



Government of India
Ministry of Earth Sciences
India Meteorological Department



Press Release

Date: 16th June, 2024

Time of Issue: 1400 hours IST

Subject:

- i. **Heavy to very heavy rainfall with isolated extremely heavy falls very likely to continue over Sub-Himalayan West Bengal, Sikkim, Assam and Meghalaya during next 4-5 days.**
- ii. **Heat wave to severe heat wave conditions likely to continue over many parts of North India during next 3 days and gradually abate thereafter.**

Realised weather during past 24 hours till 0830 hours IST of today: (details in Annexure I)

- ❖ **Heat wave to severe heat wave conditions observed** in most parts over Punjab, Haryana-Chandigarh-Delhi, Uttar Pradesh, Jharkhand, western parts of Gangetic West Bengal, southwest Bihar; many parts of Himachal Pradesh, Uttarakhand, Chhattisgarh & Odisha and in some parts over north Rajasthan and East Madhya Pradesh. **Heat wave conditions** in isolated pockets of Jammu-Kashmir, West Madhya Pradesh & Vidarbha.
- ❖ **Warm night to severe warm night conditions** observed most parts of Haryana-Chandigarh-Delhi and **Warm night conditions** observed in some parts of Punjab; in isolated pockets of Madhya Pradesh.
- ❖ **Maximum temperatures** were in the range of 44-46°C over in most parts of Haryana-Delhi; many parts of Punjab, East Uttar Pradesh, north Madhya Pradesh & Jharkhand; in some parts of north Rajasthan, West Uttar Pradesh and in isolated pockets over north Odisha & Gangetic West Bengal. These are above normal by 4-8°C over these regions.
- ❖ **The highest maximum temperature of 46.3°C** was reported at Kanpur IAF (East Uttar Pradesh) over the country.
- ❖ **Heavy to very heavy rainfall with extremely heavy falls** occurred at isolated places over Assam & Meghalaya and Sub-Himalayan West Bengal & Sikkim; **Heavy to very heavy rainfall** at isolated places over Arunachal Pradesh; **heavy rainfall** at isolated places over Nagaland, Manipur, Mizoram & Tripura, Odisha, Bihar, West Madhya Pradesh and Coastal Andhra Pradesh & Yanam.
- ❖ **Gusty winds/squally winds** data reported over the country is attached in **Annexure II**.

Advance of Southwest Monsoon:

- ❖ The Northern Limit of Monsoon continues to pass through 20.5°N/60°E, 20.5°N/63°E, 20.5°N/70°E, Navsari, Jalgaon, Amravati, Chandrapur, Bijapur, Sukma, Malkangiri, Vizianagaram, 19.5°N/88°E, 21.5°N/89.5°E, 23°N/89.5°E and Islampur.
- ❖ Conditions are favourable for further advance of Southwest Monsoon into some more parts of Maharashtra, Chhattisgarh, Odisha, Coastal Andhra Pradesh & Northwest Bay of Bengal, some parts of Gangetic West Bengal, remaining parts of Sub Himalayan West Bengal and some parts of Bihar during next 4-5 days.

Weather Systems and Forecast & Warnings:

- ❖ A cyclonic circulation lies over northeast Assam and another cyclonic circulation lies over Sub-Himalayan West Bengal an east-west trough also runs from northwest Bihar to Meghalaya in lower tropospheric levels. Strong southwesterly/southerly winds are prevailing from Bay of Bengal to northeastern States in lower tropospheric levels. Under their influence:
 - Widespread light to moderate rainfall accompanied with **thunderstorm, lightning & gusty winds (30-40 kmph)** likely over Arunachal Pradesh, Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura and Sub-Himalayan West Bengal & Sikkim during next 5 days.

- Isolated **heavy to very heavy rainfall** very likely over Sub-Himalayan West Bengal & Sikkim, Assam & Meghalaya, Arunachal Pradesh, Nagaland, Manipur, Mizoram & Tripura during next 5 days with **isolated extremely heavy rainfall also likely over Assam & Meghalaya during 16th-20th; Arunachal Pradesh on 17th & 18th and Sub-Himalayan West Bengal & Sikkim during 16th-18th and isolated exceptionally heavy rainfall also likely over Assam & Meghalaya on 18th June, 2024.**
- Isolated to scattered light to moderate rainfall accompanied with **thunderstorm, lightning & gusty winds (30-40 kmph)** very likely over Gangetic West Bengal, Bihar, Jharkhand, Odisha during next 3 days and likely to increase thereafter.
- Isolated **heavy rainfall** very likely over Odisha on 20th June, 2024.
- ❖ A cyclonic circulation lies over northeast Arabian Sea adjoining Saurashtra and a trough runs from this cyclonic circulation to Eastcentral Arabian Sea off Maharashtra coast in lower & middle tropospheric levels. Under their influence:
 - Scattered to fairly widespread light to moderate rainfall accompanied with **thunderstorm, lightning** likely over Gujarat state, Konkan & Goa, Madhya Maharashtra & Marathwada during next 5 days.
 - Isolated **heavy rainfall** very likely over Konkan & Goa on 16th & 18th-20th; Madhya Maharashtra on 16th, 19th & 20th and Saurashtra & Kutch on 16th June, 2024.
 - Fairly widespread to widespread light to moderate rainfall accompanied with **thunderstorm, lightning & gusty winds (30-40 kmph)** likely over Karnataka, Kerala & Mahe, Lakshadweep; isolated to scattered light to moderate rainfall over Coastal Andhra Pradesh & Yanam, Rayalaseema, Telangana, Tamil Nadu, Puducherry & Karaikal during next 5 days.
 - Isolated **heavy rainfall** very likely over Kerala & Mahe on 17th & 18th; Telangana on 16th; Coastal Andhra Pradesh & Yanam on 18th and Coastal Karnataka on 20th June, 2024.
- ❖ A fresh Western Disturbance as a trough in mid-tropospheric westerlies runs roughly along long. 56°E to the north of Lat. 30°N. Under its influence; light to moderate isolated to scattered rainfall with **thunderstorm, lightning & gusty winds (30-40 kmph)** very likely over Jammu-Kashmir-Ladakh-Gilgit-Baltistan-Muzaffarabad, Himachal Pradesh, Uttarakhand, Punjab, Haryana-Chandigarh-Delhi, Uttar Pradesh and Rajasthan during 18th-20th June, 2024.
- ❖ Isolated to scattered light to moderate rainfall with **thunderstorm, lightning & gusty winds (40-60 kmph)** very likely over Madhya Pradesh, Vidarbha, Chhattisgarh during next 5 days.

Maximum temperature forecast for next 5 days:

- ❖ No significant change in maximum temperatures very likely over Northwest, Central & East India during next 3 days and fall by 2-3°C thereafter.
- ❖ No significant change in maximum temperatures very likely over rest parts of the country.

Heat Wave and Warm Night warning for next 5 days:

- ❖ **Heat wave to severe heat wave conditions** very likely in many/most parts of Uttar Pradesh during 16th-18th and Punjab, Haryana-Chandigarh-Delhi on 16th & 17th; in isolated/some parts of Bihar & Jharkhand on 16th & 17th and **decrease in intensity thereafter over above regions.**
- ❖ **Heat wave conditions** very likely in isolated to some pockets of Jammu Division, Himachal Pradesh, north Rajasthan during 16th-18th; Uttarakhand, Madhya Pradesh, Chhattisgarh & Gangetic West Bengal on 16th & 17th and Vidarbha on 16th June, 2024 and abate thereafter.
- ❖ **Warm night conditions** very likely in isolated pockets of Punjab, Haryana-Chandigarh, Uttar Pradesh & Madhya Pradesh on 16th & 17th; Delhi during 16th-18th and Vidarbha on 16th June, 2024.
- ❖ **Hot & Humid weather** very likely over Odisha during 17th-20th June, 2024.

For more details, kindly refer: https://mausam.imd.gov.in/responsive/all_india_forecast_bulletin.php

Realised Rainfall during past 24 hours till 0830 hours IST of today:

- ❖ Light to moderate rainfall accompanied with thunderstorm & lightning observed **at most places** over Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura, Sub-Himalayan West Bengal & Sikkim; **at many places** over Arunachal Pradesh, Gangetic West Bengal, Konkan & Goa, Coastal Karnataka, Lakshadweep; **at a few places** over Andaman & Nicobar Islands, Odisha, Vidarbha, Chhattisgarh, Coastal Andhra Pradesh & Yanam, Kerala & Mahe; **at isolated places** over Jharkhand, Bihar, Uttarakhand, Jammu-Kashmir-Ladakh-Gilgit-Baltistan-Muzaffarabad, East Rajasthan, Madhya Pradesh, Gujarat State, Madhya Maharashtra, Marathwada, Telangana, Tamil Nadu, Puducherry & Karaikal, Interior Karnataka.

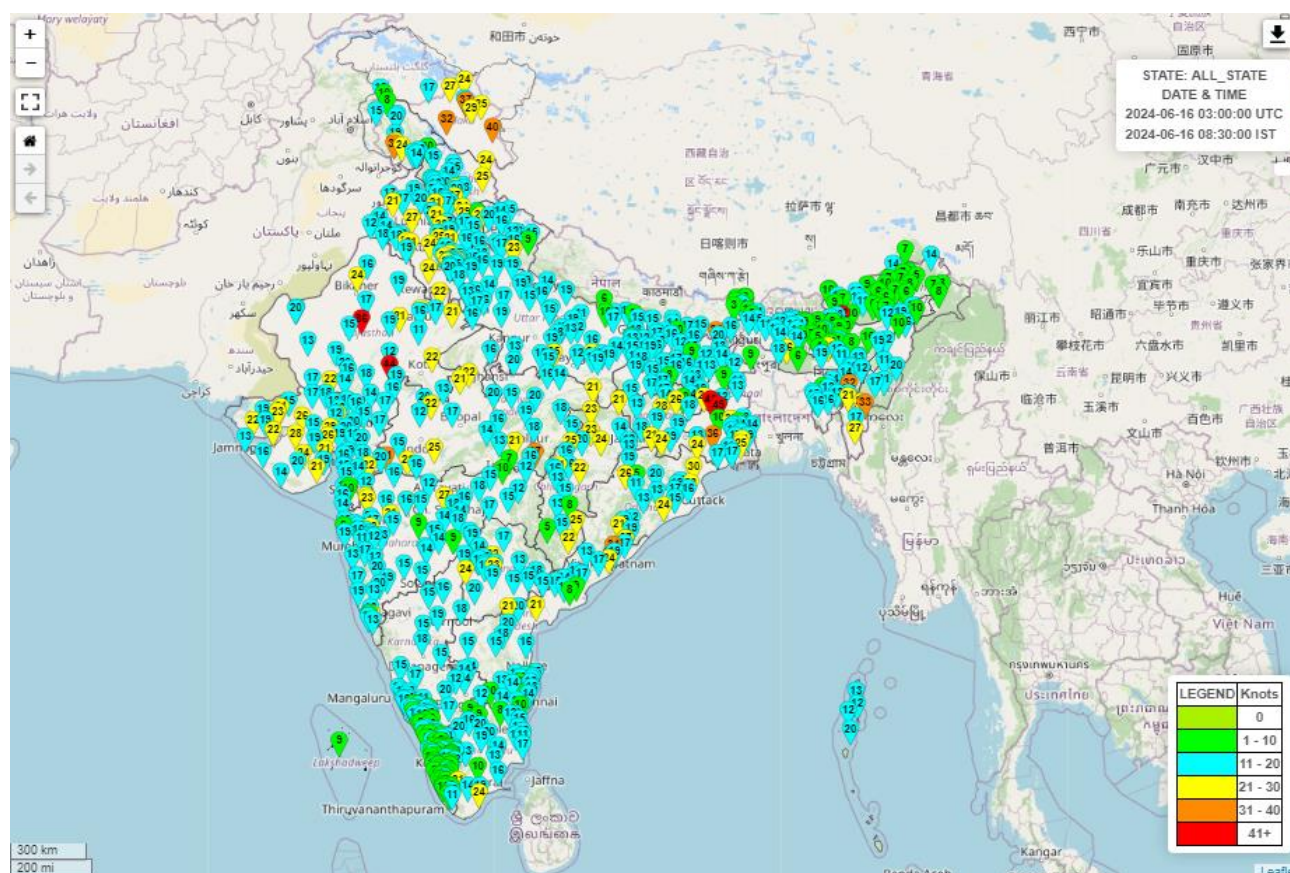
Significant amount of rainfall (in cm):

- ❖ **Assam & Meghalaya:** Barpeta (dist Barpeta) 30, Aie Nh Xing (dist Bongaigaon) 29, Beky Rly.bridge (dist Barpeta) 25, Manash Nh Xing (dist Barpeta) 24, Bahalpur (dist Dhubri) 23, Barpeta/sarbhog_aws (dist Barpeta) 23, Tihu Arg (dist Nalbari) 20, Tamulpur (dist Baksa) 20, Panbari (dist Chirang) 18, Srijangram Arg (dist Bongaigaon) 17, Mawkyrwat (dist South West Khasi Hills) 15, Williamnagar (dist East Garo Hills) 14, Mawkyrwat_arg (dist South West Khasi Hills) 13, Kokrajhar (dist Kokrajhar) 13, Fakiragram Arg (dist Kokrajhar) 13, Goibargaon (dist Baksa) 13, Gossaigaon (dist Kokrajhar) 13, Hazuah (dist Barpeta) 12, Drf (dist Baksa) 10;
- ❖ **Sub-Himalayan West Bengal & Sikkim:** Hasimara (dist Alipurduar) 25, Barobhisha (dist Alipurduar) 23, Alipurduar (pto) (dist Alipurduar) 23, Chepan (dist Alipurduar) 21, Bhutanghat (dist Alipurduar) 15, Chengmari/diana (dist Jalpaiguri) 14, Nagarkata (dist Jalpaiguri) 14, Amfu Pundibari (dist Cooch Behar) 13, Murti (dist Jalpaiguri) 12, Buxaduar (dist Alipurduar) 12, Sevoke (dist Darjeeling) 11, Falakata (dist Alipurduar) 11, Cooch Behar (dist Cooch Behar) 11, Gajoldoba (dist Jalpaiguri) 11, Kumargram (dist Alipurduar) 10, Neora (dist Jalpaiguri) 10, Champasari (dist Darjeeling) 10;
- ❖ **Arunachal Pradesh:** Koloriang (dist Kurung Kumey) 12, Nachu Arg (dist Upper Subansiri) 5;
- ❖ **Odisha:** Sambalpur 10, Bargarh & Sundargarh 7 each, Deogarh 6, Balasore & Sonepur 5 each;
- ❖ **Coastal Andhra Pradesh & Yanam:** Merakamudidam (dist Vizianagaram) 9, Vepada (dist Vizianagaram) 9, Srungavarapukota (dist Vizianagaram) 7, Cheepurupalle (dist Vizianagaram) 6, Garividi (dist Vizianagaram) 5;
- ❖ **Nagaland, Manipur, Mizoram & Tripura:** Kolasib Agri (dist Kolasib) 7, Kolasib_aws (dist Kolasib) 6, Saiha Agri (dist Saiha) 5, Mamit Agri (dist Mamit) 5, Lunglei (dist Lunglei) 5;
- ❖ **West Madhya Pradesh:** Pandhana (dist Khandwa) 7;
- ❖ **Bihar:** Thakurganj (dist Kishanganj) 7, Taibpur (dist Kishanganj) 5;
- ❖ **Saurashtra & Kutch:** Wadhvan (dist Surendranagar) 6, Porbandar (dist Porbandar) 6, Gariadhar (dist Bhavnagar) 5;
- ❖ **Konkan & Goa:** Devgad (dist Sindhudurg) 5, Mormugao - Pmo Imd (dist South Goa) 5.

Reported maximum wind speed (in kmph) during past 24 hours till 0830 hours IST of today:

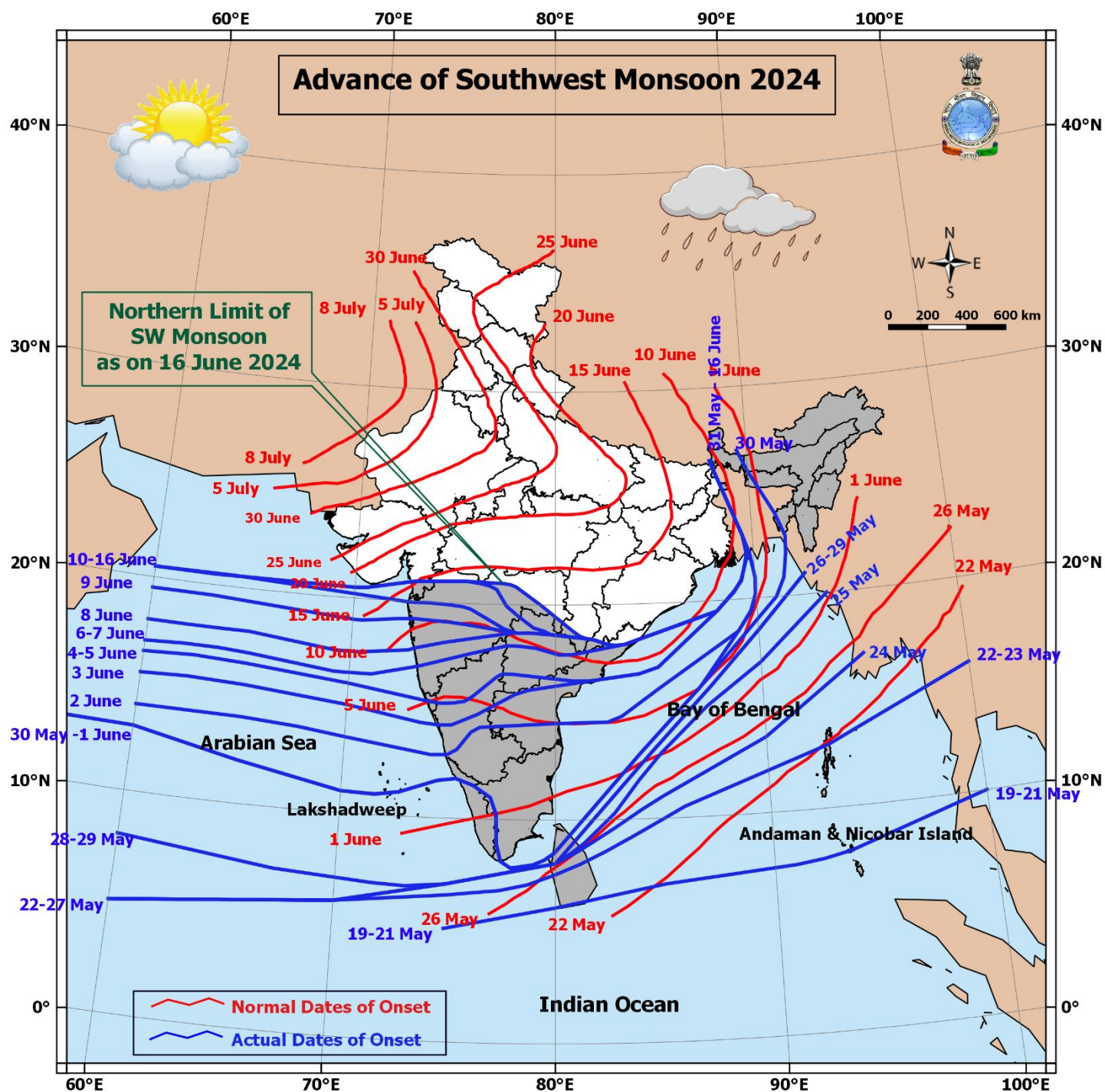
- ❖ **Tamil Nadu:** Thiruchendur-44;
- ❖ **Andhra Pradesh:** Gangavaram_port-44, Vizianagaram-63, Amadalavalasa-50;
- ❖ **Telangana:** Tandur-44, Daira-42;
- ❖ **Maharashtra:** Vilholi-42, Shahada-57, Washim-50, Gondia-53;
- ❖ **Chhattisgarh:** Jagdalpur-46, Mungeli-46, Janjgir-44, LAKHANPUR-42, Koriya-42;
- ❖ **Odisha:** Janhukuda-44, Sonepur-48, Ranital-55, Mayurbhanj-44;
- ❖ **Jharkhand:** KIRIBURU-44, Ranchi-51, Bokaro-48;
- ❖ **Gangetic West Bengal:** East Burdwan-83, Kzi_Airport-79, Asansol-44, Kharagpur-66, Tarakeswar-46, RaiDighi-46, Nimpith-44;
- ❖ **Bihar:** Araria-63;
- ❖ **Mizoram:** Champhai-61, Kolasib-59, Khawzawl-53, Chawnhu-50;
- ❖ **Madhya Pradesh:** Khandwa-46, Balaghat-68;
- ❖ **Gujarat:** Amreli-44, Targhadia-51, Kandla-42, Halwad-48, Dhorela-48, Arnej-53, Ahmedabad-48;
- ❖ **Rajasthan:** Bikaner-44;
- ❖ **Uttar Pradesh:** Ganivan-46, Bhadohi-44, Gautam_buddha_nagar-42;
- ❖ **Delhi:** Ujwa-48;
- ❖ **Haryana:** Kaul-42, Karnal-46, Pandu_pindara-44, Fatehabad-44, mahendragarh-44, Nuh-42;
- ❖ **Punjab:** Barnala-50;
- ❖ **Himachal Pradesh:** Nauni-50, Sirmour-44, Reckon-46, Tabo-44;
- ❖ **Jammu & Kashmir:** Samba-44, Chatha-59;

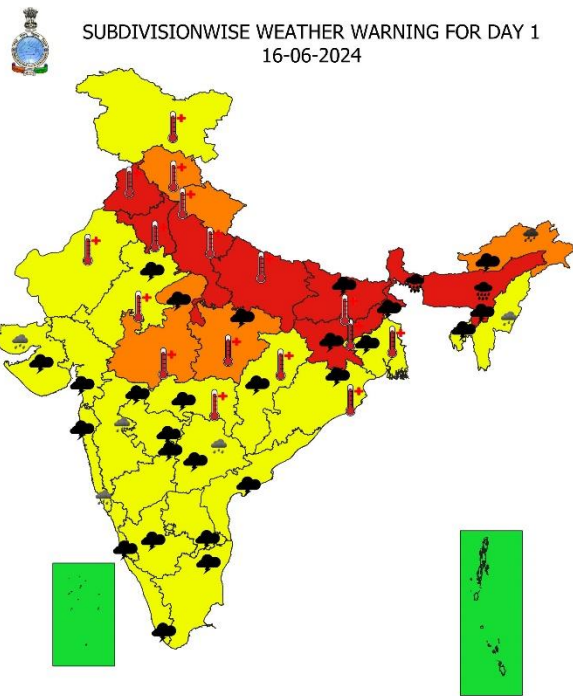
Fig.: Gusty winds reported over the country (in knots, 1 Knot = 1.85 kmph) from 0830 hrs IST of 15.06.2024 to 0830 hrs IST of 16.06.2024



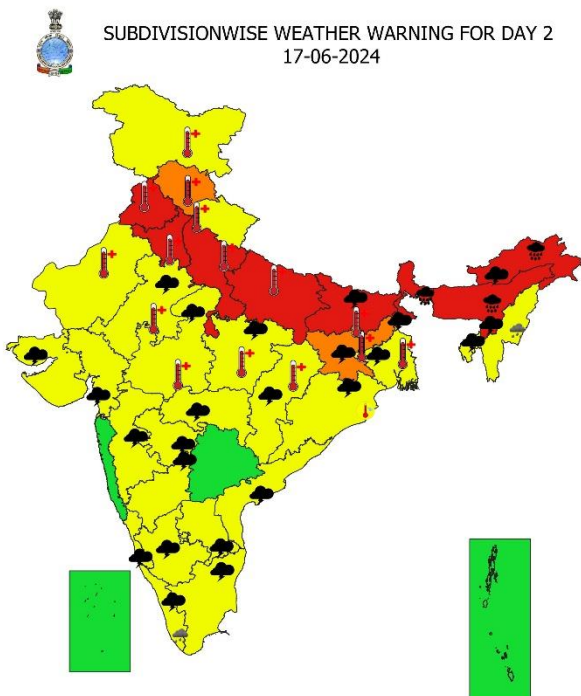
For more details, kindly refer: <http://aws.imd.gov.in:8091/>

Advance of Southwest Monsoon 2024

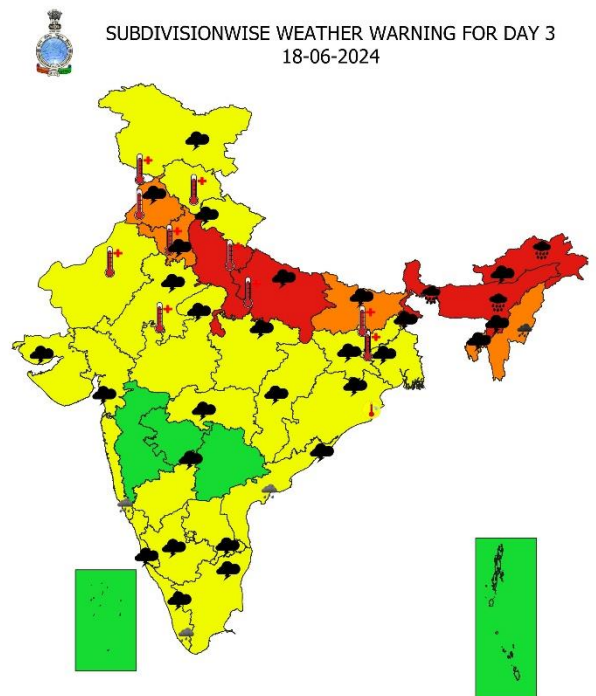




Subdivision Warning

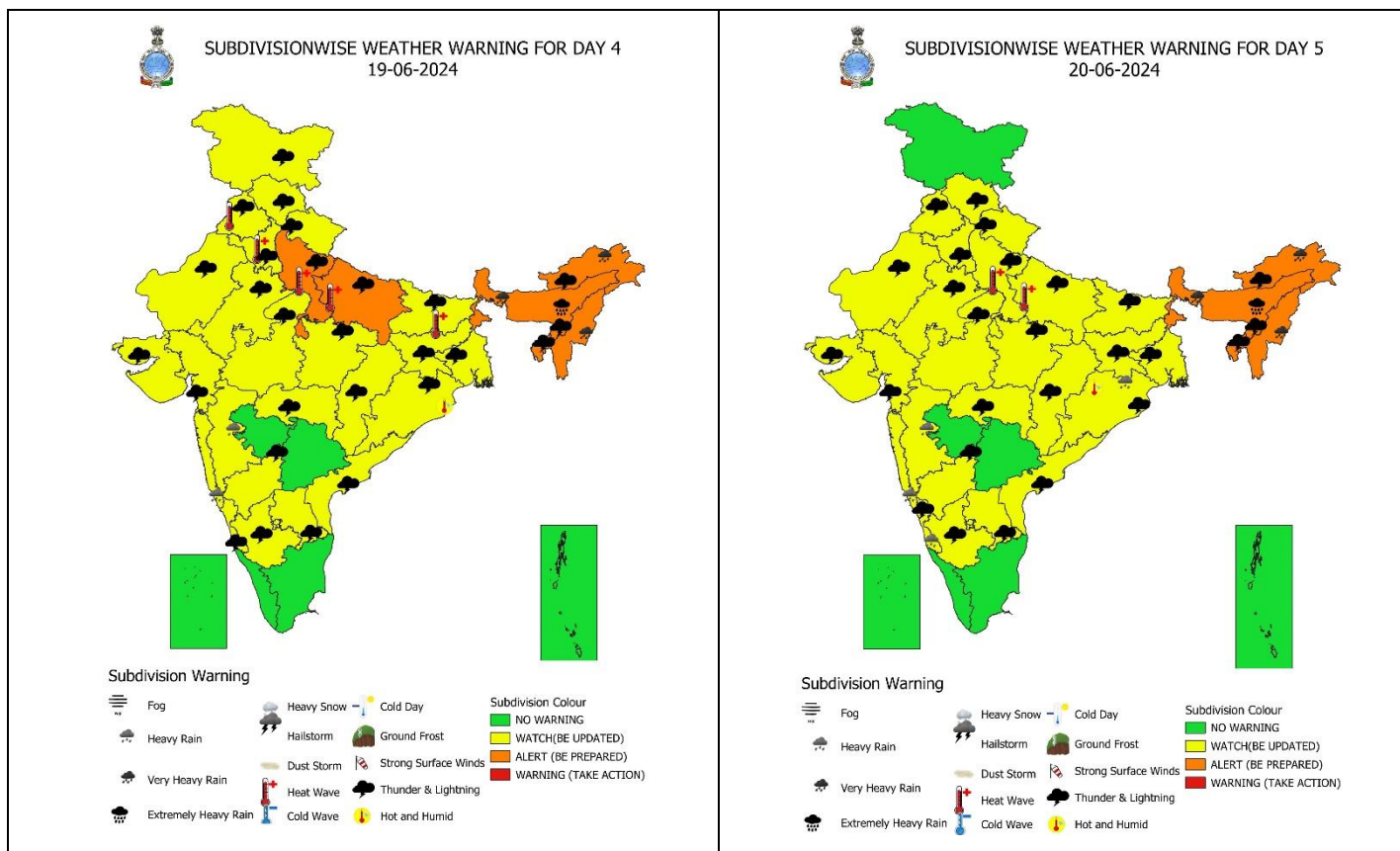


Subdivision Warning



Subdivision Warning





IMPACT & ACTION SUGGESTED due to Heat Wave Conditions:

Red alert Areas

- Very high likelihood of developing heat illness and heat stroke in all ages.
- Extreme care needed for vulnerable people.

Orange alert Areas:

- High temperature & increased likelihood of heat illness symptoms in people who are either exposed to sun for a prolonged period or doing heavy work.
- High health concern for vulnerable people e.g. infants, elderly, people with chronic diseases.
- Avoid heat exposure– keep cool. Avoid dehydration.
- Drink sufficient water- even if not thirsty.
- Use ORS, homemade drinks like lassi, torani (rice water), lemon water, buttermilk, etc. to keep yourself hydrated.

Yellow alert Areas:

- Moderate temperature & heat is tolerable for general public but moderate health concern likely for vulnerable people e.g. infants, elderly, people with chronic diseases.
- Avoid heat exposure.
- Wear lightweight, light colour, loose, cotton clothes.
- Cover your head, use a cloth, hat or umbrella.

IMPACT & ACTION SUGGESTED due to very heavy/extremely heavy rainfall over Sub-Himalayan West Bengal & Sikkim, Assam & Meghalaya, Arunachal Pradesh, Nagaland, Manipur, Mizoram & Tripura during next 5 days.

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/landslips/mudslips/landsinks/mudsinks.
- 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)

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.

Agromet advisories for Heavy Rainfall, Gusty winds and Heat Wave likely over various parts of the country:

- Make provision for draining out excess water from crop fields to avoid water stagnation in North Eastern States, Sub Himalayan West Bengal, Konkan, Madhya Maharashtra and Kerala.
- Postpone fresh planting of ginger, turmeric and sowing of pumpkin, bottle gourd, cucumber and bitter gourd in Meghalaya.
- Postpone nursery sowing of *Sali* rice and planting of papaya seedlings in Assam.
- Postpone land preparation, nursery preparation and transplanting of WRC rice in Arunachal Pradesh.
- Postpone sowing of Soybean in Sub Himalayan West Bengal.
- Apply light and frequent irrigation to standing crops to avoid heat stress; provide mulching to conserve soil moisture and minimise evaporation in Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Punjab, Haryana, Uttar Pradesh, Rajasthan, Madhya Pradesh, Vidarbha, Chhattisgarh, Gangetic West Bengal, Odisha, Bihar and Jharkhand.
- Provide mechanical support to horticultural crops & staking to vegetables.

Legends & abbreviations:

- ❖ **Heavy Rain:**64.5-115.5mm; **Very Heavy Rain:**115.6-204.4mm; **Extremely Heavy Rain:** >204.4mm.
- ❖ **Obsy:** Observatory; **AWS:** Automatic Weather Station; **dist:** District; **NH:** National Highway; **KVK:** Krishi Vigyan Kendra; **DVC:** Damodar Valley Corporation; **PTO:** Part Time Office.
- ❖ **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-Himalayan 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 Marathawada.
 - **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 (% of Stations reporting)			
% Stations	Category	% Stations	Category
76-100	Widespread (WS/ Most Places)	26-50	Scattered (SCT/ A Few Places)
51-75	Fairly Widespread (FWS/ Many Places)	1-25	Isolated (ISOL)



Probabilistic Forecast	
Terms	Probability of Occurrence (%)
Unlikely	< 25
Likely	25 - 50
Very Likely	50 - 75
Most Likely	> 75

LEGENDS

WARNING

WARNING (TAKE ACTION)
ALERT (BE PREPARED)
WATCH (BE UPDATED)
NO WARNING (NO ACTION)

Probabilistic Forecast

Terms	Probability of Occurrence (%)
Unlikely	< 25
Likely	25 - 50
Very Likely	50 - 75
Most Likely	> 75



Rain/ Snow *

Heavy: 64.5 to 115.5 mm/cm *
 Very Heavy: 115.6 to 204.4 mm/cm*
 Extremely Heavy: > 204.4 mm/cm *



Heat Wave

When maximum temperature of a station reaches $\geq 40^{\circ}\text{C}$ for plains and $\geq 30^{\circ}\text{C}$ for hilly regions
(a) Based on Departure from normal

Heat Wave: Maximum Temperature Departure from normal 4.5°C to 6.4°C .

Severe Heat Wave: Maximum Temperature Departure from normal $\geq 6.5^{\circ}\text{C}$

(b). Based on Actual maximum temperature

Heat Wave: When actual maximum temperature $\geq 45^{\circ}\text{C}$.

Severe Heat Wave: When actual maximum temperature $\geq 47^{\circ}\text{C}$

(c). Criteria for heat wave for coastal stations

When maximum temperature departure is $>4.5^{\circ}\text{C}$ from normal. Heat Wave may be described provided maximum temperature $\geq 37^{\circ}\text{C}$



Warm Night

When maximum temperature remains 40°C

Warm Night: When minimum temperature departure 4.5°C to 6.4°C .

Severe Warm Night: When minimum temperature departure $>6.4^{\circ}\text{C}$.



Cold Wave

When minimum temperature of a station $\leq 10^{\circ}\text{C}$ for plains and $\leq 0^{\circ}\text{C}$ for hilly regions.

(a). Based on departure

Cold Wave: Minimum Temperature Departure from normal -4.5°C to -6.4°C .

Severe Cold Wave: Minimum Temperature Departure from normal $\leq -6.5^{\circ}\text{C}$

(b) Based on actual Minimum Temperature (for Plains only)

Cold Wave : When Minimum Temperature is $\leq 4.0^{\circ}\text{C}$

Severe Cold Wave: When Minimum Temperature is $\leq 2.0^{\circ}\text{C}$

(c) For Coastal Stations

When Minimum Temperature departure is $\leq -4.5^{\circ}\text{C}$ & actual Minimum Temperature is $\leq 15^{\circ}\text{C}$



Cold Day

When minimum temperature of a station $\leq 10^{\circ}\text{C}$ for plains and $\leq 0^{\circ}\text{C}$ for hilly regions
Based on departure

Cold Day: Maximum Temperature Departure from normal -4.5°C to -6.4°C .

Severe Cold Day: Maximum Temperature Departure from normal $\leq -6.5^{\circ}\text{C}$



Fog

Phenomenon of small droplets suspended in air and the horizontal visibility $< 1\text{km}$

Moderate Fog: When the visibility between 500-200 metres

Dense Fog: when the visibility between 50- 200 metres

Very Dense Fog: when the visibility < 50 metres



Thunderstorm

Sudden electrical discharges manifested by a flash of light (Lightning) and a sharp rumbling sound (thunder)



Dust/Sand Storm

An ensemble of particles of dust or sand energetically lifted to great heights by a strong and turbulent wind.



Frost

Ice deposits on ground

Air temperature $\leq 4^{\circ}\text{C}$ (over Plains)



Squall

A strong wind that rises suddenly, lasts for atleast 1 minute.

Moderate: Wind speed 52-61 kmph

Severe: Wind speed 62-87 kmph

Very Severe: Wind speed >87 kmph



Sea State

Effect of various waves in the sea over specific area

Rough to very rough: Wind speed 41-62 kmph (22-33 knots) & Wave height 2.5-6 metre

High to very high: Wind speed 63-117 kmph (34-63 knots) & Wave height 6-14 metre

Phenomenal: Wind speed >117 kmph (>63 knots) & Wave height >14 metre



Cyclone

Cyclonic Storm: Wind speed 62-87 kmph (34-47 knots)

Severe Cyclonic Storm: Wind speed 88-117 kmph (48-63 knots)

Very Severe Cyclonic Storm: Wind speed 118-165 kmph (64 - 89 knots)

Extremely Severe Cyclonic Storm: Wind speed 166-220 kmph (90 -119 knots)

Super Cyclone Strom: Wind speed >220 kmph (>119 knots)