to the disaster.

Responsibilities of Engineer in Chief / Chief Engineer, RWSS / PHED

- ✓ Will ensure setting up Emergency Control Room in his office to collect, collate and transmit information relating to the natural calamities and relief operations undertaken.
- ✓ Deploy staff for carrying out rapid assessment of damage caused to drinking water and sanitation infrastructure in affected areas and produce update for State Disaster Management Authority (SDMA).
- ✓ Must inform State Secretary (RWS) on the situation update
- ✓ Under the guidance of the SDMA, CE will give instructions to DWSM on prioritizing water and sanitation activities
- ✓ Shall identify alternative sources of water and make necessary arrangements for supply to the affected population.
- ✓ Along with State Secretary (RWS), will get involved in coordinating disaster response.
- ✓ Will produce "Daily Situation Report" for SDMA in event of disaster.

3.6) Role of NGO's / UN Organizations

At State level NGO's/INGO's will facilitate formation of water and sanitation task forces to support PHED/RWS with rapid assessment reports to design water and sanitation response.

Key responsibilities at National Level

- ✓ Support State level SWSM for setting up GO-NGO Inter-agency Coordination platform during non-emergency times to ensure appropriate coordination with key humanitarian actors happens during the times of disaster response.
- ✓ Will assist PHED/ RWS with the distribution of emergency relief supplies which includes ORS, Chlorine tablets, Sanitation infrastructure, Hygiene kits and any related IEC materials.
- ✓ Will support RWS/PHED with capacity building events on water and sanitation in emergencies.

4) District / Block Level

4.1) Institutional Mechanism

District Water and Sanitation Mission (DWSM)

At the district level for the purpose of combating calamities, DWSM will function under the supervision of District Magistrate/Collector to carry out the actual implementation of rural water and sanitation relief projects.

Key duties of DWSM

- ✓ DWSM shall meet at least once before the expected normal commencement of floods/drought and thereafter as frequently as may be necessary.
- ✓ District Disaster Management Authority (DDMA) may set up Disaster Control Room's (DCR's) in district, block and lower levels and monitor their functioning.
- ✓ In case of common DCR is established, the DWSM will depute staff to be a part thereof.
- ✓ The DWSM shall extend services during disasters as per as per requirements decided upon by DDMA
- ✓ DWSM must review contingency water supply and sanitation plans submitted by RWSS /PHED.
- ✓ DWSM must review position of essential water and sanitation stock and will make arrangements for procurement of essential supplies under the SDRF/Normal funds.
- ✓ DWSM under the guidance of DDMA will monitor emergency responses at the district, block and Panchayat level and impact thereof.

Role of local self-governments in disaster response:

Local self-govt institutions like PRIs and civil society will play a vital role in emergency preparedness/response and also in coordinating search & rescue, relief, shelter management & relief camps, reconstruction and rehabilitation, preliminary damage assessment and finalisation of action plans etc. A determined effort be made to earliest cooperation / participation of local self-government / civil society coordinating with different relevant sectors for effective response.

The Block Resource Centres (BRCs) would assist the Block Panchayat in ensuring full preparedness at grass root level and mobilising of trained manpower in the event of calamity.

4.2) Preparedness

SE / Executive Engineer, RWSS shall be the district level nodal officer for coordinating emergency operations with respect to delivering water and sanitation services. The SE / Executive Engineer (Member Secretary) of DWSM in his / her capacity is entrusted with the responsibility of ensuring that all Rural Water Supply works in the district are properly maintained in an event of disaster by carrying out timely repairs wherever necessary

Responsibility of Member Secretary, DWSM

- ✓ Will share all emergency contingency plans with DDMA for effective coordination during emergencies.

- ✓ During the onset of monsoon, it is essential that the Superintending / Executive Engineers should make all out efforts to keep vigil on all water supply schemes and sources.
- ✓ In the event of scanty / deficient rainfall (drought) over a prolonged period, it is the responsibility of the SE / EE to monitor levels of drinking water based on ground water and surface water sources in the concerned district and identify possible existing sources having relatively high yield and /or explore possibility of creating sources by using available information including HGM maps, etc before 30th June.
- ✓ Will co-ordinate with Block DEE/ Panchayat, AE / Village JE on vulnerability analysis to various forms of disaster with close support from VWSC
- ✓ Procurement and safe storage (warehousing) of essential water and sanitation supplies based on contingency plans.
- ✓ An inventory / check list of water supply and sanitation resources in the district will be listed out and updated regularly.
- ✓ All the Executive Engineers/Assistant Engineers should be instructed to check up the PWS schemes which are prone to disasters in their jurisdiction and compile a report on water supply position of the concerned areas. This report should be placed before the DDMA
- ✓ Member Secretary, DWSM must conduct district level capacity building and training for line departments / stakeholders on utilization of maps, warning and watch advisories.

4.3) Early Warning

Responsibility of Member Secretary (MS), DWSM

- ✓ When early signs of distress appear in any part of the District, Member Secretary (MS), DWSM will submit a special situation update to DC indicating the position in respect of Water and Sanitation preparedness in the district.
- ✓ Will inform all concerned RWS, JE/AE of blocks and Panchayats to review essential emergency stocks and contingency plans to be able to respond in a timely manner.
- ✓ Upon receipt of early warning signals from State, he must start the monitoring of all water and sanitation infrastructure in the affected parts of the District.
- ✓ Will be in constant touch with the local IMD and other agencies in the district for information on impending disaster.
- ✓ Will ensure setting up district emergency Control Room in his office for daily monitoring of situation under the guidance of DDMA
- ✓ Will share all emergency contingency plans with district level DDMA for effective coordination during emergencies.
- ✓ Will co-ordinate with Block DEE / Panchayat, AE / Village JE on early warning signs.
- ✓ Will instruct Assistance Executive Engineers / Assistant Engineers to check up the PWS schemes in their jurisdiction and compile a report on water supply position.

4.4) Trigger Mechanism

Member Secretary (MS), DWSM

- ✓ DM/DC will be responsible for proper triggering of the disaster management mechanism in the district.
- ✓ MS shall call a meeting with his staff after early warning signals are received from concerned nodal agencies / DDMA / DC
- ✓ He must identify crucial water and sanitation systems and earmark resources in his /her district as part of life saving intervention in case of onset of disaster
- ✓ DDMA must lay down mechanism to respond to disasters with clear indication on the acceptable response time.
- ✓ DM in consultation with MS must define the roles of VWSC, NGO's and CSOs while triggering disaster management mechanism.

4.5) Response and Relief

Responsibility of Member Secretary (MS), DWSM

- ✓ Will ensure supply of clean drinking water to affected areas.
- ✓ Will ensure transportation of water with minimum wastage.
- ✓ Will ensure supply of water purification installations, mobile systems, halogen tablets etc. For providing clean drinking water.
- ✓ Will ensure that special care is taken of women with infants and pregnant women.
- ✓ Will ensure that sewer pipes and drainage are kept separate from drinking water facilities.
- ✓ Will ensure availability of adequate number of toilets to prevent further contamination of water sources.
- ✓ Will ensure cleaning arrangements for toilets.
- ✓ Will generate daily situation reports for Chief Engineer.
- ✓ Will co-ordinate with Block DEE/ Panchayat, AE / Village JE for the restoration of water supply and sanitation infrastructure as per assessment.
- ✓ Will contact potential suppliers to arrange for procurement of emergency water and sanitation materials in case of disaster.
- ✓ Will take immediate actions for the restoration of water supply and sanitation infrastructure as per damage assessment.
- ✓ Shall identify alternative sources of water and make necessary arrangements for supply to the affected population.
- ✓ Shall ensure that affected people have adequate facilities and supplies to collect, store and use sufficient quantities of water for drinking, cooking and personal hygiene.
- ✓ Shall ensure that drinking water supplied conforms to the prescribed quality standards (IS - 10500)
- ✓ It shall be ensured that water made available for personal and domestic hygiene should not cause any risk to health.
- ✓ Must launch necessary awareness campaigns on safe water handling practices, environmental sanitation and individual hygiene along with hardware provision.
- ✓ Will visit as many areas as possible to have first-hand information of the situation.
- ✓ Will keep District Collector and E-in C / Chief Engineer, RWSS informed daily about the action taken by him in his area.

- ✓ Local MLA, MP and other community leaders must be informed on measures taken by RWS / PHED for an effective disaster response.

Best practices on response

Role of Voluntary Agencies in Drought Response

- (i) *Voluntary Agencies can play an important role in drought response. For example they can operate private water tankers for the scarcity affected areas. Therefore, these agencies may, wherever necessary, be given all necessary assistance by supplying them relevant information and assisting them in water distribution among affected people.*
- (iii) *In case no such facilities are extended to any of the affected areas the Collector may in consultation with the Chief Executive Officer, Zilla Parishad endeavour that suitable voluntary agencies are encouraged to operate such schemes in the affected areas so that vulnerable group of children, mothers and adult women are provided with supplementary nutrition and other package of services.*

5. Panchayat / Village level

5.1) Institutional Mechanism

At the District / Panchayat / village level, community based water and sanitation disaster management plans will focus on enhancing the community capacity in order to respond effectively to disasters, especially for the vulnerable communities and groups. The plan will focus on hazard mapping and identifying the vulnerable areas and population groups, identifying the resources and dissemination of early warning.

Sub- Divisional Officer AE / AEE, RWSS responsibilities

- ✓ Will ensure that supply of materials and spare parts as may be required by the JE, RWSS of the affected areas are available.
- ✓ Will prepare an alternative contingency plan for providing drinking water in case of failure of regular water distribution system during disaster
- ✓ Will ensure all public sources in flood prone areas are disinfected / repaired
- ✓ Under the overall supervision of DDMA, JE/AEE will endeavour to ensure that, amenities in cyclone shelters such as drinking water, bathing and toilet facilities for large number of people during the disaster phase are in usable condition.
- ✓ Will create a roster of technicians for carrying out immediate repairs and restorations of water supply facilities in the event of disasters.
- ✓ Will utilize the services of Block Resource Centres (BRC) to train staff, VWSC & GP members in disaster preparedness / response

Junior Engineer (JE), RWSS responsibilities

- ✓ Will create a list of potential suppliers to arrange for procurement of emergency water and sanitation materials in case of disaster.
- ✓ Ensure availability of field test kits (both for chemical & bacteriological parameters) and / or refill so that GPs could test drinking water quality more frequently in emergencies
- ✓ Ensure sanitary survey of all drinking water sources so as to identify contaminated sources and take preventive/curative action in calamity prone areas.
- ✓ Arrange for safe disposal of existing sanitation waste.
- ✓ Will make prior arrangements in convergence with other relief parties and in consultation with the BDO/Control Room, to send materials in boats, etc. whenever necessary.
- ✓ Will depute designated staff and Self Employed Mechanics (SEMs) individually or in teams with adequate spare parts and materials to repair the non functioning tube wells / piped water supply systems as a measure of preparedness.
- ✓ Must emphasize, at village, VWSC / Pani Samiti levels; the need to include essential water and sanitation interventions in their community based disaster preparedness plan
- ✓ Will arrange for regular water quality testing of drinking water sources in the affected area in case of disasters.
- ✓ Maintain data on repair status of water supply systems and potable water and sanitation systems for villages and panchayats.

- ✓ Prepare plans for water distribution by water tankers, mobile water purification units and other means of distribution and storage of water in an event of disaster.
- ✓ Verify stock of equipment and material available with VWSC /Pani Samiti for performing its function as per the emergency plan.
- ✓ Ensure adequacy of hygiene, sanitation and water supply related material in the Rural Sanitary Marts/ Production Centres.

5.2) Preparedness

Junior Engineer (JE). RWSS responsibilities

- ✓ Will arrange systems for regular water quality monitoring from drinking water sources in the affected area in case of disasters.
- ✓ Must maintain data on repair status of water supply systems and portable water and sanitation systems for villages and panchayats.
- ✓ Must prepare plans for water distribution by water tankers / mobile water purification units and other means of distribution and storage of water in an event of disaster.
- ✓ BRC must maintain list of trained staff, VWSC & GP members for utilizing their services.

Involvement of Local communities/ Schools / GPs / VWSC / Self Help Groups (SHG's) / Gender perspectives

People centred early warning systems rely on the direct participation of those most likely to be exposed to hazards. Without the involvement of local communities, SHG's and communities at risk, government and institutional interventions and responses to hazard events are likely to be inadequate.

- ✓ JE RWSS/PHED must encourage local community coping mechanisms for the detection of Early warning systems.
- ✓ JE must ensure that all early warning systems must be people centred; and people are aware of hazards and potential impacts.
- ✓ Existing schools / GPs / VWSC / Self Help Groups (SHG's) must be involved in raising awareness among individuals and communities

5.3) Early Warning

Junior Engineer (JE) / Assistant Engineer (AE)

- ✓ JE with support from VWSC must conduct the first assessment of damage related to water and sanitation infrastructure.
- ✓ JE must activate the quick response team of technicians, mistrys, masons and others for carrying out quick repairs and restorations of water supply infrastructure in consultation with VWSC.
- ✓ BRC staff must be used to mobilize the trained manpower and work out tasks they can perform.

5.4) Trigger Mechanism

The objective of having Trigger mechanism for natural disasters is to have suo-motu activation mechanism for spontaneous response to set in motion command, control and management of the situation.

Junior Engineer (JE), RWSS shall personally contact the Block Control Room / BDO once or twice daily, collect information on affected areas, pass on the same to sectional Control room and act accordingly. He will request the concerned Assistant Engineer, RWSS for additional support, if required.

Sub- Divisional Officer AE / AEE. RWS responsibilities

- ✓ Will coordinate with the Subdivision & Block level Civil Administration on immediate actions to be taken.
- ✓ Will ensure setting up of emergency Control Room in his office for daily monitoring of situation.
- ✓ Will send supply of appropriate water and sanitation materials and spare parts as may be required by the JE, RWSS.
- ✓ Will take preventive measures against water borne diseases and enable chlorination of drinking water
- ✓ Will keep the EE, RWSS informed once or twice daily or as frequently as required about the situation and action taken.
- ✓ Will liaise with BRCs affectively in public interaction and communication of activities being carried out.

Junior Engineer (JE). RWSS responsibilities

- ✓ Will make prior arrangements in convergence with other relief parties and in consultation with the BDO/Control Room, to obtain and send materials in boats, etc. as necessary.
- ✓ Will arrange to depute designated staff and Self Employed Mechanics (SEMs) individually or in terms with adequate spare parts and materials to repair the non - functional tube wells / piped water supply systems.
- ✓ Will arrange for regular water quality testing of water sources in the affected area in case of disasters.
- ✓ Must ensure water distribution by water tankers / mobile water purification units and other means of distribution and storage of water in an event of disaster.
- ✓ Will arrange for safe disposal of sanitation waste, provision of temporary and mobile toilet units.
- ✓ Will arrange for continuous water quality monitoring and surveillance while transporting drinking water through tankers in filling stations, mobile treatment plants or in packaged pouches in the affected areas / relief camps.

5.5) Role of NGO's / UN Organizations

At Panchayat level NGO's/INGO's will support DWSM to establish quick water and sanitation infrastructure for the affected population.

Key responsibilities at National Level

- ✓ Support PHED/RWS with potable water distribution and protection of water sources from further contamination.
- ✓ Will assist PHED/ RWS Chlorination of water sources and monitoring of water quality parameters
- ✓ Will support RWS/PHED with the construction of field latrines and soak pit latrines at relief camps and final disposal of excreta.
- ✓ Will support RWS/PHED with community mobilization for efficient use of water and sanitation facilities and dissemination of information related to water borne diseases.

Nature of Disaster	Annexure - I Key Technical Preparedness	Responsible person	Sources for reference
Floods & Cyclones	<ul style="list-style-type: none"> ■ Drinking water supply ■ Raising tube-wells, hand-pumps and platforms above flood water level to prevent contamination. ■ Accurate maps showing updated water supply systems facilities should be maintained at all times. ■ Essential stockpiling of supplies like water purification tablets, essential spare parts including detailed user and safety instructions (IEC) in local language etc must be ready in a warehouse. ■ Identifying and maintaining lists of mobile water purification installations available for supplying clean drinking water. ■ Ensuring water supply systems and traditional water sources are maintained and kept functional ■ Water Quality assurance: - Ensuring water quality and regular chlorination of drinking water sources (both at source & point of collection) should be taken up on priority with suitable water quality monitoring system in place. ■ All technicians must be trained on repair and restoration of water sources in emergencies <p><u>Sanitation</u></p> <ul style="list-style-type: none"> ■ For areas prone to floods, appropriate approaches to sanitation such as raised latrines, pit liners or rings, sealed pits / Eco-san toilets must be constructed. ■ Safe management of sanitation waste to prevent outbreak of disease & maintains a clean environment / identifying and maintaining lists of mobile toilets units. 	<p>EE /JE/ AE, RWSS</p>	<p>NDMA Guidelines - "Minimum standards of relief for drinking water" & "Minimum standards of relief for Sanitation and hygiene" / State Relief Codes</p>
Earthquakes	<ul style="list-style-type: none"> ■ Identify vulnerable/weak points of water supply schemes, mainly covering number of villages in seismic area, specially storage tanks and treatment plants ■ Prepositioning of water tankers specially with pumps ■ Prepositioning of HDPE tanks to provide mobile/ temporary storage in the shelter zone ■ Prepositioning of stock of chlorine tablets to avoid contamination or epidemic outbreak ■ Prepositioning of DG sets / solar pumps / electric pumps / drilling rigs / pipes and other related misc items for immediate restoration of water supply schemes 	<p>EE /JE/ AE, RWSS</p>	<p>NDMA Guidelines - "Management of Earthquakes"</p>
Drought	<ul style="list-style-type: none"> ■ A detailed contingency plan for supply of drinking water in rural areas to be formulated with technical help from the Central Ground Water Board (CGWB) and utilising, if need be the rigs and other capital equipment from the CGWB ■ Identify habitations/ villages indicating the month from which they are likely to face water scarcity. 	<p>JE/AE, RWSS</p>	<p>Base material : Rajasthan Drought Relief Manual</p>

	<ul style="list-style-type: none"> ▪ Identification of new bore wells, dug wells, sanitary wells of high yield using HGM maps ▪ Identify high yielding agricultural bore wells for hiring ▪ Prepare adequate plans with route maps to supply safe drinking water through tankers for vulnerable areas covering villages in drought areas, month-wise, identifying sources, routes, delivery points, storage structures etc. ▪ Monitor continuously rural and urban drinking water availability in drought affected areas ▪ Undertake repairs of all tube-wells and hand pumps to make all tube-wells operational and install additional tube-wells after proper identification of sites with desired yield using HGM maps and geo-physical methods. ▪ Steps to be taken for repair, rehabilitation, replacement, rejuvenation and augmentation of existing water supply schemes so that they are all functional and supply water at maximum efficiency. ▪ Implement small schemes like bunding in river as relief work to augment water supply. ▪ Identify water supply systems that are defunct or low yielding and take up artificial recharge structures to benefit the sources through MNREGS, NRDWP Sustainability funds. ▪ Collaborate with NGO's, CBO's in raising awareness ▪ Close monitoring of ground water level and assessing feasibility of drilling of tube wells at various depths. Regional Directors of GWB may be contacted by State agencies in this regard. ▪ In very critical situations transportation of water for drinking purposes by special trains from outside regions must be considered. Source of water, infrastructure for filling rakes and for unloading and for distribution to households has to be planned. States have to indicate requirement to Railways. ▪ Adoption of traditional methods of water storage and completion of ongoing storage projects on top priority. ▪ To reduce the water losses due to evaporation, special chemicals can be used as retardants. ▪ Promote different rainwater harvesting systems, as drought proofing measures through MNREGS as the first priority. ▪ Promote construction of check dams and rejuvenation of other traditional sources ▪ Promote wise water management, dual water supply systems, water saving habits of daily life 		
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	<ul style="list-style-type: none"> ▪ Small cisterns can be erected and submersible pump-sets installed in bore wells where the water level has reduced, for storage of water, and taps can be provided all around the cisterns. ▪ Wherever surface sources of assured capacity are available, they may be preferred by putting infiltration wells in the rivers or by construction of summer storage (SS) tanks to store water during summer. ▪ Construction of cattle troughs in adequate quantity near hand pumps by collecting runoff and near water storages. ▪ Put in place single toll free number and centralised / computerized call centre for registering complaints received on phone, in writing and through internet and provide redressal. ▪ Ensure water quality testing of drinking water sources through laboratories and at village level by trained persons with field test kits. ▪ Identify all water sources like dams, reservoirs, tanks etc. and plan for reserving requirement of drinking water in the event of water scarcity at the earliest to avoid conflict with agricultural demand. ▪ Reservation of water for drinking purposes in multipurpose water reservoirs ▪ Planning for availability and supply of hardware viz. pipes, DG sets, HDPE tanks, vehicles, hand pump repair kits, hand pumps, motors, drilling machines and equipment etc. and chemicals used for water treatment should be done. ▪ Different types of technical assistance and models available with Central Government agencies, scientific and educational institutions should be taken to tackle the situation. 		
<p>Tsunami</p>	<p><u>Drinking water supply</u></p> <ul style="list-style-type: none"> ▪ Essential stockpiling of supplies like water purification tablets, essential spare parts including detailed user and safety instructions (IEC) in local language must be kept in a warehouse. ▪ Coastal area population must be advised by the authorities, not to use well water which gets flooded with water after tsunami for drinking purpose. These wells will remain unsafe for some more time and in future the local authorities must drain all the wells before they can be used. ▪ Water trucking provision / mobile water purification units should be made available for drinking water supply to tsunami relief camps and welfare centres with clear water quality inspection mechanisms. 	<p>EE / JE/AE, RWSS</p>	

<ul style="list-style-type: none"> ▪ Technically feasible technologies must be selected while determining cleaning methods for wells and other sources. ▪ Agreed standards and procedures should be maintained to minimise the risk of collapse during dewatering. ▪ Disinfection of the water and water quality testing should be carried out post cleaning <p><u>Sanitation</u></p> <ul style="list-style-type: none"> ▪ Arrangements for providing temporary sanitary toilets, mobile toilets and for cleaning and disinfecting them twice daily should be planned. ▪ Prior discussion on the prototype of latrine design must be carried out with PHED, DRDA & NGO partners <p><u>Solid and liquid waste management</u></p> <ul style="list-style-type: none"> ▪ For areas prone to tsunami, appropriate approaches to sanitation such as raised latrines, pit liners or rings, sealed pits / Eco-san or tanks must be considered ▪ Proper mechanism must be designed for solid and liquid waste segregation & separating organic waste and inorganic wastes to avoid potential public health risk 		
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Strategic Activity Planner for Drought Preparedness

Annexure-II

Activity	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Monitoring												
Rainfall												
Temperature												
Surface water level												
Assessment												
Drinking water availability												
Irrigation water availability												
Water Conservation measures												
Check dams / water shed												
Rain water harvesting												
Ground water recharge												

Strategic Activity Planner for Drought Early Warning

Annexure - III

Activity	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Potential water deficit												

Nature of Disaster	Annexure - IV Key Response measures	Responsible Person	Sources for reference
Cyclones, Tsunami, Floods, Landslides, Avalanches and Earthquake	<p><u>Drinking water supply</u></p> <p>Objective: Ensure the availability of minimum safe drinking water and sanitation taking into account privacy & dignity</p> <ul style="list-style-type: none"> ▪ Amenities in cyclone shelters such as drinking water, bathing and toilet facilities for large number of people during the disaster phase must be taken into account. ▪ Water Quality assurance: - Ensure water quality and regular chlorination of drinking water sources (both at source & point of collection) is taken up on priority including detailed user and safety instructions in the local language with a suitable water quality monitoring system in place. ▪ Protect existing water sources from contamination, adding chlorine tablets in water for residual disinfection ▪ Provide soaps, detergents, bleaching powder and Jerry cans, including messages in the local language on handling of water and disposal of excreta and solid waste. • If tankering water, always ensure there are tanks with tap stands for tankers to discharge the water, rather than people collecting straight from the back of the tanker. Also ensure appropriate disinfection of water is done. ▪ When tankering water, always factor in the exit strategy before implementing the activity ▪ Follow standards and procedures to minimise the risk of collapse during dewatering; disinfection of the water. water quality testing should be carried out post cleaning of all water sources. ▪ Provide water facilities close to the toilets for hand washing and anal cleansing apart from flushing. ▪ Train village water persons who traditionally operate the GP owned piped water supply schemes. Training inputs need to be provided in areas like disinfection of water using bleaching powder, storage of bleaching powder and checking residual chlorine. <p><u>Sanitation</u></p> <ul style="list-style-type: none"> ▪ For areas prone to floods, appropriate approaches to sanitation such as raised latrines, pit liners or rings, sealed pits toilets must be considered. 	EE / JE/ AE, RWSS	NDMA Guidelines - "Minimum standards of relief for drinking water" & "Minimum standards of relief for Sanitation and hygiene"

	<ul style="list-style-type: none"> • Hand washing must be addressed for all latrines constructed – either at the latrine or at the household level – by the promotion and provision of soap and hand-washing devices. • Women must be consulted about their requirements to manage their menstrual hygiene needs • Where possible, female bathing cubicles should be included in a screened courtyard design with toilets • Camp school latrines should be semi-permanent whereas permanent structures are built for existing schools. It is important to match the construction materials of the school building. <p>Hygiene promotion</p> <ul style="list-style-type: none"> ▪ Continuous IEC activities encouraging and motivating the individuals to use toilets. ▪ Provide audio-visual aids for encouraging toilet utilization. ▪ Provide pictorial representations of toilet use, quantum of water use, hand washing and basic cleanliness. ▪ Disease surveillance and organising hygiene promotion in camps / embankments must be done. ▪ Provision should be made to support adolescent girls and women to address menstrual hygiene management; especially when the communities are forced to leave home to stay in camps with very little belongings. Sanitary cloth/ disposable sanitary napkin should be provided to adolescent girls and women. Proper disposal system is established in the form of incinerator or other mechanism. 		
<p>Drought</p>	<ul style="list-style-type: none"> ▪ Construction of exploratory wells in drought prone areas by the State Govt. with assistance from CGWB and NGO's and energize them as quickly as possible and use for mitigating water scarcity. ▪ Construction of check dams or percolation tanks should be taken up to improve recharge of the ground water drinking water sources. ▪ Drilling of new bore wells of high yield using HGM maps ▪ Implement small schemes like bunding in river as relief work to augment water supply ▪ Collaborate with NGO's in raising awareness ▪ In critical situation transportation of water for drinking purposes by water tankers or special trains from outside regions must be considered. ▪ Construction of different rainwater harvesting systems, as drought proofing measures. ▪ Deepening of riser pipes in hand pumps 	<p>JE /AE, RWSS</p>	<p>Rajasthan Drought Relief Manual & NDMA Guidelines - "Minimum standards of relief for drinking water" & "Minimum standards of relief for Sanitation and hygiene"</p>

- Deepening of bore wells and open wells and raising of parapets of open wells
- Flushing of bore wells and disinfection of all hand pumps & bore wells frequent reborring and energisation of tube wells.
- Introduce regulatory measures for regulating the drawl of groundwater around drinking water sources in affected area.
- Construction of cisterns wherever submersible pump-sets are installed for storage of water and taps can be provided all around the cisterns.

Annexure -V
Early Warning Nodal Agencies

Type of Disaster	Nodal Agency	PHED to monitor key parameters
Cyclone	IMD / Regional Meteorological centre	1) Intensity of rainfall 2) Period of rainfall
Tsunami	Indian National Centre for Oceanic Information Services	1) Height of tidal wave 2) Speed of tidal wave
Floods	CWC	1) Intensity of rainfall 2) Period of rainfall 3) Quantum of release of water 4) Water supply assets in low lying / flood prone / flood plain areas, water quality and disinfection
Landslides	GSI	1) Intensity of rainfall (if applicable) 2) Distribution network / treatment plants situated on steep slopes prone to landslides
Avalanches	Snow and Avalanche Study Establishment	1) Wind speed 2) Intensity of rainfall 3) Overhead service reservoirs without braces 4) Water supply assets on hills/ hill slopes
Heat & Cold waves	IMD	1) Quality of drinking water
Earthquake	IMD	1) Water retaining structures 2) Water treatment plants
Drought	Department of Agriculture	1) Intensity and period of rainfall 2) Declining ground water levels 3) Drying up of surface water bodies 4) Poor recharge of aquifers 5) Wilting of crops