Subject: Heavy to very heavy rainfall spell likely over Uttarakhand, Himachal Pradesh, Northern parts of Uttar Pradesh & Bihar and over Sub-Himalayan West Bengal-Sikkim & Northeast India during next 3-4 days and decrease thereafter.

Weather observed during past 24 hours ending at 0830 hours IST of today (Annexure I):

Significant Weather features:
❖ A cyclonic circulation lies over central Madhya Pradesh & neighbourhood in middle tropospheric levels.
❖ Monsoon Trough lies to the north of its normal position. It is likely to remain north of its normal position during next 7 days.
❖ The Western Disturbance as a trough in middle tropospheric westerlies runs roughly along Long. 60°E to the north of Lat. 30°N.

Weather Forecast and Warnings: (Annexure II)

Northwest India: Light/moderate fairly widespread to widespread rainfall/thunderstorm & lightning with isolated heavy rainfall likely over Himachal Pradesh during 22nd-25th; over Uttarakhand and Uttar Pradesh during 22nd-25th and over northern Punjab & Haryana-Chandigarh on 22nd August, 2023. Isolated very heavy rainfall also likely over north Uttar Pradesh, Himachal Pradesh & Uttarakhand during 22nd-24th August, 2023.

Isolated extremely heavy rainfall also likely over Uttarakhand on 23rd & 24th August, 2023.

Central India: Light/moderate fairly widespread to widespread rainfall with isolated thunderstorm & lightning very likely over the region during next 3 days.

East India: Light/moderate fairly widespread to widespread rainfall/thunderstorm & lightning with isolated heavy rainfall activity very likely over Sub-Himalayan West Bengal & Sikkim during next 5 days; Gangetic West Bengal during 23rd-25th; Odisha during 22nd-25th & Jharkhand during 23rd -24th and over Bihar during 22nd- 26th August, 2023. Isolated very heavy rainfall also likely over Sub-Himalayan West Bengal & Sikkim on 24th & 25th; over Bihar during 22nd & 25th August.

Isolated extremely heavy rainfall also likely over Sub-Himalayan West Bengal-Sikkim on 22nd &

Northeast India: Light/moderate fairly widespread to widespread rainfall/thunderstorm & lightning with isolated heavy rainfall activity very likely over the region during next 5 days.

Isolated very heavy rainfall also likely over Assam & Meghalaya and Arunachal Pradesh during 22nd-26th August, 2023.

South India: Light/moderate scattered to fairly widespread rainfall/thunderstorm & lightning with isolated heavy rainfall activity very likely over north Tamil Nadu on 22nd August, 2023.

No significant weather over rest parts of the country during next 5 days.

For more details kindly refer:

https://mausam.imd.gov.in/responsive/all_india_forcast_bulletin.php
Annexure I

Rainfall observations: (from 0830 hours IST of yesterday to 0830 hours IST of today, the 22nd August, 2023):

- **Heavy to very heavy rainfall** at isolated places over Jharkhand, Jammu-Kashmir-Ladakh-Gilgit-Baltistan-Muzaffarabad, Uttar Pradesh, Bihar, East Madhya Pradesh, Assam & Meghalaya and **heavy rainfall** at isolated places over Himachal Pradesh, Punjab, Uttarakhand, East Rajasthan, Odisha, Coastal Andhra Pradesh & Yanam, Arunachal Pradesh, Nagaland, Manipur, Mizoram & Tripura.

- **Significant rainfall recorded (in cm):**
  - **Jharkhand:** Majhgaon - 20, Noamundi-19, Kumardungi-17, Tantnagar-12, Hatgamharia-10;
  - **Jammu-Kashmir-Ladakh:** Katra (dist Reasi) 17, Reasi Kvk Aws (dist Reasi) 14, Reasi Arg (dist Reasi) 14, Kathua (dist Kathua) 12, Kathua_kvk (dist Kathua) 11, Kawa Aws (dist Udhampur) 3;
  - **East Uttar Pradesh:** Gaighat (Bla Fmo) (dist Ballia) 17, Katerniaghat (dist Bahraich) 13, Birdghat (dist Gorakhpur) 7, Sardenagar (dist Kheri) 7, Bansgaon (dist Gorakhpur) 5;
  - **Bihar:** Patahi (dist East Champaran) 15, Forbesganj (dist Araria) 14, Saraiya (dist Muzaffarpur) 13, Jalalgarh (dist Purnea) 11, Amour (dist Purnea) 10, Banmankhi (dist Purnea) 9, Madhipura (dist Madhepura) 9, Singheshwar (dist Madhepura) 7, Chakia (dist East Champaran) 7, Kumarkhand (dist Madhepura) 7, Chatia (dist East Champaran) 6;
  - **Assam & Meghalaya:** Chauldhowaghat (dist Lakhimpur) 15, Sivasagar (dist Sibsagar) 10, Rangananti Nt Xing (dist Lakhimpur) 9, N.lakhimpur/lilabari (dist Lakhimpur) 9, Neamatighat (dist Jorhat) 8, B P Ghat (dist Karimganj) 8, Tamulpur (dist Baks) 8, Barpeta/sarbhog_aws (dist Barpeta) 8, Jorhat (dist Jorhat) 7, Dhemaji (dist Dhemaji) 7, Jorhat Aws (dist Jorhat) 7, Hazuah (dist Barpeta) 7;
  - **West Uttar Pradesh:** Baheri (dist Bareilly) 12, Saharanpur (dist Saharanpur) 9, Gunnaur (dist Sambhal) 8, Narora (dist Bulandshahr) 8, Sambhal (dist Sambhal) 6;
  - **East Madhya Pradesh:** Shahpura (dist Dindori) 12, Hatta (dist Damoh) 7, Mehadvani (dist Dindori) 7;
  - **Himachal Pradesh:** Sujanpur Tira (dist Hamirpur) 10, Nagrota Surian (dist Kangra) 8, Guler (dist Kangra) 6;
  - **Punjab:** Malikpur (dist Pathankot) 10, Pathankot Arg (dist Pathankot) 8, Madhopur (dist Pathankot) 6;
  - **Uttarakhand:** Rishikesh 9, Dehradun,Kashipur and Jollygrant 8 each , Kotdwara 7 , Jaspr, Khatima,
  - Narendranagar and Laksar 6 each;
  - **East Rajasthan:** Mandal Sr (dist Bilwara) 9, Arai Sr (dist Ajmer) 7;
  - **Odisha:** Kashinagar (dist Gajapati) 9, Kantapada (dist Cuttack) 8, Alipingal (dist Jagatsinghpur) 8, Nawapara (dist Nawapara) 7, Astaranga (dist Puri) 6;
  - **Coastal Andhra Pradesh & Yanam:** Salur (dist Parvathipuram Manyam) 9, Jiyyamma Valasa (dist Parvathipuram Manyam) 7;
  - **Arunachal Pradesh:** Basar (dist West Siang) 7, Itanagar (dist Papumpara) 7, Roing (dist Lower Dibang Valley) 6;
  - **Nagaland, Manipur, Mizoram & Tripura:** Lengpui (dist Aizawl) 7, Mamit Agri (dist Mamit) 6;
Impact & Action Suggested due to very heavy/Extremely heavy rainfall over:

1. Uttarakhand, Himachal Pradesh, East Uttar Pradesh and Sub-Himalayan West Bengal & Sikkim during 22\textsuperscript{nd} - 24\textsuperscript{th} August.
2. Bihar during 22\textsuperscript{nd} – 25\textsuperscript{th} August
3. West Uttar Pradesh on 22\textsuperscript{nd} August.
4. Arunachal Pradesh and Assam & Meghalaya during 22\textsuperscript{nd} – 26\textsuperscript{th} August.

A. Impact Expected

- Localized Flooding of roads, water logging in low lying areas and closure of underpasses mainly in urban areas of the above region.
- Occasional reduction in visibility due to heavy rainfall.
- Disruption of traffic in major cities due to water logging in roads leading to increased travel time.
- Minor damage to kutcha roads.
- Possibilities of damage to vulnerable structure.
- Localized Landslides/Mudslides in the hilly areas.
- Damage to horticulture and standing crops in some areas due to inundation.
- It may lead to riverine flooding in some river catchments (for riverine flooding please visit Web page of CWC).

B. Action Suggested

- Check for traffic congestion on your route before leaving for your destination.
- Follow any traffic advisories that are issued in this regard.
- Avoid going to areas that face the water logging problems often.
- Avoid staying in vulnerable structure.
Legends:

❖ **Heavy Rain:** 64.5 to 115.5 mm; **Very Heavy Rain:** 115.6 to 204.4 mm; **Extremely Heavy Rain:** >204.4 mm.

❖ **AWS:** Automatic Weather Station

❖ **Region wise classification of meteorological Sub-Divisions:**
  - **Northwest India:** Western Himalayan Region (Jammu-Kashmir-Ladakh-Gilgit-Baltistan-Muzaffarabad, Himachal Pradesh and Uttarakhand); Punjab, Haryana-Chandigarh-Delhi; West Uttar Pradesh, East Uttar Pradesh, West Rajasthan and East Rajasthan.
  - **Central India:** West Madhya Pradesh, East Madhya Pradesh, Vidarbha and Chhattisgarh.
  - **East India:** Bihar, Jharkhand, Sub-Himalaya West Bengal & Sikkim; Gangetic West Bengal, Odisha and Andaman & Nicobar Islands.
  - **Northeast India:** Arunachal Pradesh, Assam & Meghalaya and Nagaland, Manipur, Mizoram & Tripura.
  - **West India:** Gujarat Region, Saurashtra & Kutch, Konkan & Goa, Madhya Maharashtra and Marathwada.
  - **South India:** Coastal Andhra Pradesh & Yanam, Telangana, Rayalaseema, Coastal Karnataka, North Interior Karnataka, South Interior Karnataka, Kerala & Mahe, Tamil Nadu, Puducherry & Karaikal and Lakshadweep.

![Spatial Distribution Table]

<table>
<thead>
<tr>
<th>Subdivision Warning</th>
<th>Dust Storm</th>
<th>Subdivision color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy Rain</td>
<td>Strong Surface Winds</td>
<td>NO WARNING</td>
</tr>
<tr>
<td>Heavy Snow</td>
<td>Heat Wave</td>
<td>WATCH (BE UPDATED)</td>
</tr>
<tr>
<td>Thunderstorms &amp; Lightning</td>
<td>Cold wave</td>
<td>ALERT (BE PREPARED)</td>
</tr>
<tr>
<td>Hailstorm</td>
<td>Fog</td>
<td>WARNING (TAKE ACTION)</td>
</tr>
</tbody>
</table>

![Probabilistic Forecast Table]

<table>
<thead>
<tr>
<th>Terms</th>
<th>Probability of Occurrence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unlikely</td>
<td>&lt; 25</td>
</tr>
<tr>
<td>Likely</td>
<td>25 - 50</td>
</tr>
<tr>
<td>Very Likely</td>
<td>50 - 75</td>
</tr>
<tr>
<td>Most Likely</td>
<td>&gt; 75</td>
</tr>
</tbody>
</table>

![Flash Flood Risk Table]

- **High Risk (Take Action)**
- **Moderate Risk (Be Prepared)**
- **Low Risk (Be Updated)**