

GOVERNMENT OF ASSAM
PUBLIC HEALTH ENGINEERING DEPARTMENT
DISPUR, GUWAHATI-06

No. E-.652951/250

From : Shri Champak Deka
Deputy Secretary to the Govt. of Assam
Public Health Engineering Department

To : The State Project Coordinator
Assam State Disaster Management Authority
Dispur, Guwahati-06

Sub : Regarding submission of Departmental Disaster Management Plan
for the Financial Year 2026-27 pertaining to Public Health
Engineering Department.

Sir,

With reference to the subject cited above, I am directed to forward herewith a copy of Departmental Disaster Management Plan for the Financial Year 2026-27 pertaining to Public Health Engineering Department for favour of your kind information and necessary action.

This has the approval of Special Chief Secretary to the Govt. of Assam, Public Health Engineering Department.

Yours faithfully,
Digitally signed by
CHAMPAK DEKA
Date: 22-06-2026
17:43:20

Enclo: As stated above.

Deputy Secretary to the Govt. of Assam
Public Health Engineering Department

Memo No E-652951/250-A

Copy forwarded to:

1. The Chief Engineer (PHE) Water, Assam, Hengrabari, Guwahati-36 for information.
2. The Chief Engineer (PHE) Sanitation, Hengrabari, Guwahati-36 for information.

By Order etc.,

e-Signed/-
Deputy Secretary to the Govt. of Assam
Public Health Engineering Department



Government of Assam
Office of the Chief Engineer, Public Health Engineering Department, Assam
Hengrabari, Guwahati-36

No. PHE/TB/544/2022(Pt-I)/ 2152

Date: 19/06/2024

To,

The Secretary to the Government of Assam
Public Health Engineering Department
Guwahati, Dispur-36

Sub - Regarding submission of Disaster Management Plan 2026-27.

Sir,

With reference to the subject cited above and letter under reference, I have the honour to submit herewith the departmental **Disaster Management Plan 2026-27** pertaining to the Public Health Engineering Dept.

This is for favour of your kind information and necessary action.

Encl: As stated above

Yours faithfully,

Chief Engineer (PHE), Water, Assam Cum
Additional Mission Director, JJM, Assam
Hengrabari, Guwahati - 36



DISASTER MANAGEMENT PLAN, 2026-27
PUBLIC HEALTH ENGINEERING
DEPARTMENT

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NR Baruah
PO(DM), PHED.

Chunhury 17/06/2026
 Executive Engineer (PHE)
 O/o The Chief Engineer (PHE) W. Assam
 Hengrabari, Guwahati-36

Asstt. Engineer (PHE) W.
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stt. Executive Engineer (PHE) W.
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Superintending Engineer (PHE) W.
 O/o the Chief Engineer (PHE) W.
 Assam, Hengrabari, Guwahati-36

Addl. Chief Engineer (PHE) W.
 O/o C.E. (PHE)W, Assam,
 Hengrabari, Guwahati-36.

Chief Engineer (PHE)
 Assam, Guwahati-36

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Chapter 1: Introduction

❖ Profile of the Department:

The present Assam Public Health Engineering Department (APHED) was created in 1956 as Public Health Engineering (PHE) Organisation under the Directorate of Health Services to look after the implementation of Rural and Urban Water Supply. This PHE organization started functioning as full-fledged department since 1981 and a separate secretariat was created for Public Health Engineering Department in the year 1989. As per the Rules of Executive Business, the PHED is responsible for providing safe and potable drinking water supply, safe disposal of solid and liquid waste and environmental hygiene in rural areas.

Alongside implementing sanitation activities in rural areas, the Department through its State Training Management Unit (STMU) conducts string of seminars and workshops to educate the rural mass on the importance of sanitation in order to achieve open defecation free status (ODF) for attaining the ultimate goal of better community health. More impetus has been given to sanitation sector with the launching of the Swachh Bharat Mission (Gramin)[renaming of Nirmal Bharat Abhiyan (NBA)] and thereafter as Swachh Bharat Mission, Gramin (SBM-G) by the Hon'ble Prime Minister of India during October 2014.

After achieving ODF status on 5th March, 2019, the focus of SBM(G) has shifted towards ODF Plus in its 2nd phase (2020-21 to 2025-26) with focus on sustaining the efforts during the 1st phase along-with scientific management of solid and liquid waste as well as ensuring overall visual cleanliness in rural areas of Assam.

❖ Mission and Vision of the Department:

The mission of the APHED is to enhance quality of life of the people by ensuring sustainable safe water and sanitation facilities and services along with promoting hygiene practices according to their choices and affordability. The departmental vision is a clean and healthy Assam, in which each person individually and collectively owns and takes the responsibility to ensure an equitable and good quality of life through safe water supply, adequate sanitation facilities and best hygiene practices.

❖ Objective of Departmental Disaster Management Plan:

The objective of the Departmental Disaster Management Plan is

- a. To minimize the loss of lives and Departmental, social and community assets because of natural and man-made disasters.
- b. To provide efficient systems for cooperation and collaboration among **Disaster Management Authority**, at appropriate level/ all the departments / agencies of the Governments at all levels including State / district administration and NGOs.
- c. To build capacities of communities and line departments at national/state/ district/village levels in effective preparedness, response & relief.

- d. To ensure quick and effective response during disasters to minimize casualties and enable quick recovery, restoration and rehabilitation of water & Sanitation facilities without delay.
- e. Disaster means a catastrophe, mishap, calamity or grave occurrence in an area, arising from natural or man-made causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of property, or damage to, or degradation of environment and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area. Safe Drinking Water, Sanitation Facility and Hygiene are some of the basic needs and without availability of those in adequate quality and quantity, there could be serious impacts on human and animal health. 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 of the Departmental Disaster Management Plan:**

Approaches adopted in this plan and Scope of the plan are:

Departmental Disaster Management Plan is to be designed as **Supporting Plan/Sub Plan (para 1.3.4 of SDMP)** and with the intention of assisting everyone:

- In the Public Health Engineering Department, Assam including
- Divisions
- Sub- Divisions
- NGOs and
- The community

It also has to indicate actions that need to be taken in collaboration with other departments at various levels. This Plan should explain, for each category of staff, exactly what they are responsible for and what steps they should take before, during and after a disaster. These would be standard guidelines for staff at all levels so that they may take action immediately.

❖ **Review procedures of the Departmental Disaster Management Plan:**

This **Departmental Disaster Management Plan** will be reviewed and endorsed by the Departmental Disaster Management Committee / Cell and further placed to ASDMA and the State Executive Committee (SEC) for approval of the Chief Secretary, Assam as Chairperson (SEC). Once the SEC endorses the plan, it would be further placed in the SDMA for approval of the Hon’ble Chief Minister, Assam as Chairman, State Disaster Management Authority (SDMA). The plan has to be accompanied by a “Mitigation Action Plan” of the department for the financial year along with a Disaster Management budget earmarked for completion of mitigation activities by the department.

❖ **Mandatory provisions for State Govt. department under “The Disaster Management Act, 2005”:**

Section 40 (1) of the Disaster Management Act, 2005 states that-“Every department of the State Government, in conformity with the guidelines laid down by the State Authority, shall-

- (a) Prepare a disaster management plan which shall lay down the following-
 - i. The types of disasters to which different parts of states are vulnerable.
 - ii. Integration of strategies for the prevention of disaster or mitigation of its effects or both with the development plans and programmes by the department.
 - iii. The Roles & Responsibilities of the department of the State in the event of any threatening disaster situation or disaster & emergency support functions it is required to perform.
 - iv. Present status of its preparedness to perform such roles or responsibilities or emergency support function under sub-clause (iii).
 - v. The capacity building and preparedness measures proposed to be put into effect in order to enable the Ministries or the Departments of the Government of India to discharge their responsibilities under section 37;
- (b) Annually review & update the plan referred to in clause (a); and
- (c) Furnish a copy of the plan referred to in clause (a) or clause (b), as the case may be, to the State Authority

Section 40 (2) Every department of the State Government, while preparing the plan under sub-section (1), shall make provisions for financing the activities specified therein.

Section 40 (3) Every department of the State Government shall furnish an implementation status report to the State Executive Committee regarding the implementation of the disaster management plan referred to in the sub-section (1)

❖ **Organizational Structure of PHED, Assam:**

The Department presently is headed by one Cabinet Minister. One Senior most Secretary looks after PHED besides some other developmental departments of state Govt.

- A. The Department has 2 full-fledged **Secretaries who** look after all the matters of the department viz. all schemes & fund related matter pertaining to Jal Jeevan Mission and SBM (G), matter relating to water sector under SOPD, all establishment matter including RTI on related issues, Court Case/Assembly matters, all schemes relating to Trade & Commerce and inter-departmental coordination etc.

- B. PHED has two Chief Engineers viz.
 - 1. **Chief Engineer (PHE) Water, Assam** deals with Budgets and general administration relating to rural water supply in the state.
 - 2. **Chief Engineer (PHE) Sanitation** deals with the entire sanitation activities in the state.
- C. The State is divided into **7 Zones** headed by **7 Additional Chief Engineers**. Out of these **3 zones fall under sixth schedule areas** without having any Circle. Works Divisions are controlled by the Additional Chief Engineers directly.
- D. **Deputy Director, KRC**, in the rank of a Superintending Engineer looks after Support activities of water supply & sanitation sector besides Water Quality Monitoring.
- E. Under the Additional Chief Engineers there are **9 Circles headed by Superintending Engineers**. Moreover, there is **one Superintending Engineer posted at Head Quarter to look after Quality Control measures** of works for the entire state.
- F. Under those Circles, there are **46 works Divisions in rural areas and 3 urban Division headed by Executive Engineers**.
- G. Amongst the 48 rural divisions, **Store & Workshop Division** procures inventory for all Divisions.
- H. District level Laboratories are under the administrative control of the Divisional Executive Engineers of District Head Quarter Division.
- I. There are **91 sub-divisions** headed by **Assistant Executive Engineers** and **6 sub divisions** fall under **3 urban division**.
- J. Amongst the other technical officers there are **Assistant Engineers** and **Junior Engineers** who are posted either in the **Divisions/Sub Divisions** to look after field level activities.
- K. **Sub Divisional Laboratories** are under the administrative control of the Assistant Executive Engineers of concerned sub-divisions.

Apex Body of the State Water & Sanitation Mission (SWSM) i.e. the highest policy making body of PHED, is chaired by the Chief Secretary of the state

Flow diagram of the Institutional Architecture is furnished in **Annexure-1**.

Though PHED does not have separate Disaster Management wing, Departmental DM committee (State Level) initially formed in 2018 has been reconstituted in 2024. The committee has again been reconstituted in 2026. Detail of the present Committee is furnished in **Annexure-2**.

Present institutional structure does not conform to the norms as described in Disaster Management Act, 2005. However, to bridge the gap, an organogram is suggested in the SOP issued by GOI and PHED is following the same after

customising it for state specific purpose. The organogram is depicted in the SOP Chapter.

❖ **Manpower availability in PHED, Assam:**

- At present the department has around 12,000 employees in its payroll in addition to a good number of contractual employees through JJM at State and District level to support its activities.
- Department does not have any expert on Disaster Management/Mitigation. However, though being an engineering department, qualified engineers have acquired knowledge through training or experience.
- An abstract of manpower available in PHED is furnished in **Annexure-3**.
- However, as suggested in SOP and **Annexure-4-A**, duties and responsibilities are rearranged amongst the available manpower withdrawing from non- important activities in the wake of disaster.

❖ **Research or Training facilities in PHED:**

1. State Training Management Unit (STMU) is functioning from O/o Mission Directorate, SBM (G) Assam for imparting training on Sanitation related matters to Departmental functionaries, field functionaries such as BRCC/CRCC, Swachhagrahis and PRI members. It is under the administrative control of the Mission Director, SBM-G Assam.
2. Departmental officers are deputed to undergo short term courses/Trainings even outside the state on Technical/Managerial subjects including Disaster Management.
3. PHED has also collaborated with SIRD, NIRD for PRI trainings and trainings at community level. In this regard, it may be noted that based on the meeting held between Hon'ble Minister, PHE and Hon'ble Minister, P&RD, it was decided that convergence with P&RD will be undertaken for creation of Solid & Liquid Waste Management infrastructure at village, block and district level as well as construction of need-based Community Managed Sanitary Complex (CMSC) at village level. To carry it out in an effective manner, 6 nos. of zonal level workshops were conducted by O/o Mission Directorate, SBM-G Assam in convergence with district functionaries and PRI members to discuss the fund distribution modalities under 16th FC and activities to be undertaken by PRI functionaries during SBM (G) Phase II.

In addition to this, the specialists engaged under O/o Mission Directorate, SBM-G Assam are also invited as resource persons in various training programmes conducted by SIRD with regard to implementation of 16th FC grants at district, block and village level.

4. District Level Trainings are imparted to PRI, community members including PHED field staff on aforementioned issues by District Training Management Unit (DTMU).

Department follows a four tier training schedule for imparting training at different levels. Flow diagram of the same is furnished in **Annexure-5**.

PHED developed low cost but very effective water purifying packets to be used during natural calamities, that can purify available water (even turbid) for drinking purpose.

❖ **Acts & Rules administered by the Assam PHED:**

- A. As a state Govt. Department, PHED has to follow:
 - State Govt. rules, standing orders, circulars, advisories etc. along with any instructions issued by appropriate authority of the state Govt. in general.
 - Being an engineering Department, activities of the department is governed by APWD rules and accounting procedure.
- B. This department is implementing two flagship programmes of Central Govt. namely:
 - **Jal Jeevan Mission (JJM)**– The objective of this programme is to provide safe drinking water in adequate quantity i.e. 55 lpcd and of prescribed quality as per BIS:10500 through Functional Household Tap Connection(FHTC) to every household across the State by 2024. However, for better implementation of the works, the Mission has been further extended to 2028.
 - **Swachh Bharat Mission (Gramin)** – Main objective of this programme is to provide twin-pit toilets to rural households along with scientifically sound and geographically suited facilities for management of solid and liquid waste generated in rural areas, along-with provision of need based community managed sanitary complexes. The aim of the mission is to ensure universal coverage and attain the status of *Sampoorn Swachhta* in rural areas of Assam. Therefore, guidelines issued by the Department of Drinking Water and Sanitation, Ministry of Jal Shakti, GoI is adhered to by the Department.
- C. PHED follows BIS standards and codes for construction and procurement of materials.
 - In absence of **State water Policy**, PHED follows National Water Policy 2012 in principle. PHED is duty bound to follow instruction issued by appropriate govt. agencies on disaster management.
 - In discharging the functions under the two sectors by two Chief Engineer (PHE)s, APHED is to follow certain norms, rules & procedures as prescribed in “Assam PWD Accounts Code”, “Assam PWD Manual”, “Delegation of Financial Power – 2000”, “Assam Financial Rules” and various Govt. office memorandum, circulars and notifications issued from time to time.
 - All administrative and policy making decisions are taken at the Governmental level after obtaining approval of the minister in-charge.
 - In case of works financed by Government of India, proposal and DPR are sent to the concerned Ministry of Govt. of India for necessary approval of DPR with financial sanction etc. as required, as per norms and guidelines issued by the respective Ministry of Govt. of India.

- Financial powers are exercised as per notification of state Finance department.

❖ **Annual Plan Budget of the Department:**

1. PHED receives fund mainly from two sources namely State Government and Central Govt. for implementation of different programs.
2. **Annual Budget** for the 1st 4 months of the FY year 2026-27 is Rs. 224820.83lakhs. This includes provisions for both Water Supply and Sanitation sector. All Central & External agency funds are also routed through this annual allocation.

❖ **Schemes and programmes being implemented by the department:**

- A. PHED has mandate work in rural water supply and sanitation sector in Assam. It is also implementing two flagship programmes of Central government viz.
 - a. Jal Jeevan Mission (JJM)
 - b. Swachh Bharat Mission (Gramin) [SBM (G) and
 - c. State run programmes on water supply.
- B. PHED has established a chain of laboratories at different levels. **State Referral Laboratory is under the administrative control of Mission Director, JJM.**
- C. The department has (as on 31.03.2026) provided around 59,05,900 nos. of functional household tap connections in rural areas. On the other hand, under SBM-G, **around 62,24,676** Individual Household Toilets have been constructed by the department.
- D. On priority basis, **PHED is providing drinking water facilities to all educational institutions like Schools, Anganwadis etc.** It may be mentioned here that that Institutions (schools) are generally used as relief camps in the wake of disaster.
- E. Similarly, extensive sanitation activities are carried out under SBM (G)
- F. **Structured water quality monitoring and surveillance programme, with community support, helps the community to lessen the risk of water borne diseases.** Similarly, awareness programme and capacity building programmes in water supply and sanitation sector become very useful in containing water borne diseases and also prepare the community to be resilient to the disasters.

❖ **History of Disasters faced by the Department:**

- **Flood and erosion** are the main disasters annually faced by the department.
- **Cloud burst, flash flood and Thunder Storm/Lightning** are other types of disaster experienced and tackled by this department.
- Department has to arrange for water supply facility during **Drought like situation** in some pockets of the state.

- Outbreak of **Acute Diarrhoeal Diseases (ADD)** is sometimes noticed in Tea Garden Areas of Upper Assam districts during Monsoon.
- PHED has not yet experienced any major earthquake and devastation thereto till date.

An abstract of relief activities conducted by department during Flood, 2025 is placed in **Annexure-6**.

❖ **Provision of fund during last three years for responding to any of the disaster:**

- For the **FY 2023-24 and 2024-25 was Rs. 0.90 lakh and Rs. 0.01 lakh respectively** earmarked for **Disaster Management** activities.
- However, 2 new heads of accounts were created during FY 2024-2025 for implementation of DRR Roadmap, 2030 and an amount of **570.00 Lakh** was allocated against the 2 newly created heads of accounts for the FY 2025-26.
- Support from District Administration is sought for works undertaken by the department as per instruction of the District Administration.
- At present, department is conducting **Training and Awareness programmes on sanitation related issues under HRD Expenditure head** earmarked for the same.
- **Truck mounted mobile water treatment plants** for use during Disaster situation, was procured from normal State and Central Fund. A portion of **Flexi Fund (Central Fund)** is also used for **Disaster Management activities**.

❖ **Executive instructions and circulars issued to cope with disaster:**

- Earlier Disaster Management activities had been **relief & rehabilitation** centric. Assam Relief Manual-1976 was taken as base document for such activities. Department asked all District level officers (Executive Engineers) to follow the provisions of Chapter-XV of Assam Relief Manual. Depending on the ground situation of the relief camp, instructions are issued regarding deployment of-
 - Mobile water treatment plant, Mobile laboratory, Trucks for transportation.
 - Installation of Tube well, Sanitary Toilet and
 - Distribution of Bleaching Powder, Chlorine/Halogen Tablet, Water purification packets, Bacteriological testing vials etc.
- However, because of shift in policy i.e from Relief to Preparedness, it has been emphasized to keep the community resilient towards the disaster. A few advisories were issued from state level are enclosed in **Annexure- 4-A, 4-B & 4-C** including preparation of master inventory

as a preparedness measure. A tentative list of such inventory is furnished in **Annexure-7**.

❖ **Details of mock drills or special programmes organised:**

- Department participates in all mock drills, organized by State/District Disaster Management Authority from time to time.
- **Water Quality Testing of vulnerable sources** is done **in pre, during and post monsoon period** as a routine job.
- Water sources are also disinfected if bacteriological contamination is found.
- **Special awareness drives with community involvement** is carried out for **Japanese Encephalitis/ Acute Encephalitis** affected areas before monsoon starts. Moreover, Swachhata (Sanitation) drives are under taken along with demonstration of hygiene practice measures during that period.

❖ **Committees or User groups formed at Village/grass root level:**

- With the aim of community involvement and decentralized planning, PHED has formed Users' committees at different levels as per JJM and SBM (G) guidelines, involving PRI, Community leaders, NGO and officials. These are:
 - State Water & Sanitation Committee (SWSM)
 - District Water & Sanitation Mission (DWSM)
 - District Water & Sanitation Committee (DWSC)
 - Gaon Panchayat Water and Sanitation Committee (GPWSC)
 - Village Water & Sanitation Committee (VWSC)
- Besides, scheme level **Users' committees** are formed with the aim of dual management of Piped Water Supply Schemes.
-

❖ **Training programmes organised for departmental staff with special reference to preparedness for disaster management:**

- As mentioned above, PHED is maintaining its own Training activities through KRC.
- From 2017-18 onwards, Disaster Management/ preparedness components are included to its normal training programmes for departmental staff, PRI as well as grass root level participants.
- An abstract of the different training conducted in the FY 2025-26 is enclosed in **Annexure-8**.

❖ **Awareness Generation Programme organised:**

PHED organizes Awareness programs on water, sanitation and hygiene issues regularly; besides special drives against Japanese Encephalitis/Acute Encephalitis, Water Quality testing, cleanliness and Sanitation are organized depending on need.

❖ **Research or Impact assessment/evaluation studies conducted:**

- During 2012, Base line Survey to assess the Sanitation Status of the state was conducted. However, since the focus under SBM-G Phase II has shifted towards ODF Plus, GoI has initiated the ODF Plus Baseline Survey to ascertain the current scenario in the villages. The data collected from this survey will be helpful for the districts as well as the state in preparing action plans for achieving ODF Plus status.
 - Water Quality tests are done regularly
 - Water Supply status of habitations are updated every year
 - Techno-Economic evaluation and environment impact assessment study was undertaken in World Bank Assisted Water supply and Sanitation Project.
- Findings of such survey are regularly uploaded in the website of Department of Drinking water & Sanitation, Ministry of Jal Shakti, GoI (www.<https://jalshakti-ddws.gov.in>).

Chapter 2: Impact of Disaster on Department

A wide range of threats and hazards pose a significant risk to the State institutions, infrastructure and community. Earthquakes, landslides, floods (including flash floods and urban flooding), thunderstorms & lightning, droughts, cloud bursts, erosion, forest fire, climate variability and climate change, epidemics, infectious diseases, chemical hazards and hazardous material release / chemical spills, transportation accidents- road / rail / inland waterways including boat capsize, shortages/problems resulted due to loss of infrastructure, structural collapse of infrastructure, act of terror, riot, sabotage of critical infrastructure, dam failures, mine collapse, CBRNE, ground water pollution, any slow/rapid changes in the environment causing problems related to health / loss of life / damage to assets / impact on livelihood / economic loss / landscape damage or changes etc. present significant risks to the State of Assam.

PHED need to prepare it to respond to the following disasters in general:

Sl. No.	Type of Disaster	Name of Disaster
1	Natural	Flood, Flash Flood, Cloud Burst
		Erosion, Land slide
		Earthquake
		Thunderstorm & Lightning
		Drought
2	Operational & Man made	Fire
		Epidemic
		Act of terror, Riot, Sabotage, Explosion
		Accidents (transportation and structural failure etc.)
		Accidents (Chemical, leakage etc.)

Roles and Responsibilities of PHED, as described in clause 3.2.2 of State DRM plan, are

Department / Agency	Disaster Management Roles and Responsibilities
Public Health Engineering Department	➤ Nodal department of the state government entrusted with the responsibilities of providing safe drinking water to the people of Assam ➤ Responsible for ensuring safe hygiene through Swachh Bharat Mission (Gramin). ➤ Provide emergency supply of safe drinking water in disaster situations ➤ Assess the impacts of extreme events (natural and

	man-induced) on facilities of the department and propose / undertake mitigation measures ➤ Undertake risk assessment and management of ground water resources in emergency situations
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A matrix of main **probable disasters and areas in which those may affect the department** are furnished below-

Sl. No.	Type of Impact/ Damage	Type of Disaster	Areas likely to be affected	Dimensions of Threat/ damage	Vulnerable areas
1.	Structural	Flood	Water Supply facilities	Submersion of treatment plant; pumping facility; Flown away pipelines, Intake arrangement, silting in Piped Water supply Schemes. Submersion of Spot sources & silting.	As mentioned in Annexure-9 .
			Sanitation Facility	Submersion of Community & Institutional Toilets; Siltling Damage due to Submersion of Individual Toilets	
			Administrative Unit (Office & Establishment)	Damage to the office building, Stores due to submersion or water logging.	
			Connectivity (physical)	Road connectivity may be disrupted due to water logging/Submersion resulting difficulty in mobilization of resources to the affected area/people	
	Non Structural		Communication	Disruption of Telephonic communication may affect communication flow within the Department resulting delay in resource mobilization.	

				Difficulty in assessment of damage occurred and relief required to the marooned people due to disruption of communication.	
			Threat to or loss of life	Possibility of outbreak of water borne & Sanitation related diseases. Casualty due to flood water.	
			Threat to Eco system	River bank erosion leading to shifting of intake arrangement. Degradation of soil due to heavy siltation/water logging for a prolonged period, leading to ground and surface water contamination.	
			Strain on Institutional Capacity	Inadequate assessment/inventory of critical inputs. Inadequate information on source of availability of materials. Lack of knowledge & understanding of pooling together resources under various departments. Inadequate fund. Lack of knowledge on Command system as interpreted in SOP.	
2	Structural	Drought	Water Supply facilities	Lowering of ground water table will make the ground water structures dry & inoperable. Surface water bodies will dry up which will affect the	

	Non Structural			intake point of schemes. Damage of Rain Water harvesting Structures.	Rainshed areas of Assam. Specially pockets of Nagaon, Golaghat, Udalguri and hill Districts.
			Sanitation Facility	Less water for ablution may lead to unhygienic condition of the toilets.	
			Communication	Difficulty in assessment of damage occurred and relief required to the affected people due to non-identification of proper contacts in the community.	
			Threat to or loss of life	Scarcity of drinking water may lead to use of unsafe water resulting outbreak of water borne & Sanitation related diseases.	
			Threat to Eco system	Adverse effect on Aquifer. Loss of flora & fauna.	
			Strain on Institutional Capacity	Inadequate assessment/inventory of critical inputs including Rigs & Vehicles. Unavailability of skilled driller/hand pump mechanic. Inadequate information on source of availability of materials. Lack of knowledge & understanding of pooling together resources under various departments. Inadequate fund.	
3	Structural	Earthquake	Water Supply facilities	Treatment plant; Overhead / underground reservoirs, intake points may get damaged along with snag in pipeline because of uneven	Assam is situated in Zone-V, in Earthquake zoning map

				vibration. Platforms of Spot sources and underground water structures may also be affected.	of BIS. Micro Zoning is done in some parts of Guwahati city only. Entire state may be considered vulnerable.
			Sanitation Facility	Toilets may get damaged because of destabilization of ground.	
			Administrative Unit (Office & Establishment)	Office building and inventory may get damaged	
			Connectivity (physical)	Road connectivity may be disrupted due to breach in road resulting difficulty in mobilization of resources to the affected area/people.	
	Non Structural		Communication	Disruption of Telephonic communication may effect on communication flow within the Department resulting delay in resource mobilization. Difficulty in assessment of damage occurred and relief required to the marooned people due to disruption of communication.	
			Threat to or loss of life	Casualty due to damage of structures. Possibility of outbreak of water borne & Sanitation related diseases because of consumption of unsafe water, open defecation & carcass.	
			Threat to Eco system	Destabilization of underground and surface may affect aquifer, soil characteristic. Loss of flora & fauna. Change of river course etc.	

			Strain on Institutional Capacity	Inadequate assessment/inventory of critical inputs. Inadequate information on source of availability of materials. Lack of knowledge & understanding of pooling together resources under various departments. Inadequate arrangement for quick removal of debris. Inadequate fund. Lack of knowledge on Command system as interpreted in SOP.	
4	Structural Non Structural	Thunderstorms/Lightning	Water Supply facilities Sanitation Facility Administrative Unit (Office, Establishment) Connectivity (physical) Communication	Snag in electrical equipment. Treatment plant; Overhead / intake points may get damaged along disruption of pipeline. Platforms & of Spot sources may also be affected. Toilets may be damaged because of high intensity of wind, falling of trees & man-made structures. Office building and inventory may get damaged Road connectivity may be disrupted due to closure of road resulting difficulty in mobilization of resources to the affected area/people. Disruption of Telephonic communication may effect on communication flow within the Department	

				resulting delay in resource mobilization. Difficulty in assessment of damage occurred and relief required to the marooned people due to disruption of communication.	
			Threat to or loss of life	Casualty because of damaged structures, hurt by trees, electrocution etc. Temporary scarcity drinking may lead to use of unsafe water resulting outbreak of water borne & Sanitation related diseases.	
			Threat to Eco system	Loss of flora & fauna.	
			Strain on Institutional Capacity	Inadequate assessment/ inventory of critical inputs. Inadequate information on source of availability of materials. Lack of knowledge & understanding of pooling together resources under various departments. Inadequate arrangement for quick removal of debris. Inadequate fund. Lack of knowledge on Command system.	
			Threat to or loss of life	Scarcity of drinking may lead to use of unsafe water resulting outbreak of water borne & Sanitation related diseases.	
			Threat to Eco system	Adverse effect on Aquifer. Loss of flora & fauna.	
			Strain on	Inadequate assessment/	

			Institutional Capacity	inventory of critical inputs including Rigs & Vehicles. Inadequate information on source of availability of materials. Lack of knowledge & understanding of pooling together resources under various departments. Inadequate fund. Lack of knowledge on Command system as interpreted in SOP.	
5	Structural	Erosion/Landslide	Water Supply facilities	Damage of treatment plant; pumping facility; pipelines, Intake arrangement, Damage of Spot sources.	River bank, Flood prone areas, un-stabilized soil slopes, hilly areas due to hill cutting without proper protection.
			Sanitation Facility	Damage of Sanitary Toilets.	
			Administrative Unit (Office & Establishment)	Damage to the office building, Stores materials.	
			Connectivity (physical)	Road connectivity may be disrupted due to erosion/landslide resulting difficulty in mobilization of resources to the affected area/people.	
	Non Structural		Communication	Disruption of Telephonic communication may affection communication flow within the Department resulting delay in resource mobilization. Difficulty in assessment of damage occurred and relief required to the marooned people due to disruption of communication.	

			Threat to or loss of life	Possibility of outbreak of water borne & Sanitation related diseases. Casualty.	
			Threat to Eco system	River bank erosion leading to shifting of intake arrangement. Loss of flora & fauna. Shifting of settlement.	
			Strain on Institutional Capacity	Inadequate assessment/inventory of critical inputs. Inadequate information on source of availability of materials. Lack of knowledge & understanding of pooling together resources under various departments. Inadequate fund. Lack of knowledge on Command system as interpreted in SOP.	
6	Structural	Ethnic Clash/Riot	Water Supply facilities	Damage to Pipeline, Piped Water supply scheme.	Border areas of the state and pockets of a few lower Assam Districts
			Sanitation Facility	Damage to institutional & Household toilets.	
			Administrative Unit (Office, Establishment)	Damage to the office building, Stores.	
			Connectivity (physical)	Road connectivity may be disrupted resulting difficulty in mobilization of resources to the affected area/people.	
	Non Structural		Communication	Disruption of Telephonic communication may affect communication flow within the Department	

				resulting delay in resource mobilization. Difficulty in assessment of damage occurred and relief required to the marooned people due to disruption of communication.	
			Threat to or loss of life	Loss of life. Possibility of outbreak of water borne & Sanitation related diseases because of consumption of unsafe water, Open Defecation and unsafe disposal of carcass.	
			Threat to Eco system	Damage of forest, loss of flora & fauna. New settlement	
			Strain on Institutional Capacity	Inadequate assessment/inventory of critical inputs. Inadequate information on source of availability of materials. Lack of knowledge & understanding of pooling together resources under various departments. Inadequate fund. Lack of knowledge on Command system as interpreted in SOP.	
7	Structural	Epidemic	Water Supply facilities	Contamination of water source. Abandoning water supply system out of fear.	
			Sanitation Facility	Unsafe disposal of Sewage. Abandoning sanitary toilet out of fear.	
			Administrative Unit (Office &	Risk of abandoning premises by a few	

	Non Structural	Establishment)	employees out of fear.	Japanese Encephalitis & Acute Encephalitis Syndrome affected many Districts. Diarrhea/ ADD affected areas including Tea Gardens.
		Connectivity (physical)	Road connectivity may or may not be available to reach the affected people and mobilization of emergency support.	
		Communication	Communication facility to assess the requirement of the affected people may not be available. Contacts of the department in the affected area may not be available.	
		Threat to or loss of life	Possibility of outbreak of water borne & Sanitation related diseases. Shifting of settlement may bring hardship.	
		Threat to Eco system	Surface and ground water contamination. Loss of lives may ultimately affect local eco system.	
		Strain on Institutional Capacity	Lack of knowledge to assess the seriousness of the problem. Inadequate assessment/inventory of critical inputs. Inadequate information on source of availability of materials. Lack of knowledge & understanding of pooling together resources under various departments. Inadequate fund. Lack of knowledge on Command system as interpreted in SOP.	

Executive Engineer /Nodal officer at district level will ensure dissemination of information as mentioned above, and collect field data through the field staff/ officers so that, contingency plan can be drawn up for addressing specific type of disaster.

These matrixes will help the departmental officials/staff to understand the whole gamut of disaster and prepare for the same in a better way.

Water Quality affected habitation:

Ground water of some habitations is found to be affected by water quality. Amongst those, Arsenic and Fluoride are toxic. Iron contamination is predominant in almost all districts except two hill districts. Bacterial contamination is also observed in some cases because of poor operation and maintenance of the spot sources by the community. Moreover, improper sanitation and hygiene practice may lead to outbreak of water borne diseases even though sources are kept in proper condition.

At present, these types of contamination are naturally occurring; not anthropogenic. There are two guidelines issued by NDMA for chemical hazards viz:

1. Management of chemical (terrorism) disasters and
2. **Chemical Disaster** (industrial)

But these two guidelines do not deal with such problem. In fact, such type of chemical contamination cannot be correlated with disaster management. Chemical contamination in ground water occurs naturally since prolonged period and manifestation may be visible after consuming years together because of very low concentration in drinking water.

Emergence of various contaminants in ground water like Arsenic, Fluoride, Iron etc. has obliged to put more emphasis on water Quality. Water Supply Schemes are taken up by PHED for mitigation of quality problem in those habitations according to the availability of fund. Mitigation measures include both short term/immediate and long term/permanent measures.

Chapter 3: Prevention and Mitigation

Preparedness is an important subject which needs to be provided to the community likely to be affected by any type of disaster prior to development of any plan for prevention and mitigation strategy.

Water testing activities of Public Drinking Water Sources are given priorities.

At present, Assam PHED has **1 no. of State Level Laboratory, 34 nos. of Divisional Level Laboratories and 46 nos. of Sub-Divisional Level Laboratories. Moreover, 2 nos. of Mobile Laboratory Van are there covering the entire State.**

The Mobile Laboratories for Water Quality testing is intended to cover rapid testing of the basic water quality parameters in remote and hilly areas where there are no Laboratories within a reasonable distance of the sampling station. The Mobile Laboratories shall provide support during natural disaster, epidemic, large scale emergencies, and refugee camps and to areas without electricity supply.

The key activities which may be planned to be conducted in the upcoming days under preparedness are as follows:

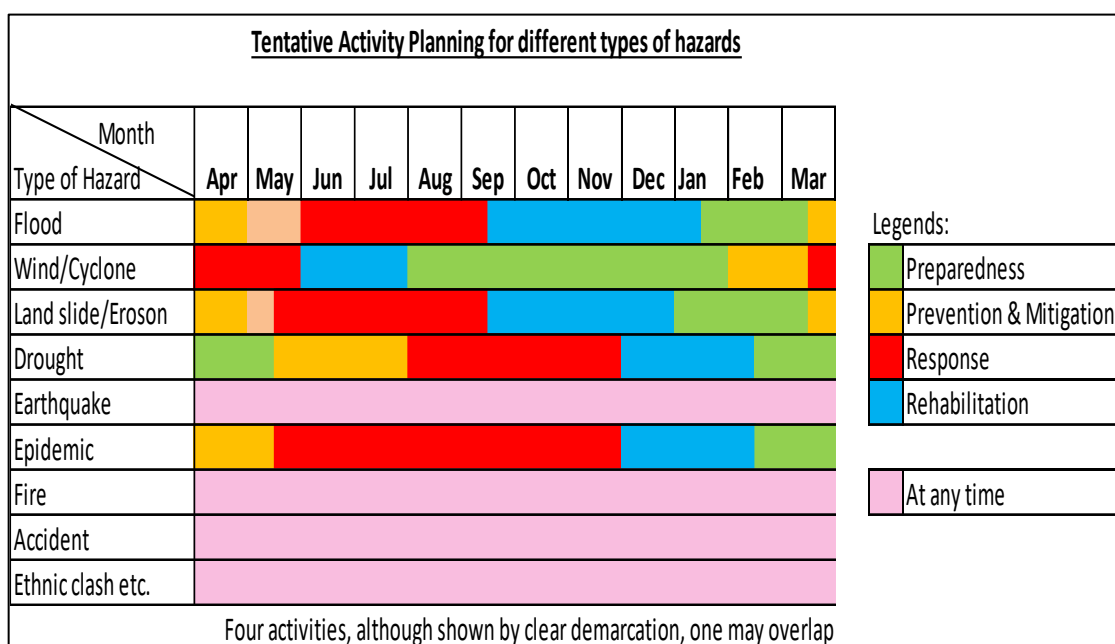
- Consultation with the Stakeholders likely to be affected by a disaster.
- Development of Emergency preparedness and 'All hazards' response plan
- Roles and responsibilities of the stakeholders before the occurrence of a disaster
- Standard Operating Procedures
- Warning /Alert systems
- Resource inventory and list of key contacts/specialist
- IEC activities

The key activities which may be planned to be conducted in the upcoming days for prevention and mitigation are as follows:

Structural and non-structural measures

- Risk transfer /Techno-financial regime
- Infrastructure strengthening Critical infrastructure protection
- Warning systems (WS)
- IEC activities
- Relocation to safe places

Disaster Management Planning is still in its infant stage in our state. A large section of the departmental functionaries still treat DM as synonyms of relief operation rather than emphasis on preparedness, Prevention and mitigation aspects.



Activity wise planning considering all hazard approach

a. Preparedness:

Activity	Field intervention	Existing level of preparedness	Additional measures to be taken
Stakeholder consultation	Identification of contact persons & PRI/Community leader.	✓ Consultation with District Administration/DDMA/A SDMA (all Govt. Departments)	Consultation with Community leaders, PRI & NGO of vulnerable area.
Emergency preparedness and 'All hazards' response plan	Assessment of resources, inventory and intensity of hazard. Engagement of expert to frame up the hazard plan.	✓ Flood contingency plan is prepared at state level.	District & State level DDMP plan are to be prepared on regular basis taking aforementioned mission area into account including financial implication thereof.
Roles and responsibilities	Identification of functions (staff) to carry out responsibility as	✓ Defined by Departmental hierarchy. ✓ As directed by Govt. rules/ASDMA/DDMA	Clear command structure during disaster, involving multi-disciplinary

	fixed by authority.		roles need to be established.
Standard Operating Procedures	Study of organisational structure and convergence initiative. Convergent SOPs to be prepared	✓ Prepared for all Rural Drinking water & Sanitation departments by GoI. ✓ Under SOP of Chapter-8.	Need to be customised as per local condition.
Mutual-aid Agreement	Assessment & Identification of such agency. Identification of area, where support is necessary.	✓ Convergence initiative amongst Govt. departments is going on. ✓ Pre-contracting agreement concept is yet to be established.	Department need to think for pre-contracting.
Mock drills /Table- top exercises/ Simulation Exercises	Identification of resources at local level.	✓ Active participation by the department, whenever arranged by District administration/ ASDMA.	Need to be organised in rural areas.
Testing of the plan		✓ Exercising the Preparedness Action Plan in all aspects for the financial year.	Achievement Report on the Action plan.
Scenario planning		None	Expertise need to be hired.
Early warning /Alert systems	Collection of historical/current data	✓ Available at state & national level. Annexure-10 and 11 respectively.	Scientific data collection is required. System need to be developed to disseminate to the field level staff immediately.
Resource inventory and list of key contacts/specialist	Identification of fast moving water supply and sanitation components. Identification of key departmental contact persons	✓ List of mobile laboratory, mobile water treatment plants are available. ✓ Contact details for procurement of water supply and sanitation related materials/ equipment etc. are	Online record of availability of equipment/materials. Names and contact nos. of key departmental personnel may be

		furnished in Annexure-12	uploaded in departmental website.
Evacuation plan	Not related to this department		

b. Prevention and mitigation

Activity	Field intervention	Existing level of preparedness	Additional measures to be taken
Structural measure	Identification of vulnerable water supply, Sanitation & office structures. Plan for mobilising resources to the affected people in the event of disruption of connectivity.	✓ Vulnerable structures are identified at Division level manually. ✓ Light weight PVC sanitation components, water storage tanks and water purifying packets are made ready considering worst connectivity. ✓ Taking support from other department and District administration in case of difficulties in connectivity with the marooned people.	Institutional & Community Toilets should be put into GIS platform.
National Building Code / Indian Standard Code of Practice (BIS)	Relevant codes, manuals are to be made available at Division level (field)	✓ RCC structures are constructed as per provision of BIS codes. ✓ Water Supply & sanitation structures are constructed as per provision of water supply, sewage & sewerage manuals (CHEEO) and GoI guidelines (MDWS). ✓ IS:10500 is followed in case of water quality issues	Recent changes made in the codes, manuals etc. need to be incorporated in design & Planning of more effectiveness.
General Development Control Regulations	Relevant codes, manuals are to be made available at Division level (field)	✓ RCC structures are constructed as per provision of BIS codes. ✓ Water Supply & sanitation structures are constructed	Recent changes made in the codes, manuals etc. need to be incorporated in

(GDCR) / Building Bye laws		as per provision of water supply, sewage & sewerage manuals (CHEEO) and GoI guidelines (MDWS). ✓ IS:10500 is followed in case of water quality issues	design & Planning of more effectiveness.
Infrastructure Strengthening		✓ Regular repair of structures. ✓ Protection measures to electrical instruments, underground sumps etc. of PWSS are taken. ✓ Raised Hand Tube wells, is installed so that those are not submerged during flood. ✓ In low lying areas, Toilet is constructed in elevated locations.	Retrofitting of old RCC structures has become necessary.
Critical infrastructure Protection.	Identification of such structures	✓ Repair, strengthening and protection measures as and when required. ✓ Protection of Intake point and Deep Tube wells, SCADA system of PWSS.	Retrofitting for earthquake/wind/ cyclone.
Non-structural including Inventory management.	Identification of key personnel, Mechanic/Mason, Water Quality Tester, Driver etc. Identification of type of materials and equipment necessary during emergency. Planning for communication network that does not fail even in worst scenario.	✓ Formation of Rapid Action Team at District Level. ✓ Procurement and deployment of resources and equipment for use in water supply and sanitation purpose strategically. ✓ Existing information sharing pattern through department field functionaries. ✓ Promoting local contacts in remote areas. ✓ Support from other departments and District administration.	Online status of inventory. Arrangement for runner and porters.
Land use planning	Study of the present land use pattern	✓ Improvement of present site.	

regulations / Zoning		✓ Selection of safe site for construction of water supply, sanitation assets and office building.	
Risk transfer /Techno-financial regime	Study of probable physical loss due to Disaster.	✓ GoI guidelines for insurance of Expensive Water Quality Instrument may be recalled. ✓ Insurance of mobile water treatment plant.	Promoting catastrophe risk financing, risk insurance, catastrophe bonds, micro-finance and insurance etc.
Early warning systems (EWS)	Collection of data and to feed the system for forecasting.	✓ For flood early warning system developed by ASDMA & NESAC is followed. ✓ For other types of disasters, name of the nodal agencies are furnished in Annexure-10 and 11.respectively. ✓ IDSP's early warning system is taken into consideration in case of diseases. ✓ For dissemination of early warnings to appropriate level, control rooms are set up at Division level or an official from division is attached to the control room set up by District Administration.	Early warning need to be disseminated to field level. In such case FLEWS, initiative by ASDMA may be replicated in case of other hazards.
Education and training	Identification of the key persons and Trainers. Training needs assessment.	✓ Imparting training regarding operation of specialised equipment. ✓ Imparting training and general awareness regarding safe water, sanitation and personnel hygiene during emergency. ✓ Special Diarrhoea control, Japanese Encephalitis/Acute	Special awareness drive prior to possibility of occurrence of a hazard.

		Encephalitis syndrome, Sanitation and Disinfection drive.	
Relocation to safe places	Identification of safer sites/highlands for relocation	✓ Vulnerability assessment of assets through flood inundation layers overlay in GIS platform ✓ Relocation of Tube wells/hand-pumps etc. to safer places if located in vulnerable area.	We can plan for identification of safer sites/ highlands for relocation in consultation with Water Resources Department and Concerned District Administration

Public Health interventions necessary for different types Disaster and responsibly of different PHED functionaries are enlisted under SOP Chapter.

Two Relief teams may be constituted as mentioned in Relief Manual-1976 in each district and may comprise of following personnel.

- AEE – as team leader
- Sectional Officer/in-charge(AE/JE) of the affected areas
- One person experienced in Lab or FTK testing
- Sectional Assistant
- One Mobile Treatment Plant with operator
- One Mobile Laboratory with water quality tester
- Drilling Rig, if available (otherwise pre contracting with private vendor)
- Driver
- Two Hand pump mechanic
- Two masons for construction of Sanitation facility including hand washing platform
- Four Labours

Hygiene Promotion:

Maintaining hygienic atmosphere during the Disaster is another aspect for hygiene promotion against water borne diseases. Support of NGO, CBO, PRI, SHG etc. proves to be more effective than departmental initiative. Department can create the enabling environment and facilitate materials & equipment necessary for that.

A monitoring checklist for hygiene promotion is furnished in **Annexure-13** for the agency responsible for maintaining hygiene during disaster.

Chapter: 4 Response

Response being an unavoidable part of disaster plays an important role after the commencement of any type of disaster.

- **PHED is the nodal department for providing safe drinking water and sanitation facilities** to the affected community during occurrence of disaster with special focus on flood.
- For the effective response to any type of disaster, response actions are immediately carried out by PHED at the pre, during and post disaster situation with special focus on flood/ any disaster with an aim to provide safe drinking water to the victim communities followed by the arrangement of proper sanitation facilities in the relief camps as it is very important to keep the affected communities out of various water borne diseases likely to be occurring during disaster.
- Accordingly, an **emergency response plan** has been developed towards proper cooperation and coordination amongst the concern departmental officials at different levels as well as the community level.
- Response action is initiated by state level upon receiving information from the concern divisions on the commencement of any disaster.
- **The State Emergency Control Room** will disseminate or instruct the district/division level officials to provide necessary support to the affected population in terms of providing **safe drinking water through operation of MWTP**, providing **disinfecting chemicals for hand pumps** and **other possible water source disinfection** under water activities. Besides, instructions are to be also made for the district/division level officials for providing **proper sanitation facilities** at relief camps as per the responsibility assigned by the district administration.

Role of PHED in disaster Response:

Phase of Disaster	Activities to be conducted	Responsibility assigned
Pre Disaster	1. Keeping detailed record of MWTP, Mobile Tanker, Water Testing Mobile Van, 2. Stock position of disinfecting chemicals and other equipment as well as the name, address, location and contact no. of key personnel of PHED along with other allied Govt. departments /NGOs etc.	EE/AEE

	3. Projection of a convenient and effective mechanism for disseminating the message of early warning to - Department officials - Community on advancement of a Disaster. 4. For the rapid action to be taken by the divisions/ subdivisions 5. Dissemination of the warning play a very important role. 6. Dissemination of any such warning/ information with the help of radio/mobile or wireless media	EE/AEE
	7. Monitoring and ensuring the working condition of - MWTP - Water Tanker - Water Testing Mobile Van and - Other departmental equipment - Status of stock position of TW - Source disinfecting chemicals.	EE/AEE
	8. Maintaining updated detail of staff members with their name, address and telephone number and collection of detailed information of the same from other allied departments. 9. Send the updated list of man-power available in each position along with contact details, in each quarter of the year to the ASDMA for maintenance of record in State Emergency Operations Center (SEOC), ASDMA	EE
	10. Establishing pre contracts/ MoUs with agencies/ organizations 11. Ensure tagging/ color-coding of machineries/ equipment by contractors/agencies executing pre-contracts for easy identification of items installed during disasters 12. Arrangement of Government or private tankers to provide water during and after disaster through district administration/NGOs/CBOs.	EE
	13. Preventive measures to be taken for water borne diseases viz. chlorination of Tube Wells and other drinking water sources likely to be contaminated during flood.	EE/AEE

	14. Making arrangement for ensuring supply of safe drinking water to the inaccessible/remote areas in coordination with district administration.	EE/AEE
	15. Ensuring the proper arrangements for availability of Bleaching Powder, Chlorine tablets/ Ferric Alum/Hydrated Lime in sufficient quantity and arrangement for distribution of the same.	EE/AEE
	16. Developing Special standard operating procedures at the District/ Divisional level and assigning responsibilities to all departmental staff members on their role of duty in pre, during and after the disaster.	EE/ SE in case of multi division districts.
During Disaster	1. Will immediately contact the district Control Rooms for providing necessary assistance to the affected population.	EE/ SE in case of multi division districts.
	2. Will ensure that all the staff members remain on duty at their respective headquarters.	EE/ SE in case of multi division districts.
	3. Ensuring that all the departmental staff members follow the assigned duty as per SOP.	EE/ SE in case of multi division districts.
	4. Undertake all the actions for disaster management on receiving instruction from district/divisional nodal officers.	EE/AEE
	5. Respective teams will make a proper assessment of the damages related to water supply schemes as well as sanitary set ups. Estimates will be prepared against the assessment done for further submission to the state office after approval of DDMA.	EE/AEE
	6. Supply of safe drinking water during the emergency time as well as provision of proper sanitation facility.	SE/EE/AEE
	7. Ensure the supply of Bleaching Powder /Chlorine Tablets/Ferric Alum/Hydrated Lime in sufficient quantity and distribution of same.	EE/AEE

Post Disaster	1. Will follow the instructions of District Administration.	SE/EE/AEE
	2. Will provide all manpower in terms of water supply as well as sanitation for disaster affected areas.	EE/AEE
	3. Rapid damage assessment to be done for preparation of a primary report of damage in the affected area within a short time frame looking to the emerging situation and report to the concerned department to get the immediate relief assistance from the Government.	SE/EE
	4. Will make arrangements for electricity, water and latrines in the temporary shelter and also inspect the approach roads leading to the temporary shelter and repair the same if required.	EE/AEE
	5. Implement the alternative contingency plan to provide drinking water in case of failure of regular water distribution system.	EE/AEE
	6. Will start work for immediate repairing of water supply pipes in case of damage.	EE/AEE

Chapter 5: Relief and Rehabilitation

PHED, Assam is the nodal Department of the State with respect to water supply and sanitation in rural areas.

In any type of disaster, proper arrangement of drinking water supply and sanitation facilities to the affected people on an immediate basis is an essential requirement.

The main activity of the department is related to supply of safe and quality drinking water in adequate quantities to the affected population along with basic sanitation facilities in rural areas.

PHED plays a major role and is responsible for providing safe drinking water during the occurrence of Disaster/flood to the victims. During and after the occurrence of disaster in highly disaster/flood prone areas, the provision of safe drinking water is made through Truck Mounted Mobile Water Treatment Plant (MWTP). PHED issued **54 nos. of Truck Mounted Mobile Water Treatment Plant (MWTP) to different divisions**. The defunct MWTP which need minimum repairing are made ready to use. In addition to this, packets of disinfecting chemicals like **Bleaching Powder, Chlorine tablets, Ferric Alum and Hydrated Lime** are also prepared and distributed for source disinfection before, during and even after the occurrence of disaster/ flood amongst the victims who practically deserve the safe drinking water but unable to avail the same due to contamination of the various drinking water sources. The disinfecting chemicals are supplied to the concerned divisions as per their requirement. The provision of supplying the safe drinking water through MWTP along with the distribution of disinfecting chemicals to the affected community is continued even at post disaster situation till prevailing of normal condition.

The key activities which may be planned to be conducted in the upcoming days under relief and rehabilitation are as follows:

Relief activities include

- Providing safe drinking water to the disaster/ flood victims in rural areas.
- Preventing water borne-diseases and disability through mitigation measures for Arsenic, Fluoride and other bacteriological contaminated sources in pre, during and post disaster situation.
- Installation of temporary toilets in relief camps with proper instruction and financial assistance from district administration.

Rehabilitation refers to those programmes which go beyond the provision of immediate relief to assist those who have suffered the full impact of a disaster to rebuild their homes, lives and services and to strengthen their capacity to cope with future disasters by restoring the pre-disaster status.

Ingredients of good rehabilitation

- Preparation of area wise disaster plan
- Effective coordination to avoid delays & providing timely help
- Psychological counseling to kindle will power among the affected people
- Effective coordination in correct assessment of the damages & losses
- Prioritizing restoration arrangements
- Harmony & good will among the affected people avoiding political & community discrimination.
- Good governance through dedicated personnel in administration

Some of the restoration works undertaken by PHED

- Repairing of piped water supply system
- Raising of hand pumps and platforms above flood water level for ease of access and to prevent contamination
- Restoring sanitation facilities
- Maintaining environmental sanitation

Prior to taking up rehabilitation works

- Documentary evidence along with photographs prior to and post disaster is essential for correct assessment of the magnitude of restoration works involved.

Effective monitoring at relief camps

- Name of Block
- Name of GP
- Name of Village
- Location of the Camp-Elevated grounds such as embankments , on the roadside /Institutions like schools and other buildings
- Name of the Designated Camp
- Name of habitation and village from where people were dislocated for taking shelter
- No of inhabitants in the Camp
- Existing water supply facilities
- Existing sanitation facilities
- Water supply arrangement provided in the camp
- Extension of pipeline from nearby piped water supply schemes
- Rejuvenation of existing source
- Installation of tube wells

Sanitation arrangement in relief camps

- Installation of low cost sanitary toilets
- Total no of such other Camps in the Block
- Date on which the Relief camp was set up
- Probable date till which the Camp is going to continue

Situation reporting for flood affected areas

- Date for which the report is prepared
- Time of preparation the report
- Name of District
- Name of Division
- No. of Blocks affected
- No. of GPs affected
- Approximate no. of population affected
- Details of affected no. of water sources
- Piped water supply schemes-fully submerged
- Piped water supply schemes-partially submerged
- Spot sources- submerged
- Ponds –contaminated
- Barges- damaged
- Intake wells – damaged
- No. of disinfecting packets distributed with detail instructions as how to use
- Chemical packets containing 2g bleaching powder, 30g alum and 15g lime
- Bleaching powder packets
- No. of water tankers provided for carrying safe potable water
- No. of purified water packets distributed through mobile water treatment plants
- No. of Stand Alone Water Filter Systems provided
- Details of no of tube wells and hand pumps disinfected
- Repaired-minor repairing
- Repaired-major repairing
- No. of individual house hold latrines affected
- No. of rain water harvesting structures damaged
- No. of awareness camps arranged
- No. of posters / leaflets distributed for awareness generation
- Whether inter personal communication arranged in the camp area for direct interaction with affected people
- No. of water samples tested by Field Testing Kits
- No. of bacteriological tests performed with vials
- Type and no. of water sources disinfected
- Ponds
- Intake wells

Chapter 6: Capacity building of departmental functionaries:

PHED has mandate to work in rural water supply and sanitation sector. With introduction of operational guideline for JJM in 2019-20, emphasis has been laid down on decentralised planning and capacity building of departmental staff, PRI and stakeholders like NGO, Users' Committee etc.

- ✓ Operation & Maintenance of water supply installations
 - ✓ Water handling practices
 - ✓ Water Quality Monitoring and source disinfection
 - ✓ Awareness generation for Hygiene practice
 - ✓ Use and Operation & Maintenance of Toilets.
- **Capacity of the department to deal with the identified disaster-Institutional, Organisational and infrastructural**

Institutional hierarchy of the department is enclosed in the Annexure-1; command structure for Disaster Management is also placed in the SOP chapter. At District level, Divisions are headed by Executive Engineers. Sub Divisions are attached to Divisions headed by Assistant Executive Engineer. Assistant Engineer/Junior Engineers are responsible for field activities and field staffs are working under them. Divisions possesses

- ✓ Technicians – driller, electrician, mechanics etc.
- ✓ Masons, pump mechanic etc.
- ✓ Laboratories: Mobile & Stationary
- ✓ Water installations & Mobile treatment Plant
- ✓ Record of trained personnel in water supply and sanitation sector.

Service of aforementioned functions and facilities are utilised in the wake of disaster.

Details of Training Strategy are furnished in **Annexure-5**.

Divisions will maintain a list of trained personnel/specialists including contact details so that they can be made available as and when necessary.

▪ **Gaps in the existing capacity building programme**

PHED is basically an engineering department. It responds in the wake of disaster in association to the District Administration. New concepts have been introduced in Disaster Management and are in infant stage i.e. shifting from relief to preparedness.

PHED lacks systematic knowledge of such new concepts. Moreover, inputs of disaster preparedness need to be incorporated in the existing capacity building

programmes. To streamline its normal activities towards disaster preparedness and response, support from **ASDMA/experts** is necessary.

▪ **Initiative to bridge the gap:**

A few training programmes are identified under water and sanitation sectors which contributes towards pre disaster capacity building and awareness generation. These programmes are held at State as well as G.P level involving Departmental Personnel and NGO/Villagers.

Details of those, including contact details, are to be made available to the district administration/DDMA, in hard & soft copies. If possible same should be uploaded in departmental web site.

Sl. No	Programme Category	Level (Yes/No)		Target Group (Yes/No)		Useful for Disaster Situation (Yes/No)		
		State	Other (GRL)	In-house	GRL(N GO/Villagers)	Pre	During	Post
1	FTK Testing (WQ)	-	Y	-	Y	Y	Y	Y
2	Laboratory Testing including Mobile Lab(WQ)	Y	-	Y	-	Y	Y	Y
3	Hand Pump Mechanic	-	Y	Y	-	Y	Y	Y
4	Hand pump maintenance/ repair including Source Disinfection	-	Y	-	Y	Y	Y	Y
5	Mason training for Toilet construction	-	Y	-	Y	Y	Y	Y
6	Hygiene awareness with emphasis on proper sanitation, personal hygiene/Hand washing, Drinking Water handling	-	Y	-	Y	Y	Y	Y

Training and Capacity Building:

Training and Capacity Building is the vital component of entire Disaster Risk Reduction process through which the ability of individuals, organizations and different societies can be obtained, strengthened, adopted and maintained over time to minimize vulnerabilities to Disaster Risk and prevent and mitigate the adverse impacts of hazards. Hence, adequate training to the key stakeholders, creating adequate training opportunities, strengthening of training infrastructures, sharing of skills and knowledge on DRR, adequate funding and resource allocation and their sustainability are needs to be considered. It is necessary to continuously undertake measures to build capacities amongst those responsible for disaster response and augmenting public awareness.

Steps needed for capacity building in respect of disaster management

Training Need Assessment (TNA)

Training Need Assessment (TNA) a systematic process conducted prior to designing a training programme which involves determining the training needs at organizational, operational or individual level, identifying what kind of trainings are needed for different categories of stakeholders, and finally identifying the individuals needed to be trained or retrained.

Inclusion of Disaster Management Modules/Sessions in regular training programmes/ Annual Training Calendar of PHED:

Departmental functionaries at various levels have been classified as per their role and subsequent training required for Disaster management activities to be done. The different trainings imparted to various target groups/ departmental functionaries with inclusion of Disaster Management sessions is furnished in **Annexure-8**.

Chapter 7: Citizen Engagement

Community as 1st responder during Disaster:

- It is the community who experiences the first impact of disaster. The aim of any citizen engagement plan should be to make the community resilient to disaster, as the same cannot be avoided.
- PHED has created citizens '**consultative groups**' at different levels as per provision of JJM and SBM (G) guidelines. Decentralised planning strategy suggests for consultation with the community at the time of planning, implementation and operation & Maintenance of any water supply and sanitation projects.
- Capacity Development programme of the community is also a part of the strategy for community involvement in the decision making process. Department will take the advantage of such training and awareness programmes by incorporating Disaster Management component in the module.

As mentioned in chapter 6, awareness & training programmes would be organised to make them aware regarding their roles in:

- preparedness
- prevention & mitigation
- response and
- Rehabilitation stages of disaster management cycle.

Community organisation created by PHED at community level as per central guidelines are as follows:

- **GPWSC (Gram Panchayat Water and Sanitation Committee) at G.P level**
- **Users' committee at water supply scheme level.**

Besides these, local NGOs are engaged for awareness generation campaign, water quality testing. Hygiene promotion campaign like Hand washing, cleanliness etc. are conducted in schools. Students/ Teachers are also trained to test water quality with the help of **Field Testing Kits**.

- **Resource mapping** is another area where CBO (community based organisation)/NGO may be engaged in data collection.
- **Awareness programmes** (are to be organised prior to the probable time of occurrence of any disaster emphasising on Dos & Do-nots, their roles.
- Expectations of the community prior to normal time/at the time of disaster from PHED (within the roles defined in SDMP of ASDMA) may be collected so as to incorporate those after proper examination in preparedness & response plan.
- **Pre-Monsoon Awareness camps on departmental Schemes** for disaster awareness can be conducted with the collaboration of DDMA.

A GP/Village wise list of key contact persons, PRI member and NGO/CBO, if any, is to be maintained at Division/Sub Division level along with their contact details. Similarly, list of

trained citizens is also to be maintained along with their address/phone numbers. Name and contact number of Departmental key persons, must be made available to such trained/key citizens.

A suggestive communication approach to involve community in disaster management programme is suggested below:

Large Group Meeting	• Eliciting a group decision - for example, an agreement to ban open defecation, appoint sanitation wardens or set up a system to ensure upkeep of community toilets (Community Sanitary Complex etc.) during disaster as well as normal situation. Not to tolerate stagnation of water source of contamination near water source. Upkeep water source & platform etc. • Feedback to community on results of focus group discussions, for example, about toilet design and location, water source protection for a larger group decision.
Focus Group Discussion (typically gender segregated) - may be reinforced by participatory assessment of hygiene and sanitation problems	• Demonstration of safe water handling practices and storage. • Demonstration of water source protection. • Demonstration of source disinfection & water quality test. • Identifying priorities and specific needs of women and/or adolescent girls. • Demonstration of different toilet options using models to elicit preferences • Discussing with women the best options for place of washing and drying menstrual cloths • Eliciting priorities and needs of a socially marginalised group within the centre population
Schools	Key hygiene messages, in particular, use of toilet and hand-washing with soap. A school provides an excellent place to reinforce safe domestic practices. School children can also help monitor and improve environmental conditions in a relief centre. Water quality tests and messages of water borne diseases.
Visits to other centres	Taking representative groups of delegates to see a clean centre, a successful approach or to demonstrate a toilet design can be a very strong way of eliciting change. Taking representatives to see protected water sources, good water handling practices and protection measures taken for water sources as preparedness measure.

Religious and cultural events	Discussions on proper handling of drinking water and food hygiene -but not sanitation
Plays and puppet shows	Demonstration of how faecal-oral diseases are transmitted and how transmission can be broken through hygiene practice even at the time of disaster.
Household visits by Field personnel of PHED or NGO	Domestic and personal hygiene, including menstrual hygiene Safe water storage and handling in the home and even at relief camp during disaster.
Posters and wall paintings	Used to convey key hygiene practices/ A wall-painted 'monitoring chart' focusing on hygiene and sanitary conditions in centre, can be linked to a 'clean centre' campaign. Danger of water borne diseases during Disaster.
Audio Visual Media Radio & TV	'Video on wheels' shows and radio programmes on transmission of diseases. Community Radio programmes discussing hygiene in temporary centres and sharing information on key practices.

Tentative roles of citizen committees at State and Local level are furnished in SOP chapter. Specific attention to be undertaken by Water User Groups as part of Flood/Drought Preparedness is furnished in **Annexure-14-C**.

Initiatives towards citizen engagement:

Assam, a land of multi ethnic, multi linguistic and multi religious society, needs different approaches for implementation of a program, where **behaviour change** is in the core of the program.

To overcome the challenges of bringing in the desired behaviour change, several new initiatives have been taken for community mobilization to usher new dimension to the sanitation movement in the state.

During the FY 2020-21, COVID-19 had engulfed the world and Assam also had its fair share of battle against this pandemic. In this regard, the GoI had initiated the COVID-19 Appropriate Behaviour Campaign under which, IEC messages on social distancing, hand-washing with soap/sanitizer etc. messages were displayed through the medium of wall-paintings, banners etc. to sensitize people about these habits and also inculcate safe sanitation and hygiene related practices in their daily lives to arrest the spread of this pandemic in rural areas. Moreover, as per directions of Hon'ble PHE Minister, a 30-day sanitization campaign was also initiated by all the District Water and Sanitation Committee (DWSCs) across the state to sanitize all public institutions such as offices, PHCs, CHCs etc. The major areas to be targeted for spraying the disinfectant will include shutters of shops, handrails/handles, premises of schools and colleges, all the offices premises such as Panchayat office, Block office etc. Surroundings and premises of Anganwadi centers, Public

Health Care centers, Hospitals, Market places, district Quarantine centers and other such public places. Special focus was to be provided in containment zones.

Under 15th FC convergence between SBM-G & P&RD, district and block level convergence workshops have been conducted by the districts across the state. These workshops included importance of sensitization of citizens and citizen engagement on issues of waste segregation at household level, operation and maintenance of SLWM infrastructure to be constructed at district, block and village levels.

Another initiative with regard to citizen engagement was the 1-week Gandagi Mukta Bharat initiated by DDWS, Ministry of Jal Shakti, GoI for promoting positive behaviour change on sanitation and hygiene.

Chapter 8: Standard operating Procedures (SOP)

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, cyclone, 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 PHED i.e. State Govt.'s Rural Water Supply & Sanitation Service provider / 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 as well as 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 Public Health Engineering Department and State Govt. Divisional offices, 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

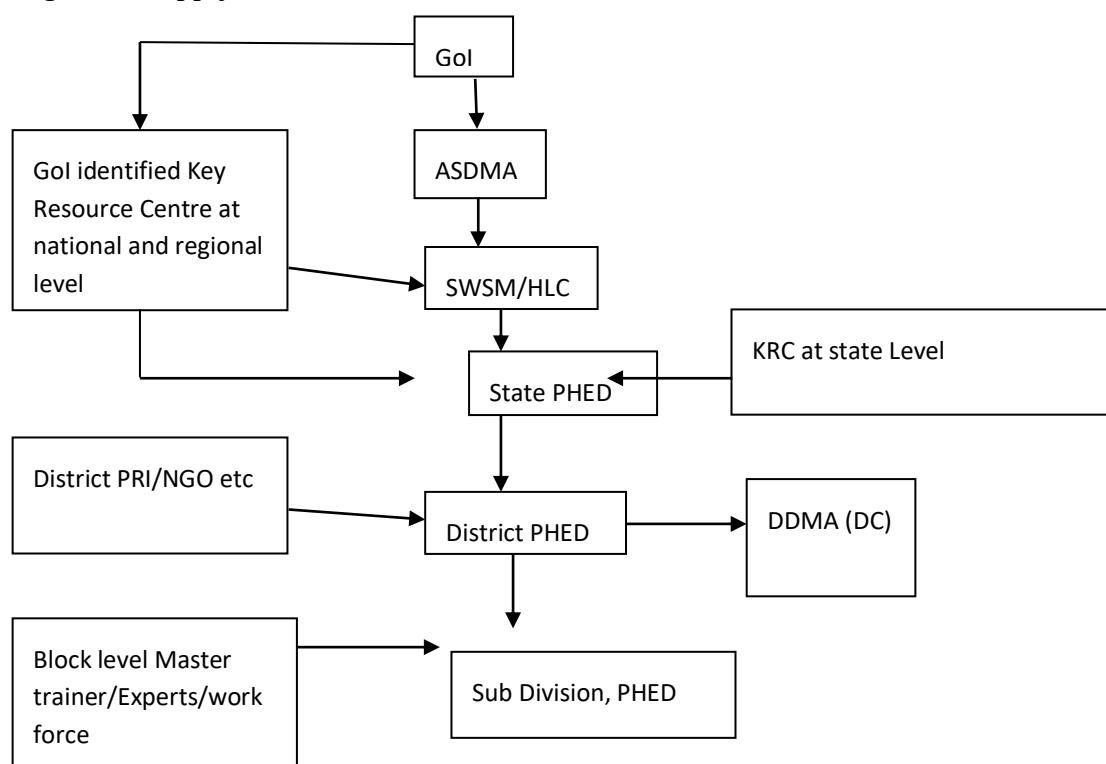
before, during and after a disaster. These are standard guidelines for staff at all levels so that they may take action immediately.

2) State Level:

In the aftermath of a disaster, the primary responsibility for undertaking rescue, relief and rehabilitation measures rests with the concerned State governments.

Institutional Mechanism:

At the State level, State Water Sanitation Mission (SWSM) or a High Level Committee, empowered by SWSM with Senior most Secretary in charge of PHED, as Chairman under the Assam State Disaster Management Authority (ASDMA) and State Executive Committees (SEC) will be the basis for coordination of emergency support relating to drinking water supply and sanitation.



As the first step towards a coordinated disaster response mechanism, the Govt. has to establish a clear cut organizational structure with the following designated PHED nodal officers.

Nodal officers for PHED in an event of Emergency:

Hierarchy	Level	Nodal Officer
Govt.	State	Secretary, PHED/ Spl. Secretary, PHED/ Deputy Secretary, PHED
Directorate/ Departmental	State	Additional Chief Engineer/ Superintending Engineer in the office of the Chief Engineer (PHE)Water, Assam
District & Local Level	District	SE in case of multi Division District and Executive Engineer at HQ in case of Single Division District
	Block	AEE

Key duties of SWSM/ High Level Committee (HLC):

✓ SWSM/ HLC will support ASDMA on overall coordination of emergency water & sanitation response.

✓ SWSM/ HLC will work under the overall direction of ASDMA and in coordination with State Executive Committee convened by Secretary (DM).

✓ SWSM/ HLC shall meet at least once before the expected normal commencement of a flood/ drought and thereafter as frequently as may be necessary.

✓ Mission Director, JJM& SBM (G) would frame technical guidelines and IEC/HRD strategy for water and sanitation in emergencies.

✓SWSM/ HLC will set up Disaster Control Rooms (DCRs) at the Directorate offices in State, District and other levels and monitor their functioning

✓SWSM/ HLC must review water supply & Sanitation needs and strategies for effective emergency response.

✓SWSM/ HLC must review position of stock and arrangements for procurement of essential supplies.

✓SWSM/ HLC must monitor responses to the emergency and impact thereof.

Composition of HLC may be as follows:

1. Senior most Secretary in Charge of PHED– Chairman
2. Secretary, PHED – Member Secretary
3. Chief Engineer (PHE)Water, Assam – Member
4. Chief Engineer (PHE)Sanitation, Assam – Member
5. Deputy Director, KRC, PHED, Assam – Member
6. Additional Chief Engineers from all Zones (7 nos.) - Members

State Resource Analysis:

Human Resource/expertise analysis:

PHED 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 PHED, involving all relevant institutions & departments. PHED will also maintain a roster of professionals whose services might be required in management of disasters.

Preparedness:

PHED will take 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 Secretary, PHE Department shall be the State Nodal Officer and shall coordinate the response of the PHE Department to the disaster. Chief Engineer (PHE), Water, Chief Engineer (PHE), Sanitation & Deputy Director, KRC shall implement the emergency support functions relating to drinking water supply and sanitation.

Responsibilities of Secretary PHED:

- ✓to Coordinate vulnerability hazard analysis exercise conducted in districts.
- ✓to set-up linkages with KRC on guidance for framing technical guidelines and IEC/ HRD strategy for managing disasters.
- ✓to ensure all necessary steps for Flood/Drought are taken before 30th April/30th June every year for flood/drought preparedness
- ✓to 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.

✓to have a roster of PHED staff to be deployed from other areas to any affected region to cope with the requirements of the affected areas in consultation with SE/ EE.

✓to ensure setting up of central/divisional/sub-divisional/sectional stores for emergency water and sanitation supplies.

✓to ensure formulation of state disaster management plan based on vulnerability analysis for each district for the rural drinking water and sanitation sector.

✓to ensure all relief codes be strengthened to include measures for stockpiling of water disinfection tablets and essential water and sanitation equipment.

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

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

Early Warning:

PHED will 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, Nodal officer with the help of Chief Engineers/Deputy Director, KRC at the State shall alert his counterparts in District and lower levels. The Deputy Commissioner 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, Chief Engineers shall issue appropriate instructions on actions to be taken including restoration /augmentation of water sources to the SE / EE/AEE, who will then supervise responses.

At the State level, the Secretary PHED shall be the Nodal officer for coordinating the emergency support functions relating to drinking water supply and sanitation under the guidance of ASDMA.

The Chief Engineers shall implement the decisions taken by the State PHED (Govt. Level) and the SDMA/ SEC.

Responsibilities of Nodal Officer at Directorate Level:

- ✓ Must be in touch with various Nodal Agencies at State/National level mandated for disseminating early warning signals and inform Chief Engineers, Deputy Director, KRC immediately.
- ✓ Must monitor all parameters related to various types of threatening disaster in the State and timely inform Chief Engineers, Deputy Director, KRC immediately.

✓Upon receipt of weather warnings or reports of actual disaster, he must inform Chief Engineers, Deputy Director, KRC immediately and then the respective District level Officers (SE/EE).

✓Will share all emergency contingency plans with SDMA for effective coordination during emergencies on behalf of Chief Engineers, Deputy Director, KRC.

Upon receipt of weather warnings or reports of actual disaster, he will inform and activate the G.O/NGO on behalf of Chief Engineers, Deputy Director, KRC for taking up awareness generation, Hygiene practice, water quality testing activities.

Response & relief:

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

Responsibilities of State Nodal Officer on behalf of Chief Engineers & Deputy Director, KRC:

✓ Will ensure setting up Emergency Control Room in the office of the Chief Engineer(Water),/ Deputy Director, KRC 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 Assam State Disaster Management Authority (ASDMA).

✓Under the guidance of the ASDMA and Chief Engineers, he 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.

✓He will initiate plan to get PHED involved in coordinating disaster response.

✓Will produce "Daily Situation Report" for ASDMA in event of disaster.

Role of NGOs, CBOs /UN Organizations at State Level:

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

✓Support State level SWSM/HLC 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 with the distribution of emergency relief supplies which includes ORS, Halogen/ Chlorine tablets, Sanitation infrastructure, Hygiene kits and any related IEC materials.

✓Will support PHED with capacity building events on water and sanitation in emergencies.

3 District/ Lower Level:

a. Institutional Mechanism:

At the district level for the purpose of combating calamities, PHED Divisions will function under the Supervision of Deputy Commissioner, to carry out the actual implementation of rural water and sanitation relief projects.

Key duties of SE/EE:

✓He/ She shall call a meeting of key Departmental officials under his jurisdiction at least once before the expected normal commencement of foods/drought and thereafter as frequently as may be necessary.

✓District Disaster Management Authority (DDMA) may set up Disaster Control Rooms (DCRs) in district, block and lower levels and monitor their functioning.

✓In case of common DCR is established, the SE/EE will depute staff to be a part thereof.

✓The SE/EE shall extend services during disasters as per requirements decided upon by DDMA

✓SE/EE must review contingency water supply and sanitation plans as per demand of the situation

✓SE/EE must review position of essential water and sanitation stock and will make arrangements for procurement of essential supplies under the SDRF/Normal funds.

✓SE/EE 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 Level nodal officer i.e. AEE of concerned area would assist the BDO/Block Panchayat in ensuring full preparedness at grass root level and mobilising of trained manpower

in the event of calamity.

b. Preparedness:

SE / Executive Engineer, of PHED shall be the district level nodal officer for coordinating emergency operations with respect to delivering water and sanitation services. The SE / Executive Engineer 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 SE/EE:

✓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 BDO/Engineers of DRDA-Panchayat/ AEE / Field level Technical staff of PHED on vulnerability analysis to various forms of disaster with close support from G.P.

✓ 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 Assistant Executive Engineers should be instructed to check up the PWSS 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

✓SE/EE must conduct district level capacity building and training for line departments / stakeholders on utilization of maps, warning and watch advisories.

c. Early Warning:

Responsibility of SE/EE:

✓ When early signs of distress appear in any part of the District, S/He 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, JE/AE/AEE of PHED 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 Division/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/ Village Panchayats/ Administration 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.

d. Trigger Mechanism:

Role of SE/EE:

✓ SE/EE 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.

✓ DC in consultation with SE/EE must define the roles of GP, NGO's and CBOs while triggering disaster management mechanism.

Response and Relief:

Responsibility of SE/EE:

✓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 Engineers.
- ✓ Will coordinate with lower level officials and stakeholders 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 D.C and Chief Engineers/Director-WSSO, PHED 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 PHED for an effective disaster response.

4. **Block / Village level:**

a. 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.

Responsibilities of AEE:

- ✓Will ensure that supply of materials and spare parts as may be required by the Sectional Officer (JE)/AE, PHED 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, AEE in support of JE/AE 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 master trainers at Block Level to train staff, VWSC & GP members in disaster preparedness / response

Responsibilities of Section Officer (JE)/AE of PHED:

- ✓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, 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/ GP/ Users' Committee 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.

b. Preparedness:

Sectional Officer (JE)/Assistant Engineer:

✓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.

✓ PHED Sub Division must also maintain list of trained staff, GP members for utilizing their services.

Involvement of Local communities/ Schools / GPs / VWSC / Self Help Groups ISHG's) / Gender perspective:

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.

✓Section Officer (JE)/AE of PHED must encourage local community coping mechanisms for the detection of Early warning systems.

✓ Section Officer (JE)/AE of PHED 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

c. Early Warning:

Junior Engineer (JE) / Assistant Engineer (AE):

✓ JE with support from VWSC/GP/Users' Committee 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/GP/Users' Committee.

✓ Sub Divisional office staff must be used to mobilize the trained manpower and work out tasks they can perform.

d. 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)/AE, PHED 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 Executive Engineer, PHED for additional support, if required.

Sub- Divisional Officer AEE PHED 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, PHED.

✓ Will take preventive measures against water borne diseases and enable chlorination of drinking water

✓ Will keep the EE, PHED informed once or twice daily or as frequently as required about the situation and action taken.

✓Will liaise with pool of master trainers/experts affectively in public interaction and communication of activities being carried out.

Junior Engineer (JE)/AE PHED 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/ Mobile Laboratory /Mobile Water Treatment Plant 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.

Role of NGOs/ CBOs:

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

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

Activity Mapping of PHED functionaries in preparedness and Response stages of Disaster Management:

Preparedness:

Nature of Disaster	Key Technical Preparedness	Responsible person	Source of reference
Flood/ Erosion	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 Sanitation • 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	EE / JE / AE, PHED	NDMA Guidelines - “Minimum standards of relief for drinking water” & “Minimum standards of relief for Sanitation and hygiene” / State Relief Codes

	outbreak of disease & maintaining a clean environment / identifying and maintaining lists of mobile toilets units.		
Earthquake	- 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	EE / JE / AE, PHED	NDMA Guidelines - "Management of Earthquakes"
Drought	- 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. - 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	JE / AE of PHED	Base material: Rajasthan Drought Relief Manual

	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 CGWB 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 on-going 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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	• 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 run-off 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.		
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Cyclones/ Wind	Drinking water supply •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. •Population of affected areas must be advised by the authorities, not to use well water which may get flooded/contaminated with water after cyclone 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 cyclone relief camps and welfare centres with clear water quality inspection mechanisms. •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 Sanitation •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 Solid and liquid waste management •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.	EE / JE / AE, PHED	
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Response:

Nature of Disaster	Key Response measures	Responsible person	Source of reference
Cyclones, Floods, Landslides, and Earthquake	Drinking water supply Objective: Ensure the availability of minimum safe drinking water and sanitation taking into account privacy & dignity •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.	EE / JE / AE, of PHED	NDMA RWSS Guidelines - “Minimum standards of relief for drinking water” & “Minimum standards of relief for Sanitation and hygiene” Assam Relief Manual - 1976

Cyclones, Floods, Landslides, and Earthquake	•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. Sanitation •For areas prone to floods, appropriate approaches to sanitation such as raised latrines, pit liners or rings, ‘sealed pits’ toilets must be considered. •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 Hygiene promotion •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 for of incinerator or other mechanism.	EE / JE / AE, of PHED	NDMA RWSS Guidelines - “Minimum standards of relief for drinking water” & “Minimum standards of relief for Sanitation and hygiene” Assam Relief Manual - 1976
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Ethnic Violence	Besides aforementioned steps, provision is to be made for security personnel guarding the camp.	EE / JE / AE, of PHED	
Drought	•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 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 •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 re-boring 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.	JE / AE, of PHED	Rajasthan RWSS Drought Relief Manual & NDMA Guidelines - "Minimum standards of relief for drinking water" & "Minimum standards of relief for Sanitation and hygiene"

SOP for different activities to be undertaken by PHED during the wake of Disaster:

- Disinfection of spot sources along with other sources
 - (i) Frequent disinfection
 - (ii) Use of Chlorine Tablets
- Ensuring Safe Drinking Water Supply and operation of MWTP
 - (i) Installation of temporary spot sources
 - (ii) Use of Chemical Packets and chlorine tablets
 - (iii) Necessary temporary extension from PWSS (unaffected ones)
 - (iv) Placement and operation of MWTP
 - (v) Regular Water Quality Monitoring and Surveillance
 - (vi) Immediate restoration plan for affected drinking water sources
- Ensuring safe Sanitation Practices
 - (i) Installation of Sanitary Toilets for Relief Camps inmates
 - (ii) Installation of Sanitary Toilets for Security Personnel deployed in Rescue and Relief operations
 - (iii) Ensuring regular use of Sanitary Toilets and full stop for open defecation
- Establishing Safe Hygienic front
 - (i) Facilitating use of Soap by all before food and after using toilet
 - (ii) Safe WASH practices involving interested volunteers from the affected community
 - (iii) Community awareness through IPC through WASH Volunteers (preferably selecting the educated youth among the inmates), Leaflets etc.
 - (iv) Capacity development and Empowering the Relief Camp Management Committee for food and water safety
- Sanitizing the environmental perspectives
 - (i) Sanitizing the Relief Camp neighborhood and Cleanliness drive the Relief Camps inmates
 - (ii) Cleanliness drive through community involvement and sanitizing affected areas during post disaster period
- State as well district level coordination
 - (i) All time contact with Control Room and ASDMA / DDMA
 - (ii) Resource mobilization (both HR & Financial)
 - (iii) Active Coordination with all stakeholders involved with rescue, relief and rehabilitation approach
 - (iv) Up-to-date monitoring followed by spot fixing through community involvement
- Maintenance, storage and mobilization of various departmental equipment. Back-up planform capacity enhancement, material management, Resource mobilization, situation analysis
- Relief Camps and role of PHED
 - (i) Ensuring safe drinking water supply
 - (ii) Ensuring safe sanitation infrastructures

- (iii) Ensuring safe WASH practices
- (iv) Appropriate sanitizing and Cleanliness Drive
- (v) Mobilizing capacity development and empowering community with preventive measure on self-help basis
- Mobilization of disinfecting chemicals and others only for PHED owned sources
 - (i) Necessary stock maintenance (for materials / machineries / vehicles etc.) during pre-disaster period and filling the critical gaps during and post disaster period
 - (ii) All water sources are to be maintained as functional ones and routine chlorination shall be done.
 - (iii) Capacity enhancement and Resource mobilization (both HR and financial)

This SOP shall remain in force for the Rural Areas only and shall be subjected to the fund mobilization aspect, taken care by DDMA. However, in town areas too, the activities shall be taken up, except in case of few infrastructural issues.

In all the activities included in the SOPs planned to be conducted during disaster, the overall responsibility at state level will be under the control of the CE(PHE) Water and CE(PHE) Sanitation. On the other hand, the responsibility for the district level activities is assigned to the respective district nodal officers.

Specific Guidelines and SOP regarding relief camp management in context of COVID-19:

Annexure 1- Responsibilities of PHED as enlisted in the Assam Disaster Management Manual, 2015 Government of Assam has notified the Assam State Disaster Management Manual, 2015 in line with the provisions of National Disaster Management Act 2005 by replacing the ‘Assam Relief Manual, 1976’ via Notification No.RGR.454/2014/168. This manual marks a paradigm shift

In approach to manage disasters in the state by adopting a multi-hazard-multi-stakeholder approach towards holistic risk management across all phases.

The manual puts due emphasis upon the importance of public health in emergencies including emergency water, sanitation and hygiene. Being the nodal department for public health and WASH, public health engineering department has been assigned critical responsibilities across phases of disaster management which are mentioned below:

1.Preparedness:

- a. Develop department wide disaster preparedness plan
- b. Identify in advance emergency groundwater resources resistant to natural and man-made disasters that could replace damaged public and domestic drinking water supplies
- c. Develop guidelines for consumption/purification of water during disaster

2.Prevention and Mitigation:

- a. Ensure departmental/public awareness and encourage economic use of water
- b. Train department engineers in Disaster Management/DRR
- c. Plan movement of staff to disaster affected areas, delegation of responsibilities
- d. Restoration plans for damaged facilities
- e. Maintain emergency stock of supplies (pre-contract agreement with suppliers can be add-on)

- f. Undertake conditional assessment of existing infrastructure
- g. Undertake risk assessment of the departmental facilities and cite recommendations
- h. Protect/strengthen the supply network with alternative/complementary source
- i. Undertake protection measures of distribution infrastructure (pumps, motors and the like)

3.Alert and Warning Stage:

- a. On receipt of warning, make provisions for acquiring water supply tankers
- b. Undertake chlorination programmes
- c. Protect vital water supply infrastructure from contamination
- d. Arrange for alternate energy sources should the electricity grids fail

4.Response:

- a. Provide immediate safe drinking water supply in disaster affected areas
- b. Provide immediate safe drinking water supply for conduct of response activities at hospitals, emergency shelters, schools designated as shelters, relief camps
- c. Provide latrines/sanitary latrines in Relief Camps quickly
- d. Provide hygienic measures to keep Relief Camps free from outbreak of epidemics/ health hazards

5.Recovery and Rehabilitation:

- a. Assist line departments and agencies in identification sources of potable water
- b. Undertake swift actions to restore damages lines
- c. Undertake regular checks to determine key potable parameters of the water supplied
- d. Restore all service for pre-disaster phase and maintain check on vital quality including bacteriological parameters

Over and above, the manual also clearly states the roles and responsibilities of Executive Engineer, PHED for Flood Management which are stated below:

1. **Pre Flood-** The Executive Engineer, Public Health Engineering shall visit the generally flood affected areas by the 30th of April, and
 - a. Assess measures likely to be required for safe water supply in the areas;
 - b. Prepare:
 - i. A list engineering personnel of different categories already available in the nearest PHE division and the number of additional hands that may be required in each area in case of heavy floods;
 - ii. A list of engineering personnel of different categories who, in case of necessity can be withdrawn from their places of work and utilised for relief work;
 - c. Arrange for mobilizing at short notice two PHE teams at the district headquarters to rush them for relief work;
 - d. Ensure adequate stocks of:
 - i. Equipment and materials for sinking tube well, ring well, pit/sanitary latrines in the relief camps and other places in the flood affected areas; and
 - ii. Camp materials and other stores for workers and keep them in appropriate places.
 - iii. Preposition the water purifier mounted vehicle used for providing packaged drinking water in vulnerable locations in the State.
 - e. Keep the departmental vehicles in good running condition.

2. During Flood-

On receipt of flood warning, EE shall:

- a. Alert subordinate officers and staff regarding floods;
- b. Check vehicles, equipment, stores and
- c. Draw up tentative programmes for action

On Occurrence of Floods, EE shall:

- a. Keep close touch with the DC;
- b. Visit the flood affected areas immediately with one PHE team and start measures for water supply and pit/sanitary latrines
- c. Assess extent of water supply measures required and deploy necessary staff. If the staff available in the district are not sufficient to cope with the situation, arrange through CPHE additional staff; and
- d. Constantly visit the flood affected areas and ensure adequate safe water supply measures and sanitation in the relief camps.

3. Post Flood-

- a. Restore tools and equipment, stores, etc.
- b. Repair/replace damaged tools and equipment
- c. SDRF proposals for damaged water supply pipelines and infrastructures

Further in case of relief camps, the manual prescribes certain minimum standards related to water and sanitation which are to be maintained and the department being the nodal department for water and sanitation also bears the responsibility for the same. The various standards as per the manual are stated below:

For water arrangement in relief camps

- Assessment of requirement of drinking water, water for toilets, bath & washing of clothes and Utensils in every camp
- 20 Litres of water should be provided to per person per day (*This is increased to 30 litres in the current context of COVID-19 outbreak*)
- One Sr. Officer of PHED. should be detailed for maintaining water supply in the camp.

Annexure 2- Responsibilities of PHED as enlisted in Revised guidelines and SoP on relief camp management, 2020

In the context of COVID-19 outbreak, where management of flood require additional measures, Government of Assam has issued specific guide lines and Standard Operating Procedures (SoP) for relief camp management via Letter No. ASDMA.37/2019/Part/55 dated 16th May, 2020. The SoP establishes and clarifies the responsibilities of all departments engaged in relief camp management and also specifies COVID-specific adaptations to be adhered to in relief camp management. The SoP enlists the following as the responsibility of the Executive Engineer, PHED in relief camp management process:

Before floods:

- Coordinate with CEO, DDMA/ SDO (Civil) and collect list of designated relief camps in advance. Map Water, Sanitation and Hygiene situation of the designated against their stated capacity of intake during emergencies
- Designate Camp wise focal points from the PHED department for planning, pre-position in delivering WASH services during disasters/emergencies and share their contact details with DEOC

- Procure and pre-position (at strategic locations for rapid deployment) materials to construct temporary toilets in the designated camps e.g., Squatting Plates, Tarpaulin, bamboo etc.
- Map water supply needs and make arrangements including mobile water treatment vehicles, handpumps and other sources to meet the water needs in camps
- Ensure that existing water sources in the designated camps are tested for quality and necessary measures to decontaminate/purify water are in place well in advance
- Conduct orientation of staff and ground level designated work-force on Emergency Preparedness for response and their role in relief camps
- Develop/adapt social and behavior change communication materials to be used in camp for safe WASH practices and keep them ready for delivery in camps
- Ensure that each identified relief camp is given a pre-WASH compliance certificate
- Make plans and ensure availability of human resource and materials for arranging basic amenities (water, sanitation and hygiene related) in make shift camp locations, raised platforms etc.
- Disinfectant drive at all notified Relief Camps/ shelters in advance

During floods:

- Coordinate with CEO, DDMA/ SDO (Civil) and collect list of designated relief camps in advance. Map Water, Sanitation and Hygiene situation of the designated against their stated capacity of intake during emergencies
- Designate Camp wise focal points from the PHED department for planning, pre-positioning and delivering WASH services during disasters/ emergencies and share their contact details with DEOC
- Procure and pre-position (at strategic locations for rapid deployment) materials to construct temporary toilets in the designated camps e.g., Squatting Plates, Tarpaulin, bamboo etc.
- Map water supply needs and make arrangements including mobile water treatment vehicles, hand pumps and other sources to meet the water needs in camps
- Ensure that existing water sources in the designated camps are tested for quality and necessary measures to decontaminate/ purify water are in place well in advance
- Conduct orientation of staff and ground level designated work-force on Emergency Preparedness for response and their role in relief camps
- Develop/ adapt social and behavior change communication materials to be used in camps for safe WASH practices and keep them ready for delivery in camps
- Ensure that each identified relief camp is given a pre-WASH compliance certificate
- Make plans and ensure availability of human resource and materials for arranging basic amenities (water, sanitation and hygiene related) in make shift camp locations, raised platforms etc.
- Disinfectant drive at all notified Relief Camps/ shelters in advance
- Be responsible for the overall Water, Sanitation and Hygiene (WASH) facilities and services in the Relief camps.
- Demonstrate Hand wash and other hygiene practices in the Relief camps.
- Implement aggressive awareness drive including installation of additional hand washing facilities in camps (in the context of outbreak of infectious diseases)

- Supervise the designated Sectional Officer (Junior Engineer) and other staffs to ensure
 - Availability of water (20litres/person/day and/or 1 handpump for 200 persons. *This was increased to 30 litres in context of COVID-19 outbreak*)
 - safety of water sources (distance of hand pumps at least 20 feet from toilet)
 - Adequate latrines are available and temporary latrines are set up as per need (*Maximum 50 Meters from the designated residential spaces*)
 - Latrine pits are de-sludge on time
 - Separate bathing spaces for male and female
 - Privacy in the toilets and bathing spaces
 - Proper drainage of waste water
 - monitor safe disposal of solid waste in the available garbage bins or designated locations
- As part of the Relief Camp Monitoring Team, EE will specifically monitor the quality of the WASH facilities and materials in the relief camps, provide on-site guidance/instruction if there's any scope for improvement and provide SMART recommendations to DDMA/ SDO (Civil) for any WASH related requirement in the relief camps.
- Ensure that all the interventions taken up in camps are reported in the master register maintained by the camp in-charge.
- Take up the activities in coordination with District administration on their written instructions.

Post Flood

- Ensure de-commissioning of temporary WASH infrastructure in camps (as per need)
- Ensure that fixed water sources in and around camp along with other affected areas are decontaminated
- Conduct a debriefing for the designated officials on what went well and what needs to improve in future.

The SoP also includes a separate guideline for management relief camps in the context of COVID. The additional measures to be implemented by PHED in relief camps in the context of COVID-19 are as follows:

Related to water in relief camps

- Disinfection measures for drinking water shall be practiced for water provisioned for drinking to camp inmates.
- Hand washing area shall be established in each camp with multiple hand washing points at appropriate distance with soap should be provided at entry and exit of camp
- Water shall be made available. Per person availability shall be increased to 30 litre/ person/ day.

Related to sanitation in relief camps

- All guidelines for sanitation facilities in relief camps should be strictly maintained
- Ensure sufficient Hand wash/soap, sanitizers, masks for the camp inmates.
- Cleaning of common spaces shall be done thrice a day particularly hand rails, door latches, switches etc. which are frequently touched
- Adequate disinfectant shall be made available in the camp.
- Mosquito control measures to be strictly followed

Waste Management and Vermin Control

- Closed bins of different colors must be in place in all the camps for disposal of used items
- Adequate stock of disinfectants shall be made available in the camps with designated sanitation worker to keep the camp sanitized.

Chapter 9: Knowledge Management

▪ Identification of Knowledge Institutions and Mechanism of Knowledge

Sharing-

Knowledge Institutions in the field of Disaster Management will be identified with support from

- ✓ ASDMA and
- ✓ NDMA.

Central and State Govt. organisations along with Private institutions/organizations also need to be identified. Nodal Department, as identified by GoI/ NDMA/ASDMA, would be approached for scientific data. PHED will entrust them to identify Hazard & Vulnerability scenario and its impact.

After identification of the vulnerability scenario, micro level and précised disaster management plan can be chalked out.

▪ Need for creating network of knowledge institutions for scientific data & related research for mitigation projects-

Details of Nodal Agencies i.e source of scientific data related to disaster are furnished in **Annexure-10-and 11 respectively**.

PHED at State Level, shall establish network with aforementioned agencies through SDMA for collection of scientific as well as historical data regarding disaster e.g. scientific data to be collected for Drought forecasting is furnished in Annexure-14-A.

Flood Atlas has been made available by NRSC and uploaded in website of ASDMA. Abstract of the same is enclosed in **Annexure-9**.

Private institutions and experts in this field will be involved for analysis of the scientific data and preparation of precise **disaster management plan** followed by **activity plan** for different functionaries.

- Synopsis of Activity plan during disaster Preparedness and Response stage is furnished in SOP Chapter.
 - Information regarding availability of Water supply & Sanitation related components is furnished in **Annexure-12**.
 - Ready reckoner for Disinfection, use of readymade water purification products and Low cost sanitary latrines are also furnished in **Annexure-15, 16 and 17 respectively**.
 - Name and contact number of head Divisions is furnished in Annexure-18.
- ### ▪ Documentation of lesson learnt-

Documentation of historical events of disaster and response by the department is very important. Such documents may be used for planning purposes of future probable events.

Reports regarding activities undertaken during relief and preparedness thereof will be compiled at districts level and reviewed the same for any shortcoming during implementation. Lesson learnt from such study will be disseminated at all levels in the department for sensitisation and innovative practices. **Support from Private institutions/ experts** will be sought, if required in preparation of such documents.

▪ **Documentation of best practices and uploading of the same in the departmental website-**

Best practices within the state and outside the state, while implementing Disaster Management Plan, will be compiled by the department with support from SMDA through Knowledge Institutions. Such best practices and Traditional wisdom for early warning, preparedness and response shall also be compiled.

One such traditional wisdom for early warning for flood in Assam is also included in **Annexure-14-B.**

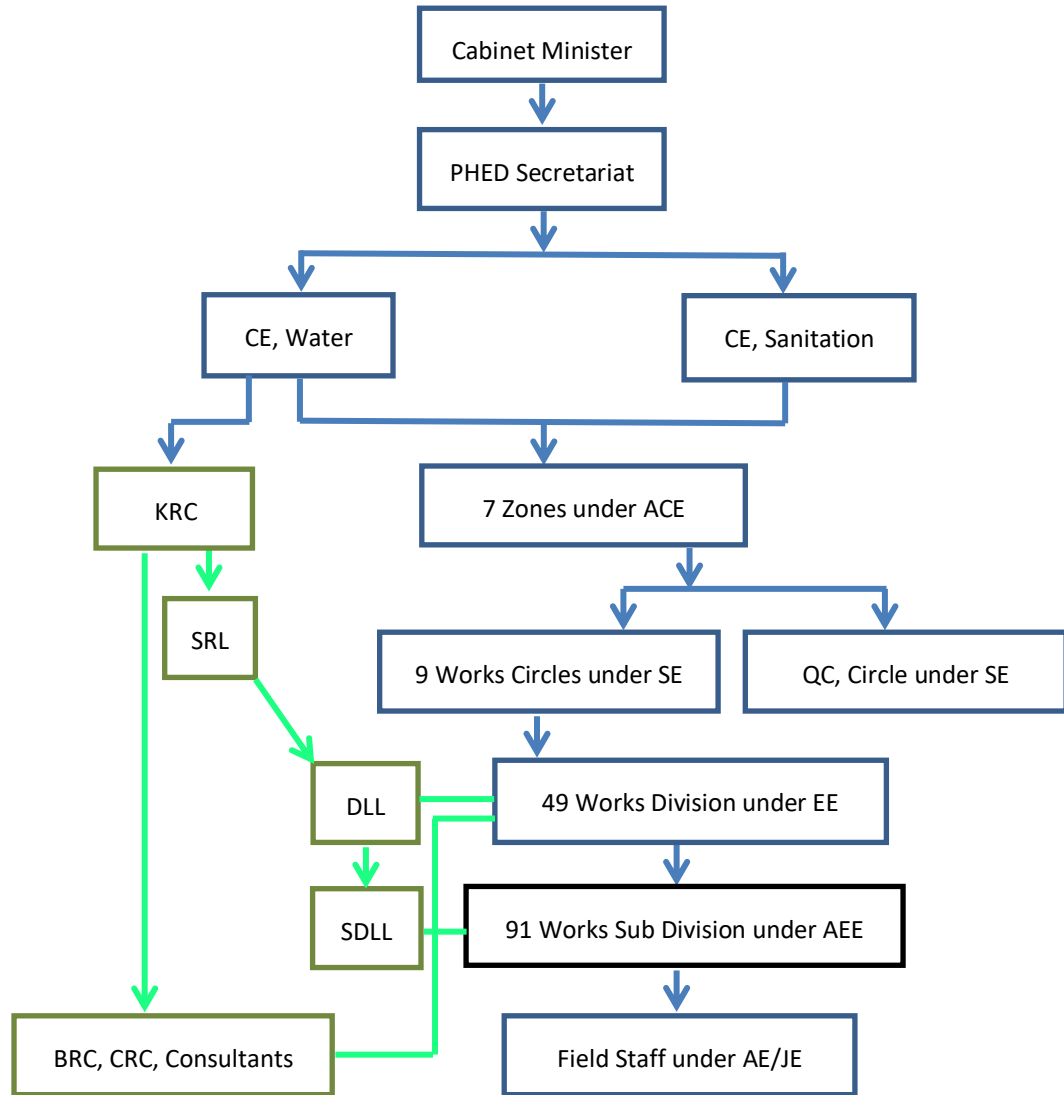
Chapter 10: Tentative Action plan

Sl No	Suggested Action	Tentative Timeline		
		Short term	Mid term	Long term
1.	GIS Mapping of all Piped Water Supply Schemes and Community Toilets.	2026-27 to 2027-28		
2.	Testing of 100% water sources owned by PHED before, during as well as after monsoon.	(To be conducted every year)		
3.	Disinfection of all water sources will be done during, pre and post monsoon period.	(To be conducted every year)		
4.	Inclusion of DM related session in the regular training calendar of PHE Department for the FY- 2026-27.	2026-27		
5	GIS/GPS Mapping of all PHE infra-structure and develop a database categorizing them as per disaster and structural vulnerability (safe and unsafe).		2026-27 to 2027-28	

It is to be mentioned here that, the Final action plan along with the financial implication would be submitted after allocation of budget provision for the whole financial year i.e. 2026-27.

Annexure-1

Institutional set up of PHED, Assam



Annexure-2



**Government of Assam
Office of the Chief Engineer, Public Health Engineering Department, Assam
Hengrabari, Guwahati-36**

No.PHE/TB/544/2022(Pt-I)/ 1323

Date: 25-05-2026

To,

**The Secretary to the Government of Assam
Public Health Engineering Department
Guwahati, Dispur-36**

Sub – Submission of Disaster Management committee for the year 2026-27 pertaining to the PHE(Water) Department.

Sir

With reference to the subject cited above, I have the honour to submit herewith that the Disaster Management committee for the year 2026-27 pertaining to the PHE(Water) Department. The committee has been constituted with the following members for effective coordination and management of disaster preparedness, response and related activities-

1. Chairperson- Secretary to the Government of Assam, PHE Department
2. Member Secretary- Chief Engineer(PHE) Water, Assam
3. Members-
 - a) Chief Engineer (PHE), Sanitation, Assam
 - b) Additional Chief Engineer (PHE), O/o the Chief Engineer (PHE), Water, Assam
 - c) Deputy Secretary (PHE)/Under Secretary (PHE) to the Govt. of Assam, PHE department.
 - d) Superintending Engineer (PHE), O/o the Chief Engineer (PHE), Water, Assam
 - e) Executive Engineer (PHE), Store & Workshop Division, Guwahati, cum Nodal officer (DM).
 - f) Assistant Executive Engineer (PHE), O/o the Chief Engineer (PHE), Water, Assam
 - g) Assistant Engineer (PHE), O/o the Chief Engineer (PHE), Water, Assam
 - h) Junior Engineer (PHE), O/o the Chief Engineer (PHE), Water, Assam
 - i) Project Officer (DM), PHE Department

This is for favour of your kind information .

Yours faithfully,

**Chief Engineer (PHE), Water, Assam Cum
Additional Mission Director, JJM, Assam
Hengrabari, Guwahati – 36**

Annexure-3

PHED has around 12,000 employees including officers, support field staff and Ministerial staff.

Cadre Strength position of officers

a) PHED Secretariat:

- | | | |
|----------------------|---|---|
| i. Secretary | : | 2 |
| ii. Deputy Secretary | : | 1 |
| iii. Under Secretary | : | 2 |

b) Directorate (Implementing set up):

- | | | |
|--|---|-----|
| i. Chief Engineer (PHE), Water , Assam | : | 1 |
| ii. Chief Engineer (PHE), Sanitation | : | 1 |
| iii. Additional Chief Engineer | : | 11 |
| iv. Deputy Director, KRC | : | 1 |
| v. Superintending Engineer | : | 15 |
| vi. Executive Engineer | : | 66 |
| vii. Assistant Executive Engineer | : | 166 |
| viii. Assistant Engineer | : | 289 |
| ix. Junior Engineer | : | 691 |

Annexure-4-A

GOVERNMENT OF ASSAM

OFFICE OF THE CHIEF ENGINEER (PHE), Water, ASSAM, HENGRAHARI, GUWAHATI-36

Phone: 03612232543, FAX: 03612232534, e mail: asphe@rediffmail.com

No. PHE-

Dt. 31/3/2025

To

The Executive Engineer (PHE)

.....

.....

Subject: Flood Preparedness activities at District level.

You may be aware that role and responsibilities of PHED have been explained under section 3.2.2 of State Disaster Management Plan (SDMP). Divisions have to gear up its activities beforehand, to meet the challenges of probable flood. Districts might have already submitted Departmental Disaster Management Plan (DDMP) to District Administration.

All the District level officials must be in close contact with the District Administration and get themselves prepared for the flood. In this context, DDMP and draft SOP (circulated through e mail) may be helpful for you in defining roles and responsibilities of different departmental functionaries.

Extracts from the letter, received from Assam Disaster Management Authority (ASDMA), is also enclosed herewith for your ready reference.

You are also requested to submit stock position of following items (before 15/4/2025), which may be mobilized on the wake of flood, so that, State Executive Committee (SEC) can be apprised of the same on 20/4/2025.

Sl. No.	Item	Nos.	Remark
1	HTW (Singur /TP etc.) with spares		
2	Ready made Squatting Plate for sanitation facility.		
3	Water Purifying Packets (Proposed to be produced and made ready)/ Halogen Tablets etc.		
4	Bleaching Powder (bag)		
5	H ₂ S (Bacteriological strip)		

You are also requested to furnish a report regarding availability of

1. Mobile Water Treatment Plant,
2. Mobile Laboratory

under your control and that may be mobilized to nearby District (area) including you Division.

Enclo: Annexures as stated above

**Chief Engineer (PHE), Water, Assam
Hengrabari, Guwahati-36.
Dt. 31/3/2025**

Memo. No. PHE-

Copy to:

1. The Chief Executive Officer, Assam State Disaster Management Authority, Assam Secretariat, Guwahati-6 for favour of his kind information with reference to letter vide No. RGR/ASDMA/12/12/76 Dt. 9/3/15.
2. The Secretary, PHED, Block-B, 2nd Floor, Assam Secretariat, Dispur, Guwahati-6 for favour of his kind information with reference to aforementioned letter forwarded on 18/3/25
3. The Chief Engineer (PHE), Sanitation, Hengrabari, Guwahati-36 for favour of his kind information.
4. The Additional Chief Engineer (PHE), ...Zone, ...for information.
5. The Superintending Engineer (PHE), ...Circle, ...for information.

**Chief Engineer (PHE), Water , Assam
Hengrabari, Guwahati-36.**

Annexure-I

Roles & Responsibilities of PHED as mentioned in section 3.2.2 of SDMP:

Department / Agency	Disaster Management Roles and Responsibilities
Public Health Engineering Department (List is not exhaustive & primarily focused at state level)	➤ Nodal department of the state government entrusted with the responsibilities of providing safe drinking water to the people of Assam ➤ Responsible for ensuring safe hygiene through Total Sanitation Campaign (TSC) ➤ Providing safe drinking water to all the schools located in rural areas ➤ Provide emergency supply of safe drinking water in disaster situations ➤ Assess the impacts of extreme events (natural and man-induced) on facilities of the department and propose / undertake mitigation measures ➤ Undertake risk assessment and management of ground water resources in emergency situations.

Important Dates:

- A. **By 15th February** – Meeting with District Administration to take the stock of flood preparedness.

- B. From 15th May to 15th Oct-** Establishment of Control room at District Level Office of the Department and regular communication with the Control room of District Administration.
- C. By 30th April –** Visit to Flood Affected area to assess readiness of installations (water & sanitation) and keep ready all stock materials so that the same can be mobilized immediately in the wake of flood.
- D. Latest by 15 days after receding flood –** Flood damage assessment
- E. Latest by 15th Oct –** Infrastructure related proposals for funding under State Disaster Response Fund in prescribed format.

Flood Affected area: Flood Hazard Atlas (prepared by NRSC) and available in website, asdma.gov.in

Roles and Responsibilities of Executive Engineer PHED in Flood Management:

Pre Flood	The Executive Engineer, Public Health Engineering will visit the generally flood affected areas by 30th April, and: (1) Assess measures likely to be required for safe water supply in these areas;
	(2) Prepare- • A list engineering personnel of different categories already available in the nearest P. H. E. division and the number of additional hands that may be required in each area in case of heavy floods; • A list of engineering personnel of different categories who, in case of necessity, can be withdrawn from their places of work and utilised for relief work;
	(3) Arrange for mobilising at short notice two P. H. E. teams at the district head quarters to rush them for relief work;
	(4) Ensure adequate stocks of- • Equipment and materials for sinking of tube well, ring well, water reservation etc., in the relief camps and other places in the flood affected areas; and • Camp materials and other stores for workers and keep them in appropriate places. • Preposition the water purifier mounted vehicle used for providing packaged drinking water in vulnerable locations in the state • Keep the departmental vehicles in good running condition

During Flood	On receipt of flood warning, Executive Engineer will- (1) Alert subordinate officers and staff for floods; (2) Check vehicles, equipment, stores etc. ; and (3) Draw up tentative programme of action.
	On occurrence of floods, Executive Engineer will- (1) Keep close touch with the D. C. (2) Visit the flood affected areas immediately with one P. H. E. team and start water supply measures and pit/sanitary latrines ; (3) Assess extent of water supply measures required and deploy necessary staff. If the staffs available in the district are not sufficient to cope with the situation, arrange through Chief Engineer (PHE). additional staff;

	and (4) constantly visit the flood affected areas and ensure adequate safe water supply and sanitation measures in the relief camps.
Post Flood	After Flood relief operation, Executive Engineer will: (1) Restore tools and equipment, stores etc.; and (2) Repair/replace damaged tools and equipment. (3) DSRF proposals for damaged water supply pipelines and infrastructures.

Annexure-4-B

GOVERNMENT OF ASSAM

OFFICE OF THE CHIEF ENGINEER (PHE), Water, ASSAM, HENGGRABARI, GUWAHATI-36

Phone: 03612232543, FAX: 03612232534, e mail: asphe@rediffmail.com

No. PHE-

Dt. 31/3/2025

To

The Executive Engineer (PHE)

..... **Division,**

.....

Subject: Preparation of Departmental Disaster Management Plan at District Level for the year 2025-26.

You may be aware that **Departmental Disaster Management Plan (DDMP)** is a live document and is to be updated at-least once in a year. This document needs to be submitted to the District Disaster Management Authority (DDMA) for their approval.

Now it is the time for preparation of District level DDMP for the year 2015-16 for your District. In this context, you also seek support from

- District coordinator of DDMA beside
- Trained up District Resource Group of PHED and
- State Resource Group of PHED.

You are also requested to consult following documents:

- Resource materials distributed at the time of training,
- Aforementioned DDMP prepared at state level and
- District Disaster Management Plan prepared by DDMA,

It has been informed that budget provision for Disaster Management/Training activities has been made against each Directorate, however, Department is advised to incorporate Disaster Management activities within its normal functions and budget. You are therefore, requested to share with DDMA regarding availability of fund for software/hardware activities.

- Trained officers (trained by ASDMA)
- Resource persons of Water Sanitation & Hygiene Practice (WASH) training at District level
- NGOs involved in Awareness Campaign and IEC
- Water Quality Testers with the help of Field Testing Kit, and Masons
- Mobile water treatment Plant, if any, or nearest available location
- Mobile Water Testing units, if any, or nearest available location
- Key Departmental personnel

may be prepared and made a part of DDMP.

A copy of DDMP prepared for your District may please be submitted to the office of the undersigned. In case of any support, if needed, may please be intimated to the undersigned without further delay.

Chief Engineer (PHE), Water, Assam
Hengrabari, Guwahati-36

Annexure-4-C

GOVERNMENT OF ASSAM
OFFICE OF THE CHIEF ENGINEER (PHE), Water, ASSAM, HENGRABARI, GUWAHATI-36
Phone: 03612232543, FAX: 03612232534, e mail: asphe@rediffmail.com

No. PHE-1939/TB /2014/T-395-249

31/3/2025

To
The Executive Engineer (PHE)
..... Division,
.....

Subject: **Daily reporting of relief and rehabilitation measures during and aftermath of flood.**

Divisions might have already framed preparedness plan to face the probable flood. In this context all district are once again requested to:

- Establish control room at Division office so that, early warning can be shared and immediate action can be taken thereon besides liaison with District Administration.
- Assess stock of materials, equipment etc. related to water supply & Sanitation besides readiness for installation of the same in the wake of flood.

You are also requested to submit daily reports on relief and rehabilitation measures taken by your Division to the undersigned without fail so that, weekly report can be forwarded to the ASDMA/CS on every Monday. Soft copy of the report (**in Excel format only**) may be submitted at 3.00 PM every day to the **following e-mail addresses** from your **official e-mail address**. Two formats are furnished herewith for your ready reference and daily submission.

E- Mail address: i) **asphe@rediffmail.com**
and ii) **as-phe@nic.in**

Encl: Two formats as stated above.

Chief Engineer (PHE), Water, Assam
Hengrabari, Guwahati-36

Memo. No. PHE-

31/3/2025

Copy to:

1. The Secretary, PHED, Block-B, 2nd Floor, Assam Secretariat, Dispur, Guwahati-6 for favour of his kind information.
2. The Chief Engineer (PHE) B&S, Hengrabari, Guwahati-36 for favour of his kind information.

3. The Additional Chief Engineer (PHE), ...Zone, ...for information & necessary action.
4. The Director, WSSO, PHED, Assam, Betkuchi, Guwahati-35 for information & necessary action.
5. The Superintending Engineer (PHE), ...Circle, ...for information & necessary action.

**Chief Engineer (PHE), Water, Assam
Hengrabari, Guwahati-36**

Daily Report of Flood affected areas (Relief)															Date:								
Name of District:																							
Name of Division:																							
Sl. No.	Name of Block	No. of Affected		Approximate No. of Population affected	Water Sources affected				No. of disinfection packets Distributed			Details of relief camps established by District Admn.		Water Supply arrangement in the camp from				No. of Toilets affected		No. of Sanitation facility provided in the relief Camp			Remark
		GP	Village		Name of PWSS		Spot source		Chemical Packets	Bleaching Powder	Halogen /NaDCC tablets	No. of relief camp	No. of Inmates	No. of				IHHL	Community/ Institutional	Toilet	Bath room	Hand Wash platform	
					Fully submerged	Partially submerged	Type	Numbers						PWSS	Temp. HTW/ Spot	Mobile Plant	Tanker						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	

**** Note: Cumulative figures are to be furnished from column 3 to 22 from the date of inception of flood during the financial year.**

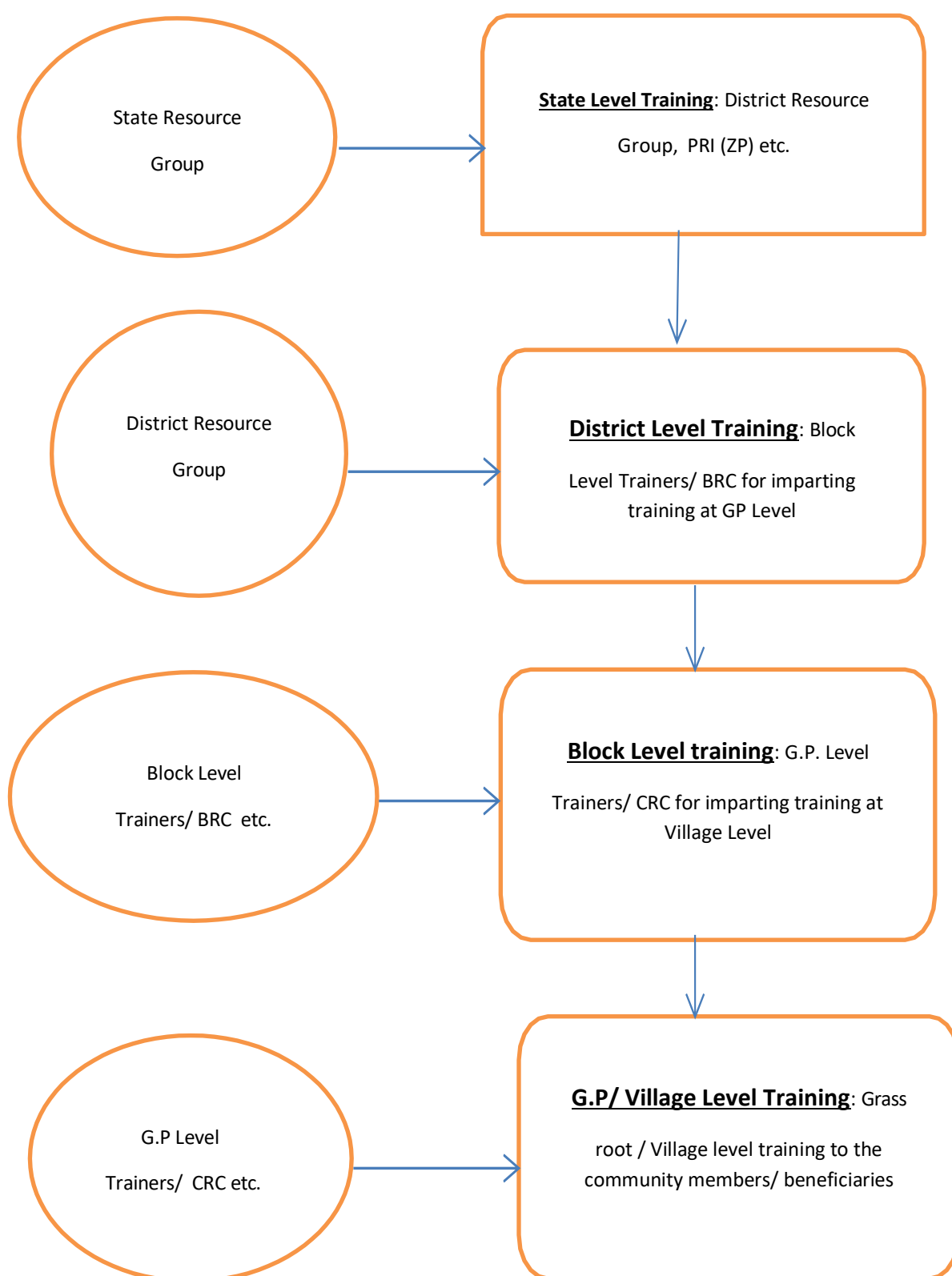
**Executive Engineer (PHE)
Division.....**

Daily Report of Flood affected areas (For Rehabilitation of Scheme/Facility)															Date:		
Name of District:																	
Name of Division:																	
Sl. No.	Name of Block	No. of		Restoration /Rehabilitation of affected scheme/ Facility										Community/ Institutional Toilets	Remark		
		GP	Village	Water sources affected						Disinfection of Water supply installation							
				Name of PWSS			Spot source			PWSS	Spot source	Pond					
				Fully Submerged	Partially Submerged	Probable cost of restoration	Type	Number	Probable cost of restoration								

Note: Data should be furnished in cumulative figure

**Executive Engineer (PHE)
Division.....**

Annexure-5



Specialised trainings are organized at state level for imparting training on recent development in water supply and Sanitation Sector for the departmental staff, PRI etc. besides need based training on request from District Level.

Annexure-6

Report on damages and activities undertaken on Relief works during flood in 2025 (Upto 22.9.2025)

- a. Total nos. of PWSS affected = 542
- b. Total nos. of spot sources affected = 2086
- c. Total nos. of IHHL affected = 20856
- d. Total nos. of spot sources installed at relief camp/ affected villages = 115
- e. Total nos. of spot sources disinfected = 478
- f. Total nos. of Chemical Packets distributed = 140204
- g. Total nos. of Halogen Tablets distributed = 514870
- h. Total nos. of Spot Sources repaired = 7
- i. Total nos. of Leaflet distributed = 22484
- j. Total nos. of Water Pouches distributed = 984100

Annexure-7

Master Inventory to be made ready as preparedness measure

Sl. No.	Items	Sector
1	Hand tube well sets	Water supply
2	Fast moving spare parts of hand Tube well	
3	Specials necessary for extension from nearby PWSS	
4	Mobile Water Treatment Plant with accessories	
5	Water Tanks (Reservoir)	
6	Water Tankers with vehicle	
7	Rigs, if not available may go for pre contracting	
8	Small water container for use in relief camp by individuals	
9	Water Purifying packets	Water purifiers
10	Chlorine /Halogen / NaDCC tablets	
11	Bleaching Powder for disinfection	
12	Field Water Testing Kits with reagents	Water testing
13	Bacteriological strips	
14	Mobile Laboratory	
15	Squatting Plate	Sanitation & Hygiene
16	Light weight sanitation components	
17	Mobile Toilets	
18	Toilet components for Temporary urinals & Bathrooms	
19	Tarpauline or Plastics to be used in Toilets	
20	Sprayer for campus disinfection	

Annexure-8

**TRAINING PROGRAMS CONDUCTED AT KEY RESOURCE CENTER, JJM, ASSAM,
BETKUCHI, GUWAHATI – 35 DURING THE FINANCIAL YEAR 2025-26.**

Sl No	Name of the Training	Target Group	No of Participants	Date
1	State Workshop on IT Technologies at Assam water center (FEEMA)	Senior Officer s of PHED, JJM, National NGO's	20	8 th April,2025
2	Two days Training Program on Drinking water supply Management system as per Is 17482:2020 in collaboration with BIS India and UNICEF Assam	Assistant Engineer	35	20 th November, 2025 to 21 st November, 2025
3	Hands- on Training for Laboratory personnel on Laboratory Methodologies	Microbiologist, Assistant Chemist, Lab Assistant	26	8 th December,2025 to 9 th December, 2025
	Hands- on Training for Laboratory personnel on Laboratory Methodologies	Microbiologist, Assistant Chemist, Lab Assistant	26	11 th December,2025 to 12 th December, 2025
4	Hands- on Training for Laboratory personnel on Laboratory Methodologies	Microbiologist, Assistant Chemist, Lab Assistant	26	15 th December,2025 to 16 ^h December, 2025
5	Induction Training for the Newly Recruited Junior Engineers under PHED, Assam.	Junior Engineers	66	10 th March to 2 nd April, 2026
6	Induction Training for the Newly Recruited Junior Engineers under PHED	Junior Engineers	64	17 th March, 2026 to 6 th April, 2026
7	Induction Training for the Newly Recruited Junior Engineers under PHED	Junior Engineers	65	9 th March, 2026 to 9 th April, 2026
8	Training for Sujalam Bharat App for implementing agencies (Batch 1)	Assistant Executive Engineer, Assistant Engineer, Technical Officer, MIS Co-coordinator	43	25 th February,2026
9	Training for Sujalam Bharat App for implementing agencies (Batch 2)	Assistant Executive Engineer, Assistant Engineer, Technical Officer, MIS Co-coordinator	48	25 th February,2026

10	Training for Sujalam Bharat App for implementing agencies (Batch 3)	Assistant Executive Engineer, Assistant Engineer, Technical Officer, MIS Co-coordinator	59	26 th February, 2026
11	State Level workshop on Acceleration and Sustaining of SBM-G outcomes	Assistant Executive Engineer, Assistant Engineer,	150	8 th to 16 th December, 2026
12	One Day State Level Training of Trainers (ToT) under SBM-G, Assam on Sustaining Solid Liquid waste management Assets	DPM/ADPM,TO,IEC ,HRD,SLWM	200	20 th & 21 st January, 2026

Internship at Key Resource Center, JJM, Assam, Betkuchi, Guwahati – 35

Sl No	Institute/ Organisation	Department	No of Interns	Duration
1	Assam Engineering College, Guwahati	Civil Engineering	11	10th June, 2025 to 3rd July, 2025
2	B. Borooah College, Guwahati	Zoology	3	2nd July, 2025 to 22nd July, 2026
3	Gauhati University	Environmental science	4	2nd July, 2025 to 28th July, 2025
4	Baksa Polytechnic, Baksa	Chemical Engineering	6	26th June, 2025 to 10th July, 2025
5	Bineswar Brahma Engineering college Kokrajhar	Civil Engineering	22	7th July, 2025 to 30th July, 2025
6	RIST Meghalaya	Civil Engineering	6	4th August, 2025 to 3rd September, 2025

Annexure-9

Flood Hazard Area and potential shelter place with raised platform (As on 2016)

Sl. No	Name of the District	No. of Villages in High & Very high Flood Hazard Category	Area in Hectares in High & Very High Flood Hazard Category	No. of potential shelter place & raised platform
1	Baksha	17	44	57
2	Barpeta	218	22334	17+8=25
3	Bongaigaon	37	3739	94+4=98
4	Cachar	295	41279	358
5	Chirang	8	32	10
6	Darrang	45	6818	59+54=113
7	Dhemaji	11	4084	31+59=90
8	Dhubri	202	23880	78+22=100
9	Dibrugarh	179	16716	94+3=97
10	Goalpara	154	17738	300+41=341
11	Golaghat	80	8209	110
12	Hailakandi	101	10061	47
13	Jorhat	109	13053	107+6=113
14	Kamrup	157	22431	230+31=261
15	Kamrup (M)	53	9774	45+5=50
15	KarbiAnglong	Nil	Nil	66+7=73
16	Karimganj	195	20310	No record available
17	Kokrajhar	Nil	Nil	113
18	Lakhimpur	208	22737	111+37=148
19	Marigaon	265	35465	173
20	Nagaon	331	35354	205+2=207
21	Nalbari	39	4332	143+14=157
22	DimaHasao	Nil	Nil	53
23	Sibsagar	280	20152	74
24	Sonitpur	81	12179	97+17=114
25	Tinsukia	28	2728	18+1=19
26	Udalguri	Nil	Nil	69+7=76
Total		3093	353449	3077

source: ASDMA

Annexure-10

Early warning Nodal Agency:

Disaster	Nodal Agency	PHED to monitor key parameters as made available by nodal agency
Floods	CWC/ Water Resource Department	1) Intensity & period of rainfall. 2) Quantum of release of water 3) Water supply/Sanitation assets in flood areas, Water Quality & disinfection.
Landslides	GSI	1) Intensity of rainfall 2) Distribution line/TP & sanitation units on steep slopes & prone to landslides.
Earthquake	IMD	1) Water retaining structures/ Water TP 2) Community Sanitation facilities.
Cyclone	IMD/RMC	Intensity & period of rainfall.
Drought	Department of Agriculture	1) Intensity and period of rainfall 2) Declining ground water level & surface water bodies 3) Poor recharge of aquifers 4) Wilting of crops
Epidemic	H & FW Dep	Water Quality Monitoring

Annexure-11

Contact details of important Nodal Agencies:

Nodal Agency	Type of Disaster	Address	Contact numbers
Control Room Disaster Management Division, Ministry of Home affairs, Govt. of India	All disasters	Integrated Operations Centre, Ministry of Home affairs, Room No.-12, North Block New Delhi	Ph: (011) 23092763, 23092885, 23092923, 23093054, 23093563, 23093564, 23093556, Fax: (011) 23093750
Indian Meteorological Department, Dy. Director (Meteorology)	Cyclone & Earthquake	Dy. Director General of Meteorology, Lodhi Road New Delhi	Ph.: (011) 24690279 e-mail: amss20042000 @yahoo.co.in
Central Water Commission	Floods	SWC, Sewa Bhawan, RK Puram, New Delhi-110066	Ph.: (011) 26108855 Fax: (011) 26195518
Geological Survey of India (GSI)	Landslide	27, JL Nehru Road, Kolkata- 700016, West Bengal	Ph: (033) 22861676 Fax: (033) 22861661
Department of Agriculture	Drought	Dr. Rajendra Prasad Road, New Delhi-110001	(011) 23382719
Ministry of Drinking Water & Sanitation (MDWS)	Water & Sanitation	9 th Floor, Paryavaran Bhawan, CGO Complex, Lodhi Road, New Delhi-110003	Ph: (011) 24361043 Fax: (011) 24364113 E mail: jstm@nic.in
National Disaster Management Agency (NDMA)	Disaster Management	NDMA Bhawan, A-1 Safdarjung Enclave, New Delhi-110029	Ph: (011) 26701728, Fax: (011) 26701729 E mail: info@ndma.gov.in
Central Seismological Observatory	As on 2011		09863022211
Central Water Commission			0361-2674268/
Indian Meteorological Department, Borphar			0361-2840201/2840552
NDRF, Guwahati			2840284
NEEPCO (Control Room)			03642-504153/2222938
NESAC			03642-908830
ARSAC			0361 - 2464617
ASDMA (FLEWS & others) Website: sdmassam.nic.in e mail: statedmcontrolroomassam@gmail.com			0361- 2237221

Annexure-12

List of firms dealing with emergency water supply & sanitation components (source: wes-net India)

Agencies and Suppliers Providing Products and Services related to WATSAN in Emergencies	
S.No	Name and Address of the Agency
1	Agencies offering Technical Service on Water Supply & Sanitation
a)	RedR India A-14, Nivedita Apartments, 70 Rambagh Colony, Paud Rd., Kothrud, Pune, India-411038, <i>Phone:</i> +91 (0) 20 3091 2532, <i>Fax:</i> +91 (0) 20 2544 6659, <i>Email:</i> info@redrindia.org,
b)	Action for Food Production (AFPRO) 25/1A, Pankha Road, D-Block, Janakpuri, New Delhi - 110058 <i>Phone:</i> 011-28525412 <i>Email:</i> ed@afpro.org
c)	Training and Development Centre (TDC) 11-13-242, Road No. 5, Alkapuri Colony, Disukhnagar Hyderabad, <i>Phone:</i> 040-24032689 <i>Mobile:</i> 9908930123 <i>Email:</i> tdchyd@gmail.com
2	Agencies offering Technical Service on ECOSAN & DEWATS (Sanitation)
a)	Ecosan Services Foundation "Vishwa Chandra", 1002/42 Rajenda nagar, Pune – 411030, Maharashtra, India <i>Phone :</i> 0091 (0)20 64 000 736 <i>Fax :</i> 0091 (0)20 24 530 061 <i>Email:</i> ecosanindia@gmail.com <i>website:</i> http://www.ecosanservices.org/page.php?id=1
b)	Eco-Solutions "Pulari", 49 Asan Nagar , Vallakadavu, Trivandrum 695008, Kerala, India <i>Tel :</i> ++91 471 2502622 <i>Email:</i> paul@eco-solutions.org
c)	SCOPE P/17, 6th Cross, Ahamed Colony, Ramalinganagar, Tiruchirappalli - 620 003, Tamil Nadu <i>Phone No:</i> 0431 – 2774144 <i>Email:</i> scopeagency86@rediffmail.com
d)	Consortium for DEWATS Dissemination, No 220, 4th 'A' Cross, 3rd Block, HRBR Layout, Kalyan Nagar, Bangalore – 560043 <i>Tel:</i> +91-080-25431772, <i>Telfax:</i> +91-080-25431773, <i>Email:</i> cddindia@eth.net <i>Internet:</i> http://www.borda-sa.org

Agencies and Suppliers Providing Products and Services related to WATSAN in Emergencies	
S.No	Name and Address of the Agency
3	Manufacturers of Water Testing Kits (approved by Government of India)
a)	Techno-ad Sysytems Inc. Bhaskar Lane, Jayendra Ganj, Gwalior, Madhya Pradesh 474 009, <i>Telefax: 2323765</i> <i>Email: watersafe@hotmail.com</i>
b)	Tamilnadu Water Supply and Drainage Board (TWAD) 31, Kamarajar Salai, Chepauk, Chennai - 600 005 <i>Telefax: 044-285 25501</i> <i>Website: http://www.twadboard.com/</i>
c)	Development Alternatives B-32, TARA Crescent, Qutab Institutional Area, New Delhi 110 116 <i>Phone: 011-26898264, 26967983</i> <i>Email: tara@sdaalt.ernet.in</i> <i>Website: http://www.devalit.org/</i>
d)	LTEK Systems 2 B Rajkamal Complex, Dhantoli, Nagpur 440 012 <i>Phone # 91-712-542230</i> <i>Fax # 91- 712-521746</i> <i>Email: vishva@nagpur.dot.net.in</i> <i>Website: http://www.lteksystems.com/bactoh2s/</i>
e)	Royal Enterprises 3rd Floor, No.23, Narasingapuram Street, Anna Salai, Chennai-2 <i>Contact No: 09444231620</i>
f)	Prerana Laboratories Prerana House, near Chatrapati Bank, Vishal Nagar (Jagtap Dairy) Off Aundh-Wakad Road, Pune - 411027
g)	Water Tech Engineers Saluja Arcade, 1st Floor, Thokatta, Tank bund, Secunderabad – 500 009
4	Personal Water Purifier & Moquito Repellent Nets
a)	Vestergaard Frandsen India Pvt. Ltd. Add: 302, Rectangle One, D-4, Saket New Delhi – 110017 <i>Tel: +91 11 4055 3666</i> <i>Mobile: +91 99104 44725</i> <i>E-mail: mas@vestergaard-frandsen.com</i> <i>Web: www.vestergaard-frandsen.com</i>
5	Tarpaulin & Tents

Agencies and Suppliers Providing Products and Services related to WATSAN in Emergencies	
S.No	Name and Address of the Agency
a)	United Canvas Udyog BG-295, 1st floor Sanjay Gandhi Transport Nagar New Delhi-110042 Contact nos.- 0-9810320501,9313323792, 011-27831226,65900226 Fax-011-27833906 Email: united_canvas@yahoo.com
b)	Priyanka (India) Pvt. Ltd. B - 109, Mayapuri Industrial Area Phase – I New Delhi – 110064 Tel: 011-28117755, 09899222000 Fax: 011-28115192 Email: srv@priyankaindia.com
6	Chlorine/Halozen Tablets and other Water Treatment chemical & Equipments
a)	Water Chem Laboratories H.No.11-6-652/1 1 st Floor, Red Hills, Hyderabad – 500 004 Tel: 040-23300428, Fax: 040-23300428 Email: waterchemlabs@yahoo.co.in
b)	Gripo Laboratories 1519-A, Bhagirath Palace, Chandni Chowk Delhi-110006 Ph: 011-23865913 Email: gripolabs@gmail.com
7	Domestic Water Filters
a)	Bio-Sand Filters Mr.A.Gurunathan / Ms.J.Kanagavalli DHAN Vayalagam (Tank) Foundation No.17, Vellai Pillaiyar Koil Street S.S.Colony, Madurai – 625 010, Tamilnadu, INDIA Ph: 91-452-2601673, 2610794, 2610805 Fax: 91-452-2602247 Email: dhantank@airtelbroadband.in Website: http://www.dhan.org/
b)	Terafil S. Khuntia, A. K. Sahu & P. C. Beuria Regional Research Laboratory (Council of Scientific & Industrial Research) Bhubaneswar – 751 013, India. Tel. No. + 91 – 671, 2581 635, 2581 636. Email: khuntias@yahoo.com & skhuntia@rmlbhu.res.in Website: http://www.thinkcycle.org/tc-filesystem/download/development_by_design_2002/publication:_terafil_water_filter_for_sustainable_drinking_water_programme/dyd_o2-Terafil-paper.PDF
c)	Rice Husk based Water Filter Prof. Mathai Joseph, Executive Director TATA Research Development and Design Centre 54B, Hadapsar Industrial Estate, Pune 411 013, Maharashtra Phone: 020-6871058; fax: 020-6810921 Email: mj@pune.tcs.co.in ; website : www.tcs.com
d)	Candle Filters (Should be used along with chlorination if bacteriological contamination is suspected) Available in Open Market

Agencies and Suppliers Providing Products and Services related to WATSAN in Emergencies	
S.No	Name and Address of the Agency
e)	Zero-B (On tap purifier & Storage type filters) Ion-Exchange Tiecicon House, Dr. E. Moses Road, Mahalaxmi, Mumbai-400 011, India Tel : (91) 22 3989 0909 Fax : (91) 22 2493 8737 email : hocro@ionexchange.co.in , ieil@ionexchange.co.in Website: http://www.ionindia.com/residentiallink.html#sur
f)	Nadi Filters A. Khurshid Bhatti President Association for Humanitarian Development (AHD) 60/A, Block-C, Unit No. 6, Latifabad Hyderabad, Pakistan- 71800 Ph: +92-22-2933236 E-mail: ahdpak@yahoo.com Website: www.ahdpak.org

Annexure-13

Monitoring Checklist for Hygiene promotion

Safe excreta disposal	(based on SPHERE standards) • People use toilets • Children's faeces is disposed off hygienically and immediately • Toilets are used in the most hygienic way • Parents are aware of the needs to dispose children's faeces safely
Hand washing with soap	• Women and men know the importance of hand washing for getting rid of germs from hands • People wash hands after defecation and handling children's faeces and before handling food • Children can demonstrate method-rubbing with an agent/soap
Safe handling of drinking water	• A safe/protected source is used for fetching drinking water • Observation shows proper storage of drinking water - clean, covered narrow mouth vessel, long handle ladle, disinfection method (if any) • Observation shows hands not being dipped into the drinking water at the time of collection from the water source. • Pots not being dipped in storage tanks at water collection points.
Women's health and hygiene	• A safe/protected source is used for fetching drinking water • Observation shows proper storage of drinking water - clean, covered narrow mouth vessel, long handle ladle, disinfection method (if any) • Observation shows hands not being dipped into the drinking water at the time of collection from the water source. • Pots not being dipped in storage tanks at water collection points.
Proper use and maintenance of sanitation facilities	• No excreta including child faeces, visible in temporary relief centre or in solid waste. • Proper usage of toilets/ No excreta visible in pans or slabs • Women articulate a safe method of disposal of child excreta

Disinfection dose for different types of contaminations			
Use of disinfection	Excreta/Vomits/Shoes/Corpses	Floor/Utensils/Beds	Hand/Skin/Cloths
Starting with	2% solution	0.2% solutions	0.05% solutions
Calcium Hypochlorite at 70% active Chlorine	30 gm/litre or 2 tablespoons in 1 Litre	30 gm/10 Litres or 2 tablespoons in 10 Litre	7 gm/10 litres or Half tablespoon in 10 Litres
Bleaching Powder (Chlorinated Lime) at 30% Chlorine	66 gm/Litre or 4 tablespoons in 1 Litre	66 gm/10 Litres or 4 tablespoons in 10 Litres	16 gm/10 litres or 1 tablespoon in 10 Litres

Annexure-14-A

Strategic Activity Planner for Drought Preparedness												
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												

Strategic Activity Planner for Drought Early Warning												
Activity	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Potential water deficit												
For Irrigation												
For Drinking water												

Annexure-14-B

Traditional wisdom/ Local beliefs on Early warning In terns 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.

Annexure-14-C

Specific attention to Water User Groups as part of Flood/Drought Preparedness

Drinking Water User Group	Flood/ Drought possibility	Potential initiative for
Public Drinking Water Supply	Flood	Raising HP's height, Covering Ring Well, Water testing followed by Disinfection, if necessary
	Flood/Drought	Repairing of leaks.
	Drought	Non-essential water use restriction, emergency source enhancement/ deepening of HPs if technically feasible; mandatory water conservation; Pressure reduction.

Annexure-15

Chlorination (Disinfection of water source)

Chlorination

(Based on the Guidelines of the Department for Drinking Water Supply, Govt. of India)

It has been observed that addition of 4 mg of bleaching powder for every litre of dug well water very effectively destroys the micro-organisms in water and the residual chlorine remains in the range of 0.2-0.5 mg/l.

Working process:

The quantity of water can be measured on the basis of the formula given below.

By assessing the depth and diameter of the well and thereafter by following the chart, the quantity of bleaching powder needed can be determined. The diameter and the height of the well has to be measured by meter. If the measurement is done in feet then it has to be converted to meter by multiplying the feet by 0.304.

$$\text{Volume of Water} = \frac{3.14 \times \text{diameter}^2 \times \text{height}}{4} \times 1000 \text{ litre}$$

Example : If the depth of water is 4 m. diameter is 2 meter then the volume of water in the dug well is

$$= \frac{3.14 \times 2 \times 2 \times 4 \times 1000}{4} = 12560 \text{ litre}$$

Therefore 12560 x 4 mg of bleaching powder or 50.28 gm of bleaching powder will be needed.

The chlorine in bleaching powder is unstable. Therefore, it should be kept with care in cool and dry place. The available chlorine in bleaching powder should always be 25% i.e. 4 mg/l bleaching powder should be used for disinfection.

Necessary things required:

- a) Bucket
- b) Bleaching Powder
- c) Glass Rod

Process of adding bleaching powder:

After the required quantity of bleaching powder is determined, it should be taken in a bucket. Then with a little water and with the help of a glassrod it should be made into a paste. After this, water from the dugwell should be poured into the bucket. It should be allowed to settle for some time. After the lime is settled at the bottom the water from above is poured into another bucket. This bucket of water then poured into the dugwell. Then the water of the dugwell is stirred well, so that chlorine mixes well with the dugwell water. After a period of 30 minutes the residual chlorine of the dugwell is assessed and then used for drinking purpose.

Other methods of disinfection :

Pot Chlorination :

Single Pot System

An earthen pot or a plastic container of 7 - 10 litres capacity with 6 - 8 mm dia. holes at the bottom is half filled with gravels of 20 to 40 mm size. Bleaching powder and sand (1:2 proportion) is placed on top of the gravels and the pot is further filled with gravels up to the neck. The pot is then lowered into the well with its mouth open.

For a well from which water is taken at a rate of 1000 - 1200 litres/day, a pot containing about 1.5 kg. of bleaching powder could provide adequate chlorination for about 1 week. (figure I)

Double Pot System :

When a single pot system is used in a small household well, it may be found to give too high a chlorine content to the water (over chlorination - very effective after flood). In such situations, a unit consisting of two cylindrical pots one inside the other has been found to work well. The inner pot is filled with moistened mixture of 1 kg. of bleaching powder with 2 kg. of coarse sand to a little below the level of the hole and is then placed inside the outer pot. This unit is lowered into the well with the help of a rope. It has been found by a study conducted by AIH&PH that such a unit could work effectively for 2 - 3 weeks in household wells from which water is withdrawn at a rate of 400 - 500 litres/day. (figure II)

Drop Chlorination :

Main requirements of this arrangement are a plastic container of 3 - 4 litre capacity with a 6 - 8 mm brass tap, 1 kg. of bleaching powder and a fine strainer .

Bleaching powder would be mixed with water in a separate container and then the solution would be filtered into the plastic container by the strainer. The container would then be placed in a nylon net and lowered by a rope inside the well at ground level. Drop adjustment from the container in the well would be made by the tap/stopper by

calculating the quantity of average daily water drawn from the well. It has been found that for a well from which water is taken at a rate of 1000 litres/day, this unit could provide adequate chlorination for about 1 week. (figure III)

This system had been field tested in villages of Kerala by AIH&PH and had been found to give satisfactory results in maintaining residual chlorine in dug wells.

Dose of Bleaching Powder for Disinfection of Different Size of Dug Wells — A Ready Reckoner

Diameter of the Dugwell (ft/metre)	Depth of Water (ft/metre)	Volume of Water (litre)	Amount of Bleaching Powder* (gram)
3 ft. (0.9 m)	1 ft. (0.3 m)	190.7	0.7
	2 ft. (0.6 m)	381.4	1.5

	3 ft. (0.9 m)	572.2	2.2
	4 ft. (1.2 m)	762.9	3.0
	5 ft. (1.5 m)	956.7	3.8
	6 ft. (1.8 m)	1144.4	4.5
	7 ft. (2.1 m)	1335.1	5.3
	8 ft. (2.4 m)	1525.9	6.1
	9 ft. (2.7 m)	1716.6	6.8
	10 ft. (3.0 m)	1907.4	7.6
	15 ft. (4.5 m)	2861.1	11.4
	20 ft. (6.0 m)	3814.8	15.2
	25 ft. (7.6 m)	4832.0	19.3
	30 ft. (9.1 m)	5785.7	23.1
	35 ft. (10.6 m)	6739.4	26.9
	40 ft. (12.1 m)	7693.1	30.7
	45 ft. (13.7 m)	8711.1	34.8
	50 ft. (15.2 m)	9664.1	38.6
3.6 ft. (1 m)	1 ft. (0.3 m)	235.5	0.9
	2 ft. (0.6 m)	471.0	1.8
	3 ft. (0.9 m)	706.5	2.9
	4 ft. (1.2 m)	9442.0	3.7
	5 ft. (1.5 m)	1177.5	4.7
	6 ft. (1.8 m)	1413.0	5.6
	7 ft. (2.1 m)	1648.5	6.5
	8 ft. (2.4 m)	1884.0	7.5
	9 ft. (2.7 m)	2119.6	8.4
	10 ft. (3.0 m)	2355.0	9.4
	15 ft. (4.5 m)	3532.5	14.1
	20 ft. (6.0 m)	4710.0	18.8
	25 ft. (7.6 m)	5966.0	23.8
	30 ft. (9.1 m)	7183.5	28.5
	35 ft. (10.6 m)	8321.0	33.2
	40 ft. (12.1 m)	9498.5	37.9
	45 ft. (13.7 m)	10754.5	43.0
	50 ft. (15.2 m)	11932.0	47.7
4 ft. (1.2 m)	1 ft. (0.3 m)	339.1	1.3
	2 ft. (0.6 m)	678.2	2.7
	3 ft. (0.9 m)	1017.3	4.0
	4 ft. (1.2 m)	1356.4	5.4
	5 ft. (1.5 m)	1695.6	6.7
	6 ft. (1.8 m)	1808.6	7.2
	7 ft. (2.1 m)	2373.8	9.4

	8 ft. (2.4 m)	2712.9	10.8
	9 ft. (2.7 m)	3052.0	12.2
	10 ft. (3.0 m)	3351.2	13.5
	15 ft. (4.5 m)	5086.8	20.3
	20 ft. (6.0 m)	6782.4	27.1
	25 ft. (7.6 m)	8551.0	34.3
	30 ft. (9.1 m)	10286.6	41.1
	35 ft. (10.6 m)	11982.2	47.9
	40 ft. (12.1 m)	13677.8	54.7
	45 ft. (13.7 m)	15486.4	61.9
	50 ft. (15.2 m)	17182.0	68.7

* @4 mg/l of Bleaching Powder (B.P.) or 1 mg/l of Chlorine

4.2.2 Tube Well & Hand Pump

The tube well as well as hand pump may get contaminated due to entry of polluted water through the annular spaces around the tube well, entry of contaminated water during flood, local priming with contaminated water etc. Hence, tube well and hand pump need to be disinfected regularly once or twice a year.

Process of disinfection of tubewell water

Working Process :

Before the installation of the pump, the tubewell should be disinfected. Moreover, during repair also disinfection is necessary. With the help of the formula given below determine the quantity of water and bleaching powder. In case of tubewell 200 mg/l of bleaching powder is added. After 30 minutes water should be pumped and allowed to flow out for some time.

$$\text{Volume of Water} = \frac{3.14 \times \text{diameter}^2 \times \text{height}}{4} \times 1000 \text{ litre}$$

Necessary articles required :

- Bucket
- Bleaching powder
- Glass rod

Process of Adding Bleaching Powder:

After determining the required amount of bleaching powder to be added it is taken in a bucket. Then with the help of the glass rod and a little water a paste is made. Then water is added and the powder is mixed. This mixture of water is poured into another bucket. Now one part of the water is poured into the tubewell and in the remaining part the different parts of the tubewell immersed, after 30 minutes water is pumped and the water allowed to flow away for some time before using it.

Dose of Bleaching Powder for Disinfection of Tubewells — A Ready Reckoner

Depth of Water	India Mark-II		India Mark - III		Tara Pump	
Metre	Volume of Water	Amount of Bleaching Powder	Volume of Water	Amount of Bleaching Powder	Volume of Water	Amount of Bleaching Powder
<i>Metre</i>	<i>Litre</i>	<i>Gram</i>	<i>Litre</i>	<i>Gram</i>	<i>Litre</i>	<i>Gram</i>
1	25	5	51	11	39	8
2	50	10	102	20	78	16
3	75	15	153	31	117	23
4	100	20	204	41	156	31
5	125	25	255	51	195	39
6	150	30	306	61	234	47
7	175	35	357	72	273	55
8	200	40	408	82	312	62
9	225	45	459	92	351	70
10	250	50	510	102	390	78
15	375	75	765	953	585	117
20	500	100	1020	204	780	156
25	625	125	1275	255	975	195
30	750	150	1530	306	1170	234
35	875	175	1785	357	1365	273
40	1000	200	2040	416	1560	312
45	1125	225	2215	459	1755	351
50	1250	250	2550	510	1950	390

Annexure-16

Residual Chlorine testing Kit, FTK, Vials & Water Purification sachets

Measurement of Residual Chlorine with the help of FTK:



FTK



H₂S Strip



NaDCC Tablet

- Content: 1000 no.s of 0.5 gm
- Purification Capacity: 20 to 25 Lt. per tablet
- Potency: 36 months
- Manufacturer: Water Chem Laboratories, Hyderabad.
- Ingredient: 35mg of Sodium Dichlor Isocyanurate
- Available Chlorine= 20 to 25 mg



Step I: Adding 1 tablet to 20 to 25 Lt. of clear Water.
Step II: Waiting for 15 minutes for Chlorination.
Step III: Stirring well before use.

Halogen Tablet

- Content: 1000 no.s
- Purification Capacity: 1 Lt. per tablet
- Potency: 12 months
- Manufacturer: Water Chem Laboratories, Hyderabad.
- Ingredient: Halazone U.S.P 4 mg



- Step I: Adding 1 tablet to 1 Lt. of raw water.
- Step II: Stirring well
- Step III: Keeping undisturbed for 15 minutes.

Water Purifying Chemical

- Content: 100 gm
- Purification Capacity: 250 Lt. per sachet
- Potency: 12 months
- Manufacturer: PHED, Assam
- Ingredient:
 - (i) B.P=4 gm & (ii) Lime=32 gm
 - (iii) Alum= 64 gm
- To use within 1 month after opening.



Step I: Adding ¼ Teaspoon from 1st packet & ½ from 2nd Packet to 10 to 15 Lt. of raw water
Step II: Stirring well & keeping undisturbed for 30 minutes.
Step III: Filtering through clean cotton cloth.

Water Purifying Chemical



- a) Safe,
- b) Recognition at National Level (SRII, New Delhi).
- c) Easily available & easy to handle,
- d) Economic.

PUR

- Content: 4 gm
- Purification Capacity: 10 Lt.
- Potency: 3 Years
- Manufacturer: P & G
- Ingredient:
 - (i) Calcium Hypochlorite
 - (ii) Iron Sulphate: 352 mg (Ferric Iron)

Step I: Mixing

Step II: (i) Stirring for 5 minutes (ii) Keeping Undisturbed for 5 minutes.

Step III: Filter through clean cotton cloth.

Step IV: Ready for use after 20 minutes if colour is not yellow.



Annexure-17

Low cost Sanitation unit for water logged area, Different low cost models & light weight PVC squatting plate in emergency use.

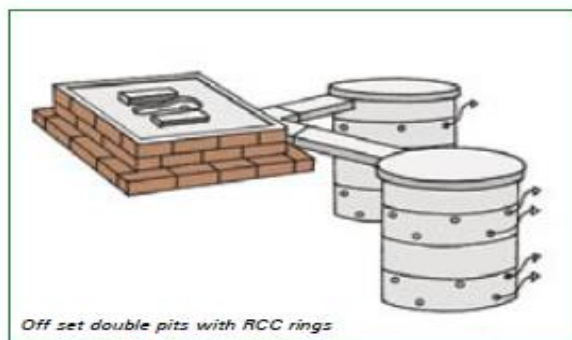


Figure 27

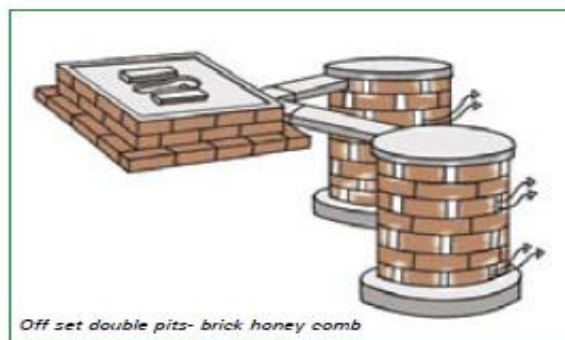
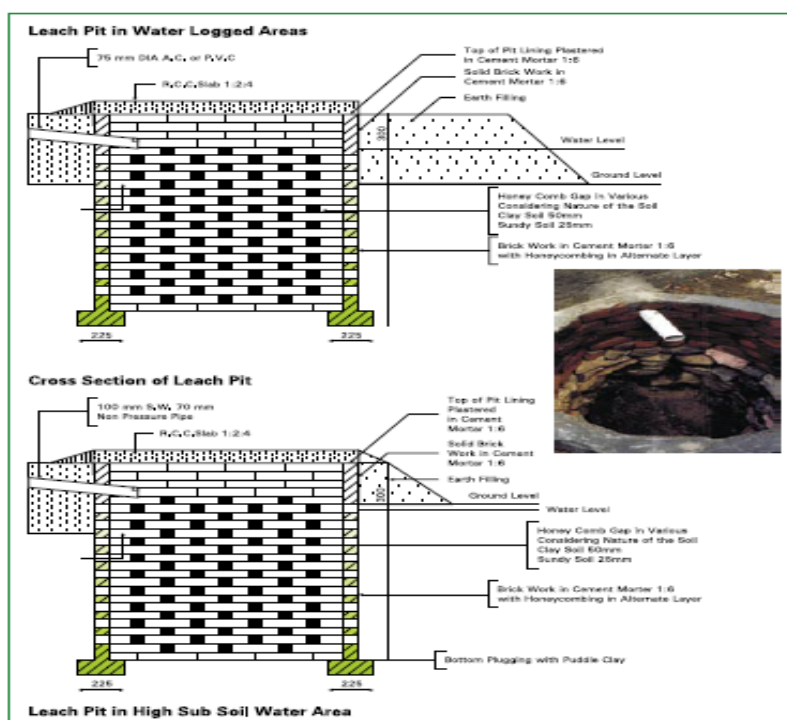
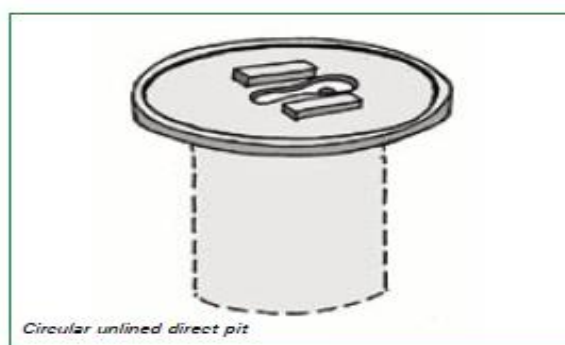
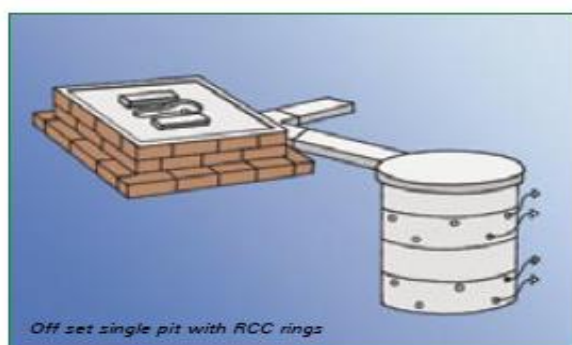


Figure 28



Annexure-18

Contact Details of PHED officials at Govt. and State

Sl. No.	Name of		Head Quarter	Name of Officer	Cell Phone Number
	Area of Operation	Office			
1.	Water Supply & Sanitation Services	PHED Secretariat	Secretariat	Kailash Karthik N, IAS.	95310-69185
2.	Water Supply & Sanitation Services	PHED Secretariat	Secretariat	Gitimoni Pkukan, IAS	94350-48493
3.	Water Supply in rural areas	O/o the Chief Engineer (PHE), Water, Assam	Hengrabari, Guwahati-36	Sri Pallab Kr. Das	94350-44140
4.	Sanitation Services in rural areas	O/o the Chief Engineer (PHE), Sanitation	Hengrabari, Guwahati-36	Bhaskar Jyoti Sarma	91270-09694

Contact Details of Divisional Executive Engineers

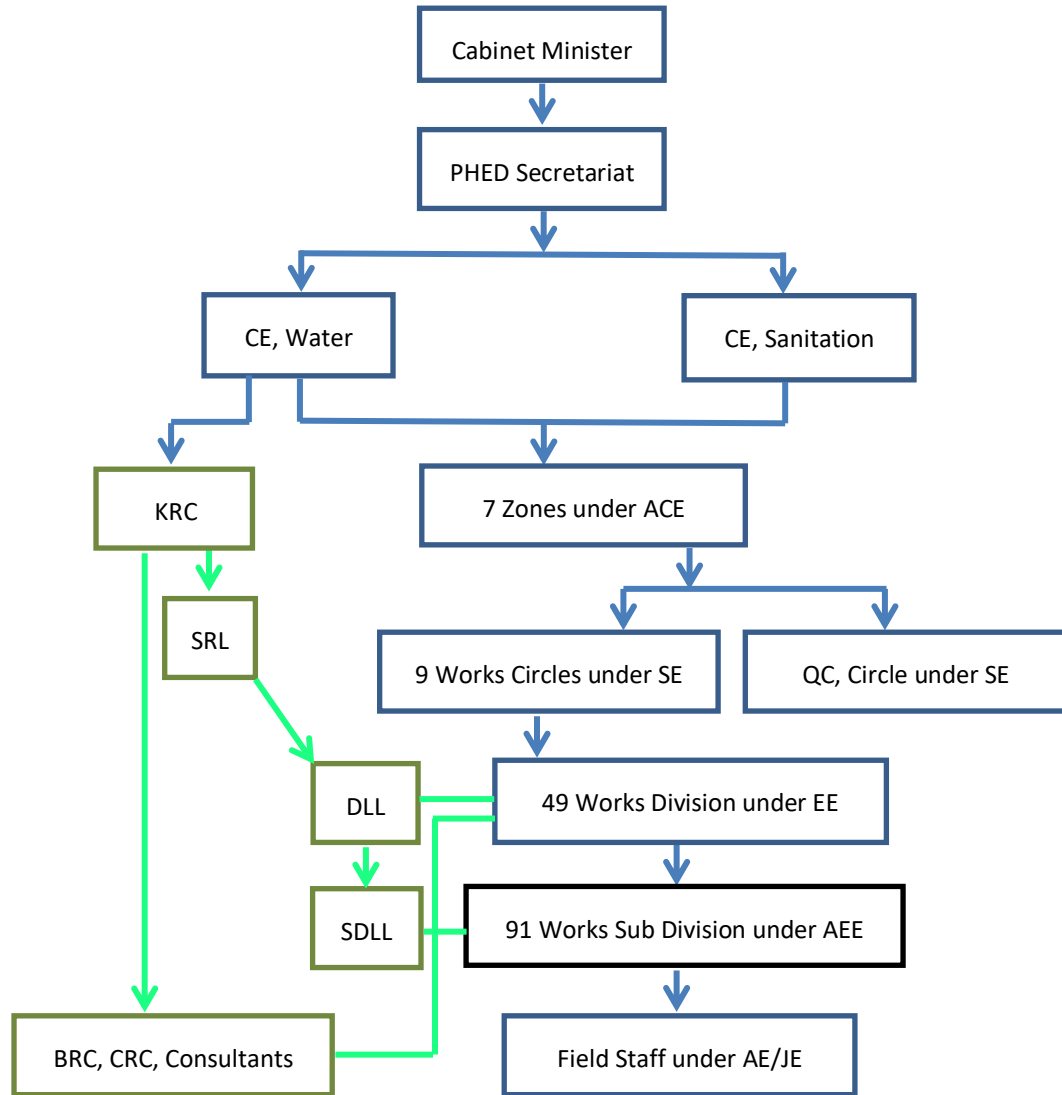
Sl. No.	Division	Executive Engineer	Contact No.
1.	Guwahati-I	Mukut Barman	98641-06939
2.	Guwahati-II	Saraju Prasad Kalita	86380-75845
3.	Store & Workshop	Sanjib Pathak	94358-01258
4.	Goalpara	Prakash Haloi	86385-81352
5.	Rangia	Samiran Das	70026-67321
6.	Nalbari	Nitul Talukdar	86381-36185
7.	Barpeta	Sisir Bharali	93957-24162
8.	Bajali	Pranab Deka i/c	70866-40755
9.	Belsor	Mahidul Hoque	88118-15757
10.	Dhubri	Hitesh Rabha	78960-49473
11.	S.S. Mankachar	Sanjoy Dev Choudhury	94357-00673 84538-99049 86384-24869
12.	Bongaigaon	Khanindra Narayan Das	69016-51906 94355-11639
13.	Baksa	Pranjal Pathak	94350-24988
14.	Gossaigaon	Phanindra Mushahary	86384-17774
15.	Kokrajhar-I	Jitumoni Das	97068-86277
16.	Kokrajhar-II	Sabir Ahmed	98643-51179

17.	Tangla	Bikash Kalita	98540-80486
18.	Jorhat	Ajay Lahon	94353-52061
19.	Majuli	Neetamoni Gogoi	94355-30445
20.	Golaghat	Abhijita Arundhoti Bhagawati	98642-52383
21.	Bokakhat	Prabin Kr. Handique	69007-84246 86381-45244
22.	Nagaon	Rupjyoti Bordoloi	88227-45835
23.	Morigaon	Babul Boro	99541-23855 98640-29416
24.	Kaliabor	Mandeep Bharali i/c	70028-63624
25.	Hojai	Sarat Bora	70860-37474 60026-51084
26.	Dhing	Badruz Zaman	7399568298
27.	Charaideo	Tapan Lal Phukan	94350-59547 86388-72815
28.	Sivasagar	Dipankar Bora	88765-42478
29.	Tinsukia	Juganta Gohain	87230-77020
30.	Dibrugarh	Nibir Bora i/c	81360-73859 70023-52190
31.	North Lakhimpur	Rubi Hazarika	86382-12955
32.	Dhemaji	Bidyut Borgohain	70025-63379
33.	Ghilamara	Tapas Ranjan Das i/c	98643-11515
34.	Biswanath Chariali	Debojit Sonowal i/c	99546-93901
35.	Tezpur-I	Gomug Pegu	76388-12787
36.	Tezpur-II	Bikash Jyoti Nath	88221-66793
37.	Mangaldoi	Pradip Hazarika	70024-89449 91272-95412
38.	Silchar-I	Pradip Dey i/c	94350-74148 70021-29721
39.	Silchar-II	Debdulal Das	94353-22388
40.	Karimganj	Mandip Kar	98640-86507
41.	Hailakandi	Afjal Hussain Mazumdar	81348-36698 94350-79630
42.	Maibong	Pratijna Mohan Bora I/C AEE	70865-63080
43.	Umrangso	Monjit Kemprai	99546-72248 94014-27987
44.	Haflong	Pratijna Mohan Bora I/C AEE	70865-63080
45.	Diphu Rural	Kenny Beypi i/c	70026-49669
46.	Diphu Urban	Kenny Beypi	70026-49669

47.	Hamren	Amarnath Regon	97062-08993
48.	Ulukunchi	Jyotish Hazarika	60038-11842
49.	Howraghat	Mamoni Rongpharpi	86387-88939

Annexure-1

Institutional set up of PHED, Assam



Annexure-2



**Government of Assam
Office of the Chief Engineer, Public Health Engineering Department, Assam
Hengrabari, Guwahati-36**

No.PHE/TB/544/2022(Pt-I)/ 1323

Date: 25-05-2026

To,

**The Secretary to the Government of Assam
Public Health Engineering Department
Guwahati, Dispur-36**

Sub – Submission of Disaster Management committee for the year 2026-27 pertaining to the PHE(Water) Department.

Sir

With reference to the subject cited above, I have the honour to submit herewith that the Disaster Management committee for the year 2026-27 pertaining to the PHE(Water) Department. The committee has been constituted with the following members for effective coordination and management of disaster preparedness, response and related activities-

1. Chairperson- Secretary to the Government of Assam, PHE Department
2. Member Secretary- Chief Engineer(PHE) Water, Assam
3. Members-
 - a) Chief Engineer (PHE), Sanitation, Assam
 - b) Additional Chief Engineer (PHE), O/o the Chief Engineer (PHE), Water, Assam
 - c) Deputy Secretary (PHE)/Under Secretary (PHE) to the Govt. of Assam, PHE department.
 - d) Superintending Engineer (PHE), O/o the Chief Engineer (PHE), Water, Assam
 - e) Executive Engineer (PHE), Store & Workshop Division, Guwahati, cum Nodal officer (DM).
 - f) Assistant Executive Engineer (PHE), O/o the Chief Engineer (PHE), Water, Assam
 - g) Assistant Engineer (PHE), O/o the Chief Engineer (PHE), Water, Assam
 - h) Junior Engineer (PHE), O/o the Chief Engineer (PHE), Water, Assam
 - i) Project Officer (DM), PHE Department

This is for favour of your kind information .

Yours faithfully,

**Chief Engineer (PHE), Water, Assam Cum
Additional Mission Director, JJM, Assam
Hengrabari, Guwahati – 36**

Annexure-3

PHED has around 12,000 employees including officers, support field staff and Ministerial staff.

Cadre Strength position of officers

a) PHED Secretariat:

- | | | |
|----------------------|---|---|
| i. Secretary | : | 2 |
| ii. Deputy Secretary | : | 1 |
| iii. Under Secretary | : | 2 |

b) Directorate (Implementing set up):

- | | | |
|--|---|-----|
| i. Chief Engineer (PHE), Water , Assam | : | 1 |
| ii. Chief Engineer (PHE), Sanitation | : | 1 |
| iii. Additional Chief Engineer | : | 11 |
| iv. Deputy Director, KRC | : | 1 |
| v. Superintending Engineer | : | 15 |
| vi. Executive Engineer | : | 66 |
| vii. Assistant Executive Engineer | : | 166 |
| viii. Assistant Engineer | : | 289 |
| ix. Junior Engineer | : | 691 |

Annexure-4-A

GOVERNMENT OF ASSAM

OFFICE OF THE CHIEF ENGINEER (PHE), Water, ASSAM, HENGRAHARI, GUWAHATI-36

Phone: 03612232543, FAX: 03612232534, e mail: asphe@rediffmail.com

No. PHE-

Dt. 31/3/2025

To

The Executive Engineer (PHE)

.....

.....

Subject: Flood Preparedness activities at District level.

You may be aware that role and responsibilities of PHED have been explained under section 3.2.2 of State Disaster Management Plan (SDMP). Divisions have to gear up its activities beforehand, to meet the challenges of probable flood. Districts might have already submitted Departmental Disaster Management Plan (DDMP) to District Administration.

All the District level officials must be in close contact with the District Administration and get themselves prepared for the flood. In this context, DDMP and draft SOP (circulated through e mail) may be helpful for you in defining roles and responsibilities of different departmental functionaries.

Extracts from the letter, received from Assam Disaster Management Authority (ASDMA), is also enclosed herewith for your ready reference.

You are also requested to submit stock position of following items (before 15/4/2025), which may be mobilized on the wake of flood, so that, State Executive Committee (SEC) can be apprised of the same on 20/4/2025.

Sl. No.	Item	Nos.	Remark
1	HTW (Singur /TP etc.) with spares		
2	Ready made Squatting Plate for sanitation facility.		
3	Water Purifying Packets (Proposed to be produced and made ready)/ Halogen Tablets etc.		
4	Bleaching Powder (bag)		
5	H ₂ S (Bacteriological strip)		

You are also requested to furnish a report regarding availability of

1. Mobile Water Treatment Plant,
2. Mobile Laboratory

under your control and that may be mobilized to nearby District (area) including you Division.

Enclo: Annexures as stated above

**Chief Engineer (PHE), Water, Assam
Hengrabari, Guwahati-36.
Dt. 31/3/2025**

Memo. No. PHE-

Copy to:

1. The Chief Executive Officer, Assam State Disaster Management Authority, Assam Secretariat, Guwahati-6 for favour of his kind information with reference to letter vide No. RGR/ASDMA/12/12/76 Dt. 9/3/15.
2. The Secretary, PHED, Block-B, 2nd Floor, Assam Secretariat, Dispur, Guwahati-6 for favour of his kind information with reference to aforementioned letter forwarded on 18/3/25
3. The Chief Engineer (PHE), Sanitation, Hengrabari, Guwahati-36 for favour of his kind information.
4. The Additional Chief Engineer (PHE), ...Zone, ...for information.
5. The Superintending Engineer (PHE), ...Circle, ...for information.

**Chief Engineer (PHE), Water , Assam
Hengrabari, Guwahati-36.**

Annexure-I

Roles & Responsibilities of PHED as mentioned in section 3.2.2 of SDMP:

Department / Agency	Disaster Management Roles and Responsibilities
Public Health Engineering Department (List is not exhaustive & primarily focused at state level)	➤ Nodal department of the state government entrusted with the responsibilities of providing safe drinking water to the people of Assam ➤ Responsible for ensuring safe hygiene through Total Sanitation Campaign (TSC) ➤ Providing safe drinking water to all the schools located in rural areas ➤ Provide emergency supply of safe drinking water in disaster situations ➤ Assess the impacts of extreme events (natural and man-induced) on facilities of the department and propose / undertake mitigation measures ➤ Undertake risk assessment and management of ground water resources in emergency situations.

Important Dates:

- A. **By 15th February** – Meeting with District Administration to take the stock of flood preparedness.

- B. From 15th May to 15th Oct-** Establishment of Control room at District Level Office of the Department and regular communication with the Control room of District Administration.
- C. By 30th April –** Visit to Flood Affected area to assess readiness of installations (water & sanitation) and keep ready all stock materials so that the same can be mobilized immediately in the wake of flood.
- D. Latest by 15 days after receding flood –** Flood damage assessment
- E. Latest by 15th Oct –** Infrastructure related proposals for funding under State Disaster Response Fund in prescribed format.

Flood Affected area: Flood Hazard Atlas (prepared by NRSC) and available in website, asdma.gov.in

Roles and Responsibilities of Executive Engineer PHED in Flood Management:

Pre Flood	The Executive Engineer, Public Health Engineering will visit the generally flood affected areas by 30th April, and: (1) Assess measures likely to be required for safe water supply in these areas;
	(2) Prepare- • A list engineering personnel of different categories already available in the nearest P. H. E. division and the number of additional hands that may be required in each area in case of heavy floods; • A list of engineering personnel of different categories who, in case of necessity, can be withdrawn from their places of work and utilised for relief work;
	(3) Arrange for mobilising at short notice two P. H. E. teams at the district head quarters to rush them for relief work;
	(4) Ensure adequate stocks of- • Equipment and materials for sinking of tube well, ring well, water reservation etc., in the relief camps and other places in the flood affected areas; and • Camp materials and other stores for workers and keep them in appropriate places. • Preposition the water purifier mounted vehicle used for providing packaged drinking water in vulnerable locations in the state • Keep the departmental vehicles in good running condition

During Flood	On receipt of flood warning, Executive Engineer will- (1) Alert subordinate officers and staff for floods; (2) Check vehicles, equipment, stores etc. ; and (3) Draw up tentative programme of action.
	On occurrence of floods, Executive Engineer will- (1) Keep close touch with the D. C. (2) Visit the flood affected areas immediately with one P. H. E. team and start water supply measures and pit/sanitary latrines ; (3) Assess extent of water supply measures required and deploy necessary staff. If the staffs available in the district are not sufficient to cope with the situation, arrange through Chief Engineer (PHE). additional staff;

	and (4) constantly visit the flood affected areas and ensure adequate safe water supply and sanitation measures in the relief camps.
Post Flood	After Flood relief operation, Executive Engineer will: (1) Restore tools and equipment, stores etc.; and (2) Repair/replace damaged tools and equipment. (3) DSRF proposals for damaged water supply pipelines and infrastructures.

Annexure-4-B

GOVERNMENT OF ASSAM

OFFICE OF THE CHIEF ENGINEER (PHE), Water, ASSAM, HENGRAHARI, GUWAHATI-36

Phone: 03612232543, FAX: 03612232534, e mail: asphe@rediffmail.com

No. PHE-

Dt. 31/3/2025

To

The Executive Engineer (PHE)

..... **Division,**

.....

Subject: Preparation of Departmental Disaster Management Plan at District Level for the year 2025-26.

You may be aware that **Departmental Disaster Management Plan (DDMP)** is a live document and is to be updated at-least once in a year. This document needs to be submitted to the District Disaster Management Authority (DDMA) for their approval.

Now it is the time for preparation of District level DDMP for the year 2015-16 for your District. In this context, you also seek support from

- District coordinator of DDMA beside
- Trained up District Resource Group of PHED and
- State Resource Group of PHED.

You are also requested to consult following documents:

- Resource materials distributed at the time of training,
- Aforementioned DDMP prepared at state level and
- District Disaster Management Plan prepared by DDMA,

It has been informed that budget provision for Disaster Management/Training activities has been made against each Directorate, however, Department is advised to incorporate Disaster Management activities within its normal functions and budget. You are therefore, requested to share with DDMA regarding availability of fund for software/hardware activities.

- Trained officers (trained by ASDMA)
- Resource persons of Water Sanitation & Hygiene Practice (WASH) training at District level
- NGOs involved in Awareness Campaign and IEC
- Water Quality Testers with the help of Field Testing Kit, and Masons
- Mobile water treatment Plant, if any, or nearest available location
- Mobile Water Testing units, if any, or nearest available location
- Key Departmental personnel

may be prepared and made a part of DDMP.

A copy of DDMP prepared for your District may please be submitted to the office of the undersigned. In case of any support, if needed, may please be intimated to the undersigned without further delay.

**Chief Engineer (PHE), Water, Assam
Hengrabari, Guwahati-36**

Annexure-4-C

**GOVERNMENT OF ASSAM
OFFICE OF THE CHIEF ENGINEER (PHE), Water, ASSAM, HENGGRABARI, GUWAHATI-36
Phone: 03612232543, FAX: 03612232534, e mail: asphe@rediffmail.com**

No. PHE-1939/TB /2014/T-395-249

31/3/2025

To
The Executive Engineer (PHE)
..... **Division,**
.....

Subject: Daily reporting of relief and rehabilitation measures during and aftermath of flood.

Divisions might have already framed preparedness plan to face the probable flood. In this context all district are once again requested to:

- Establish control room at Division office so that, early warning can be shared and immediate action can be taken thereon besides liaison with District Administration.
- Assess stock of materials, equipment etc. related to water supply & Sanitation besides readiness for installation of the same in the wake of flood.

You are also requested to submit daily reports on relief and rehabilitation measures taken by your Division to the undersigned without fail so that, weekly report can be forwarded to the ASDMA/CS on every Monday. Soft copy of the report (**in Excel format only**) may be submitted at 3.00 PM every day to the **following e-mail addresses** from your **official e-mail address**. Two formats are furnished herewith for your ready reference and daily submission.

E- Mail address: i) asphe@rediffmail.com
and ii) as-phe@nic.in

Encl: Two formats as stated above.

**Chief Engineer (PHE), Water, Assam
Hengrabari, Guwahati-36**

Memo. No. PHE-

31/3/2025

Copy to:

1. The Secretary, PHED, Block-B, 2nd Floor, Assam Secretariat, Dispur, Guwahati-6 for favour of his kind information.
2. The Chief Engineer (PHE) B&S, Hengrabari, Guwahati-36 for favour of his kind information.

3. The Additional Chief Engineer (PHE), ...Zone, ...for information & necessary action.
4. The Director, WSSO, PHED, Assam, Betkuchi, Guwahati-35 for information & necessary action.
5. The Superintending Engineer (PHE), ...Circle, ...for information & necessary action.

**Chief Engineer (PHE), Water, Assam
Hengrabari, Guwahati-36**

Daily Report of Flood affected areas (Relief)															Date:								
Name of District:																							
Name of Division:																							
Sl. No.	Name of Block	No. of Affected		Approximate No. of Population affected	Water Sources affected				No. of disinfection packets Distributed			Details of relief camps established by District Admn.		Water Supply arrangement in the camp from				No. of Toilets affected		No. of Sanitation facility provided in the relief Camp			Remark
		GP	Village		Name of PWSS		Spot source		Chemical Packets	Bleaching Powder	Halogen /NaDCC tablets	No. of relief camp	No. of Inmates	No. of				IHHL	Community/ Institutional	Toilet	Bath room	Hand Wash platform	
					Fully submerged	Partially submerged	Type	Numbers						PWSS	Temp. HTW/ Spot	Mobile Plant	Tanker						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	

**** Note: Cumulative figures are to be furnished from column 3 to 22 from the date of inception of flood during the financial year.**

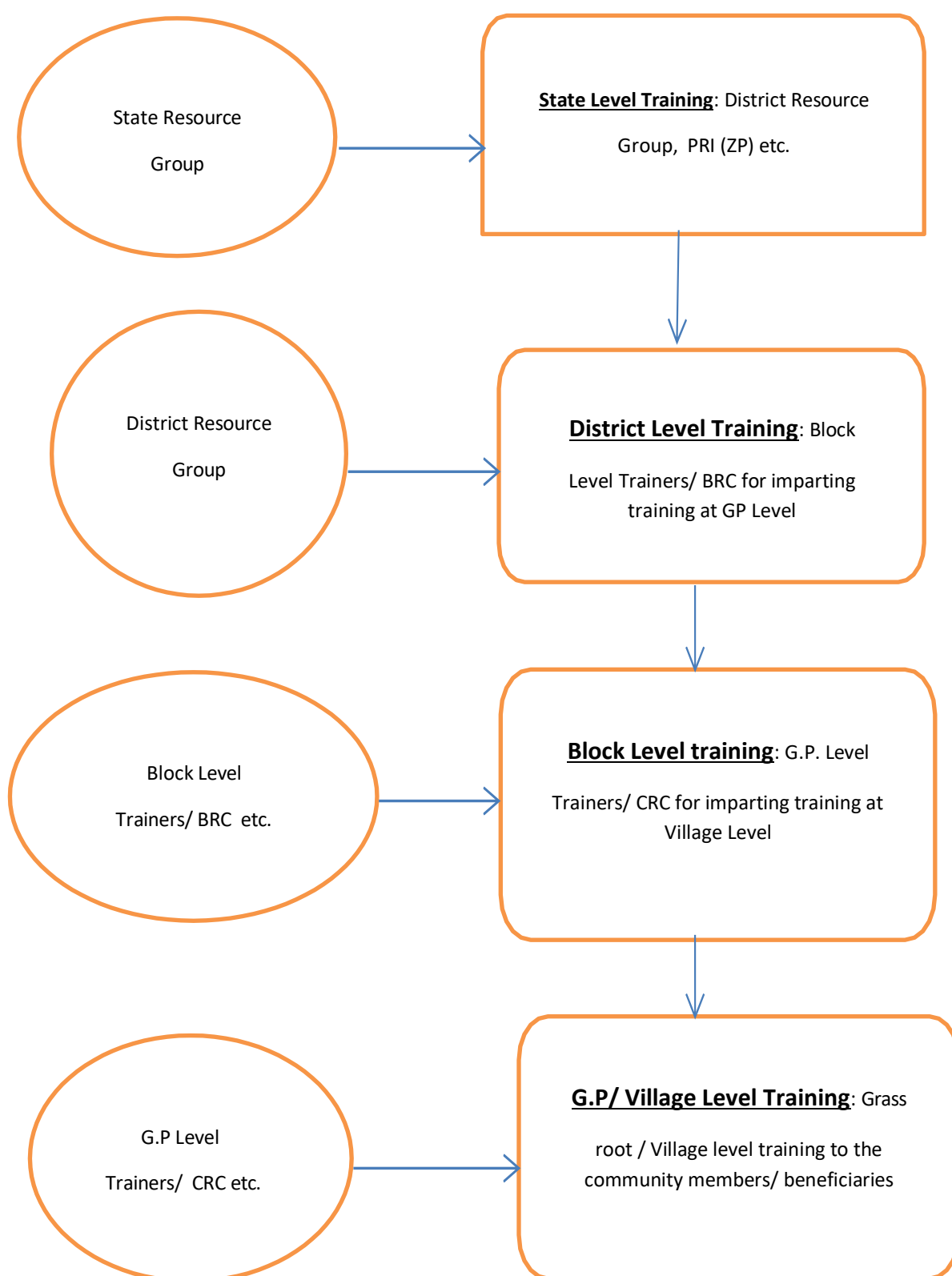
**Executive Engineer (PHE)
Division.....**

Daily Report of Flood affected areas (For Rehabilitation of Scheme/Facility)															Date:		
Name of District:																	
Name of Division:																	
Sl. No.	Name of Block	No. of		Restoration /Rehabilitation of affected scheme/ Facility										Community/ Institutional Toilets	Remark		
		GP	Village	Water sources affected						Disinfection of Water supply installation							
				Name of PWSS			Spot source			PWSS	Spot source	Pond					
				Fully Submerged	Partially Submerged	Probable cost of restoration	Type	Number	Probable cost of restoration								

Note: Data should be furnished in cumulative figure

**Executive Engineer (PHE)
Division.....**

Annexure-5



Specialised trainings are organized at state level for imparting training on recent development in water supply and Sanitation Sector for the departmental staff, PRI etc. besides need based training on request from District Level.

Annexure-6

Report on damages and activities undertaken on Relief works during flood in 2025 (Upto 22.9.2025)

- a. Total nos. of PWSS affected = 542
- b. Total nos. of spot sources affected = 2086
- c. Total nos. of IHHL affected = 20856
- d. Total nos. of spot sources installed at relief camp/ affected villages = 115
- e. Total nos. of spot sources disinfected = 478
- f. Total nos. of Chemical Packets distributed = 140204
- g. Total nos. of Halogen Tablets distributed = 514870
- h. Total nos. of Spot Sources repaired = 7
- i. Total nos. of Leaflet distributed = 22484
- j. Total nos. of Water Pouches distributed = 984100

Annexure-7

Master Inventory to be made ready as preparedness measure

Sl. No.	Items	Sector
1	Hand tube well sets	Water supply
2	Fast moving spare parts of hand Tube well	
3	Specials necessary for extension from nearby PWSS	
4	Mobile Water Treatment Plant with accessories	
5	Water Tanks (Reservoir)	
6	Water Tankers with vehicle	
7	Rigs, if not available may go for pre contracting	
8	Small water container for use in relief camp by individuals	
9	Water Purifying packets	Water purifiers
10	Chlorine /Halogen / NaDCC tablets	
11	Bleaching Powder for disinfection	
12	Field Water Testing Kits with reagents	Water testing
13	Bacteriological strips	
14	Mobile Laboratory	
15	Squatting Plate	Sanitation & Hygiene
16	Light weight sanitation components	
17	Mobile Toilets	
18	Toilet components for Temporary urinals & Bathrooms	
19	Tarpauline or Plastics to be used in Toilets	
20	Sprayer for campus disinfection	

Annexure-8

**TRAINING PROGRAMS CONDUCTED AT KEY RESOURCE CENTER, JJM, ASSAM,
BETKUCHI, GUWAHATI – 35 DURING THE FINANCIAL YEAR 2025-26.**

Sl No	Name of the Training	Target Group	No of Participants	Date
1	State Workshop on IT Technologies at Assam water center (FEEMA)	Senior Officer s of PHED, JJM, National NGO's	20	8 th April,2025
2	Two days Training Program on Drinking water supply Management system as per Is 17482:2020 in collaboration with BIS India and UNICEF Assam	Assistant Engineer	35	20 th November, 2025 to 21 st November, 2025
3	Hands- on Training for Laboratory personnel on Laboratory Methodologies	Microbiologist, Assistant Chemist, Lab Assistant	26	8 th December,2025 to 9 th December, 2025
	Hands- on Training for Laboratory personnel on Laboratory Methodologies	Microbiologist, Assistant Chemist, Lab Assistant	26	11 th December,2025 to 12 th December, 2025
4	Hands- on Training for Laboratory personnel on Laboratory Methodologies	Microbiologist, Assistant Chemist, Lab Assistant	26	15 th December,2025 to 16 ^h December, 2025
5	Induction Training for the Newly Recruited Junior Engineers under PHED, Assam.	Junior Engineers	66	10 th March to 2 nd April, 2026
6	Induction Training for the Newly Recruited Junior Engineers under PHED	Junior Engineers	64	17 th March, 2026 to 6 th April, 2026
7	Induction Training for the Newly Recruited Junior Engineers under PHED	Junior Engineers	65	9 th March, 2026 to 9 th April, 2026
8	Training for Sujalam Bharat App for implementing agencies (Batch 1)	Assistant Executive Engineer, Assistant Engineer, Technical Officer, MIS Co-coordinator	43	25 th February,2026
9	Training for Sujalam Bharat App for implementing agencies (Batch 2)	Assistant Executive Engineer, Assistant Engineer, Technical Officer, MIS Co-coordinator	48	25 th February,2026

10	Training for Sujalam Bharat App for implementing agencies (Batch 3)	Assistant Executive Engineer, Assistant Engineer, Technical Officer, MIS Co-coordinator	59	26 th February, 2026
11	State Level workshop on Acceleration and Sustaining of SBM-G outcomes	Assistant Executive Engineer, Assistant Engineer,	150	8 th to 16 th December, 2026
12	One Day State Level Training of Trainers (ToT) under SBM-G, Assam on Sustaining Solid Liquid waste management Assets	DPM/ADPM,TO,IEC ,HRD,SLWM	200	20 th & 21 st January, 2026

Internship at Key Resource Center, JJM, Assam, Betkuchi, Guwahati – 35

Sl No	Institute/ Organisation	Department	No of Interns	Duration
1	Assam Engineering College, Guwahati	Civil Engineering	11	10th June, 2025 to 3rd July, 2025
2	B. Borooah College, Guwahati	Zoology	3	2nd July, 2025 to 22nd July, 2026
3	Gauhati University	Environmental science	4	2nd July, 2025 to 28th July, 2025
4	Baksa Polytechnic, Baksa	Chemical Engineering	6	26th June, 2025 to 10th July, 2025
5	Bineswar Brahma Engineering college Kokrajhar	Civil Engineering	22	7th July, 2025 to 30th July, 2025
6	RIST Meghalaya	Civil Engineering	6	4th August, 2025 to 3rd September, 2025

Annexure-9

Flood Hazard Area and potential shelter place with raised platform (As on 2016)

Sl. No	Name of the District	No. of Villages in High & Very high Flood Hazard Category	Area in Hectares in High & Very High Flood Hazard Category	No. of potential shelter place & raised platform
1	Baksha	17	44	57
2	Barpeta	218	22334	17+8=25
3	Bongaigaon	37	3739	94+4=98
4	Cachar	295	41279	358
5	Chirang	8	32	10
6	Darrang	45	6818	59+54=113
7	Dhemaji	11	4084	31+59=90
8	Dhubri	202	23880	78+22=100
9	Dibrugarh	179	16716	94+3=97
10	Goalpara	154	17738	300+41=341
11	Golaghat	80	8209	110
12	Hailakandi	101	10061	47
13	Jorhat	109	13053	107+6=113
14	Kamrup	157	22431	230+31=261
15	Kamrup (M)	53	9774	45+5=50
15	KarbiAnglong	Nil	Nil	66+7=73
16	Karimganj	195	20310	No record available
17	Kokrajhar	Nil	Nil	113
18	Lakhimpur	208	22737	111+37=148
19	Marigaon	265	35465	173
20	Nagaon	331	35354	205+2=207
21	Nalbari	39	4332	143+14=157
22	DimaHasao	Nil	Nil	53
23	Sibsagar	280	20152	74
24	Sonitpur	81	12179	97+17=114
25	Tinsukia	28	2728	18+1=19
26	Udalguri	Nil	Nil	69+7=76
Total		3093	353449	3077

source: ASDMA

Annexure-10

Early warning Nodal Agency:

Disaster	Nodal Agency	PHED to monitor key parameters as made available by nodal agency
Floods	CWC/ Water Resource Department	1) Intensity & period of rainfall. 2) Quantum of release of water 3) Water supply/Sanitation assets in flood areas, Water Quality & disinfection.
Landslides	GSI	1) Intensity of rainfall 2) Distribution line/TP & sanitation units on steep slopes & prone to landslides.
Earthquake	IMD	1) Water retaining structures/ Water TP 2) Community Sanitation facilities.
Cyclone	IMD/RMC	Intensity & period of rainfall.
Drought	Department of Agriculture	1) Intensity and period of rainfall 2) Declining ground water level & surface water bodies 3) Poor recharge of aquifers 4) Wilting of crops
Epidemic	H & FW Dep	Water Quality Monitoring

Annexure-11

Contact details of important Nodal Agencies:

Nodal Agency	Type of Disaster	Address	Contact numbers
Control Room Disaster Management Division, Ministry of Home affairs, Govt. of India	All disasters	Integrated Operations Centre, Ministry of Home affairs, Room No.-12, North Block New Delhi	Ph: (011) 23092763, 23092885, 23092923, 23093054, 23093563, 23093564, 23093556, Fax: (011) 23093750
Indian Meteorological Department, Dy. Director (Meteorology)	Cyclone & Earthquake	Dy. Director General of Meteorology, Lodhi Road New Delhi	Ph.: (011) 24690279 e-mail: amss20042000 @yahoo.co.in
Central Water Commission	Floods	SWC, Sewa Bhawan, RK Puram, New Delhi-110066	Ph.: (011) 26108855 Fax: (011) 26195518
Geological Survey of India (GSI)	Landslide	27, JL Nehru Road, Kolkata- 700016, West Bengal	Ph: (033) 22861676 Fax: (033) 22861661
Department of Agriculture	Drought	Dr. Rajendra Prasad Road, New Delhi-110001	(011) 23382719
Ministry of Drinking Water & Sanitation (MDWS)	Water & Sanitation	9 th Floor, Paryavaran Bhawan, CGO Complex, Lodhi Road, New Delhi-110003	Ph: (011) 24361043 Fax: (011) 24364113 E mail: jstm@nic.in
National Disaster Management Agency (NDMA)	Disaster Management	NDMA Bhawan, A-1 Safdarjung Enclave, New Delhi-110029	Ph: (011) 26701728, Fax: (011) 26701729 E mail: info@ndma.gov.in
Central Seismological Observatory	As on 2011		09863022211
Central Water Commission			0361-2674268/
Indian Meteorological Department, Borphar			0361-2840201/2840552
NDRF, Guwahati			2840284
NEEPCO (Control Room)			03642-504153/2222938
NESAC			03642-908830
ARSAC			0361 - 2464617
ASDMA (FLEWS & others) Website: sdmassam.nic.in e mail: statedmcontrolroomassam@gmail.com			0361- 2237221

Annexure-12

List of firms dealing with emergency water supply & sanitation components (source: wes-net India)

Agencies and Suppliers Providing Products and Services related to WATSAN in Emergencies	
S.No	Name and Address of the Agency
1	Agencies offering Technical Service on Water Supply & Sanitation
a)	RedR India A-14, Nivedita Apartments, 70 Rambagh Colony, Paud Rd., Kothrud, Pune, India-411038, <i>Phone:</i> +91 (0) 20 3091 2532, <i>Fax:</i> +91 (0) 20 2544 6659, <i>Email:</i> info@redrindia.org,
b)	Action for Food Production (AFPRO) 25/1A, Pankha Road, D-Block, Janakpuri, New Delhi - 110058 <i>Phone:</i> 011-28525412 <i>Email:</i> ed@afpro.org
c)	Training and Development Centre (TDC) 11-13-242, Road No. 5, Alkapuri Colony, Disukhnagar Hyderabad, <i>Phone:</i> 040-24032689 <i>Mobile:</i> 9908930123 <i>Email:</i> tdchyd@gmail.com
2	Agencies offering Technical Service on ECOSAN & DEWATS (Sanitation)
a)	Ecosan Services Foundation "Vishwa Chandra", 1002/42 Rajenda nagar, Pune – 411030, Maharashtra, India <i>Phone :</i> 0091 (0)20 64 000 736 <i>Fax :</i> 0091 (0)20 24 530 061 <i>Email:</i> ecosanindia@gmail.com <i>website:</i> http://www.ecosanservices.org/page.php?id=1
b)	Eco-Solutions "Pulari", 49 Asan Nagar , Vallakadavu, Trivandrum 695008, Kerala, India <i>Tel :</i> ++91 471 2502622 <i>Email:</i> paul@eco-solutions.org
c)	SCOPE P/17, 6th Cross, Ahamed Colony, Ramalinganagar, Tiruchirappalli - 620 003, Tamil Nadu <i>Phone No:</i> 0431 – 2774144 <i>Email:</i> scopeagency86@rediffmail.com
d)	Consortium for DEWATS Dissemination, No 220, 4th 'A' Cross, 3rd Block, HRBR Layout, Kalyan Nagar, Bangalore – 560043 <i>Tel:</i> +91-080-25431772, <i>Telfax:</i> +91-080-25431773, <i>Email:</i> cddindia@eth.net <i>Internet:</i> http://www.borda-sa.org

Agencies and Suppliers Providing Products and Services related to WATSAN in Emergencies	
S.No	Name and Address of the Agency
3	Manufacturers of Water Testing Kits (approved by Government of India)
a)	Techno-ad Sysytems Inc. Bhaskar Lane, Jayendra Ganj, Gwalior, Madhya Pradesh 474 009, <i>Telefax: 2323765</i> <i>Email: watersafe@hotmail.com</i>
b)	Tamilnadu Water Supply and Drainage Board (TWAD) 31, Kamarajar Salai, Chepauk, Chennai - 600 005 <i>Telefax: 044-285 25501</i> <i>Website: http://www.twadboard.com/</i>
c)	Development Alternatives B-32, TARA Crescent, Qutab Institutional Area, New Delhi 110 116 <i>Phone: 011-26898264, 26967983</i> <i>Email: tara@sdaalt.ernet.in</i> <i>Website: http://www.devalit.org/</i>
d)	LTEK Systems 2 B Rajkamal Complex, Dhantoli, Nagpur 440 012 <i>Phone # 91-712-542230</i> <i>Fax # 91- 712-521746</i> <i>Email: vishva@nagpur.dot.net.in</i> <i>Website: http://www.lteksystems.com/bactoh2s/</i>
e)	Royal Enterprises 3rd Floor, No.23, Narasingapuram Street, Anna Salai, Chennai-2 <i>Contact No: 09444231620</i>
f)	Prerana Laboratories Prerana House, near Chatrapati Bank, Vishal Nagar (Jagtap Dairy) Off Aundh-Wakad Road, Pune - 411027
g)	Water Tech Engineers Saluja Arcade, 1st Floor, Thokatta, Tank bund, Secunderabad – 500 009
4	Personal Water Purifier & Moquito Repellent Nets
a)	Vestergaard Frandsen India Pvt. Ltd. Add: 302, Rectangle One, D-4, Saket New Delhi – 110017 <i>Tel: +91 11 4055 3666</i> <i>Mobile: +91 99104 44725</i> <i>E-mail: mas@vestergaard-frandsen.com</i> <i>Web: www.vestergaard-frandsen.com</i>
5	Tarpaulin & Tents

Agencies and Suppliers Providing Products and Services related to WATSAN in Emergencies	
S.No	Name and Address of the Agency
a)	United Canvas Udyog BG-295, 1st floor Sanjay Gandhi Transport Nagar New Delhi-110042 Contact nos.- 0-9810320501,9313323792, 011-27831226,65900226 Fax-011-27833906 Email: united_canvas@yahoo.com
b)	Priyanka (India) Pvt. Ltd. B - 109, Mayapuri Industrial Area Phase – I New Delhi – 110064 Tel: 011-28117755, 09899222000 Fax: 011-28115192 Email: srv@priyankaindia.com
6	Chlorine/Halozen Tablets and other Water Treatment chemical & Equipments
a)	Water Chem Laboratories H.No.11-6-652/1 1 st Floor, Red Hills, Hyderabad – 500 004 Tel: 040-23300428, Fax: 040-23300428 Email: waterchemlabs@yahoo.co.in
b)	Gripo Laboratories 1519-A, Bhagirath Palace, Chandni Chowk Delhi-110006 Ph: 011-23865913 Email: gripolabs@gmail.com
7	Domestic Water Filters
a)	Bio-Sand Filters Mr.A.Gurunathan / Ms.J.Kanagavalli DHAN Vayalagam (Tank) Foundation No.17, Vellai Pillaiyar Koil Street S.S.Colony, Madurai – 625 010, Tamilnadu, INDIA Ph: 91-452-2601673, 2610794, 2610805 Fax: 91-452-2602247 Email: dhantank@airtelbroadband.in Website: http://www.dhan.org/
b)	Terafil S. Khuntia, A. K. Sahu & P. C. Beuria Regional Research Laboratory (Council of Scientific & Industrial Research) Bhubaneswar – 751 013, India. Tel. No. + 91 – 671, 2581 635, 2581 636. Email: khuntias@yahoo.com & skhuntia@rmlbhu.res.in Website: http://www.thinkcycle.org/tc-filesystem/download/development_by_design_2002/publication:_terafil_water_filter_for_sustainable_drinking_water_programme/dyd_o2-Terafil-paper.PDF
c)	Rice Husk based Water Filter Prof. Mathai Joseph, Executive Director TATA Research Development and Design Centre 54B, Hadapsar Industrial Estate, Pune 411 013, Maharashtra Phone: 020-6871058; fax: 020-6810921 Email: mj@pune.tcs.co.in ; website : www.tcs.com
d)	Candle Filters (Should be used along with chlorination if bacteriological contamination is suspected) Available in Open Market

Agencies and Suppliers Providing Products and Services related to WATSAN in Emergencies	
S.No	Name and Address of the Agency
e)	Zero-B (On tap purifier & Storage type filters) Ion-Exchange Tiecicon House, Dr. E. Moses Road, Mahalaxmi, Mumbai-400 011, India Tel : (91) 22 3989 0909 Fax : (91) 22 2493 8737 email : hocro@ionexchange.co.in , ieil@ionexchange.co.in Website: http://www.ionindia.com/residentiallink.html#sur
f)	Nadi Filters A. Khurshid Bhatti President Association for Humanitarian Development (AHD) 60/A, Block-C, Unit No. 6, Latifabad Hyderabad, Pakistan- 71800 Ph: +92-22-2933236 E-mail: ahdpak@yahoo.com Website: www.ahdpak.org

Annexure-13

Monitoring Checklist for Hygiene promotion

Safe excreta disposal	(based on SPHERE standards) • People use toilets • Children's faeces is disposed off hygienically and immediately • Toilets are used in the most hygienic way • Parents are aware of the needs to dispose children's faeces safely
Hand washing with soap	• Women and men know the importance of hand washing for getting rid of germs from hands • People wash hands after defecation and handling children's faeces and before handling food • Children can demonstrate method-rubbing with an agent/soap
Safe handling of drinking water	• A safe/protected source is used for fetching drinking water • Observation shows proper storage of drinking water - clean, covered narrow mouth vessel, long handle ladle, disinfection method (if any) • Observation shows hands not being dipped into the drinking water at the time of collection from the water source. • Pots not being dipped in storage tanks at water collection points.
Women's health and hygiene	• A safe/protected source is used for fetching drinking water • Observation shows proper storage of drinking water - clean, covered narrow mouth vessel, long handle ladle, disinfection method (if any) • Observation shows hands not being dipped into the drinking water at the time of collection from the water source. • Pots not being dipped in storage tanks at water collection points.
Proper use and maintenance of sanitation facilities	• No excreta including child faeces, visible in temporary relief centre or in solid waste. • Proper usage of toilets/ No excreta visible in pans or slabs • Women articulate a safe method of disposal of child excreta

Disinfection dose for different types of contaminations			
Use of disinfection	Excreta/Vomits/Shoes/Corpses	Floor/Utensils/Beds	Hand/Skin/Cloths
Starting with	2% solution	0.2% solutions	0.05% solutions
Calcium Hypochlorite at 70% active Chlorine	30 gm/litre or 2 tablespoons in 1 Litre	30 gm/10 Litres or 2 tablespoons in 10 Litre	7 gm/10 litres or Half tablespoon in 10 Litres
Bleaching Powder (Chlorinated Lime) at 30% Chlorine	66 gm/Litre or 4 tablespoons in 1 Litre	66 gm/10 Litres or 4 tablespoons in 10 Litres	16 gm/10 litres or 1 tablespoon in 10 Litres

Annexure-14-A

Strategic Activity Planner for Drought Preparedness												
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												

Strategic Activity Planner for Drought Early Warning												
Activity	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Potential water deficit												
For Irrigation												
For Drinking water												

Annexure-14-B

Traditional wisdom/ Local beliefs on Early warning In terns 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.

Annexure-14-C

Specific attention to Water User Groups as part of Flood/Drought Preparedness

Drinking Water User Group	Flood/ Drought possibility	Potential initiative for
Public Drinking Water Supply	Flood	Raising HP's height, Covering Ring Well, Water testing followed by Disinfection, if necessary
	Flood/Drought	Repairing of leaks.
	Drought	Non-essential water use restriction, emergency source enhancement/ deepening of HPs if technically feasible; mandatory water conservation; Pressure reduction.

Annexure-15

Chlorination (Disinfection of water source)

Chlorination

(Based on the Guidelines of the Department for Drinking Water Supply, Govt. of India)

It has been observed that addition of 4 mg of bleaching powder for every litre of dug well water very effectively destroys the micro-organisms in water and the residual chlorine remains in the range of 0.2-0.5 mg/l.

Working process:

The quantity of water can be measured on the basis of the formula given below.

By assessing the depth and diameter of the well and thereafter by following the chart, the quantity of bleaching powder needed can be determined. The diameter and the height of the well has to be measured by meter. If the measurement is done in feet then it has to be converted to meter by multiplying the feet by 0.304.

$$\text{Volume of Water} = \frac{3.14 \times \text{diameter}^2 \times \text{height}}{4} \times 1000 \text{ litre}$$

Example : If the depth of water is 4 m. diameter is 2 meter then the volume of water in the dug well is

$$= \frac{3.14 \times 2 \times 2 \times 4 \times 1000}{4} = 12560 \text{ litre}$$

Therefore 12560 x 4 mg of bleaching powder or 50.28 gm of bleaching powder will be needed.

The chlorine in bleaching powder is unstable. Therefore, it should be kept with care in cool and dry place. The available chlorine in bleaching powder should always be 25% i.e. 4 mg/l bleaching powder should be used for disinfection.

Necessary things required:

- a) Bucket
- b) Bleaching Powder
- c) Glass Rod

Process of adding bleaching powder:

After the required quantity of bleaching powder is determined, it should be taken in a bucket. Then with a little water and with the help of a glassrod it should be made into a paste. After this, water from the dugwell should be poured into the bucket. It should be allowed to settle for some time. After the lime is settled at the bottom the water from above is poured into another bucket. This bucket of water then poured into the dugwell. Then the water of the dugwell is stirred well, so that chlorine mixes well with the dugwell water. After a period of 30 minutes the residual chlorine of the dugwell is assessed and then used for drinking purpose.

Other methods of disinfection :

Pot Chlorination :

Single Pot System

An earthen pot or a plastic container of 7 - 10 litres capacity with 6 - 8 mm dia. holes at the bottom is half filled with gravels of 20 to 40 mm size. Bleaching powder and sand (1:2 proportion) is placed on top of the gravels and the pot is further filled with gravels up to the neck. The pot is then lowered into the well with its mouth open.

For a well from which water is taken at a rate of 1000 - 1200 litres/day, a pot containing about 1.5 kg. of bleaching powder could provide adequate chlorination for about 1 week. (figure I)

Double Pot System :

When a single pot system is used in a small household well, it may be found to give too high a chlorine content to the water (over chlorination - very effective after flood). In such situations, a unit consisting of two cylindrical pots one inside the other has been found to work well. The inner pot is filled with moistened mixture of 1 kg. of bleaching powder with 2 kg. of coarse sand to a little below the level of the hole and is then placed inside the outer pot. This unit is lowered into the well with the help of a rope. It has been found by a study conducted by AIH&PH that such a unit could work effectively for 2 - 3 weeks in household wells from which water is withdrawn at a rate of 400 - 500 litres/day. (figure II)

Drop Chlorination :

Main requirements of this arrangement are a plastic container of 3 - 4 litre capacity with a 6 - 8 mm brass tap, 1 kg. of bleaching powder and a fine strainer .

Bleaching powder would be mixed with water in a separate container and then the solution would be filtered into the plastic container by the strainer. The container would then be placed in a nylon net and lowered by a rope inside the well at ground level. Drop adjustment from the container in the well would be made by the tap/stopper by

calculating the quantity of average daily water drawn from the well. It has been found that for a well from which water is taken at a rate of 1000 litres/day, this unit could provide adequate chlorination for about 1 week. (figure III)

This system had been field tested in villages of Kerala by AIH&PH and had been found to give satisfactory results in maintaining residual chlorine in dug wells.

Dose of Bleaching Powder for Disinfection of Different Size of Dug Wells — A Ready Reckoner

Diameter of the Dugwell (ft/metre)	Depth of Water (ft/metre)	Volume of Water (litre)	Amount of Bleaching Powder* (gram)
3 ft. (0.9 m)	1 ft. (0.3 m)	190.7	0.7
	2 ft. (0.6 m)	381.4	1.5

	3 ft. (0.9 m)	572.2	2.2
	4 ft. (1.2 m)	762.9	3.0
	5 ft. (1.5 m)	956.7	3.8
	6 ft. (1.8 m)	1144.4	4.5
	7 ft. (2.1 m)	1335.1	5.3
	8 ft. (2.4 m)	1525.9	6.1
	9 ft. (2.7 m)	1716.6	6.8
	10 ft. (3.0 m)	1907.4	7.6
	15 ft. (4.5 m)	2861.1	11.4
	20 ft. (6.0 m)	3814.8	15.2
	25 ft. (7.6 m)	4832.0	19.3
	30 ft. (9.1 m)	5785.7	23.1
	35 ft. (10.6 m)	6739.4	26.9
	40 ft. (12.1 m)	7693.1	30.7
	45 ft. (13.7 m)	8711.1	34.8
	50 ft. (15.2 m)	9664.1	38.6
3.6 ft. (1 m)	1 ft. (0.3 m)	235.5	0.9
	2 ft. (0.6 m)	471.0	1.8
	3 ft. (0.9 m)	706.5	2.9
	4 ft. (1.2 m)	9442.0	3.7
	5 ft. (1.5 m)	1177.5	4.7
	6 ft. (1.8 m)	1413.0	5.6
	7 ft. (2.1 m)	1648.5	6.5
	8 ft. (2.4 m)	1884.0	7.5
	9 ft. (2.7 m)	2119.6	8.4
	10 ft. (3.0 m)	2355.0	9.4
	15 ft. (4.5 m)	3532.5	14.1
	20 ft. (6.0 m)	4710.0	18.8
	25 ft. (7.6 m)	5966.0	23.8
	30 ft. (9.1 m)	7183.5	28.5
	35 ft. (10.6 m)	8321.0	33.2
	40 ft. (12.1 m)	9498.5	37.9
	45 ft. (13.7 m)	10754.5	43.0
	50 ft. (15.2 m)	11932.0	47.7
4 ft. (1.2 m)	1 ft. (0.3 m)	339.1	1.3
	2 ft. (0.6 m)	678.2	2.7
	3 ft. (0.9 m)	1017.3	4.0
	4 ft. (1.2 m)	1356.4	5.4
	5 ft. (1.5 m)	1695.6	6.7
	6 ft. (1.8 m)	1808.6	7.2
	7 ft. (2.1 m)	2373.8	9.4

	8 ft. (2.4 m)	2712.9	10.8
	9 ft. (2.7 m)	3052.0	12.2
	10 ft. (3.0 m)	3351.2	13.5
	15 ft. (4.5 m)	5086.8	20.3
	20 ft. (6.0 m)	6782.4	27.1
	25 ft. (7.6 m)	8551.0	34.3
	30 ft. (9.1 m)	10286.6	41.1
	35 ft. (10.6 m)	11982.2	47.9
	40 ft. (12.1 m)	13677.8	54.7
	45 ft. (13.7 m)	15486.4	61.9
	50 ft. (15.2 m)	17182.0	68.7

* @4 mg/l of Bleaching Powder (B.P.) or 1 mg/l of Chlorine

4.2.2 Tube Well & Hand Pump

The tube well as well as hand pump may get contaminated due to entry of polluted water through the annular spaces around the tube well, entry of contaminated water during flood, local priming with contaminated water etc. Hence, tube well and hand pump need to be disinfected regularly once or twice a year.

Process of disinfection of tubewell water

Working Process :

Before the installation of the pump, the tubewell should be disinfected. Moreover, during repair also disinfection is necessary. With the help of the formula given below determine the quantity of water and bleaching powder. In case of tubewell 200 mg/l of bleaching powder is added. After 30 minutes water should be pumped and allowed to flow out for some time.

$$\text{Volume of Water} = \frac{3.14 \times \text{diameter}^2 \times \text{height}}{4} \times 1000 \text{ litre}$$

Necessary articles required :

- Bucket
- Bleaching powder
- Glass rod

Process of Adding Bleaching Powder:

After determining the required amount of bleaching powder to be added it is taken in a bucket. Then with the help of the glass rod and a little water a paste is made. Then water is added and the powder is mixed. This mixture of water is poured into another bucket. Now one part of the water is poured into the tubewell and in the remaining part the different parts of the tubewell immersed, after 30 minutes water is pumped and the water allowed to flow away for some time before using it.

Dose of Bleaching Powder for Disinfection of Tubewells — A Ready Reckoner

Depth of Water	India Mark-II		India Mark - III		Tara Pump	
Metre	Volume of Water	Amount of Bleaching Powder	Volume of Water	Amount of Bleaching Powder	Volume of Water	Amount of Bleaching Powder
<i>Metre</i>	<i>Litre</i>	<i>Gram</i>	<i>Litre</i>	<i>Gram</i>	<i>Litre</i>	<i>Gram</i>
1	25	5	51	11	39	8
2	50	10	102	20	78	16
3	75	15	153	31	117	23
4	100	20	204	41	156	31
5	125	25	255	51	195	39
6	150	30	306	61	234	47
7	175	35	357	72	273	55
8	200	40	408	82	312	62
9	225	45	459	92	351	70
10	250	50	510	102	390	78
15	375	75	765	953	585	117
20	500	100	1020	204	780	156
25	625	125	1275	255	975	195
30	750	150	1530	306	1170	234
35	875	175	1785	357	1365	273
40	1000	200	2040	416	1560	312
45	1125	225	2215	459	1755	351
50	1250	250	2550	510	1950	390

Annexure-16

Residual Chlorine testing Kit, FTK, Vials & Water Purification sachets

Measurement of Residual Chlorine with the help of FTK:



FTK



H₂S Strip



NaDCC Tablet

- Content: 1000 no.s of 0.5 gm
- Purification Capacity: 20 to 25 Lt. per tablet
- Potency: 36 months
- Manufacturer: Water Chem Laboratories, Hyderabad.
- Ingredient: 35mg of Sodium Dichlor Isocyanurate
- Available Chlorine= 20 to 25 mg



Step I: Adding 1 tablet to 20 to 25 Lt. of clear Water.
Step II: Waiting for 15 minutes for Chlorination.
Step III: Stirring well before use.

Halogen Tablet

- Content: 1000 no.s
- Purification Capacity: 1 Lt. per tablet
- Potency: 12 months
- Manufacturer: Water Chem Laboratories, Hyderabad.
- Ingredient: Halazone U.S.P 4 mg



- Step I: Adding 1 tablet to 1 Lt. of raw water.
- Step II: Stirring well
- Step III: Keeping undisturbed for 15 minutes.

Water Purifying Chemical

- Content: 100 gm
- Purification Capacity: 250 Lt. per sachet
- Potency: 12 months
- Manufacturer: PHED, Assam
- Ingredient:
 - (i) B.P=4 gm & (ii) Lime=32 gm
 - (iii) Alum= 64 gm
- To use within 1 month after opening.



Step I: Adding ¼ Teaspoon from 1st packet & ½ from 2nd Packet to 10 to 15 Lt. of raw water
Step II: Stirring well & keeping undisturbed for 30 minutes.
Step III: Filtering through clean cotton cloth.

Water Purifying Chemical



- a) Safe,
- b) Recognition at National Level (SRII, New Delhi).
- c) Easily available & easy to handle,
- d) Economic.

PUR

- Content: 4 gm
- Purification Capacity: 10 Lt.
- Potency: 3 Years
- Manufacturer: P & G
- Ingredient:
 - (i) Calcium Hypochlorite
 - (ii) Iron Sulphate: 352 mg (Ferric Iron)

Step I: Mixing

Step II: (i) Stirring for 5 minutes (ii) Keeping Undisturbed for 5 minutes.

Step III: Filter through clean cotton cloth.

Step IV: Ready for use after 20 minutes if colour is not yellow.



Annexure-17

Low cost Sanitation unit for water logged area, Different low cost models & light weight PVC squatting plate in emergency use.

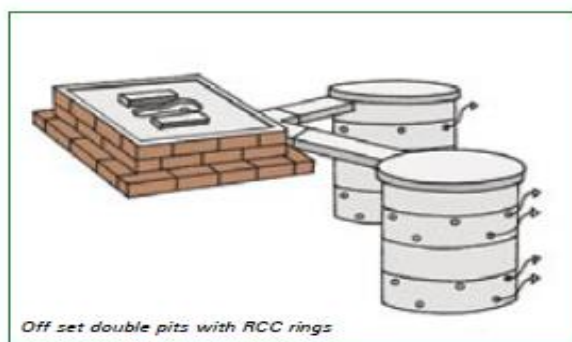


Figure 27

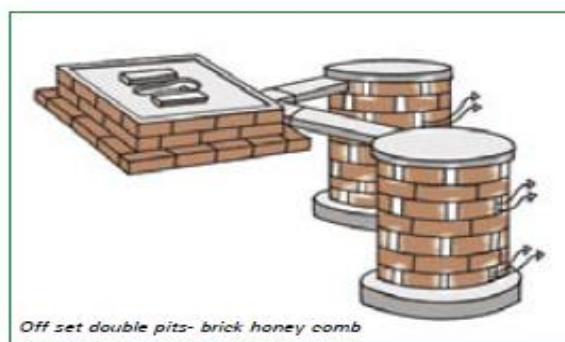
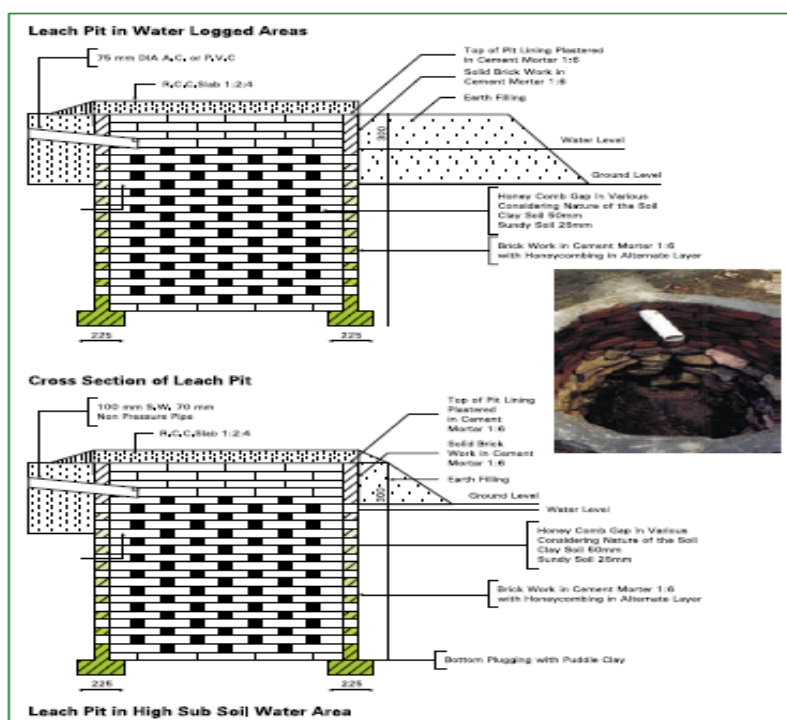
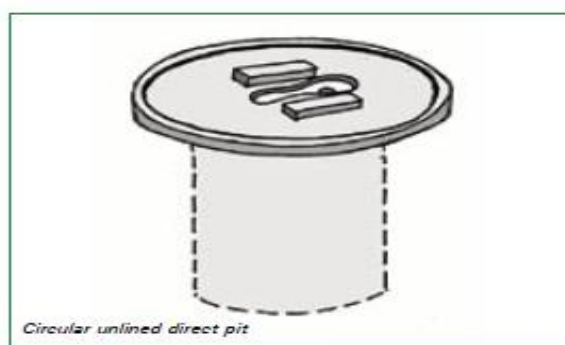
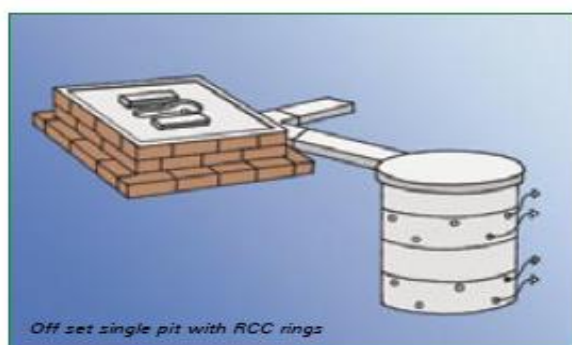


Figure 28



Annexure-18

Contact Details of PHED officials at Govt. and State

Sl. No.	Name of		Head Quarter	Name of Officer	Cell Phone Number
	Area of Operation	Office			
1.	Water Supply & Sanitation Services	PHED Secretariat	Secretariat	Kailash Karthik N, IAS.	95310-69185
2.	Water Supply & Sanitation Services	PHED Secretariat	Secretariat	Gitimoni Pkukan, IAS	94350-48493
3.	Water Supply in rural areas	O/o the Chief Engineer (PHE), Water, Assam	Hengrabari, Guwahati-36	Sri Pallab Kr. Das	94350-44140
4.	Sanitation Services in rural areas	O/o the Chief Engineer (PHE), Sanitation	Hengrabari, Guwahati-36	Bhaskar Jyoti Sarma	91270-09694

Contact Details of Divisional Executive Engineers

Sl. No.	Division	Executive Engineer	Contact No.
1.	Guwahati-I	Mukut Barman	98641-06939
2.	Guwahati-II	Saraju Prasad Kalita	86380-75845
3.	Store & Workshop	Sanjib Pathak	94358-01258
4.	Goalpara	Prakash Haloi	86385-81352
5.	Rangia	Samiran Das	70026-67321
6.	Nalbari	Nitul Talukdar	86381-36185
7.	Barpeta	Sisir Bharali	93957-24162
8.	Bajali	Pranab Deka i/c	70866-40755
9.	Belsor	Mahidul Hoque	88118-15757
10.	Dhubri	Hitesh Rabha	78960-49473
11.	S.S. Mankachar	Sanjoy Dev Choudhury	94357-00673 84538-99049 86384-24869
12.	Bongaigaon	Khanindra Narayan Das	69016-51906 94355-11639
13.	Baksa	Pranjal Pathak	94350-24988
14.	Gossaigaon	Phanindra Mushahary	86384-17774
15.	Kokrajhar-I	Jitumoni Das	97068-86277
16.	Kokrajhar-II	Sabir Ahmed	98643-51179

17.	Tangla	Bikash Kalita	98540-80486
18.	Jorhat	Ajay Lahon	94353-52061
19.	Majuli	Neetamoni Gogoi	94355-30445
20.	Golaghat	Abhijita Arundhoti Bhagawati	98642-52383
21.	Bokakhat	Prabin Kr. Handique	69007-84246 86381-45244
22.	Nagaon	Rupjyoti Bordoloi	88227-45835
23.	Morigaon	Babul Boro	99541-23855 98640-29416
24.	Kaliabor	Mandeep Bharali i/c	70028-63624
25.	Hojai	Sarat Bora	70860-37474 60026-51084
26.	Dhing	Badruz Zaman	7399568298
27.	Charaideo	Tapan Lal Phukan	94350-59547 86388-72815
28.	Sivasagar	Dipankar Bora	88765-42478
29.	Tinsukia	Juganta Gohain	87230-77020
30.	Dibrugarh	Nibir Bora i/c	81360-73859 70023-52190
31.	North Lakhimpur	Rubi Hazarika	86382-12955
32.	Dhemaji	Bidyut Borgohain	70025-63379
33.	Ghilamara	Tapas Ranjan Das i/c	98643-11515
34.	Biswanath Chariali	Debojit Sonowal i/c	99546-93901
35.	Tezpur-I	Gomug Pegu	76388-12787
36.	Tezpur-II	Bikash Jyoti Nath	88221-66793
37.	Mangaldoi	Pradip Hazarika	70024-89449 91272-95412
38.	Silchar-I	Pradip Dey i/c	94350-74148 70021-29721
39.	Silchar-II	Debdulal Das	94353-22388
40.	Karimganj	Mandip Kar	98640-86507
41.	Hailakandi	Afjal Hussain Mazumdar	81348-36698 94350-79630
42.	Maibong	Pratijna Mohan Bora I/C AEE	70865-63080
43.	Umrangso	Monjit Kemprai	99546-72248 94014-27987
44.	Haflong	Pratijna Mohan Bora I/C AEE	70865-63080
45.	Diphu Rural	Kenny Beypi i/c	70026-49669
46.	Diphu Urban	Kenny Beypi	70026-49669

47.	Hamren	Amarnath Regon	97062-08993
48.	Ulukunchi	Jyotish Hazarika	60038-11842
49.	Howraghat	Mamoni Rongpharpi	86387-88939