F. No.1-30/2018-PP

To
Chief Secretary
Government of States/UTs
(As per list attached)

Subject: Pre-Monsoon Preparedness for expected Floods and Urban Flooding conditions—Dissemination of Do’s and Don’ts.

Madam/Sir,

In view of the ensuing monsoon season all the flood prone States/UTs are expected to be better prepared to deal with any unexpected situation arising out of the floods. All concerned State/UT Governments, stakeholders and community should start preparing to deal with such situations before the onset of Monsoon.

2. It is also observed that during rainy season urban flooding also takes the form of a disaster. Preparedness and mitigation measures are needed before the urban flooding as well, in pre-monsoon time in order to avoid any unwarranted situation. NDMA had earlier circulated advisories to all States/UTs vide D.O. No. 1-177/2015-PP dated 24th May, 2016 and a copy of roadmap on urban flooding vide D.O. No. 1-177/2015-PP dated 6th July, 2017, which may also be referred to, for dealing with urban flooding. However, a copy of the same is enclosed herewith for your ready reference.

3. A set of comprehensive Do’s and Don’ts relating to floods and urban flooding is being sent herewith for wider dissemination and awareness generation, which can be used to ensure better and timely preparedness against floods and urban floods in forthcoming monsoon season.

4. You may also like to take other measures for preparedness on floods and urban floods and may like to share the same with NDMA, which may also be shared with other flood prone States / UTs.

Encl: as above

Yours faithfully,

Deputy Secretary (Policy & Plan)
(Alice Kujur)

P.S. uploaded in Collectors’ website.

DM 26/5/18

16/5/18

11/6/2018

Policy Plan@ndma.gov.in
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Shri Ashwani Kumar  
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Govt. of Puducherry  
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Floods: Do's and Don'ts

What to do before a flood

To prepare for a flood, you should:

- Avoid building in flood prone areas unless you elevate and reinforce your home.
- Elevate the furnace, water heater, and electric panel if susceptible to flooding.
- Install "Check Valves" in sewer traps to prevent floodwater from backing up into the drains of your home.
- Contact community officials to find out if they are planning to construct barriers (levees, beams and floodwalls) to stop floodwater from entering the homes in your area.
- Seal the walls in your basement with waterproofing compounds to avoid seepage.

If a flood is likely to hit your area, you should:

- Listen to the radio or television for information.
- Be aware that flash flooding can occur. If there is any possibility of a flash flood, move immediately to higher ground. Do not wait for instructions to move.
- Be aware of streams, drainage channels, canyons, and other areas known to flood suddenly. Flash floods can occur in these areas with or without such typical warnings as rain clouds or heavy rain.

If you must prepare to evacuate, you should:

- Secure your home. If you have time, bring in outdoor furniture. Move essential items to an upper floor.
- Turn off utilities at the main switches or valves if instructed to do so. Disconnect electrical appliances. Do not touch electrical equipment if you are wet or standing in water.

If you have to leave your home, remember these evacuation tips:

- Do not walk through moving water. Six inches of moving water can make you fall. If you have to walk in water, walk where the water is not moving. Use a stick to check the firmness of the ground in front of you.
- Do not drive into flooded areas. If floodwaters rise around your car, abandon the car and move to higher ground if you can do so safely. You and the vehicle can be quickly swept away.
Floods: Pointers

A) Before Floods

ignore rumours, Stay calm, Don't panic

Stay available - Keep your mobile phones charged for emergency communication; use SMS

Be alert - Listen to radio, watch TV, read newspapers for weather updates

Don't ignore animals - Keep cattle/animals untied to ensure their safety

Survival is key - Prepare an emergency kit with essential items for safety and survival

Save your valuables - Keep your documents and valuables in water-proof bags

B) During Floods

Don't take risk - Don't enter flood waters. In case you need to, wear suitable footwear

Watch your step - Stay away from sewerage lines, gutters, drains, culverts, etc.

Don't get electrocuted - Stay away from electric poles and fallen power lines to avoid electrocution

Remain healthy - Eat freshly cooked or dry food. Keep your food covered

Evade Illness - Drink boiled/chlorinated water

Ensure cleanliness - Use disinfectants to keep your surroundings clean

C) After Floods

Protect children - Do not allow children to play in or near flood waters

- Don't use any damaged electrical goods, get them checked

Watch your step - Watch out for broken electric poles and wires, sharp objects and debris

See what you eat - Do not eat food that has been in flood waters

Mosquitoes can kill - Use mosquito nets to prevent malaria

Use clean water - Don't use the toilet or tap water if the water lines/sewage pipes are damaged
D) If you need to evacuate

- Raise furniture, appliances on beds and tables
- Put sandbags in the toilet bowl and cover all drain holes to prevent sewage back flow
- Turn off power and gas connection
- Move to a higher ground/ safe shelter
- Take the emergency kit, first aid box and valuables with you
- Do not enter deep, unknown waters; use a stick to check water depth
- Come back home only when officials ask you to do so
### Floods

<table>
<thead>
<tr>
<th>BEFORE FLOODS</th>
<th>DURING FLOODS</th>
<th>AFTER FLOODS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ignore rumours and stay calm. Avoid panic situations.</td>
<td>Avoid entering flood waters. If you need to enter, then wear suitable footwear.</td>
<td>Do not try to leave the safe shelter to go back home until the local officials declare normalcy.</td>
</tr>
<tr>
<td>Keep your mobile phones charged and ON.</td>
<td>Stay away from sewerage line, gutters, drains, culverts, etc.</td>
<td>Do not allow children to play in or near flood waters.</td>
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<td>Know the route to the nearest safe shelters.</td>
<td>Stay away from electric poles and fallen power lines to avoid electrocution.</td>
<td>Don’t use any damaged electric goods, get it checked by an electrician before using it.</td>
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<tr>
<td>Listen to radio or watch television for the latest weather bulletins and flood warnings.</td>
<td>Do not let children remain empty stomach.</td>
<td>Watch out for broken electric poles, damaged bridges, broken glass, sharp objects and debris.</td>
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<tr>
<td>Staying in touch with local officials is advisable. Follow instructions when asked to evacuate.</td>
<td>Use bleaching powder and lime to disinfect the surroundings.</td>
<td>Volunteer to help people who may need assistance.</td>
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<tr>
<td>Keep strong ropes, a lantern, battery operated torches and extra batteries ready.</td>
<td>Eat freshly cooked or dry food. Always keep your food covered.</td>
<td>For any relief work, call the emergency control room numbers provided below.</td>
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<tr>
<td>Keep the First Aid kit ready with extra medication for snake bite and diarrhoea. Keep your blood group information handy</td>
<td>Drink boiled/chlorinated water.</td>
<td>Don’t use the toilet or tap water if the water lines or sewage pipes are damaged.</td>
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<td>Keep umbrellas and bamboo sticks with you for protection from snakes.</td>
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<td>Do not eat food that has been in flood waters.</td>
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<td>Keep cattle untied to ensure their safety.</td>
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<td>Use mosquito nets to prevent malaria.</td>
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<td>Keep a stock of fresh water, dry food, candles, matchbox, kerosene, etc. handy.</td>
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<td>If you need to evacuate:</td>
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<tr>
<td>Pack clothing, essential medication, valuables, personal papers, etc. in water proof bags to be taken to the safe shelter.</td>
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<td>Instructions</td>
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<td>-----------------------------------------------------------------------------</td>
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<td>back flow.</td>
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<td>Turn off power and gas connection before leaving the house.</td>
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<tr>
<td>Move to a higher ground where people and animals can take shelter.</td>
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<tr>
<td>Do not enter deep, unknown waters.</td>
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</tbody>
</table>
Urban Flooding: Do's and Don’ts

Before floods

1. Do not litter waste, plastic bags, plastic bottles in drains
2. Try to be at home if high tide and heavy rains occur simultaneously
3. Listen to weather forecast at All India Radio, Doordarshan. Also, messages by Municipal bodies from time to time and act accordingly.
4. Evacuate low lying areas and shift to safer places.
5. Make sure that each person has lantern, torch, some edibles, drinking water, dry clothes and necessary documents while evacuating or shifting.
6. Make sure that each family member has identity card.
7. Put all valuables at a higher place in the house.

In the Flood Situation

1. Obey orders by government and shift to a safer place.
2. Be at safe place and they try to collect correct information.
3. Switch of electrical supply and don’t touch open wires.
4. Don’t get carried away by rumors and don not spread rumors.

DO's

1. Switch off electrical and gas appliances, and turn off services off at the mains.
2. Carry your emergency kit and let your friends and family know where you are going.
3. Avoid contact with flood water it may be contaminated with sewage, oil, chemicals or other substances.
4. If you have to walk in standing water, use a pole or stick to ensure that you do not step into deep water, open manholes or ditches.
5. Stay away from power lines electrical current can travel through water, Report power lines that are down to the power company.
6. Look before you step—after a flood, the ground and floors are covered with debris, which may include broken bottles, sharp objects, nails etc. Floors and stairs covered with mud and debris can be slippery.
7. Listen to the radio or television for updates and information.
8. If the ceiling is wet shut off electricity. Place a bucket underneath the spot and poke a small hole into the ceiling to relieve the pressure.

9. Use buckets, clean towels and mops to remove as much of the water from the afflicted rooms as possible.

10. Place sheets of aluminium foil between furniture wet carpet.

Don't's

1. Don't walk through flowing water - currents can be deceptive, and shallow, fast moving water can knock you off your feet.

2. Don't swim through fast flowing water - you may get swept away or struck by an object in the water.

3. Don't drive through a flooded area - You may not be able to see abrupt drop-offs and only half a meter of flood water can carry a car away. Driving through flood water can also cause additional damage to nearby property.

4. Don't eat any food that has come into contact with flood water.

5. Don't reconnect your power supply until a qualified engineer has checked it. Be alert for gas leaks - do not smoke or use candles, lanterns, or open flames.

6. Don't scrub or brush mud and other deposits from materials. This may cause further damage.

7. Never turn on ceiling fixtures if ceiling is wet. Stay away from ceilings those are sagging.

8. Never use TVs, VCRS, CRT terminals or other electrical equipment while standing on wet floors, especially concrete.

9. Don't attempt to remove standing water using your vacuum cleaner.

10. Don't remove standing water in a basement too fast. If the pressure is relieved too quickly it may put undue stress on the walls.
Urban Flooding: Pointers

A) Before Floods

- **Keep drains clean** - Do not litter waste, plastic bags, plastic bottles in drains
- **Remain safe inside** - Try to be at home if high tide and heavy rains occur simultaneously
- **Be informed/be alert** - Listen to radio, watch TV or read newspapers for weather updates and flood warnings
- **Survival is key** - Prepare an emergency kit with essential items for safety and survival
  - Keep your documents and valuables in water-proof bags

B) During Floods

**Do's**

- **Ensure safety** - Turn off power and gas connection; be alert for gas leaks
- **Respond quickly** - Evacuate low lying areas and move to safer places
- **Evade illness** - Drink boiled/chlorinated water
- **Watch your step** - Stay away from sewerage lines, gutters, sharp objects and debris
- **Don't get electrocuted** - Stay away from electric poles and fallen power lines to avoid electrocution

**Don'ts**

- Don't walk/swim through flowing water
- Don't drive through flooded areas
- Don't eat food that has come into contact with flood water
- Don't use any damaged electrical goods
- Don't use electrical equipment while standing on wet floors, especially concrete
Annexure

National Disaster Management Authority
Government of India, New Delhi-29

Advisories for immediate attention on Urban Flood Preparedness & Mitigation

1. Establishment of Urban Flood /Flood Management Cell in each city with technically qualified person as Nodal Officer;
2. Each city should put in place Standard Operating Procedure (SOP) for urban flood management and mitigation taking into consideration the city scenario i.e. i) coastal city; ii) cities on major rivers; iii) cities near dams/reservoirs; iv) inland cities; and v) cities in hilly areas. A city may have one or more of the above traits;
3. Conduct stakeholder workshops before monsoon for capacity building and improved coordination amongst them for managing urban flooding;
4. Public information and education: Each city needs to prepare and have a list of Resident Welfare Authorities or other community groups in every ward or neighborhood and subsequently involve them to cover the city.
5. Efficient cleaning & desilting of drains and holding ponds to be completed well in advance much before the onset of the monsoon season.
6. Mapping and listing of the ownership and condition of water bodies in each city. Subsequently, develop a monitoring framework anchored with the ULB;
7. Installation of portable pumps at appropriate flooding locations within the city;
8. In addition to getting rainfall nowcasts and forecasts from IMD; at all cities having airports, the nodal officer should review information regarding thunderstorms (TS) and heavy rainfall (RA) from METARS which are updated every 30 minutes. When TS/RAs are observed, the information should be communicated to the Municipal Commissioner to enable him to issue timely alerts and take preventive measures, for example closing schools if heavy rainfall and flooding is anticipated;
9. Formation of high level expert committee for each city with adequate authority to take decision on site for release of water from reservoir. During heavy rainfall this committee will have the final authority to issue gate opening and flood water releases from dams/reservoirs after duly reviewing the outflow forecasts;
10. Identification of land parcels best suited for land filling debris from emergencies;

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# Roadmap for Mitigation of Urban Flood: Short Term, Medium Term and Long Term Measures

<table>
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<tr>
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<th><strong>SHORT TERM</strong></th>
<th><strong>MEDIUM TERM</strong></th>
<th><strong>LONG TERM</strong></th>
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</table>
| **DRAINAGE**   | 1. Regular cleaning of the drains is a must for providing the flow paths for flow of water for short, medium and long term strategy  
2. In addition, efficient de-silting of drains and holding ponds should be completed well in advance before the onset of the monsoon season - 31 March (as mentioned in the NDMA Urban Flooding Guidelines);  
3. A SOP for cleaning drains and desilting holding ponds should be in place for regular cleaning of drains. | 1. Formulate a Drainage Master Plan (DMP) based on reliable and accurate data for hydraulic design of drains and other drainage related infrastructure;  
2. Topographical surveys should be carried out to clearly identify the natural drainage paths. If any unauthorized development/encroachment is found in the natural drainage path, it should be removed in cases where diversion of drain is not possible.  
3. The hierarchy of drainage network needs to be created by classifying drains into:  
   a. Major drains which consist of  
      (i) natural drains following the natural gradient, and  
      (ii) drains along the major arterial roads;  
   b. Minor drains consisting of  
      (i) drains along the sub-arterial/collector/service roads, and drains within the residential colonies/industrial/institutional areas;  
4. To ensure regular cleaning of the drains, install self-cleaning screens at appropriate locations to enable efficient cleaning of drains.  
5. Establish city specific guidelines for constructing new drainage systems using the hydrologic catchment as the unit of planning. This will ensure that the drainage is consistent with one another as well as with existing facilities; | 1. The long term mitigation measure should be the implementation of the Drainage Master Plan which was formulated as a medium term measure;  
The city master plan should take into consideration the drainage master plan providing adequate provision for drainage and water bodies. |
orage 4. In addition to receiving rainfall nowcasts and forecasts from IMD; short term METARS issued by IMD must be shared with the City Disaster Control Room/Emergency Operation Centre (EOC)/ City Municipal Commissioner/Relief Commissioner.

5. In case of cities with airports, the nodal officer should review information regarding thunderstorms (TS) and heavy rainfall (HR) from METARS which are updated every 30 minutes by the IMD. When TS/HRs are observed, the information should be communicated to the Municipal/Relief Commissioner to enable issue of timely alerts and take preventive measures, for example closing schools/offices if heavy rainfall and flooding is anticipated;

6. Identify pilots to facilitate severe weather alerts and establish direct link between pilots and EOC/mass media such as FM stations to issue severe weather/thunderstorm alerts. Continue to communicate IMD/ Aviation severe weather alerts to city authorities and public through FM radio and other mass media.

2. Each city should develop its own permanent network of Automatic Weather Station (AWS) - (1 for every 4 sq km) for effective monitoring of rainfall and issuing of heavy rainfall warnings. These should be used in conjunction with satellite map animations, IMD warnings and flood forecasting software for each city to issue warnings. It should address sudden thunderstorm flooding (20 mm/hr to 120 mm/hr), rapid moving weather disturbances, heavy rains due to various factors etc;

<table>
<thead>
<tr>
<th>WARNING</th>
<th>URBAN WATER BODIES</th>
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<td>4. In addition to receiving rainfall nowcasts and forecasts from IMD; short term METARS issued by IMD must be shared with the City Disaster Control Room/Emergency Operation Centre (EOC)/ City Municipal Commissioner/Relief Commissioner.</td>
<td>6. Map and list the ownership and condition of water bodies in each city. Subsequently, develop a monitoring framework anchored with the Urban Local Body (ULB);</td>
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<td>5. In case of cities with airports, the nodal officer should review information regarding thunderstorms (TS) and heavy rainfall (HR) from METARS which are updated every 30 minutes by the IMD. When TS/HRs are observed, the information should be communicated to the Municipal/Relief Commissioner to enable issue of timely alerts and take preventive measures, for example closing schools/offices if heavy rainfall and flooding is anticipated;</td>
<td>7. Provide adequate capacity in existing lakes and ponds for holding the floodwaters - bathymetric survey of the lakes and ponds should be conducted in order to assess the water holding capacity of the reservoir;</td>
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<td>6. Identify pilots to facilitate severe weather alerts and establish direct link between pilots and EOC/mass media such as FM stations to issue severe weather/thunderstorm alerts. Continue to communicate IMD/ Aviation severe weather alerts to city authorities and public through FM radio and other mass media.</td>
<td>8. Restore interconnection between lakes and water bodies which have been disrupted due to urbanisation in many cities;</td>
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<td>2. Each city should develop its own permanent network of Automatic Weather Station (AWS) - (1 for every 4 sq km) for effective monitoring of rainfall and issuing of heavy rainfall warnings. These should be used in conjunction with satellite map animations, IMD warnings and flood forecasting software for each city to issue warnings. It should address sudden thunderstorm flooding (20 mm/hr to 120 mm/hr), rapid moving weather disturbances, heavy rains due to various factors etc;</td>
<td>3. In the long-term, all natural drains/water bodies should be well demarcated by building flood wall to prevent encroachments and overflow of floodwaters;</td>
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<tr>
<td>URBAN PLANNING</td>
<td>RESPONSE</td>
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<td>7. Identify land parcels best suited for safe debris disposal;</td>
<td>8. Establishment of Urban Flood/Flood Management cell in each city with technically qualified person as Nodal Officers. State Urban Development Departments may be authorized to coordinate across administrative boundaries;</td>
</tr>
<tr>
<td>10. Extensive/reliable topographic field surveys should be carried out to ascertain the catchment areas, natural drainage patterns, and natural ground slopes.</td>
<td>9. Each city should put in place Standard Operating Procedure (SOP) for urban flood management and mitigation taking into consideration the city scenario i.e.</td>
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<tr>
<td>11. Start work on Integrated Master Plan for the city to provide a holistic view of the entire urban drainage system irrespective of their different political jurisdictions; Each city should start work on its own Drainage Master Plan (DMP) • To facilitate proper draining of rainwater • To prevent flooding/ water logging in developed/developing areas DMP should be integrated with the City Development Plan (CDP)/Master Plan; For developing Drainage Master Plan, while carrying out survey of drains/channels throughout the stretches, interaction with local population should be done to gain insight.</td>
<td>i. Coastal city; ii. Cities on major rivers</td>
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</table>

6. Implementation of the City master plan which should be based on the city drainage master plan
<table>
<thead>
<tr>
<th></th>
<th>CAPACITY BUILDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>iii. Cities near dams/reservoirs</td>
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<tr>
<td>iv. Inland cities;</td>
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<tr>
<td>v. Cities in hilly areas.</td>
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<tr>
<td>A city may have one or more of the above traits;</td>
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<td>10. Install portable pumps at appropriate flooding locations within the city to meet emergent situation;</td>
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<td>11. Formation of high level expert committee for each city with adequate authority to take decision on site for release of water from reservoir. During heavy rainfall this committee will have the final authority to issue gate opening and flood water releases from dams/reservoirs after duly reviewing the inflow forecasts;</td>
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<td>12. Conduct stakeholder workshop before monsoon for capacity building and improved coordination amongst them for managing urban flooding;</td>
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<td>13. Public information and education; Each city needs to prepare and have a list of Resident Welfare Authorities or other community groups in every ward or neighbourhood and subsequently involve them to cover the city;</td>
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