UTTAR PRADESH DISASTER MANAGEMENT AUTHORITY

AN ADVISORY ON FLOOD MANAGEMENT

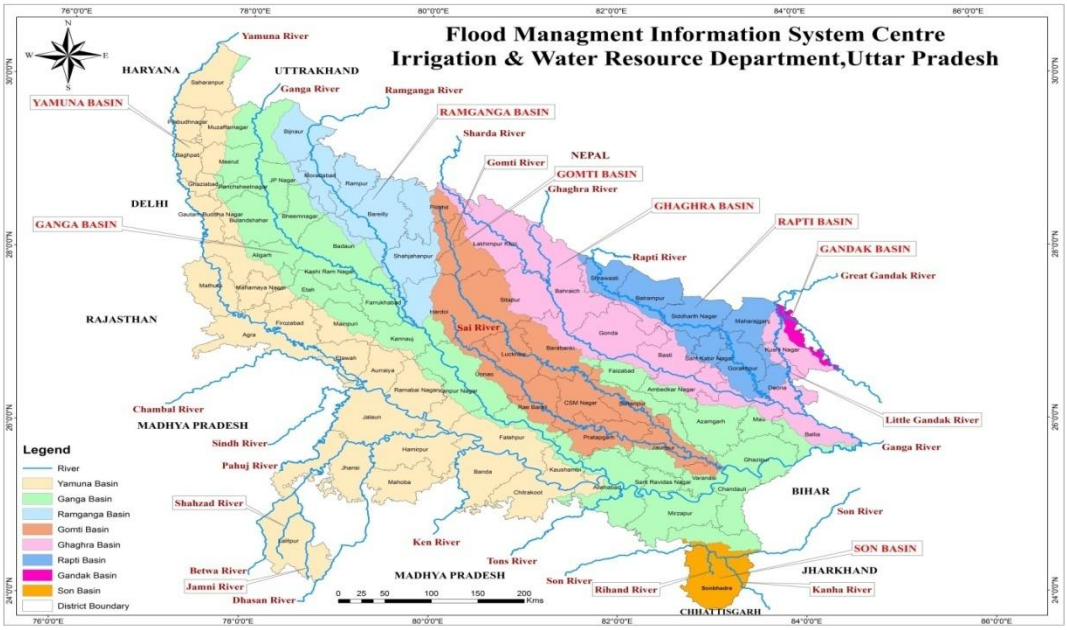
INTRODUCTION

1. Uttar Pradesh is richly endowed with rivers. There are about 31 rivers which flow through Uttar Pradesh. Many of these rivers have their origin in Nepal and most of these flow into Bihar and in some cases to Madhya Pradesh. Although rivers are the life line of the State but many of them post monsoon cause

extensive damage due to floods. Frequent floods in the State of Uttar Pradesh in past have demonstrated the urgent need for the vulnerable districts to enhance the internal competency to prepare, manage and eventually reduce its vulnerability to flood related disasters. To ensure a more effective coordination at district level with concerned stakeholders, the UPSDMA has prepared an advisory to help and guide all agencies involved in flood disaster management.

Vulnerability of State of Uttar Pradesh to Floods

2. 40 out of 75 districts are flood prone districts in the State, 73 districts suffered losses due to Hail storm and about 30% earthquakes in the state have taken place in monsoon season. It is therefore essential that state should be prepared for multi hazard scenario.



3. The area of Eastern Uttar Pradesh regularly subjected to nature's fury of severe flooding on an annual basis due to variety of reasons, essentially low lying foot plains, suspended sediments load carried by the rivers flowing down from Nepal and also sporadic release of excess/overflowing water from higher reaches. Since this part of the state is very important from the perspective of agriculture, flood risk and damage assessment assumes paramount importance.

Therefore, measures need to be taken up to combat this natural disaster so as to reduce the devastating impact and also continue development and growth unhindered.

4. The total land mass of the State of Uttar Pradesh is approximately 24.1 million hectare, of which approximately 7.33 million hectare land has been recognized as flood prone due to the flooding of major rivers like Ganga, Yamuna, Ramganga, Gomti, Ghaghra, Rapti, Sharda & Gandak. The magnitude of the flood depends upon the snow melt off, intensity of rainfall, its duration and also on ground conditions in the catchment area besides certain manmade causes which invariably compounds the impact of hazard. When heavy spell of rainfall occurs, floods cause severe damages to human life and properties. All the major river systems of Indo-Gangetic plain region transport heavy amount of sediment load, due to environmental imbalance in the hilly region. Consequently, silt load is gradually increasing in the Indo-Gangetic plain region of river system, causing obstruction in proper flow of surface water in the rivers. This leads to frequent floods in the rivers.

5. <u>Type of Damage</u>

(a) Floods affect maximum to people, material, properties, cattle and standing crop. Once water recedes stagnant water and polluted water sources cause spread of water borne diseases and contaminated potable water sources. Damage also happens to infrastructure in terms of collapse of old and unsafe houses, roads, public utilities, water reservoirs, electricity supply arrangements, sewage disposal system, railway tracks, communication network and other installations. Each of these damages have a related problems which affect the life and daily routine of common people.

(b) Most vulnerable sections are old, infirm, children, females, cattles. In the absence of adequate storage space the standing crop with the implication for future food security remain quite vulnerable to damages.

(c) There is a section of society which is economically weak is also quite vulnerable as they stay in areas which do not have adequate drainage arrangements and their dwelling units are also temporary in nature and a heavy rain affects them substantially, therefore the need for dovetailing the socio-economic conditions into flood management strategy.

6. <u>External Stake Holders</u> As stated earlier, many of the major rivers originate in Nepal and pass into neighboring States of Bihar, Madhya Pradesh and Rajasthan. Floods in upper reaches cause damage in the lower reaches as such Nepal as well as States of Bihar, Rajasthan and

Madhya Pradesh also become stake holders. There is a need to coordinate with them in pre monsoon season.

7. **<u>What Accentuates Damage on Account of Floods</u>** It is true that the floods are a natural calamity and it happens if rainfall becomes extensive. However, the damage becomes more extensive due to some natural and some manmade causes. Some of the important factors are as follows:-

(a) Global warming has adversely affected the rain fall pattern. A warmer atmosphere can hold more moisture, and globally water vapour increases by 7% for every degree centigrade of warming. Total volume of precipitation is likely to increase by 1-2% per degree of warming.

(b) Silting in the Rivers, most of the rivers in Uttar Pradesh are glacier fed and the Himalayan Glaciers are known as dirty glaciers and when they slide they bring lots of silt with them. Silting of rivers keeps reducing the depth to accommodate additional flood waters . Warmer environment results in faster melting of snow which results in more volume of water in the rivers.

(c) Increasing encroachment of river plains which restricts rivers when in spate and those who are the squatters become vulnerable to damage.

(d) Deforestation in upper reaches has further reduced the capacity of earth to arrest the flow of rainfall in those regions. It further adds to the movement of silt and debris causing rivers to get choked.

(e) Impeding natural flow of rain water going towards rivers due to new constructions not taking into account the grain of the country. Most of these constructions are illegal and they result into stagnation of water particularly in urban areas which not only causes immediate damage but is also a source of water borne diseases during post floods.

8. In view of the background explained above, there is a need to develop a comprehensive strategy to prepare well in advance to face the challenges on account of floods.

9. **<u>Network of Stakeholders (State and District)</u>**

(a) NDRF

(b) SDRF

(c) UP Police

(d) UP Fire Services

(e) Irrigation Department

(f) Public Works Department

(g) Health Department

(h) Animal Husbandry

(i) Energy/Non Conventional Energy Department

(j) Jal Sansthan

(k) Nagar Nigam/ Municipality

(l) Gram Panchayat

(m) Food Supplies

(n) Civil Defence

(o) Transport Department

(p) Information and Public Relation Department

(q) Forest Department

(r) NGOs/CBOs

(s) Private Agencies/Enterprises

10. Role of Armed Forces It also needs to be noted that while response effectiveness of the NDRF is improving steadily, Armed Forces in location or in the near vicinity of the affected area remain quite important for the timely rescue and relief operations.

AIM

11. "To evolve a comprehensive strategy to prepare the State Machinery in conjunction with Civil Society and neighboring states/country to handle floods and its aftermath".

SCOPE

12. Following aspects are covered in the flood management strategy:-

(a) **Part-1:** Preventive/Mitigation Measures

(b) **Part-2:** Actions during Preparatory Phase.

(c) **Part-3:** Actions during Rescue & Relief Phase.

(d) **Part-4:** Rehabilitation, Reconstruction and Mitigation

(e) **Part-5:** Roles and Responsibilities

(f) **Part-6:** Miscellaneous

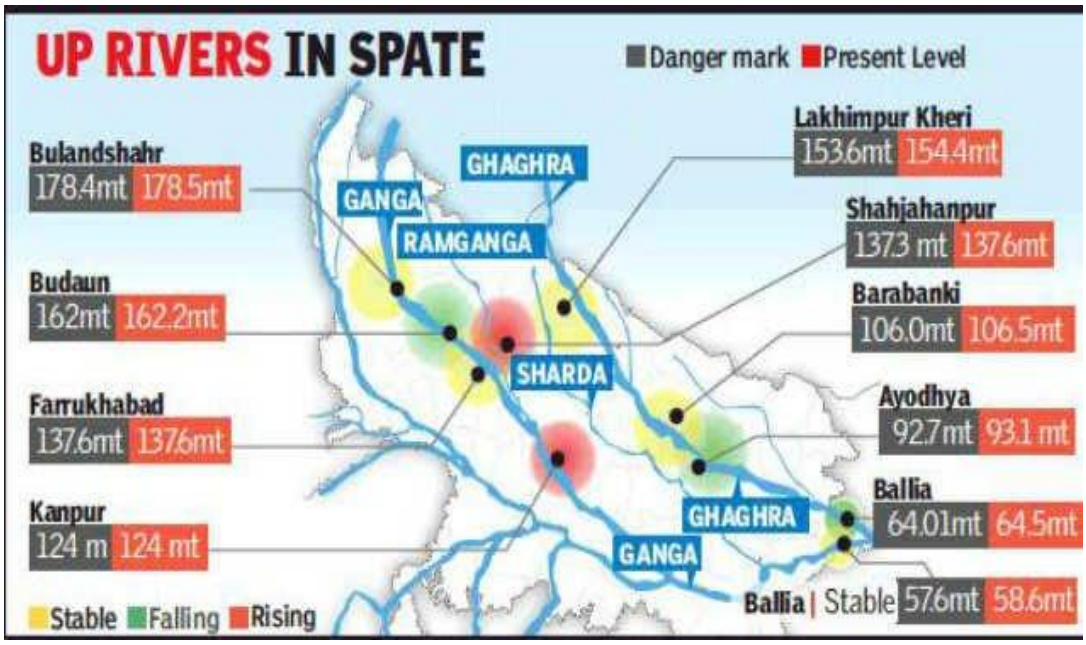
13. The paper will also address the issues of organization, communication, inter departmental coordination and other related issues.

PART-1: PREVENTION/MITIGATION MEASURES

14. The prevention and mitigation strategy of nations and states has been the hallmark of Sendai Framework for Disaster Risk Reduction and it is incumbent that the aspect be given due attention and kept at the forefront of any strategy. There exists a close relationship between the hydrological processes that leads to flood generation and water resource management, river management, forest management, land use management, erosion control and agriculture. Any imbalance in one may lead to disruption of the entire hydrological process leading to disastrous situation in the State.

15. River's drainage basin area, if not managed efficiently from hydrological perspective, has the disaster potential of unimaginable magnitude and therefore any flood management scheme should take into account the dynamics of river basin to its entirety. The strategy for flood risk reduction should also take into account the entire development activities in the river basin. The river basin flood management need to involve various organizations and institutions with the mandate related to development activities that may affect the hydrological process in the river basin.

16. The State traditionally witnesses the flooding most part of the State year on year. Year 2018 saw most rivers overflowing the danger mark with 27 districts in the grip of floods, enveloping 806 villages displacing approximately five lakh people. Water level in most rivers in 2018 is depicted in Map 4 below. By and large, flood is assumed to be a natural disaster; however, manmade contributions to this hazard cannot be ignored. Choking of the drainage system, breaching of embankments on rivers, irrigation canals or the dams by human beings for their personal motives are cases in point which need to be addressed in the State's overall scheme.



17. There is a time tested and well laid out system of early warning and dissemination that exists in the State which needs to be strengthened and operationalized more efficiently. Gauge stations and flood forecasting and base stations are very significant elements of flood management and should be incorporated in flood early warning system of the State. River level data are fed to flood forecasting centers and accordingly decision is made about the area to be flooded and the same is communicated to the various officials of the State Government including Relief Commissioner, U.P., Chief Engineer (Investigation & Planning) Irrigation Department, U.P., and the concern District Magistrate. It's, therefore, imperative that due care be taken and the existing structure made more effective.

Prevention and Mitigation Activities

18. Any expenditure on Prevention and Mitigation is required to be considered as investment as the same has potential of paying great dividends. Hazards can only become disasters if associated with loss of life and damage and destruction to property, and prevention and mitigation effortscan unequivocally minimize the disastrous effect of flood as a hazard. Both structuraland non-structural measures have the potential to reduce the impact of a disaster on a region or a population.Such mitigation measures can be integrated with normal development activities for growth as well as improving the quality of life of communities. Some of the short, medium and long term mitigation activities are listed below.

19. Short Term Mitigation Activities

(a) Structural

(i) Breaking of river embankments would prove to be more disastrous than not having them at all. Repair of embankments and overhauling of barrage gates needs to be undertaken both before and after monsoon season.

(ii) Identification and dredging of shallow river stretches and water bodies.

(iii) Renovation and cleaning of drainage.

(iv) Protection of river erosion at critical locations.

(v) Water harvesting practice and creation of structures for the purpose, both in rural as well as urban areas.

(vi) Creation of water conservation structures.

(vii) Repair/construction of approach road to flood prone areas.

(viii) Availability of transport for shifting of essential supplies and stores in flood areas.

(ix) Creation of warehousing facility in areas likely to be subjected to floods for storing of essentials.

(b) Non Structural

(i) Launch awareness campaign through mass media programs.

(ii) Carry out frequency analysis of floods based on past occurrences.

(iii) Store food grains in susceptible areas.

(iv) Establishment and operationalization of flood control rooms at District HQ or any other suitable location with communication facility.

(v) Procurement of essential stores for combating the floods; such as sand bags, cement, hollow bricks, tetra blocks and boulders etc..

(vi) Training of local communities in basics; such as handling of snake bite kit, water cleaning etc..

(vii) Awareness of community towards use of plastic and polythene bags.

20. Medium Term Mitigation Activities

(a) Structural

(i) Structural audit of all existing embankments and construction of new ones wherever required.

(ii) Develop hydrographic survey capability of the State besides the satellite based survey.

(iii) Modification and raising of roads to ensure accessibility during the period of flooding.

(iv) Construction of raised community halls within the village to also act as shelter during the calamity.

(v) Construction of new drains.

(b) Non Structural

(i) Flood risk zoning of the area duly incorporating the socio-economic conditions of community.

(ii) Constant hydrographic survey of rivers to identify sedimentation and if required undertake necessary dredging of rivers.

(iii) Constant monitoring of river configuration, essentially if there is any course change.

(iv) Awareness campaign through mass media.

(v) Frequent assessment of effectiveness of flood control work, especially before the onset of monsoons and post monsoons.

(vi) Regular updating and strengthening of medical and health facilities.

(vii) Monitoring and detecting changes in flood plains and catchment areas.

(viii) Necessary plantation in river basin and flood pains to ensure stability of soil.

21. Long Term Mitigation Activities

(a) Structural

(i) Stringent rules and regulations for construction in catchment areas. Removal of encroachments.

(ii) Promotion of plantation on embankments and bunds and in catchment areas.

(iii) De-siltation of rivers.

(iv) Research and study by employing professionals in the field for charging of ground water.

(v) Study and research on creation of water catchment areas in nearby water deficient regions and tunneling the water from flood prone areas.

(i) Establish flood wireless centres on dams and barrages.

(b) Non Structural

(i) District wise nomination of Nodal and Flood Coordination Officer.

(ii) Creation of flood risk zones and flood plain maps at district level.

(iii) Empowerment of communities.

(iv) Draw out plans for inter district coordination for floods. Similar arrangements need to be put in place for interstate coordination with neighboring states.

(v) Nomination of Nodal officer for mitigation efforts related to inter state flood problems.

22. Human Resource Development One of the important strategy for mitigation is Human Resource Development. It's paramount that this component of mitigation efforts be given due attention at all level. Not only the necessary training be imparted to the Government staff at the State as well as district level but also to the NGOs, communities and volunteer organizations. NGOs can also be used for imparting training besides themselves being trained in some particular aspect of Disaster Management. Training needs assessment exercises for different categories and levels of functionaries will enable identification of the gaps that need to be attended to through training activities. These will be done by assessment of the level of knowledge, attitudes and skills, with respect to the task to be undertaken. Preparation of training modules and materials based on such Training Needs Assessment exercises will be undertaken by the training institutions.

23. Tapping the Resources: Pool of Ex Servicemen/PMF State of Uttar Pradesh has a large available pool of retired personnel from Armed Forces as well as PMF who are trained and disciplined and willing to accept challenges. Any investment to create such a potent force is likely to pay great dividends and need to be incorporated in State's mitigation plans.

24. Integration of Mitigation Measures into Development Plans There exists tremendous scope to integrate mitigation measures into development plans, both by structural and non-structural approach. Disaster resistant construction technologies; such as disaster resistant housing, reinforcing concrete and disaster resistant pier system are some of the commonly used techniques which would substantially contribute to mitigation schemes as well. Construction/development of villages on higher ground will reduce the vulnerability of community to floods to a large extent. Similarly efficient management of river basins may reduce run off and soil erosion and thereby have a positive impact on mitigation efforts.

PART-II: ACTIONS DURING PREPARATORY PHASE

Pre Monsoon Preparedness Action Plan

25. The Emergency Support Functions identified for Disaster Response are as follows:

- Dam Management
- Communication
- Public Health & Medical Services
- Power
- Transport
- Search & Rescue
- Fire Fighting
- Public Safety and Law and Order
- Public Works & Engineering
- Shelter/Relief Camp
- Relief Supplies
- Sewerage & Sanitation
- Information & Public Relation
- Oil & Hazardous Material
- Management of Relief Camps
- Coordination within departments and with outside agencies

26. **Responsibilities of the Districts** District administration should ensure following within the district:-

(a) Formation of Village Disaster Management Teams in every Revenue Village.

(b) Trained and equipped fire services at district level and also formation and equipping of village level fire fighting teams with minimum equipment.

(c) Home Guard/Civil Defense and Volunteers trained in Search and Rescue operations.

(d) As per National Guidelines form Incident Response Teams at district level and preferably at Tehsil level.

Table-1: Pre Monsoon Activities to be undertaken by Districts

S. No	Activities to be Undertaken	Department Responsible	Completion Date	Remarks
1	Review and update District Flood Vulnerability Map . Identification of helipad grounds near identified vulnerable areas. Identification of alternate routes to vulnerable areas	DDMA	Mid Apr	
2	Formation of District, Tehsil, MC and Village level Disaster Response Teams. Ground reconnaissance of the identified vulnerable areas and areas where rescued people to be housed.	Revenue Department	End Apr	Wherever possible selected areas be on safe and on higher ground
3	Review response resources (men, material, equipment and machinery) and its availability at flood prone Tehsils, Villages, and Towns. Assess and create additional resources if required locally. Identification of areas in concerned Panchayats where relief camp would be established for both human beings and cattle.	Revenue Department and Municipal Corporations/ Councils/ Panchayats	Mid May	
4	Review and update District India Disaster Resource Network (IDRN) and renew MOUs with concerned agencies.	DDMA	Mid May	
5	Identify locations of Automatic Weather Stations (AWS) (CWC, Irrigation, Revenue and IMD) and link up with the CWC and District Control Rooms. Pre-positioning of equipment and its testing for operations. Pre-placement of fuel, oil and lubricants for the running of equipment. Detailing of teams to use the equipment. Marrying of men and machine. Stocking of emergency eatables like powder milk, cereals, cooking oil and arrangements for cooking. Coordination conference of the DDMA be held to tie up minutest possible details. Mock drill and rehearsals at DDMA be held to respond to likely disaster situation.	DDMA/ District Authorities/Zilla Parishads/Village Panchayats	End May	Wherever equipment is stored arrangements be also made for their insitu repair and maintenance.

6	Ensure the availability of small and large size boats at district level. At least one pedal boat if not motor boat should be available at tehsil level. The maintenance of boats and availability of boatman be ensured.	DDMA/ District Authorities/Zilla Parishads/Village Panchayats	End May	Ensure adequate number of boatmen are trained well in time.
7	Ensure operationalization of District and Tehsil EOC and CWC/MC/Departmental Control Rooms and their linkage with State EOC. Ensure redundancy in communication at each level. Test communication network in normal circumstances and also ensure emergency communication network is functional. Review medical arrangements at district level and also functioning of quick reaction medical teams.	SDMA/DDMA/districts and state medical authorities	First Week of Jun	
8	Establish linkage with neighbouring states and district authorities	SDMA/DDMA	First Week of Jun	
9	Ensure departmental SOPs for flood response in place	SDMA/DDMA	First Week of Jun	
10	Ensure inspection and repair of all the damaged and sensitive bunds.	DDMA/ District Authorities/Zilla Parishads/Village Panchayats	First Week of Jun	
11	Ensure conduct of village, tehsil, department level rehearsals/mock drills (Minimum one at each flood prone village, minimum two at tehsil Level)	SDMA/DDMA	Before first week of Jun	
12	State Mock Drills	NDMA/ NDRF/SDMA/ SDRF/DDMA	By second week of Jun	
13	Ensure integration of Army IS columns /SDRF/NDRF Teams during above rehearsals/mock drills	SDMA/ DDMA to coordinate with Army Authorities	As per above	
14	Ensure the dissemination of early warning by IMD up to the grass root level, well before time.	SDMA/DDMA	As per above	
15	DM should place QRTs (Quick Response Teams) at sensitive places.	District authorities	As per above	
16	Relief material such as water packets, food packets should be shared from district to district as per the requirement and availability.	District authorities	As per above	

17	Sanitary Napkins can be made a part of flood relief packets.	DDMA / Revenue Department	As per above	
18	Public Works Department plays an important role in mitigation and relief works on ground; hence PWD must be kept in loop during preparation period.	DDMA/ District authorities	As per above	
19	Additional budget should be kept for some last minute repairs.	District authorities/ Revenue Department	As per above	
20	A detailed feedback on the advisory with areas for further improvement. Details of looses due to floods should be provided to the government timely so that Flood Memorandum can be prepared within a workable time limit.	District authorities/ Revenue Department	First week of October	

DDMA in Conjunction with District Administration to Ensure Completion of Following Activities Before May

1	Ensure no encroachments in blue line	Revenue with Irrigation Department	
2	Widening, deepening and silt removal from water channel and cleaning/repairing of drains wherever necessary.	Irrigation Department	
3	River bank embankments maintained and strengthened	Irrigation Department	
4	Safety Audits of Dams conducted	CWC/Irrigation Department	
5	Vulnerable population, structures, infrastructure, facilities identified	Revenue/PWD/Electricity/ Water State/District Departments	
6	Temporary shelter location identified and its preparedness measures planned and executed including stocking of these shelters. Points to be checked are as followed:- -Charging points. -Emergency communication setup including at least one satellite phone with the manpower to use it. -Emergency medical arrangements. -Arrangements for provisioning of potable water. -Provision of powder milk and other cereals needed for emergency rations. -Arrangements for helping people to trace their lost kith and kin	DDMA, TDMC, VDMC	These should be checked in detail in such a way that they become operational instantly
7	Storm water drainage management within villages and towns . It will entail provision of necessary pumps and manpower to man them.	PWD	
8	Ensure all flood response related equipment and machineries are in operational condition and married up with the manpower to use it, necessary oils and lubricants are catered and stored. Water sterilizing kits are provisioned.	Irrigation, Electrical, Water, FES, PWD, Medical	
9	Emergency Search and Rescue equipments are checked for its operational functioning and prepositioned/deployed at desired locations. Adequate number of cutters are also provisioned to handle buildings that collapse. In addition GPS and detectors are also provisioned to trace those who may have got buried under the debris.	Chairmen Village/ Tehsil/ MC Disaster Management Committee	

10	Ensure operational continuity of all life line services, if required plan for contingencies. Health facility should have sufficient stock of medicines and insecticides	HODs of concern central /state government departments	
11	Conduct refresher training for District, Tehsil and Village Disaster Management Teams, officials and community	DDMA	
12	Place for relief camps should be decided well before and publicity for the same should be done.	DDMA/ District Authorities	
13	Law and order arrangements must be done for food and relief supplies in flood affected areas for proper and equal distribution.	DDMA/ District authorities	
14	Chlorine tablets should be available in abundant quantity.	District authorities	
15	Responsibility for Proper cleaning of relief camps should be given to the concerned department.	DDMA/ District authorities	
16	Livestock relief camps identified and arrangements for veterinary care, fodder and water ensured	Revenue, Veterinary, VDMC, NGOs and Community	
17	Veterinary doctor should be available at animal shelters.	DDMA/ District authorities	
18	Vaccination of livestock should be ensured in relief camps.	DDMA/ District authorities	
19	Evacuation plan prepared and required mode of transportation identified and planned	TDMC/VDMC/MC	
20	Identify and nominate 50 people (mix of gents and ladies) from each village as responsible citizens. Prepare directory of their mobile numbers. They shall act as medium for disseminating early warning. NGOs and other volunteer help groups to be briefed and their role factored in the rescue and relief operations. Coordination with SDRF, NDRF and local Armed Forces to identify their role and time/trigger of commencement of their association, including arrangements for liaison with these agencies.	EOC, All control rooms and TDMC/VDMC NDMA/SDMA	
21	Identify and nominate Damage Assessment Teams at each village	DDMA/District Authorities	It may be considered that system of risk transfer in terms of getting certain important assets insured be planned well in advance.

NOTE- As per the DM act 2005, Section 18 sub section 'f', The State Disaster Management Authority shall "recommend provisions of funds for mitigation and preparedness measures". Hence, it is recommended that all District Magistrates should forward a demand for funds for Capacity Building both in terms of training of manpower & purchase of equipment from State Disaster Relief Fund to Relief Commissioner, Uttar Pradesh under intimation to this authority.

27. Flood Forecasting and Early Warning: To understand the IMD forecast, all EOCs/Control Rooms will train their staff in analysing IMD Forecast. The following shall be displayed in all District EOCs and Control Rooms:

Table-2:Terminologies for Spatial Distribution of Rainfall

Distribution	No of Places	Description
Isolated	One or two Places	<25% of stations get rainfall
Scattered	At a few Places	26-50% of stations get rainfall
Fairly Widespread	At many Places	51-75% of stations get rainfall
Widespread	At Most Places	76-100%of stations get rainfall
Dry		No stations get rainfall

Table-3: Probability of Forecast

Terminology	Probability of Occurrence
Could occur	<25%
May Occur	26-50%
Would Occur	51-75%
Will Occur	76-100%

Table-4: Type of Forecast

Now casting	A short range forecast having lead time/validity of <24 hrs. This applies mostly to aviation Forecasts
Short TermForecast	Forecasts having a lead time/validity period of 1-3 days. The regional forecast and state level forecast come under this category
Medium Term Forecast	Forecasts having a lead time/validity period of 4-10 days. Meteorological forecast for agricultural purposes come under this category.
Long Term/extended term Forecast	Forecasts having lead time/validity period beyond 10 days. Usually this is issued for a season. IMD issues Long Range Forecast for South West Monsoon rainfall and onset date for Kerala, North East Monsoon Rainfall and Winter precipitation over North west India

Table-5: Description of Rain

Descriptive Term Used	Rainfall in mm
No Rain	0.0
Very Light Rain	0.1-2.4
Light Rain	2.5-7.5
Moderate Rain	7.6-35.5
Rather Heavy	35.6-64.4
Heavy Rain	64.5-124.4
Very Heavy Rain	124.5-244.4
Extremely Heavy Rain	> 244.5
Exceptionally Heavy Rain	When the amount is a value near about the highest recorded rainfall at or near the station for the month or the season. However , this term is used only when the actual rainfall amount exceeds 12 cm.

PART-III: RESCUE AND RELIEF

28. This is the most critical phase of the Plan as it would entail execution of plans prepared earlier and the initiation of the Standard Operating Procedure (SOP) set during the Preparatory Phase. In this phase, on receipt of flood warning immediate action will start from lowest to highest level simultaneously.

29. **Flood Disaster Response Action Plan at District Level-(Likely Flood Disaster Incident-D Day)** The action plan consist of the following activities:-

(a) Declaration of Anticipated Flood Situation/Flood Disaster

(b) Flood Forecasting and Warning

(c) Trigger Mechanism

(d) Mechanism of the concerned departments along with the roles and responsibilities

(e) Relief Arrangements

(f) Declaration of Help Line Number - to be displayed at prominent places, conveyed through social/print/electronic media, radio and cinema.

(g) Every District HQ / Sub Division HQ/Panchayat to have a chart listing the tasks and the responsibilities prepared. A recommended format is as follows:-

S No	Type of Warning	Task to be performed	Responsibility	Remarks

30. **Authority to Declare Anticipated Flood Situation/Flood Disaster-** **The** Disaster Management Act 2005 (section) provides for the state government to declare any area affected by flood. UP State Disaster Management Plan specifies Relief Commissioner as the competent authority for declaration of flood disaster/disaster.

31. **Trigger Mechanism**- The Central Water Commission issues Daily Flood Bulletins to State Governments/District Administration during the South West Monsoon season for all the major river basins. The nodal agency for Early Warning is State Irrigation Department. The Early Warning is issued in the following categories:

(a) **Category IV:** Low Flood (Water level between 'Warning' Level and 'Danger' Level)

(b) **Category III:** Moderate Flood (Water level below 0.50 m less than HFL and above Danger Level)

(c) **Category II:** High Flood (Water level still less than Highest Flood Level but within 0.50 m of the HFL)

(d) **Category I:** Unprecedented Flood (Water level equal and above Highest Flood Level (HFL)

Note:-

(a) In case of release of water from the dam: Location specific alert can be given depending on the distance from the dam and quantum of water released.

(b) In case of Flash Floods: local warning mechanism after ascertaining the AWS rainfall report in catchment area.

32. Flood Disaster Response and Relief Mechanism: A flood response operation should consist of following aspects:-

(a) **Warning Dissemination-** All announcements including physical announcement should be done well in time for people to move to safer places. Inhabitants of those buildings which have been declared dangerous prior to monsoon should be advised to move to safer places.

(b) **Evacuation-**Once water level starts rising in the water channels, people should be advised to move to pre designated safer place. Help should be available for old infirm, pregnant women and children.

(c) **Essential Services**- Particularly supply of potable water, electricity and sewage disposal are maintained or quickly re-established. Few aspects in this regard which merit attention are as follows:-

(i) Switching off power lines in water logged areas. Once water starts receding the power lines will have to be reenergized. It should be properly notified well in time and no accident be allowed on account of electrocution.

(ii) Provision of water sterilizing kits for water purification.

(iii) Ensure avoidance of contamination of potable water with sewage

(d) **Maintaining Access Routes**- In this connection local police to ensure that the access routes are free from flowing / submerged debris and where diversion is required proper

marking and traffic control is exercised. Regular patrolling of these routes be done to see if any underwater damaged stretch is noticed and if so, should be addressed immediately. Also, adequate recovery resources are deployed to clear the routes from damaged /stuck vehicles.

(e) **Supply of Relief Material**- Securing areas against vandalism. Plenty of relief material from various sources will be received. Its bulk breaking and supply chain to needy is a very important task. It should be planned well under a dedicated organization.

(f) **Maintaining Communication Lines-** It should **e**ither be through PL (if possible), through mobile net work or if both are not possible then through a satellite phone.

(g) **Protecting, maintaining and repairing** existing structural mitigation works.

(h) **Constructing expedient mitigation works** (such as temporary levees)

(i) **Securing Areas against Vandalism-** Police should be deployed to ensure that public/private assets are not damaged by the anti social elements.

(j) **Conducting Search and Rescue Operations-** Boatmen community should be utilised for this purpose

(k) **Evacuating Persons and Providing for their Immediate Welfare**- Particularly in terms of medical help. Besides, nodal clinics and administration needs to create small vehicle bound teams to visit the affected areas to provide medical relief. Initially, it would be against dehydration and water ingestion slowly as days pass it would be more against water borne diseases.

(l) The relief camps to have charging arrangements for mobile phones, sewage disposal arrangements, potable water for drinking, milk fresh/powder for infants

(m) **Protecting Property and Possessions-** One of the most precious asset would be harvested crop which in the absence of adequate storage space may be lying in open

(n) Coordinating the essential needs of isolated persons and communities

(o) Coordinating the immediate welfare of stranded travelers

(p) **Ensuring the Welfare of Flood-Affected Livestoc**k- dairy and poultry etc. , organizing their housing as well as fodder.

(q) **Community support** from NGOs and cultural organizations are highly important to provide relief to affected persons. Their participation in rescue and relief operations should be coordinated by the DDMA.

(r) Depending of severity of floods there may be possibility that teams from NDRF/SDRF of even Armed Forces may get inducted. It is important that the induction of these task forces is smooth and they are facilitated to perform immediately on arrival. Local administration needs to make arrangements well in advance to do that.

(s) Normally many important persons/press/media would be visiting the flood affected areas, many a times such visits may hamper the rescue and relief operations. Therefore, such visitors be taken to a specially rigged up briefing room where the VIP/media is given a detailed briefing on the situation and progress of rescue and relief operations. Visit of VIPs to severely affected areas should be minimized.

33. **Rescue and Relief in Urban Areas:-** Some of the typical issues in urban areas are as follows:-

(a) High rise buildings and also a lot of unsafe buildings.

(b) Poor drainage system which may result into reverse flow in case of floods.

(c) Excess population putting heavy pressure on rescue and relief operations particularly due to traffic snarls.

(d) Because of stagnation of water, public health issues assume great importance.

(e) There will be a number of highly congested areas having less or no storm water disposal arrangements, putting different kind of challenges where encroachments remain quite vulnerable to onslaught of water.

(f) Logistics and medical support in labyrinths of city pose different kind of challenge.

34. With the above stated challenges, the task force constitution as well as their equipping be such that rescue and relief operation remain effective. One task for which teams should be formed is to tackle the problem of collapse of buildings and rescue people, who get buried under the debris. Firefighting teams will have to be activated to rescue people from upper floors of the high rise buildings. Biggest problem in high rise buildings would be periodic charging of mobiles, arrangements for lighting as electricity supply is likely to get switched off once water level rises, provision of water sterilizing kits and first aid to those getting injured and sick. Cities are normally dotted with slums and invariably these are located at lower levels and adjacent to nallahs. Their problems are more in terms of necessity for shelters, provision of safe drinking water, pre cooked food initially and subsequently provision of fire and rations, medical support initially against injuries later water borne diseases. A well thought plan based on a detailed

reconnaissance and interaction with people and in conjunction with NGOs and volunteer group's rescue and relief teams should be planned.

35. A separate tailor made organization under DDMA for areas occupied by weaker sections of the society should be constituted. Contact numbers should be well publicized for affected people to contact for help. In this connection it is recommended that the network of police help line at tele number 100 could be of great assistance.

PART-IV: REHABILITATION, RECONSTRUCTION AND MITIGATION

36. Once water starts receding action needs to be initiated to bring back life to normalcy at the earliest. It will entail immediate rehabilitation of displaced persons, re-activating all utilities, facilitating people to move back from relief camps, re-constructing facilities which have been destroyed and finally initiating developmental works which reduce the probability of damage in future.

37. It entails: firstly assessment of the damage which floods have resulted into and generating funds to undertake tasks planned. Priority tasks will be rejuvenation of water supply, electricity supply and sewage disposal. Road repair will be next in priority and finally embankment development, rainwater harvesting, afforestation, roads on embankments with adequate arrangements for storm water not to get stagnated, waste management to avoid contamination of water bodies as well as its utilization for energy generation, strengthening a technology based early warning system, construction of silos and storage space to store the harvested crop immediately after harvesting, empowerment of panchayats /local bodies/civil society in terms of creating self help groups and awareness generation will be required to be undertaken as long term mitigation strategy. In this connection it is of importance that the 'Calamity needs to be taken as an Opportunity' to prepare the society to undertake future challenges.

38. Damage assessment is a highly specialized task and some of the important areas are as follows:-

(a) Damage to underground water reservoirs to be undertaken as an emergency measure so that potable water shortage is not allowed to happen. Also all water lines are checked for any damage. These are flushed and fresh water is released through them.

(b) Assessment of damage to electrical installation with a view to start the supply at the earliest, it will entail assessment of damage to lines, transformers, water motors and

terminal equipment. A word of caution that energizing of power lines should be done with lot of care so that no accident takes place.

(c) The rain water brings with it lots of silt and damages good agricultural land, it will be a very major task to flush out silt from the fields. Important point in this case is that the task will have to be completed prior to commencement of Rabi sowing season's commencement.

(d) Areas which are not connected with centralized sewer system and where toilet systems are soak pit based which invariably will get choked and new pits will have to be created to make toilets functional.

(e) Standing crop may have got damaged substantially and also grains stored in open also may have got wet. These will have to be compensated.

(f) A number of buildings may have got either damaged or would have become unsafe, compensation will have to be provided to affected persons.

(g) In certain cases a number of houses may have got washed away and identified people will have to e compensated.

(h) Certain cattles may have got washed away and affected people will have to be compensated.

(i) In addition a number of civic amenities like communication network, medical facilities water works, sewage treatment plant, schools etc. may have got affected and required to be restored quickly.

39. The above list is only a representative list for the team earmarked to work out details in a time bound manner. There is also a need to transfer risk by going for insurance cover for critical assets during preparatory period.

40. During rehabilitation phase, aim is to help people to get back to their routine quickly and as such planning has to be perfect and well practiced so that in shortest possible time the life is brought back to normal.

41. Reconstruction should be part of the well planned mitigation strategy. This plan should be based on following principles:-

(a) Plan has to be comprehensive and independent of the need to address the immediate damage. In this connection it is important that most of the rivers passing through the State; either originate in neighboring state/country of Uttarakhand / MadhayaPradesh / Nepal or flow into Bihar/Madhya Pradesh. Therefore all plans should be drawn in close coordination with neighboring states/Nepal.

(b) Major developmental works should be part of it, keeping in view environmental factors in mind and ensuring that the embankments are planned in such a way that the water is channelized and at no stage it is allowed to stop because that will cause bigger damage. Rain water harvesting should be part of all building complexes so that rain water is collected and is used during lean period. It should be done through building laws. Roads are built in such a way that they do not wither away post monsoon, meaning thereby that roads in high rain intensity areas like Terai should be planned as concrete roads because bitumen is porous to water. Communication network is engineered more and more on microwave based system because even during monsoon it remains effective. Uttar Pradesh has good scope for harnessing of solar energy and building laws be amended to ensure that every house hold to have PV based electrical system with a good storage system so that even a small window of open sky helps affected people to get direct power as well as stored power during cloudy phase. Buildings be planned to suit environmental condition. Most importantly sewage disposal and waste management be planned to ensure no stagnation of sewage takes place (more Sewage Treatment Plants be planned). Finally plantation will help ensuring lesser and lesser of silt and recharging of aquifer.

(c) Special emphasis should be given to continuous improvement in Early Warning System leveraging technology.

(d) Floods result into a large number of medical problems; ranging from injuries; water borne diseases and trauma. In the districts which are likely to be affected more and more numbers of Trauma Centers need to be planned.

(e) Gridding the entire state depending on peculiar characteristics of the weather and environment and making plans for executing Mitigation Strategy accordingly.

(f) Calamity should be taken as an opportunity. Development and improvement is a continuous process and therefore devastation due to floods be used to have a *de novo* look at reconstruction works/mitigation plans and attempts through developmental works be made so that all experienced/anticipated loop holes are plugged.

PART-V: ROLES AND RESPONSIBILITIES

Irrigation Department

(a) Prevention

(i) Launch awareness programs to educate communities about the consequences of floods and also survival measures in emergency.

(ii) Identify flood prone areas. Survey of river embankments and dams for any cracks and leakage. Urgent action needs to be initiated towards strengthening of structurally weak spots well before the start of monsoon season.

(iii) Identification and maintenance of materials/tool kits required for emergency response to quickly address cracking or breaching of embankments.

(iv) Stock-piling of sand and cement bags and other necessary items for breach closure.

(v) Repair of embankment and overhauling of Barrage Gates.

(vi) Protection of river erosion at critical location.

(vii) Establishment and staffing of District Flood Control Room at District HQ or any other suitable location.

(viii) Flood risk zonation mapping in conjunction with Department of Science and Technology (Remote Sensing Application Centre).

(ix) Development of checklists and contingency plans.

(b) <u>Response</u>

(i) Monitoring and protection of irrigation infrastructures.

(ii) Monitoring flood situation and dissemination of flood warning.

(iii) Inspection of bunds of dams, irrigation channels, bridges, culverts, control gates and overflow channels in the immediate aftermath of flood.

(iv) Inspection and repair of pumps, generator, motor equipments, station buildings.

(v) Assessment of situation and mobilization of resources at disposal.

(vi) Post disaster audit of all infrastructure; such as embankments, dams, irrigation facilities etc..

(vii) Prevention of river erosion at critical location.

(viii) Dredging of water bodies and shallow river stretches due to excessive sedimentation.

(c) Recovery

(i) Strengthening of infrastructure and restoration of human resources. The concept of "build back better" be ensured.

(ii) Sharing of experience, creation of knowledge bank and lessons learnt.

(iii) Audit of losses of irrigation facilities.

42. Health Department

(a) Prevention

(i) Accurate and realistic assessment of medical infrastructure and capabilities at Village, Block, District and State level including private medical and health infrastructure.

(ii) Identification and location of possible camp sites and ensure hygiene facilities are adequate.

(iii) Availability of adequate medicines and drugs for commonly occurring ailments during and post floods.

(iv) Formation of adequate number of mobile units with trained personnel, testing facilities, communication systems and emergency treatment facilities.

(v) Training of communities, field personnel, Traditional Birth Attendants, community leaders, volunteers and NGOs in basic medical first aid procedures, handling of snake bite kits and administering emergency drugs; such as morphine.

(vi) Training members of Village Disaster Management Committees and NGOs of the villages.

(vii) Promoting and strengthening Primary Health Centres and dovetailing into overall plans of medical and health care.

(viii) Ensure adequate number of ambulances is available for shifting of patients. Listing of available ambulances with civil be maintained for requisition or hiring in emergency.

(b) Response

(i) Ensure early medical attention to all patients and transfer of those needing immediate evacuation.

(ii) Constant monitoring of situation for outbreak of epidemic.

(iii) Hygiene and sanitation standards in camp location.

(iv) Establishment of public information centers with appropriate and modern means of communication to assist in providing information to patients, their families, other people living in epidemic affected areas regarding vaccination, Do's and Don'ts, treatment facilities, etc.

(v) Monitoring of water and food quality and disposal of waste in transit and relief camps.

(vi) Stock piling of life-saving drugs, de-toxicants, anesthesia, halogen tablets in vulnerable areas.

(vii) Regular situation report is given to Flood Control Room.

(viii) Immunization against infectious diseases.

(ix) Disinfections of water bodies and drinking water sources.

(x) Establishment of emergency make shift operation room with adequate staff and equipment.

(xi) Establishment of staging areas, in case of large distance from flood area to rear hospitals with basic medical comforts.

(xii) Plan air evacuation of patients, if required air ambulance can also be built in overall plans for emergency evacuation. Earmark suitable area for helipads.

(xiii) Plans for smooth induction and operationalization of resources and specialist from State and Centre sources.

(xiv) Quarantine population, if required.

(c) Recovery

(i) Continuous disease surveillance and monitoring.

(ii) Continuation of treatment, monitoring and other epidemic control activities till the situation is brought under control and the epidemic eradicated.

(iii) Establish procedures and methods of coordination with the Health Department, other local authorities/departments, NGOs to ensure that adequate prevention and preparedness measures have been taken to prevent and/or minimize the probable outbreak of epidemics.

(iv) Undertake study/research in long term plans to progressively reduce various factors that contribute to high level of vulnerability to diseases of population affected by disasters.

(v) Trauma counseling.

(vi) Treatment and socio-medical rehabilitation of injured or disabled persons.

43. Public Works Department

(a) Prevention

(i) Repair and construction of roads to ensure accessibility to the flood areas.

(ii) Availability of essential commodities for establishment of transit camps wherever required.

(iii) Keep a list of earth moving and clearing vehicles/equipments (available with Government Departments including the nearby project site of National Highway Authority, PSUs, and private contractors, etc.) and formulate a plan to mobilize those at the earliest.

(iv) Urgent repair of bridges and public utilities.

(b) Response

(i) Clearing of roads and establish connectivity. Restore roads, bridges and where necessary make alternate arrangements to open the roads to traffic at the earliest.

(ii) Mobilization of community assistance for clearing blocked roads.

(iii) Facilitate movement of heavy vehicles carrying equipments and materials.

(iv) Development of checklists and contingency plans.

(v) Construction of helipads at suitable locations.

(vi) Assist health department in creation of field operation rooms and staging areas for evacuation of patients.

(vii) Identification and notification of alternative routes to strategic locations.

(c) Recovery

(i) Restoration of public utilities at the earliest.

(ii) Reconstruct the damaged roads and public utilities on the concept of "build back better" which can withstand future disasters.

(iii) Strengthening and restoration of infrastructure with an objective to eliminate the factor(s) which caused the damage.

(iv) Review and documentation.

(v) Sharing of experiences and lessons learnt.

44. Food and Civil Supplies Department

(a) Prevention

(i) Identification, earmarking and maintenance of suitable locations for godowns/warehouses for stock piling of food and necessary supplies.

(ii) Details of each of the warehouse connected to the base warehouse and its distance from the base warehouse including the capacity of each. Similarly, detailed database of all the public distribution shops connected to each of the warehouses including the distance of each needs to be maintained. As this information can be utilized for safely stockpiling the food grains received from various sources in the immediate aftermath of a disaster.

(iii) Take appropriate preservative measures to ensure that food and other relief stocks are not damaged during storage, especially precautions against moisture, rodents and fungus infestation.

(iv) Anticipate rough requirement of food items and supplies and ensure unhindered procurement of same.

(b) Response

(i) Movement of supplies and other commodities in coordination with the transport department and railways.

(ii) Management of inventory.

(iii) Constant monitoring of stock level of food items and other commodities and ensure adequate safety stock is always maintained.

(iv) There is likelihood of some common deficiency of essential vitamins and body minerals due to deprivation. Need for constant coordination with the health department and procurement and stocking of those items.

(c) Recovery

(i) Maintain a data bank for future references.

(ii) Ensure daily needs of community till normal restoration.

45. Transport Department

(a) Prevention

(i) Ensure availability of transport for various departments; such as Public Works, Irrigation, Health and Food and Supplies etc.

(ii) Listing of availability of transport with sources other than Government for requisition or hiring whenever required.

(iii) Listing of vehicles which can be used for emergency operation especially for carrying the rescue teams and relief supplies.

(b) Response

(i) Requisition of transport for various requirements of departments.

(ii) Act as nodal department for all transport requirements.

(iii) Coordination with railways for transporting essential commodities including food requirement.

(c) Recovery

(i) Update and maintain a data bank for all future requirements.

46. Energy/Non-Conventional Energy Department

(a) Prevention

(i) Ensure and educate the minimum safety standards to be adopted for electrical installation and equipments and organize training of personnel accordingly.

(ii) Develop and administer regulations to ensure safety of electrical accessories and electrical installations.

(iii) Develop and administer code of practice for power line clearance to avoid electrocution due to broken/fallen wires.

(iv) Strengthen high-tension cable towers to withstand the impact of flooding, modernize electric installation, and strengthen electric distribution system to ensure minimum damages during floods.

(v) Conduct public/industry awareness campaigns to prevent electric accidents during normal times and during and after a natural disaster.

(b) Response

(i) Ensure electric supply to the flood affected areas is discontinued till situation improves to avoid any loss of life due to electrocution.

(ii) Restoration of electric supply at the earliest taking due safety precautions. Have a contingency plan for electric supply, essentially for emergency requirements till restoration of normal electric supply.

(iii) Attend sites of electrical accidents due to flooding and assist in undertaking damage assessment.

(iv) Ensure standby arrangements of generators for contingency plans for electric supply.

(v) Inspection and repair of high tension lines substations/transformers/poles etc. which have got damaged with the impact of floods.

(c) Recovery

(i) Replace/restore of damaged poles/salvaging of conductors and insulators with long term sustenance.

47. Information and Public Relations Department

(a) Prevention

(i) Creation of public awareness regarding various types of disasters including flood through media propagation.

(ii) Dissemination of information to public and others concerned regarding do's and don'ts during and after floods.

(b) Response

(i) Ensure no rumour mongering or public speculation by unscrupulous elements by launching extensive media programs.

(ii) Setting up of a control room to provide authentic information to public regarding impending emergencies.

(iii) Keep the public informed about the latest of the emergency situation (area affected, lives lost, etc.)

(iv) Keep the public informed about various post disaster assistances and recovery programs.

48. Panchayati Raj

(a) Prevention

(i) Training of representatives on various aspects of flood disaster management.

(ii) Public awareness on various aspects of Disaster Management through training programs to be organized at the Gram Panchayat level on pre, during and post floods, do's and don'ts to be followed strictly.

(iii) Organize regular mock drills in conjunction with district administration including evacuation drill of communities to safer places.

(iv) Strengthen the capabilities at village and block level; such as better communication, storage facilities, search and rescue equipments etc..

(v) Regular maintenance and cleaning of drainage system.

(vi) Ensure alternative routes/means of communication for movement of relief materials and personnel to marooned areas or areas likely to be marooned.

(vii) Assist the Government in their plans of prevention and mitigation by active community participation.

(b) <u>Response</u>

(i) Encourage and support Gram Panchayat members for timely and appropriate delivery of warning to the community of any floods.

(ii) Clearance of blocked drains and roads, including tree removal in the villages.

(iii) Construct alternative temporary roads to restore communication to the villages.

(iv) Identify the school buildings, community centres and operationalize them into emergency relief centres and emergency shelters.

(v) Participate in post impact assessment of flood situation.

(vi) Provide support in search, rescue and first aid activities.

(c) <u>Recovery</u>

(i) Provision of personal support services e.g. regular counseling.

(ii) Undertake rehabilitation programs with the assistance from Government.

(iii) Repair/restoration of infrastructure e.g. roads, bridges, public amenities.

(iv) Assist in commencement of schools, hospitals and economic activities at the earliest.

(v) Supporting the Gram Panchayats in development of storage houses for food stocks.

(vi) Coordination for distribution of relief and rehabilitation materials.

(vii) The Panchayat Samity and Gram Panchayat members to be trained to act as an effective interface between the community, NGOs, and other developmental organizations.

(viii) Provide training so that the elected representatives can act as key functionaries for reconstruction and recovery activities.

49. Forest Department

(a) Prevention

(i) Encourage and support plantation activities involving communities. Promote nurseries by providing seedlings. Educate communities about the absorbing power of trees especially flash floods.

(ii) Increasing involvement of the community and NGOs in plantation.

(b) Response

(i) Provide building materials such as bamboos etc. for construction of temporary shelters.

(c) Recovery

(i) Plant additional trees to make up for the loss of trees during the floods.

50. Civil Defence Department

(a) Prevention

(i) Organize training programs on first aid, search, rescue and evacuation for its personnel to improve their skills.

(ii) Preparation and implementation of first aid, search and rescue service plans for major floods.

(iii) Remain fit and prepared through regular drills and exercises at all times.

(iv) Organize training programs on search, rescue and evacuation for the members of the wards and Village Disaster Management Committees and NGOs of the areas.

(b) Response

(i) Act as support agency for provision of first aid, search and rescue services to other emergency service agencies and the public.

(ii) Act as support agency for movement of relief.

(iii) Triage of casualties and provision of first aid and treatment.

(iv) Work in coordination with medical assistance team.

(v) Help the Police for traffic management and law and order.

(c) Recovery

(i) Constant participation in various Disaster Management programs and liaison with other agencies.

(ii) Strengthen and remain abreast with latest drills and procedures.

51. Jal Sansthan/Nagar Nigam/Municipality/Gram Panchayat

(a) Prevention

(i) Plan to provide safe drinking water to all habitats.

(ii) Prior arrangement of water tankers and other means of distribution and storage of water.

(iii) Prior arrangement of stand by generators.

(iv) Adequate prior arrangements to provide water and halogen tablets.

(v) Raising of tube-well platforms, improvement in sanitation structures and other infrastructural measures to ensure least damages during future disasters.

(vi) Clearance of drains and sewerage systems, particularly in the urban areas.

(b) Response

(i) Disinfections and continuous monitoring of water bodies.

(ii) Contingency plans for water distribution.

(iii) Ensuring provision of water to hospitals and other vital installations.

(iv) Provision to acquire tankers and establish other temporary means of distributing water on an emergency basis.

(v) Arrangement and distribution of emergency tool kits required to dismantle and assemble tube wells, etc.

(vi) Carry out emergency repairs of damaged water supply systems.

(c) Recovery

(i) Strengthening of infrastructure.

(ii) Review and documentation.

(iii) Sharing of experiences and lessons learnt.

(iv) Training to staff.

(v) Development of checklists and contingency plans.

52. Police

(a) Prevention

(i) Training and preparedness for rescue, evacuation and emergency operation including operation of motor boats.

(ii) Regular mock drill and practice.

(iii) Procurement and deployment of modern equipment while modernizing the existing equipment and infrastructure for emergency response.

(iv) Regular cross training with other departments including Para Military Forces and Army.

(v) Constant liaison with District Administration and District Flood Control Room.

(vi) Ensure communication equipments including wireless sets are operational.

(vii) Conduct training on rescue, evacuation and emergency drills for ward members, Village Disaster Management Committee and volunteers.

(b) Response

(i) Conduct rescue operations for people marooned in conjunction with other agencies.

(ii) Evacuation of affected communities to safer areas.

(iii) Ensure safety of camp location and staging areas.

(iv) Ensure law and order situation always remains under control.

(v) Guard against looting by unscrupulous elements.

(vi) Ensure efficient traffic management including safe and speedy movement of ambulance and relief material.

53. Animal Husbandry

(a) Prevention

(i) Listing and record of animal population in affected or likely to be affected areas.

(ii) Stocking of medicines and necessary vaccination for animals at safer areas.

(iii) Stocking of fodder for animals at safer areas.

(iv) Listing of suitable vehicles from all sources for evacuation of injured and sick animals.

(v) Promotion of animal insurance.

(vi) Construction of mounds for animal camps.

(vii) Establishment of field veterinary hospitals with necessary infrastructure for animal health care and treatment including surgery.

(viii) Training of community and volunteer organizations for disposal of animal Caracas.

(ix) Arrangements for standby generators for veterinary hospitals.

(b) Response

(i) Ensure injured animals are evacuated to safer areas on priority.

(ii) Eradication and control of animal diseases, treatment of injured animals.

(iii) Operationalization of veterinary hospitals including mobilization of staff.

(iv) Protection of abandoned and lost cattle.

(v) Supply of medicines and fodder to affected areas.

(vi) Disposal of carcasses ensuring proper sanitation to avoid outbreak of epidemics.

(vii) Community participation for carcass disposal.

(c) Recovery

(i) Assessment of animal losses of local communities.

(ii) Facilitate rehabilitation of affected population by assisting in provision of soft loans, buying animals with insurance coverage, providing stable and disaster proof shelter/housing and necessary means of sustenance.

(iii) Establishing of animal disease surveillance system.

54. Science and Technology

(a) Flood risk zonation mapping in conjunction with irrigation department.
(b) Identification of safer places through GIS technology.
(c) Assessment of flood plains in all river basins.
(d) Frequency analysis of floods occurrence based on past year experiences through Remote Sensing Data.
(e) Creation of flood risk zones & flood plain maps at district level.
(f) Galvanize the scientific community towards disaster risk reduction.
(g) In conjunction with IMD, forecast extreme climate and weather conditions.

55. Relief Commissioner

(a) Nomination of Nodal and Flood Coordination Officer.
(b) Nomination of Nodal Officer for mitigation of interstate flood problems, if any.
(c) Creation of Coordination Committee from different department.
(d) Act as chief coordinator of the State and link between State, Districts and State Disaster Management Authority.
(e) Establishment and operationalization of State Emergency Operation Centre or Control Room.
(f) Coordinate with district/departments for mitigation and preparedness, quick relief and rescue, reconstruction and rehabilitation efforts.
(g) Exercise financial powers as Secretary to the Government of India related to Disaster Management including disbursement of financial relief to the affected communities.
(h) Periodically review and coordinate the activities of relief operations, if considered necessary, in the interest of relief operation.

(i) Sanction detailed schemes, approved in principle, within the relief budget and SDRF & NDRF norms.

(j) Constant review of existing capabilities of relief operations and take measures to upgrade the same wherever needed.

(k) Supervise and provide funds for the rescue and relief operations.

(l) Undertake long-term measures by coordinating the activities of different departments in order to minimize the impact of natural calamities and human causalities.

(m) Steer the mitigation activities towards development and growth of communities.

(n) Monitor hunger and starvation and initiate action to eradicate the same, in any part of the State due to food scarcity on account of flood disaster.

56. Revenue Department

(a) Carry out the administration relating to land and land revenue and allied subject.

(b) Conduct survey of land and prepare, maintain, update and preserve the land records in the aftermath of floods.

(c) Control and maintain State Calamity Relief Fund.

(d) Grant financial assistance and relief to affected and displaced individuals in conjunction with Relief Commissioner and on recommendation of district administration.

57. State Executive Committee The State Executive Committee, being the highest executive body would undertake the implementation of State Plan and act as coordinating and monitoring body for management of floods in the affected district of State. The body shall also monitor the plans prepared by departments of Government of State and district administration. Remains in constant liaison with National Executive Committee and keep all State and district authorities informed of latest national policies.

PART-6: MISCELLANEOUS

58. There are some other aspects which are needed to be addressed to make Flood Relief Operations more effective. This part of the paper will address some of those issues.

59. Capacity Building:- The scope of capacity building entails following:-

(a) Cadre committed for planning.

(b) Manpower meant to contribute during Rescue and Relief operations.

(c) Skill development of those who work on ground/those who help the workers on ground to be more effective.

(d) Identification, acquisition and absorption of technology.

(e) Awareness generation among the people and also the stakeholders.

60. Methodology which needs to be adopted to build capacity should have following elements:-

(a) Conduct of courses for all strata of professionals in conjunction with NIDM/UPAAM/ Fire Safety Department.

(b) Reconnaissance of all 40 flood affected districts (17 sensitive, 23 extra sensitive) by a designated officer not less than inspector rank of NDRF/SDRF. Each officer should get in touch with their respective district administration and along with district authorities, visit the areas which get inundated regularly during floods to obtain first hand information of relief and rescue plans, distribution of food, medicine and water to marooned villages and relief camps.

(c) Use of Kaushal Vikas Yojna to prepare skilled workers.

(d) Development of Early warning in conjunction with IMD.

(e) Training in first aid of police/self help groups in first aid medical techniques.

(f) Use of NGOs in the domain of capacity building for conduct of short term refresher courses on various aspects of rescue/relief operations, media handling, technology awareness generation, damage assessment, logistics management and other financial management.

61. Stores Management:- Timely availability of stores would play an important part in rescue and relief operations. However the ground reality in case of floods will be that many a times certain areas would be inaccessible due to inundation. It is therefore essential that stores/critical equipment/spares are prepositioned based on a ground reconnaissance and teams earmarked to handle them. These teams be pre-designated and, through rehearsals, should be made well versed in handling them. The content of these bricks should be such that they can be used for immediate rescue/relief The stores can be a tailor made brick; consisting of boats without board motors, earthmoving equipment, water pumps, water purification kits, power banks for mobile chargers, field expedients to make small bridges, emergency rations, bottled water and medicines. The serviceability and of these items should be checked from time to time by those who are going to be their ultimate users.

62. Organization:-Success of these operations will substantially depend on a organization which is unitary in accountability with delegated responsibility. SDMA is a designated authority

and it should be at the apex. On declaration of commencement of Flood Relief Operations all agencies/departments connected with relief and rescue operations should come under the control of SDMA. Once Relief phase is over and the rehabilitation/reconstruction/mitigation phase commences the authority of control should revert back to administration. For preparatory Phase as well as rehabilitation/reconstruction/mitigation phase, SDMA should however remain in the consultancy role.

Emergency Operation Centre

63. **Functions & Responsibilities** Emergency Operation Center for flood situation will be established at UP SDMA. The roles and responsibilities will be as under.

- Set up the control room EOC at UP SDMA with communication linkages with NDMA, IMD, CWC , irrigation department of U.P., district head quarter/DDMA.
- The communication network will also include linkages with the following.
  (a) Army-Headquarter, Central Command, Lucknow
  (b) Indian Air Force – Headquarter Central Air Command , Prayagraj
  (c) 11th Battalion N.D.R.F., Varanasi
  (d) ADGP – PAC / S.D.R.F.
  (e) Other organization / Institutes including NGO's working for flood relief and rescue operation.
- Obtain the data input regarding rainfall, water levels at strategic location along each river basins and all other activities concerning flood relief and rescue from concerned organization/authority and institution.
- Monitor real time input regarding forecasting of rainfall and increasing water level from IMD / CWC.
- Dissemination of the above data to the concerned District Headquarter/DDMA's to ensure timely preparedness for relief and rescue operation from respective districts.
- Obtain data for rise in water levels both in vertical and horizontal planes.
- Coordinate relief and rescue operation with District Headquarter/DDMA and Army, Air force, S.D.R.F. and volunteer organizations.
- Compilation of situation report obtained from flood affected districts.

CONCLUSION

64. Flood Relief operations are meant not only to ameliorate the sufferings of the affected people but are highly important to ensure the continued growth of the Pradesh. The scope of these

operations is so wide that almost the entire state machinery needs to work together in a coordinated manner to ensure its success in conjunction with neighboring states, Nepal and the Central Government, NGOs, cultural organizations and self Help Groups. To achieve coordination between various stakeholders and inter agency cooperation is so challenging due to sheer size and scope of the work a lot of rehearsals and preparations are needed and therefore it is essential that all concerned put their best foot forward to achieve success in these operations.