

UTTAR PRADESH STATE FLOOD MOCK EXERCISE

16th & 25th JULY 2024

INTRODUCTION

1. The State of Uttar Pradesh experiences severe flooding every year. The geographical terrain of the State allows the natural flow of water from North-West to South-East. The inflow of water in the State is essentially from three directions. The catchment areas of the State of Uttarakhand feed the river system Yamuna, Ganga, Ramganga and Sharda (known as River Kali in North). The river basins of Narayani, Mahakali and Karnali in Nepal feed River Sharda, Ghaghra, Rapti, Rohini and Gandak. The Northern areas of the State witness flash floods while the areas in the South are subject to inundation. The Southern rivers Betwa, Ken, Tons of Madhya Pradesh are tributaries of Yamuna. These rivers have Parichha, Matatila, Govindsagar, Shahzad and Sukma-Dukma dams on them. Release of water from these dams results in the overflow of River Yamuna and inundation of adjoining areas. The confluence of Yamuna and Ganga at Prayagraj and the further confluence of Ganga with Gomti, Ghaghra, Saryu and other northern rivers upto Ballia can cause severe inundation in the adjacent areas. The river system in the State of Uttar Pradesh is depicted in the map below.



2. In the State of Uttar Pradesh, 44 out of 75 districts, have been categorized as hyper sensitive/sensitive to floods for 2024. A Mock Exercise at the State level in each district was conducted as a TTEx on 23^{rd} and Mock Exercise on 25^{th} July 2024 to carry out rehearsals for reviewing preparedness, response and relief during flood disasters or similar threatening situations in these 44 hyper sensitive/sensitive districts of the State. The other 31 districts of the State also attended the Mock Exercise as observers.

FLOOD SCENARIOS IN THE STATE

- 3. The main causes of Floods in the State of Uttar Pradesh are:
 - a) <u>Heavy Rainfall</u>: The monsoon season starts in the region by mid/end June. During this period, there is heavy rainfall in Nepal, Uttarakhand and the Terai region which causes severe flooding in the foothills.
 - b) <u>Breaches in Embankments</u>: Numerous embankments have been constructed along the rivers to control flooding. The breaching of river embankments causes widespread damage and loss of human lives, livestock and property.
 - c) <u>Siltation</u>: The run-off water from higher reaches carries large amounts of silt which gets accumulated in the river beds, reducing the carrying capacity of rivers and thereby causing floods in the surrounding areas.
 - d) <u>Deforestation</u>: Deforestation at some places has further aggravated soil erosion leading to siltation of river beds.
 - e) <u>Melting Snow and Ice</u>: The State of Uttar Pradesh lies in the foothills of the Himalayas. The rapid melting of glaciers and ice in the higher reaches of the mountains due to warming aggravates the flood situation in the State.
 - f) <u>Urban Flooding</u>:
 - (i) <u>Choking of Drainage System</u>: During heavy rains, the drainage systems in urban and semi urban areas get choked by plastic and other non-degradable materials resulting in water logging for a considerable period of time.
 - (ii) <u>Reduced Percolation of Rainwater</u>: Cities are constructed mostly of concrete and other impermeable material which greatly reduces the percolation of rainwater through the soil. During rains, this results in accumulation of water causing inundation and water logging.
 - **g**) <u>**Release of Water from Dams/ Barrages:** Water released from dams/ barrages in Nepal, Uttarakhand and Madhya Pradesh, causes flooding in the downstream areas.</u>

River Basins In Uttar Pradesh

4. <u>Yamuna River Basin</u>:

a) <u>Affected Districts</u>: Saharanpur, Shamli, Gautam Budh Nagar, Bagpat, Ghaziabad, Aligarh, Mathura, Agra, Firozabad, Itawa, Auraiya, Kanpur Dehat, Lalitpur, Jhansi, Banda, Hamirpur, Jalaun, Prayagraj, Fatehpur, Chitrakoot, Kaushambi.

b) **Events Leading to Inundation:**

- i. Heavy rainfall and release of water from Parichha and Matatila dam on Betwa river result in overflowing of River Yamuna and River Ganga - Prayagraj and Mirzapur.
- ii. Situation further aggravates with release of water from Kanpur barrage Raibareilly.
- iii. Release of water from catchment areas of Uttarakhand.

5. Ganga/Ramganga River Basin:

 a) <u>Affected Districts</u>: Bijnaur, Muzzafarnagar, Bulandshahr, Moradabad, Badaun, Shahjahanpur, Unnao, Raibarelly, Pratapgarh, Prayagraj, Mirzapur, Varansi, Ghazipur, Ballia, Rampur, Bareilly, Farukhabad, Kannauj, Kasganj, Meerut, Amroha, Hapud, Aligarh, Badaun, Eta, Hardoi, Kanpur Nagar, Bhadhohi and Chandauli.

b) **Events Leading to Inundation:**

- i. Heavy rainfall in catchment areas of Uttarakhand.
- ii. Release of water from Kalagarh/Ramganga dam in Uttarakhand.
- iii. This dam has limited storage capacity and affects Bijnor, Rampur, Bareilly, Shahjahanpur, Moradabad, Farrukhabad.

6. <u>Gomti River Basin</u>:

a) <u>Affected Districts</u>: Pilibhit, Lakhimpur-Khiri, Sitapur, Hardoi, Lucknow, Barabanki, Raibareli, Amethi, Sultanpur, Pratapgarh and Jaunpur.

b) **Events Leading to Inundation:**

- i. Heavy rainfall and water from its tribuaries, such as Sai, Kathana, and Kukrail.
- ii. The flood situation is exacerbated by inadequate drainage systems in the cities, which cannot handle the runoff from urban areas.
- iii. Encroachment and illegal construction on flood plains and wetlands further reduces the river's capacity to absorb excess water.

7. Ghaghra/Sharda River Basin:

a) <u>Affected Districts</u>: Bahraich, Lakhimpur Kheri, Sitapur, Gonda, Basti, Gorakhpur, Deoria, Ballia, Mau, Ayodhya, Sant Kabir Nagar, Azamgarh, Ambedkarnagar, Barabanki and Pilibhit.

b) **Events Leading to Inundation:**

- i. Heavy rainfall in terai region.
- ii. Heavy rainfall in catchment areas of Nepal and Uttarakhand.
- iii. Release of water from Nepal-Karnali River.
- iv. Release of water from Ghaghra River Barrage Bahraich.

- v. Overflow of water from Mahakali River in Nepal.
- vi. Release of water from Banbasa dam in Uttarakhand.

8. <u>Rapti River Basin</u>:

a) <u>Affected Districts</u>: Maharajganj, Gorakhpur, Deoria, Sidharth Nagar, Balrampur, Shravasti, Sant Kabir Nagar, Basti

b) **Events Leading to Inundation:**

- i. Heavy rainfall in catchment areas in Nepal.
- ii. Extensive rainfall in terai region of UP.
- iii. Overflow of water from Narayani River Basin in Nepal.
- iv. Breach in River Embankment on Rohini/Rapti.

9. Gandak River Basin:

a) Affected Districts: Kushinagar, Deoria and Maharajganj

b) **Events Leading to Inundation:**

- i. Release of Water from Balmiki Nagar Barrage, Nepal.
- ii. Overflow of water from Narayani River in Nepal.
- iii. Khadda tehsil being closest immediately affected.

10. Sone River Basin:

- a) <u>Affected Districts</u>: Sonbhadra
- b) **Events Leading to Inundation:** Heavy rainfall in catchment.

Flood Sensitivity of Districts

11. In the year 2024, the 44 districts categorized as hyper sensitive/ sensitive to floods are given below: -

- a) <u>Hyper Sensitive Districts (29)</u>: These districts are Sambhal, Lakhimpur Kheri, Sitapur, Bahraich, Barabanki, Gonda, Ayodhya, Ambedkar Nagar, Basti, Sant Kabir Nagar, Azamgarh, Mau, Ballia, Deoria, Kushinagar, Gorakhpur, Sidharthnagar, Badaun, Farukhabad, Balrampur, Shravasti, Maharajganj, Kasganj, Banda, Hardoi, Prayagraj, Shahjahanpur, Fatehpur and Kanpur Nagar.
- b) <u>Sensitive Districts (15)</u>: These districts are Hapur, Amroha, Ghazipur, Unnao, Bulandshaher, Bareilly, Aligarh, Agra, Etawah, Kannauj, Raibareli, Kaushambi, Bhadhohi, Mirzapur and Chandauli.



STATE FLOOD MOCK EXERCISE 2024

Incident Response System

12. The Incident Response System (IRS) is the mandated response mechanism for managing disasters in India. Accordingly, the State of Uttar Pradesh has notified IRTs at State and District level.

13. Both the Table Top Exercise (TTEx) and the Mock Exercise (ME) were based on the IRS. The broad objectives of the Flood ME were as follows: -

- a) To exercise the key disaster managers in their roles and responsibilities through simulated emergency situations.
- b) To review the DM plans and associated SOPs of the State, various ESF Departments and the Districts.
- c) Practice coordination between the Administration, emergency response agencies, Emergency Support Function Depts and other stakeholders.
- d) Generate public awareness through the Media, Local Governing Bodies (LGBs), NGOs and community.
- e) Identify gaps, if any, in the resources, manpower, communications and response capabilities.

Participation

14. The TTEx and the ME were co-chaired by Lt Gen Syed Ata Hasnain, PVSM, UYSM, AVSM, SM, VSM** (Retd), Member NDMA and Lt Gen Yogendra Dimri, PVSM, AVSM, VSM (Retd), Vice Chairman UPSDMA. Brig Ajay Gangwar (Retd), Senior Consultant, NDMA was the Exercise Coordinator.

15. The exercise was conducted for 44 districts of the State that have been declared as hyper sensitive/sensitive to floods this year. The DDMAs of all these 44 flood districts, the relevant line departments, Army, Air Force, NDRF, SDRF, NGOs and other stakeholders participated in the State Level Flood Exercise. Representatives of the remaining 31 Districts participated as observers.

Exercise Scenario

- 16. The Exercise Scenario was as follows:
 - a) Information received from IMD on heavy rainfall in catchment areas in Nepal, Uttarakhand and Terai region of UP. The SEOC has disseminated early warning message to the DEOCs of all hyper sensitive and sensitive districts to activate their IRTs.
 - b) Water released from Barrages/ Dams (Balmiki Nagar Barrage, Nepal, Ghaghra River Barrage, Bahraich, Parichha & Matatila dam on Betwa river, Banbasa and Kalagarh/Ramganga dams in Uttarakhand). Water also overflows from the Narayani, Karnali & Mahakali Rivers in Nepal.
 - c) DEOCs and District/ Tehsil IRTs have been activated.
 - d) Precautionary evacuation has been carried out and Relief Camps setup at multiple locations.
 - e) Breaching of River Embankment on rivers such as Rohini / Rapti inundated adjoining areas. Overflowing rivers and continued rainfall cause floods in many districts. Damage to infrastructure, crops and buildings reported from many areas along with some loss of lives. Incidents of boat capsizing and people drowning reported from some parts of the State. Many persons have been marooned on building roofs and other high grounds.
 - f) NDRF/ SDRF, PAC and other response agencies along with various volunteer organisation carry out search and rescue. Relief supplies being distributed to a large number of affected persons in the State. Community volunteers are assisting the Administration in large numbers.
 - g) In view of the large number of injuries and flood related ailments, the capacities of the health department were overwhelmed. Evacuation of the casualties was carried out by various means. Hospitals witnessed a surge in patients.
 - h) Communications and various other essential services have been seriously affected.

Conduct

17. The Flood Mock Exercise was conducted in three phases as follows: -

(a)	Phase 1: Orientation & Coordination Conference	- 16 Jul 2024
(b)	Phase 2: Table Top Exercise (TTEx)	- 23 Jul 2024
(c)	Phase 3: Physical ME	- 25 Jul 2024

Execution

18. <u>Table Top Exercise</u>:

- a) The TTEx was conducted from Yojna Bhawan, Lucknow where all the SDMA and State level ESF officials congregated. The DDMA and other stakeholders from the districts participated in the TTEx from their respective locations through video conferencing.
- b) Districts confirmed that their DM Plans have been updated. Some key State Departments presented their DM plans during the session.
- c) The NDMA Coordinator gave out the exercise scenario and painted several hypothetical situations to which the representatives of the districts and other participants responded.
- d) At the end, coordination for the ME was carried out along with a briefing to the observers.

19. <u>Mock Exercise</u>:

- a) The physical ME was carried out in all the 44 districts. Five locations were pre-selected in each of these districts for practising various contingencies. The ME was controlled from the State HQ and coordinated by the DDMAs from the DEOCs.
- b) Response was initiated by relevant stakeholders based on directions of the Incident Commander. Specialised response was carried out by the National Disaster Response Force (NDRF), State Disaster Response Force (SDRF), PAC and the Armed Forces.
- c) The response was practised as per the IRS. Various IRS facilities like Staging Area, Incident Command Post, Relief Camp, etc were set up in support of the operations. The Relief Camp and the Staging Area setup at Barabanki district was visited by the Vice Chairman, UPSDMA and NDMA representatives.
- d) Communication through police wireless networks and HAM operators was practised.
- e) Evaluators were assigned for each site. They were given an evaluation form to assess the response to the simulated situations. A self-assessment form was also distributed to all DDMAs for self-evaluation.
- f) In the end, a debriefing session was held via video conference with all the districts to discuss the conduct of the ME.

20. The photographs of various activities carried out in the Districts during the Mock Exercise are attached at **Appendix 'A'**.

FEEDBACK BY EVALUATORS AND FROM DISTRICTS

Areas of Strength

21. A number of strong points and good practices were observed during the TTEx and the ME. These are summarised below: -

a) <u>TTEx</u>:

The TTEx was well conducted and realistic lessons were derived for all participants. The learnings from the TTEx helped in conduct of the ME.

b) <u>Coordination</u>:

- i. Coordination among the various emergency response agencies was good. The roles and responsibilities were clear to all responders.
- ii. Traffic arrangements and crowd management was well coordinated during the ME.
- iii. The participation and role of the Armed Forces was coordinated effectively.

c) <u>Communications</u>:

- i. The wireless network setup for communications with the Flood Chowkies was very effective.
- ii. HAM operators were incorporated in the ME for the first time and usefulness of this valuable resource has been adequately highlighted.
- iii. Damini and Sachet Apps are being used by many stakeholders. The proliferation of these apps can be further improved.

d) <u>Participation</u>:

- i. There was active and enthusiastic participation from the local communities.
- ii. Telecommunication Service providers were incorporated in the ME for the first time
- iii. NCC volunteers participated in a large number.

e) <u>Resource Management</u>:

- i. The Search and rescue equipment available with the emergency responders were adequate for the task at hand.
- ii. Boats were available and pre-positioned in all the flood prone tehsils.
- iii. A number of districts practised making improvised floating aids using locally available resources.

f) <u>Media and Public Awareness</u>:

- i. The ME generated greater awareness in the local population and communities and also instilled a sense of confidence.
- ii. The print media coverage of the ME at district level was very encouraging. Some DDMA made effective use of social media platforms. All the activities of Gorakhpur district were streamed live over YouTube through "Suno Gorakhpur Channel".
- iii. 'RJ mention' initiative of the SDMA over FM radio was very effective in publicising the ME and proliferating associated messages.

Areas for Improvement

22. There is a need for greater coordination and training. The areas that need improvement and greater attention are summarised below: -

- a) <u>Training</u>:
 - i. <u>IRS Training capsules.</u> The line departments and other stakeholders need training on IRS for better understanding of the response mechanism during disasters. Regular IRS training capsules are needed at the District level to cater for new appointees to various appointments and normal turnover of manpower on transfers.
 - ii. NCC, Scouts & Guides, NCC and other volunteer organisations need regular orientation and training capsules.
 - iii. Community volunteers need training on handling of casualties and first aid during the 'golden hour'. They also need to be trained in swimming and rescue of drowning victims.

b) <u>Resource Management</u>:

- i. There is an overall shortage of life jackets, skilled boatmen and divers in few districts. Districts need to train and keep an updated list of boatmen and deep divers.
- ii. Inventory of all the available resources for flood response is required to be maintained at the districts and tehsil level.
- iii. Districts do not have an updated list of NGOs and details of their capabilities.
- iv. There is a need for centralised procurement for equipment like Drones and satellite phones for the Districts.

c) **Early Warning and Communications:**

- i. The bulk SMS sent through Sachet from the SEOC were delivered after considerable time lag. This aspect needs to be resolved on priority as delay in dissemination of early warning may be catastrophic during disasters.
- ii. The facility of 'Priority Call Routing' needs to be streamlined for the districts and practised during the MEs
- iii. There is a need for more wireless radio sets for better communication facilities at the IRS facilities such as Staging areas and ICPs
- iv. The Department of Telecommunications (DoT) needs to direct the TSPs to activate the short code 1077 for DEOC disaster helpline in the districts.
- v. Telecommunication Service Providers (TSPs) need to cater for sufficient portable BTS, satellite phones and mobile DG sets. They also need to coordinate with the district authorities for supply of fuel for DG Sets during disasters.
- vi. Some of the sites chosen for ME activities has very poor communication arrangements.

d) **Emergency Operations Centre (EOC):**

i. DEOC facilities are rudimentary and need upgrading. Adequate staff is needed for full

scale activation of the EOC during disasters.

- ii. Line departments also need to establish EOCs for command and control during disasters.
- iii. Satellite phones are needed in the flood prone.

e) <u>Plan and SOPs</u>:

- i. Hospitals need to have updated DM Plans.
- ii. Crowd management is very crucial during emergency situations and this aspect must be covered in DM Plans and SOPs.
- iii. Community Radio Station is an important instrument for community awareness and needs to be dovetailed in DM Plans.

OBSERVATIONS AND SUGGESTIONS

23. <u>Follow up Actions of Last Mock Exercise</u>: The last State level ME was conducted on 20th July 2023. A number of actions listed in the last Exercise Report remain as a gap in the State's preparation against disasters. These are summarised below:-

- a) <u>Schedule of Conduct</u>: State flood ME should be completed by the first week of July. Deployment of resources, both men and material and all preparatory action must be completed by 30th June by all departments.
- b) <u>EOC</u>:
 - i. GIS and NDEM experts are required at SEOC.
 - ii. Common Alert Protocol (CAP) should be fully functional at the SEOC.
 - iii. Use of Satellite phones and wireless radio sets in the EOC.
 - iv. On demand availability of satellite imagery from NRSC/RSAC
 - v. Police and Armed forces must be outstations in Communication networks of the EOC.
 - vi. Communication facilities upto IRS locations in the field need to be catered.
 - vii. Mobile EOCs may be planned at district level.

c) <u>Resource Management</u>:

- i. Include inventory of flood response resources in district Flood Management Plans
- ii. Increase Satellite phone availability in sensitive districts.
- iii. Provision of IRB and OBM in all the flood prone tehsils.
- iv. Updated list of deep divers and their training.
- v. IDRN not updated regularly. Lack of a comprehensive database of resources.

d) <u>Coordination</u>:

- i. Civil Military Liaison Conference (CMLC) must be conducted by districts regularly.
- ii. Coordination with Uttarakhand, Bihar and Madhya Pradesh for real-time information sharing & early warning. **Similar coordination is also required with Nepal.**
- iii. Lack of synergy between IMD, CWC and Irrigation Department for Impact Based Assessment. A single joint web portal needs to be developed.
- iv. Need for CWC representation at districts and integration with Irrigation Department. Coordination with NGOs and CSOs for relief actions. Updated list of NGOs not maintained.

- e) Community Radio Station should be dovetailed in plans.
- f) Participation of agencies like railways in the MEs.
- g) Hospital surge capacity not planned in some districts.
- h) Use of drones for real time information and distribution of relief material.

24. <u>**Preparatory Actions:**</u> A number of preparatory actions outlined during the Orientation and Coordination Conference were not completed. Many districts failed to submit documents and other requirements in time.

25. <u>Participation in TTEx and ME</u>:

- a) There is a requirement of active involvement of the senior leadership both at State and at District level. In some districts, the DDMA Disaster Expert was left in charge of the entire coordination and conduct of various ME activities. It is imperative that all the State and District IRS Officials participate both in the TTEx and ME and practise their assigned roles.
- b) A number of critical ministries, line departments and ESF organisations did not attend the TTEx and the ME. There is a need for each ministry, department and organisation to ensure that senior officers attend the TTEx and the ME. The particulars of the person(s) nominated to attend the exercise must be intimated well in advance.
- c) Teams of various ESF agencies need to participate and practise their roles during the mock exercise. They need to mobilise and deploy the resources nominated for disaster and rehearse disaster drills and SOPs. Examples of some such teams are:
 - i. TSP mobile repair teams
 - ii. Electricity restoration teams
 - iii. Water department teams catering for Drinking Water, Dewatering Pumps etc.
 - iv. PWD teams for restoration of essential facilities and road axis clearance
 - v. Livestock management teams with fodder and medical arrangements
 - vi. Animal carcasses disposal teams
 - vii. Municipal department teams for debris clearance, hygiene and sanitation
 - viii. Temporary Shelter teams
 - ix. Transport department teams for evacuations

26. <u>State Flood Action Plan</u>: The State Flood Action Plan is a comprehensive document that is revised and updated regularly. The districts also need to update their respective flood action plans 30 April each year as well as complete all the actions and preparations required to be completed before the flood season.

27. <u>Emergency Operation Centre</u>: The District EOCs are required to be upgraded with adequate communication arrangements and staff. They must cater for adequate space for full operationalisation

during emergencies.

28. <u>Communication Arrangements</u>:

- a) The use of wireless radio sets provided by the police department was effective but needs a more widespread deployment.
- b) Other arrangements like HAM operators, community radios, satellite phones must be mainstreamed for effective communication among various stakeholders.
- c) Coordination is needed to ensure that the existing communication networks of the organisations like the Police, Railways and the Armed Forces can be integrated and utilised during disasters. There is a need to coordinate frequencies, have provisions of liaison officers and establish a common radio network for disasters.
- d) The Department of Telecommunication (DoT) needs to ensure that all TSPs maintain resources and spares for early restoration of communication networks as per the SOP (2020) for Telecommunication Services for Responding to Disasters. The Resource Centre for the State of Uttar Pradesh must be established and stocked as per the SOP. These resources must be mobilised during State MEs.

29. <u>Use of Technology</u>: There is a need to incorporate technology like drones in disaster management and practice the same during mock exercises.

30. <u>Media and Public Awareness</u>: The local media coverage of the mock exercise was good. The FM radio was also used effectively in the period before the mock exercise to give a wide publicity to the mock exercise. Districts must carry out public awareness of the hazard along with Do's and Don'ts through the print and broadcast media in the period before the actual exercise.

31. <u>Fire and Emergency Services</u>: Fire and emergency services need to be more effectively exercised during the mock exercise with properly designed scenarios for fire as a secondary hazard. The Fire and Emergency Services can also be used for organising well-rehearsed demonstrations in schools and other institutions.

32. <u>Capacity Building of Emergency Responders</u>: The training needs of the emergency responders including community volunteers needs to be systematically appraised and additional courses on various aspects of disaster management demanded/ conducted. The PAC flood companies and SDRF along with Civil Defence volunteers, Home Guard personnel and Aapda Mitras are important resources whose capabilities must be continuously upgraded. Additional IRS training courses also need to be conducted for the District IRTs and line departments.

33. <u>**Resource Management:**</u> There is a need to document both public and private resources needed during floods. There is a shortage of life jackets and other equipment that needs to be addressed. There is also a shortage of boats and boat drivers in some districts. There is also a need to train additional deep

divers for flood rescue.

34. <u>Establishment of IRS Facilities</u>: There is a need to practise setting up various IRS facilities like ICP, incident base, camps, relief camps, helipads, etc. These are presently established in name's sake with just banners depicting the facility. They should be set up with all mandated capabilities and equipment including required communication arrangements.

35. <u>Hospitals and Medical Facilities</u>: The Medical, Health and Family Welfare Ministry performed well in setting up medical aid posts and evacuation of injured through ambulances. There is a need to practise surge capability in all major hospitals of the district. They also will be affected by disasters to a varying degree and must practise how to overcome emergency situations. For this, the hospitals must have their own DM Plans and SOPs. The ministry may plan separate dedicated mock exercises for hospitals in the districts for this purpose.

36. Multi district exercises are big events and every stakeholder may not get adequately exercised due to paucity of time and resources. To derive maximum benefit from such large-scale exercises, they should be preceded by smaller district/ tehsil drills including Table Top exercises and IRS training capsules.



ß

MOCK EXERCISE ACTIVITIES

INCIDENT COMMAND POST & STAGING AREA



င္ပူ

R

















AMBEDKAR NAGAR

















ချ





IB

















)IB















SUS



GONDA







IB







