

National Agromet Advisory Service Bulletin

Friday 25th July 2014

(For the period 25th to 29th July 2014)



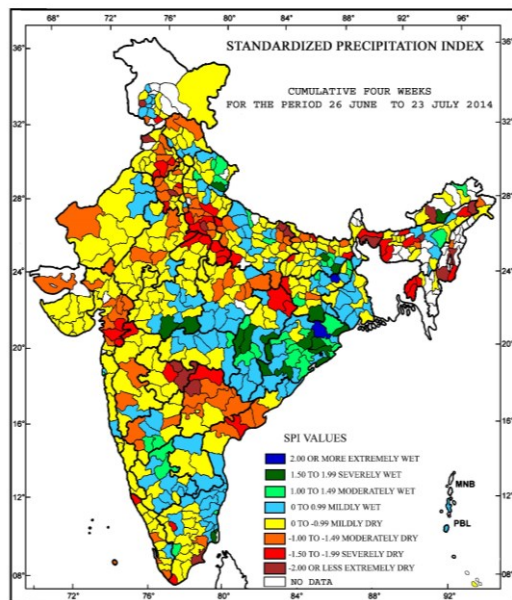
Issued by

**National Agrometeorological Advisory Service Centre,
Agricultural Meteorology Division,
India Meteorological Department, Shivajinagar, Pune.**



Standardised Precipitation Index
Four Weekly
for the Period 26th June to 23rd July 2014

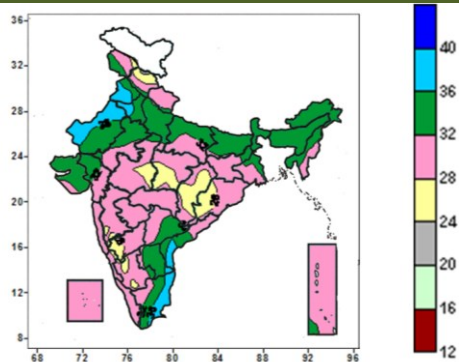
MINISTRY OF EARTH SCIENCES
INDIA METEOROLOGICAL DEPARTMENT
HYDROMET SECTION, PUNE



- Extremely/severely wet conditions experienced in few districts of Odisha, Nanital district of Uttarakhand, Begusarai, Banka districts of Bihar; Papumpara district of Arunachal Pradesh; Deoghar, West Singhum districts of Jharkhand; Betul and Khandwa districts of West Madhya Pradesh; Durg, Rajnandgaon and Mahasamund districts of Chattisgarh; Nagapattinam and Tiruvarur districts of TamilNadu.
- Extremely/ moderately/ severely dry conditions experienced in many districts of Telangana; few districts of North East, Punjab, Haryana, Uttar Pradesh, Bihar, Gujarat; Udhampur, Jammu and Poonch districts of Jammu & Kashmir; Lahaul & Spiti and Chamba districts of Himachal Pradesh; Jaisalmer, Sirohi, Bhilwara, Bundi, Alwar and Dausa districts of Rajasthan; Damoh, Panna, Umaria, Shahdol and Sidhi districts of Eastt Madhya Pradesh; Surguja and Jashpur districts of Chhattisgarh; Simdega, Ranchi district of Jharkhand; Satara, Ahmednagar, Parbhani, Nanded and Hingoli districts of Maharashtra; Belgam, Dharwad, and Yadgir districts of Karnataka; East Godavari, West Godavari, Guntur and Krishna districts of Andhra Pradesh; Kanyakumari, Ramanathapuram, Pudukottai and Tiruppur districts of Tamil Nadu; Kasargod, Thrissur, Alapuzha and Trivandrum districts of Kerela.
- Rest of the country experienced mild wet/dry conditions.

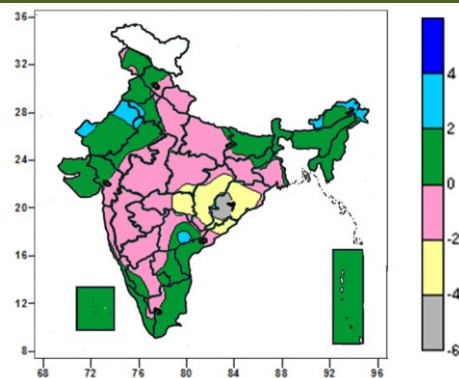
Contour maps for Mean Maximum and Minimum Temperature and their anomaly for the week ending on 23.07.2014

Actual Mean Maximum Temperature (°C) in India for the week ending 23.07.2014



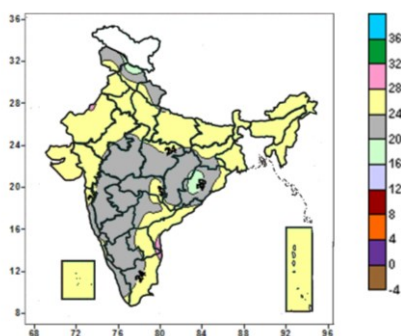
- 36 to 40°C over many parts of Punjab, some parts of Haryana, West Rajasthan, Coastal Andhra Pradesh and Tamil Nadu.
- 32 to 36°C over many parts of Haryana, Delhi, Uttar Pradesh, Rajasthan, Gujarat, Bihar, Sub-Himalayan West Bengal & Sikkim, Arunachal Pradesh, Assam & Meghalaya, Nagaland, Telangana, Rayalaseema, some parts of Jammu & Kashmir, Himachal Pradesh, Punjab, Jharkhand, Gangetic West Bengal, Manipur, Mizoram, Tripura, Coastal Andhra Pradesh, Tamil Nadu and Andaman & Nicobar Islands.
- 28 to 32°C over many parts of Uttarakhand, Jharkhand, Gangetic West Bengal, Odisha, Madhya Pradesh, Maharashtra, Karnataka, Kerala, Lakshadweep, Andaman & Nicobar Islands, some parts of Jammu & Kashmir, Himachal Pradesh, Uttar Pradesh, Mizoram, Tripura, Chhattisgarh, Gujarat and Tamil Nadu.
- 24 to 28°C over many parts of Chhattisgarh, some parts of Jammu & Kashmir, Himachal Pradesh, Madhya Pradesh, Odisha, Madhya Maharashtra and Interior Karnataka.

Mean Maximum Temperature (°C) Anomaly in India for the week ending 23.07.2014



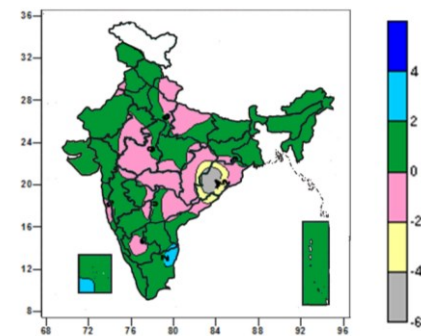
- 2 to 4°C over some parts of Haryana, West Rajasthan, Arunachal Pradesh and Telangana.
- 0 to 2°C over many parts of Jammu & Kashmir, Himachal Pradesh, Punjab, Haryana, Rajasthan, Bihar, Sub-Himalayan West Bengal & Sikkim, North East India, Gujarat, Andhra Pradesh, Tamil Nadu, Kerala, Coastal Karnataka, Lakshadweep, Andaman & Nicobar Islands, some parts of Uttar Pradesh, Jharkhand, Gangetic West Bengal, , South Interiors Karnataka.
- -2 to 0°C over many parts of Uttarakhand, Uttar Pradesh, Jharkhand, Gangetic West Bengal, Maharashtra, Interior Karnataka, some parts of Jammu & Kashmir, Himachal Pradesh, Bihar, Chhattisgarh, East Rajasthan, Gujarat region, Andhra Pradesh Coastal Karnataka, Tamil Nadu and Kerala.
- -6 to -2°C over many places over Odisha, Chhattisgarh, some parts of Vidarbha, East Madhya Pradesh and Coastal Andhra Pradesh.

Actual Mean Minimum Temperature (°C) in India for the week ending 23.07.2014



- 24 to 28°C over many parts of Punjab, Haryana, Delhi, Uttar Pradesh, Bihar, West Bengal & Sikkim, North East India, Rajasthan, Gujarat, Coastal Andhra Pradesh, Rayalaseema, Tamil Nadu, Lakshadweep, Andaman & Nicobar Islands, some parts of Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Odisha, Madhya Pradesh, Vidarbha, Telangana, Coastal Karnataka, Konkan and Kerala.
- 20 to 24°C over many parts of Jammu & Kashmir, Uttarakhand, Central India, Odisha, Maharashtra, Telangana,

Mean Minimum Temperature (°C) Anomaly in India for the week ending 23.07.2014



- 2 to 4°C over some parts of Tamil Nadu, Lakshadweep Islands.
- 0 to 2°C over many parts of Jammu & Kashmir, Himachal Pradesh, Bihar, Jharkhand, West Bengal & Sikkim, North East India, East Madhya Pradesh, Marathwada, Madhya Maharashtra, Gujarat, Coastal Andhra Pradesh, Rayalaseema, Karnataka, Tamil Nadu, Kerala, Lakshadweep, Andaman & Nicobar Islands, some parts of Uttarakhand, Uttar Pradesh,

Karnataka, Kerala, some parts of Himachal Pradesh, East Rajasthan, Rayalaseema and Tamil Nadu.

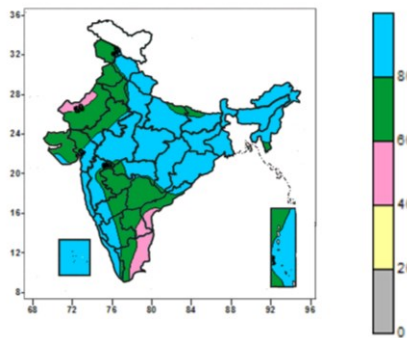
- 16 to 20°C over some parts of Jammu & Kashmir, Himachal Pradesh, Chhattisgarh, Odisha.

Odisha, Chhattisgarh, Telangana, Konkan and East Rajasthan.

- -2 to 0°C over many parts of Uttarakhand, Uttar Pradesh, East Rajasthan West Madhya Pradesh, Chhattisgarh, Telangana, Vidarbha, some parts of West Rajasthan, Punjab, Jharkhand, Odisha, Coastal Andhra Pradesh, South Interior Karnataka, Konkan & Goa, Marathwada.
- -6 to -2°C over many parts of Odisha, some parts of Chhattisgarh, Coastal Andhra Pradesh.

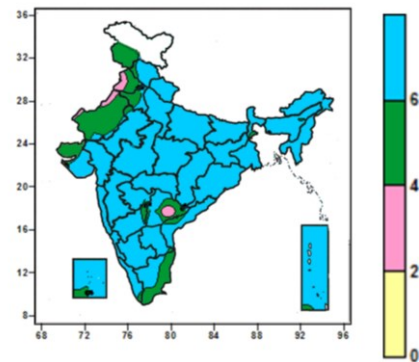
Contour maps for Relative Humidity, Cloud amount and Wind speed for the week ending on 23.07.2014

Relative Humidity (%) over India for the week ending 23.07.2014



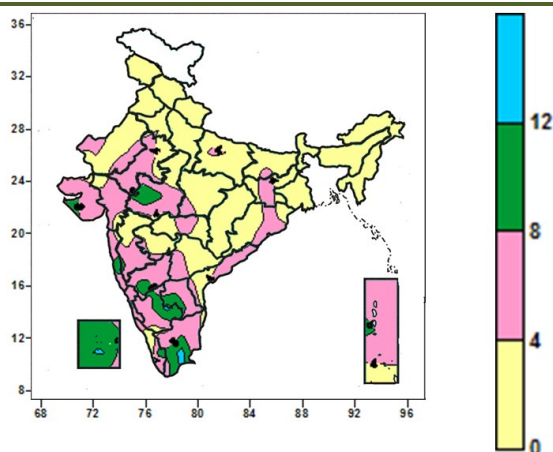
- 80 to 100% over many parts of Himachal Pradesh, Uttarakhand, Uttar Pradesh, East India, North East India, Central India, Kerala, Coastal & South Interior Karnataka, Konkan & Goa, Madhya Maharashtra, Vidarbha, Gujarat, Lakshadweep and Andaman & Nicobar Islands, some parts of East Rajasthan, Saurashtra, Coastal Andhra Pradesh, South Interior Karnataka and Tamil Nadu.
- 60 to 80% over many parts of Jammu & Kashmir, Punjab, Haryana, Delhi, Rajasthan, Gujarat, Marathwada, Andhra Pradesh, Tamil Nadu, North Interior Karnataka, some parts of Himachal Pradesh, Uttar Pradesh, Bihar, Tripura, Madhya Maharashtra, Vidarbha, Tamil Nadu, Kerala and South Interior Karnataka.
- 40 to 60% over some parts of West Rajasthan, Coastal Andhra Pradesh, Rayalaseema and Tamil Nadu.

Cloud amount (okta) over India for the week ending 23.07.2014



- 6 to 8 okta over many parts of Himachal Pradesh, Uttarakhand, Uttar Pradesh, East Rajasthan, East India, North East India, Central India, West India, South India, Lakshadweep and Andaman & Nicobar Islands, some parts of Haryana, Delhi, West Rajasthan.
- 4 to 6 okta many parts of Jammu & Kashmir, West Rajasthan, Punjab, Haryana, Telangana, some parts of Himachal Pradesh, Coastal Andhra Pradesh, Rayalaseema, Tamil Nadu, Kerala, North Interior Karnataka, Marathwada, Saurashtra & Kutch.
- 2 to 4 okta over some parts of Punjab, West Rajasthan, Telangana.

Wind speed (knots) over India for the week ending 23.07.2014



- 12 to 16 knots over some parts of Tamil Nadu and Lakshadweep Islands.
- 8 to 12 knots over many parts of Lakshadweep Islands, some parts of Saurashtra & Kutch, West Madhya Pradesh, Konkan, Interior Karnataka, Rayalaseema and Tamil Nadu.
- 0 to 8 knots over entire country except many parts of Lakshadweep Islands, some parts of Saurashtra & Kutch, West Madhya Pradesh, Konkan, Interior Karnataka, Rayalaseema and Tamil Nadu.

Monsoon Watch

- The Southwest monsoon was Vigorous over Gujarat region & Madhya Maharashtra and active over West Madhya Pradesh, Saurashtra & Kutch and north & south interior Karnataka.

Weather Forecast

Weather Forecast for next 3 days (upto 0830 hours IST of 28th July, 2014)

- Rain/thundershowers would occur at many places over Andaman & Nicobar Islands during the period.
- Rain/thundershowers would occur at a few places over Arunachal Pradesh during next 48 hours and at many places thereafter.
- Rain/thundershowers would occur at many places over Assam & Meghalaya, Nagaland, Manipur, Mizoram and Tripura during the period.
- Rain/thundershowers would occur at many places over Sub-Himalayan West Bengal & Sikkim during next 48 hours and at most places thereafter.
- Rain/thundershowers would occur at a few places over Gangetic West Bengal during next 24 hours and over Bihar and East Uttar Pradesh during next 48 hours and at many places thereafter.
- Rain/thundershowers would occur at isolated places over Odisha and Jharkhand during next 24 hours and at many places thereafter.
- Rain/thundershowers would occur at many places over Jammu & Kashmir, Himachal Pradesh and Uttarakhand during the period.
- Rain/thundershowers would occur at isolated places over Punjab, Haryana & Delhi and West Uttar Pradesh during next 24 hours and increase thereafter.
- Rain/thundershowers would occur at a few places over West Rajasthan during next 24 hours and at many places thereafter.
- Rain/thundershowers would occur at many places over

Weather Warning during next 3 days

- **25 July (Day 1):** Heavy rainfall would occur at isolated places over Jammu division of Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Saurashtra & Kutch, Konkan & Goa, Assam & Meghalaya and Andaman & Nicobar Islands.
- **26 July (Day 2):** Heavy rainfall would occur at isolated places over Jammu division of Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Konkan & Goa, Assam & Meghalaya and Andaman & Nicobar Islands.
- **27 July (Day 3):** Heavy rainfall would occur at isolated places over Jammu division of Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Coastal Karnataka and Odisha.

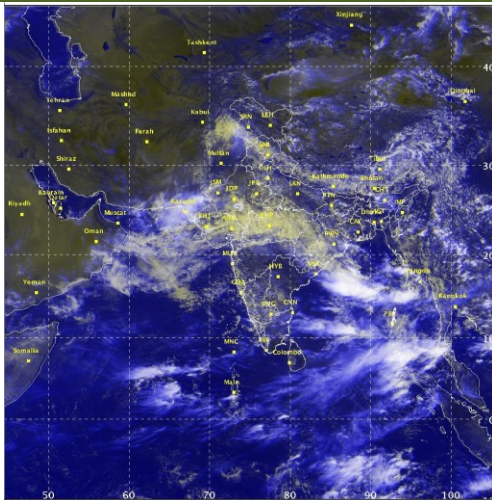
Weather Outlook for subsequent 4 days from 28th July to 1st August 2014

- Increase in rainfall activity over east & adjoining central India and western Himalayan Region.
- Rain/thundershowers would occur at many places over northeastern states and at most places along west coast.
- Scattered rainfall activity would occur over plains of northwest India.
- Subdued rainfall activity would continue over south interior peninsular India.

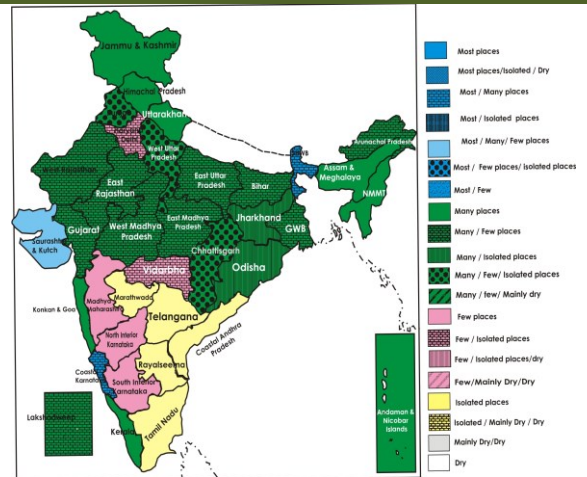
East Rajasthan during next 24 hours and at a few places thereafter.

- Rain/thundershowers would occur at a few places over East Madhya Pradesh during next 24 hours and over West Madhya Pradesh during next 48 hours and at many places thereafter.
- Rain/thundershowers would occur at isolated places over Chhattisgarh during next 24 hours and increase thereafter.
- Rain/thundershowers would occur at most places over Saurashtra & Kutch during next 24 hours and decrease thereafter.
- Rain/thundershowers would occur at many places over Gujarat region during next 24 hours and at a few places thereafter.
- Rain/thundershowers would occur at many places over Konkan & Goa, Kerala and at a few places over Madhya Maharashtra and Interior Karnataka during the period.
- Rain/thundershowers would occur at many places over Coastal Karnataka during next 48 hours and at most places thereafter.
- Rain/thundershowers would occur at isolated places over Vidarbha during next 48 hours and at a few places thereafter.
- Rain/thundershowers would occur at isolated places over Marathwada, Coastal Andhra Pradesh, Telangana, Rayalaseema, Tamilnadu & Pudduchery during the period.
- Rain/thundershowers would occur at a few places over Lakshadweep during next 24 hours, at a many places on 26th and at a few places on 27th July.

Satellite image dated 25.07.2014, 0600 UTC



Weather Forecast Map (Valid upto 0830 hours of 28th July, 2014)



Salient Advisories

- Due to subdued rainfall in major parts of **South Interior Karnataka**, continue sowing of the following medium duration varieties of crops like groundnut - TMV-2, JL-24 and Chintamani-2; finger millet - Indaf- 8, MR-1, MR-2 and MR-6; Sunflower: KBSH-42 and KBSH-44; maize - Ganga, Deccan, Vijaya composite and Composite NAC after receipt of sufficient rainfall.
- In view of subdued rainfall activity over **North Interior Karnataka**, sowing of green gram and black gram is not recommended. Instead of that undertake sowing of onion, sesame, maize, sunflower, niger, castor, bajra, groundnut (spreading), redgram, desi cotton, horsegram, cowpea, also sowing of intercrops like, pearl millet + pigeonpea (2:1), pearl millet + castor (2:1), kharif sorghum + redgram (5:1), redgram + sesame (1:2 or 2:4); redgram + horsegram (2:1) is suggested to minimize risk from subdued rainfall situations.
- In **Royalaseema**, continue intercropping of red gram + groundnut, castor and cotton. In **Anantpur** district undertake sowing of groundnut and bajra utilizing the realized rainfall.
- Due to non-receipt of rainfall in earlier weeks in most of the districts of **Gujarat**, normal kharif crops like cotton, pigeon pea, castor, pearl millet and other crops could not be sown. As there is improvement in rainfall during last week over Gujarat and rain would occur at many places, continue sowing of following contingency crops of Gujarat as given below:
 - i. **For South and Middle Gujarat region:**
 - Prefer soybean cv. GS-1, GS-2, JS-335.
 - Prefer short duration varieties in Sunflower (cv. Modern and EC-68414 and Guj-1) and Sesame (cv. Guj. Tal 1,2, 10), blackgram (cv. T-9, Guj. Udid-1), Greengram (cv. GM-4, K-851, Meha), Cowpea (cv. Guj. Cowpea 1,2,4, Pusa Falguni).
 - Sowing of grain Sorghum (cv. GJ-35,36 and 37) and Fodder sorghum (cv. S-1049, C-10-2, Gundari, GFS 4,5) is recommended to overcome future fodder shortages.
 - ii. **North Gujarat Region:**
 - In sesame varieties like GT-1, GT-2, GT-10, in sunflower - Modern, EC 68414 and in fodder sorghum - S-1049, C-10-2 are suggested. In cotton Hy-8, 10, V-797, G. Cot 13,21, 23 can be taken up.
 - iii. **For Saurashtra region:**

In groundnut, short duration Spanish bunch varieties like GG-2, GG-5, GG-7 and TG 37 A are recommended.

 - In blackgram, T-9, Guj. Udid-1 and Greengram - GM-4, K-851, Meha are suggested.
 - For fodder purpose, sorghum cv. CSH-6 and CFS-4 are recommended.
 - In sesame cv. Purva-1, in cotton - G. cot-13, 21, 23, V-797, in pigeonpea - cv. BDN-2, ICPL-87, GT-100, GT-101, Vaishali may be preferred. For Kutch region, Guar cv. Guj. Gaur 1 and 2 specially for Kutch region.
- In **West Madhya Pradesh**, continue sowing of early maturing varieties of maize (JVM 421, JM 12), red gram (UPAS 120, Pusa 9, TJT 501), sunflower (Modern, sesame variety TKG-8) and black gram (T 9, JU 86) utilizing realised and expected rainfall.
- Continue transplanting of rice and sowing of maize and soybean in **East Madhya Pradesh** utilizing the realized and expected rainfall.
- In **Madhya Maharashtra**, complete transplanting of rice in Western parts of Kolhapur, Pune and Nasik districts. In north Madhya Maharashtra (Dhule, Nandurbar, Jalgaon and Ahmednagar) undertake short duration improved variety of pearl millet, red gram, sunflower. Intercropping of pearl millet+redgram in 2:1, sunflower+redgram in 2:1, and guar+redgram in 2:1 ratios. In South Madhya Maharashtra except in Solapur district undertake sowing of contingency crops like sunflower, sesame, pearl millet, red gram, horse gram and moth bean. Intercropping of pearl millet+redgram in 2:1, sunflower+redgram in 2:1, and guar+redgram in 2:1 ratios.
- In **Marathwada** continue sowing of red gram and bajara with short duration improved varieties in Aurangabad, Jalna and Hingoli districts. Adopt intercropping systems like cotton + pigeon pea (6:1), bajra + pigeon pea (3:3), etc. for minimizing risk.
- Continue nursery sowing of rice, direct seeding of rice may be taken up with short duration varieties under dry conditions and later converted to wet paddy after receipt of good rainfall in Guntur, Krishna and Prakasam districts in the South Coastal Zone of **Andhra Pradesh**.

- In **Assam and Meghalaya**, continue transplanting of *Sali* rice and in **Arunachal Pradesh** continue sowing of *kharif* rice utilizing the realized and expected rainfall.
- Continue transplanting of main *kharif* rice and early cauliflower, sowing of black gram and rice bean in **Manipur**, continue sowing of soybean in **Nagaland** and continue nursery sowing of *aman* rice in **Tripura**.
- Continue direct sowing of *kharif* rice in Sub Montane and Low Hills Sub Humid Zone of **Himachal Pradesh** and complete transplanting of *kharif* rice in **Uttarakhand**.

Detailed Zonewise Agromet Advisories

SOUTH INDIA [TN, AP, KERALA, KARNATAKA, LAKSHADWEEP]



Land preparation/ Sowing

Rice Nursery

Sugarcane

Okra

- **Realised Rainfall:** Rainfall occurred in all districts of Coastal Karnataka; Belgaum, Dharwad and Haveri districts of North Interior Karnataka; Chikmagalur, Davangere, Hassan, Kodagu and Shimoga districts of South Interior Karnataka; all districts of Kerala except Thiruvananthapuram; Srikakulam and Vizianagaram districts of Coastal Andhra Pradesh; Adilabad district of Telangana; Coimbatore and Nilgiris districts of Tamil Nadu. Mainly dry weather prevailed over remaining parts of the region.
- **Weather Forecast:** Rain/thundershowers would occur at many places over Coastal Karnataka during next 48 hours and at most places thereafter. Rain/thundershowers would occur at many places over Kerala; at a few places over Interior Karnataka and at isolated places over Coastal Andhra Pradesh, Telangana, Rayalaseema, Tamil Nadu & Pudducherry during the period . Rain/thundershowers would occur at a few places over Lakshadweep during next 24 hours, at a many places on 26th and at a few places on 27th July.
- **Weather Warning:** Heavy rainfall would occur at isolated places over Coastal Karnataka on 27th July.
- **Weather Outlook:** Subdued rainfall activity would continue over south interior peninsular India.
- **Advisories:**
 - **Karnataka:**
 - As rain/thundershowers would occur at most/ many places over Coastal Karnataka along with heavy rainfall at isolated places on 27th July, postpone irrigation, intercultural operations and application of fertilizers and plant protection measures in standing crops. Provide adequate drainage in standing crops to remove excess water.
 - Undertake transplanting of lowland and upland rice of proper age of seedlings utilizing the realized and expected rainfall in the Hill Zone of Karnataka.
 - Undertake transplanting of vegetables in the Southern Transition Zone of Karnataka.
 - Continue nursery sowing of rice, ragi and land preparation for planting of ginger, turmeric, arecanut and banana in the Southern Transition Zone of Karnataka utilizing the realized and expected rainfall.
 - Sowing of *kharif* crops is delayed due to inadequate rainfall in major parts of South Interior Karnataka. Continue sowing of the following medium duration varieties of crops like groundnut - TMV-2, JL-24 and Chintamani-2; finger millet - Indaf- 8, MR-1, MR-2 and MR-6; Sunflower: KBSH-42 and KBSH-44; maize - Ganga, Deccan, Vijaya composite and Composite NAC are suggested.
 - In view of subdued rainfall activity over North Interior Karnataka, sowing of green gram and black gram is not recommended. Instead onion, sesame, maize, sunflower, niger, castor, bajra, groundnut (spreading), redgram, desi cotton, horsegram, cowpea may be taken up for North Interior Karnataka, sowing of intercrops like, pearl millet + pigeonpea (2:1), pearl millet + castor (2:1), *kharif* sorghum + redgram (5:1), redgram + sesame (1:2 or 2:4); redgram + horsegram (2:1) is suggested to minimize risk from prevailing rainfall situations.
 - **Kerala:**
 - As rain/thundershowers would occur at many places during the period, postpone irrigation, intercultural operations and application of fertilizers and plant protection measures in standing crops.
 - Continue direct sowing of rice and planting of Poovan, Robusta and Kannan varieties of banana and rainfed Nendran banana in the Problem Area Zone of Kerala.
 - Continue planting of Nendran banana and cultivation of monsoon vegetables in the Northern Zone of Kerala.
 - Present cloudy weather with high humidity and low temperature condition is congenial for the incidences of black

bug, stem borer and leaf roller attack on rice crop in the Problem Area Zone of Kerala. Monitor the crop and spray Asataf @ 2 g/litre at the basal part of the plant after draining the field, if noticed.

- Due to high humidity and moist weather conditions, there is chance of increase of leaf folder and stem borer attack on rice crop in the Central Zone of Kerala. To manage, use Trichogramma cards @ 2CC per acre and apply Quinalphos (2ml per one litre of water) or Cartap hydrochloride (25g per one hectare) if the attack is severe after current spells of rain. Due to continuous rain, there is a chance of bud rot disease in coconut. Cut and remove all the affected tissues of the crown. Apply Bordeaux paste and protect it from rain till normal shoot emergence.
- High humidity is congenial for the incidence of sheath blight and sheath rot in rice and sigatoka disease in bananas in the Southern Zone of Kerala. Spray Bavistin @ 200 g/Tilt (Propiconazol) @ 150 ml/ 200 litre of water to manage sheath blight and sheath rot in rice and apply propiconazol 1ml / litre of water and copper oxy chloride 4 g/ litre of water alternately at two weeks interval after current spells of rain.

▪ **Andhra Pradesh:**

- Continue nursery sowing of rice, direct seeding of rice may be taken up with short duration varieties under dry conditions and later converted to wet paddy after receipt of good rainfall in Guntur, Krishna and Prakasam districts in the South Coastal Zone of Andhra Pradesh.
- Complete planting of rainfed sugarcane and sowing of irrigated maize, green gram, black gram and red gram, nursery sowing of rice utilizing the realized rainfall in the North Coastal Zone of Andhra Pradesh.
- In the Southern Telangana Zone of Andhra Pradesh, complete sowing of rainfed crops like cotton, maize, groundnut, pulses etc. at the earliest. Continue nursery sowing and transplanting of tomato, brinjal and chilli and direct sowing of cucurbits, beans and bhendi utilizing the realized and expected rainfall.
- In Scarce Rainfall Zone of Rayalaseema, continue sowing of red gram and intercropping of korra + redgram @ 5:1 and red gram + groundnut, castor and cotton in the rainfed tracts in Kurnool district. In Anantpur district, continue sowing of rainfed castor and red gram, groundnut and bajra utilizing the realized rainfall.
- Undertake transplanting of rice in Nellore district in the Southern Zone of Andhra Pradesh. Continue direct sowing of rice, groundnut and red gram in the remaining districts.

▪ **Tamil Nadu:**

- Continue transplanting of *kuruvai* rice and undertake land preparation for nursery sowing of *samba* rice in Nagapattinam, Thanjavur and Trichy districts in the Cauvery Delta Zone of Tamil Nadu with irrigation.
- Since prevailing wind speed is high, five months old banana and sugarcane may be propped against lodging in the Western Zone and Southern Zone of Tamil Nadu.
- Black bug incidence was noticed in *kuruvai* rice in tillering stage in the Cauvery Delta Zone of Tamil Nadu and likely to persist, spray Cholorpyrifos 20 E.C @ 500 ml /acre or Neem seed kernel extract 5% to manage the incidence.
- Prevailing humid weather condition is congenial for *cercospora* leaf spot in groundnut in the Western Zone of Tamil Nadu. Monitor the crops and if already infected, spray Mangozeb @ 2.5 g per litre of water.
- Suitable varieties are given in Annexure III.

• **Animal Husbandry**

- Prevailing weather conditions are congenial for Anthrax in cattles in the Scarce Rainfall Zone of Andhra Pradesh. Vaccinate the animals to prevent the disease.

NORTHEAST INDIA [ARUNACHAL PRADESH, NMM&T, ASSAM, MEGHALAYA]



Rice Nursery



Land preparation/Sowing



Okra



Jute

- **Realised Rainfall :** Rainfall occurred in Changlang, East Siang, Lohit, Lower Dibang Valley, Papumpara, Tawang, Tirap, Upper Siang, Upper Subansari, West Kameng and West Siang districts of Arunachal Pradesh; Barpeta, Bongaigaon, Cachar, Chirang, Dhemaji, Dhubri, Dibrugarh, Goalpara, Golghat, Hailakandi, Jorhat, Karbi Anglong, Karimganj, Kokrajhar, Lakhimpur, N.C.Hills, Nalbari, Sonitpur, Sibsagar, Tinsukia, and Udalgiri districts of Assam; East Garo Hills, East Khasi Hills, South Garo Hills and West Garo Hills districts of Meghalaya; Saiha and Serchhip districts of Mizoram; Chandel, Imphal East, and Imphal West districts of Manipur; Dimapur, Kohima and Phek districts of Nagaland. Mainly dry weather prevailed over remaining parts of the region.
- **Weather Forecast:** Rain/thundershowers would occur at many places over Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura during the period. Rain/thundershowers would occur at a few places over Arunachal Pradesh

during next 48 hours and increase thereafter.

- **Weather Warning:** Heavy rainfall would occur at isolated places over Assam & Meghalaya on 25th and 26th July.
- **Weather Outlook:** Rain/thundershowers would occur at many places over northeastern states.
- **Advisories:**
 - **Assam & Meghalaya, Arunachal Pradesh:**
 - As rain/thundershowers would occur at many places over Assam and Meghalaya along with isolated heavy spells on 25th and 26th July, postpone irrigation, intercultural operations, application of plant protection measures and fertilizers in the standing crops. Provide adequate drainage in crop fields to remove excess water.
 - In Assam, continue transplanting of *sali* rice. The proper age of seedling for transplanting is 21 days for short duration varieties, 30-35 days for medium duration varieties and 35-40 days for long duration varieties. Replanting of dead hills or gap filling with seedlings of similar age should be done within 7-10 days of transplanting.
 - In Meghalaya, continue transplanting of *sali* rice, sowing of pigeon pea and planting of khasi mandarin. Complete transplanting of *sali* rice by the end of July. In water stressed upland fields, farmers are advised to grow tuber crops like sweet potato, colocassia, tapioca, etc. for better land utilization and risk minimization.
 - In Arunachal Pradesh, complete transplanting of local varieties and continue transplanting of HYV of *Kharif* rice utilising realised and expected rainfall.
 - In Upper Brahmaputra Valley Zone and Central Brahmaputra Valley Zone of Assam, continue transplanting of medium duration (130-135 days) *sali* rice varieties like Satyaranjan, Basundhara, Jaya, IR 36 etc till 15-20 August.
 - Continue sowing of arhar, groundnut and sesame in Hill Zone of Assam and complete sowing of sesame in Lower Brahmaputra Valley Zone of Assam.
 - In Upper Brahmaputra Valley Zone and North Bank Plain Zone of Assam, there is chance of continuing of the attack of fruit fly, red pumpkin beetle and epilechna beetle in summer gourds, spray Malathion 50 EC @ 1 ml per litre after current spells of rain.
 - Present weather of alternate dry and wet condition may favour occurrence of rotting of leaves and stems of beetle vine and quick wilt in black pepper in Central Brahmaputra Valley Zone of Assam. Prophylactic application of Bordeaux mixture in clear weather may prevent the spread/ outbreak of the disease.
 - In Hill Zone of Assam, due to humid weather, there is chance of red rot/ stem borer infestation in sugarcane. Plants showing symptoms of red rot and stem borer should be rouged out and buried or burned. Also continue soil drenching with 1.0% Bordeaux mixture or 0.05% Bavistin for managing banana wilt in banana after current spells of rain.
 - Due to prevailing humid weather conditions, there is chance of attack of aphid on black gram in Arunachal Pradesh. Spray Methyl Demeton 25 EC or Dimethoate @ 500 ml /500 litres of water per ha on non rainy days. Also there is chance of fruit flies in cucurbits, for control, spray Malathion @ 3ml per litre of water after current spells of rain.
 - **Nagaland, Manipur, Mizoram and Tripura:**
 - As rain/thundershowers would occur at many places over Nagaland, Manipur, Mizoram and Tripura during the period, postpone irrigation, intercultural operations, application of plant protection measures and fertilizers in the standing crops.
 - In Mizoram, continue nursery sowing of rice and main field preparation for transplanting of rice utilizing the realized and expected rainfall.
 - In Nagaland, continue transplanting of rice and sowing of soybean, groundnut and pulses like black gram, green gram utilizing the realized and expected rainfall. Right after transplanting of rice, adequate land submergence of around 5cm of water is necessary to prevent damage to establishing seedlings and for root development.
 - Complete transplanting of main *kharif* rice by the end of July in Manipur. Continue nursery raising of early cauliflower in raised beds and undertake land preparation for transplanting of early cauliflower.
 - In Mild Tropical Plain Zone of Tripura, continue transplanting of *aman* rice and continue sowing of vegetables.
 - In Tripura, due to cloudy and humid weather there is chance of Panama wilt disease in banana. Drench with Bavistin @1g per liter of water and Trichodermaviride and pseudomonas fluorescence may be incorporated in the soil after current spells of rain. Also there are chances of attack of yellow stem borer in *aman* rice. To manage the attack, spray Validamycin 3L @ 2.5 ml or Hexaconazole 5 EC @ 2.0 ml per litre of water after current spells of rain.
 - In Nagaland, cloudy weather is conducive for attack of thrips in chilli, spray 3% and 5% neem oil for control after current spells of rain.
 - Suitable varieties are given in Annexure III.
 - **Animal Husbandry**
 - In the Northeastern States, animal sheds should be kept dry and avoid dampness during rainy days. Immunizations against FMD, HS and BQ in cattle & buffaloes and swine-fever in pigs may carry out during monsoon season. Keep pig sheds warm using gunny bags, straw, enclosure.
 - Monsoon weather could lead to gastrointestinal parasites infection in pigs and poultry in Tripura. Farmers are advised to keep good sanitary conditions in pig and poultry sheds.
 - In Nagaland, high humidity is favourable for occurrence of coccidiosis disease in poultry, provide anti-coccidial

drugs.

- **Fisheries**

- In flood affected areas of Lower Brahmaputra Valley Zone of Assam, protect the fish ponds by putting nylon net or bamboo net around the ponds. Due to heavy rainfalls & muddy water influx from the surrounding areas, the ponds may result reduction of dissolved oxygen. Stirring the water with a bamboo pole will help in increasing the oxygen and protect the fishes from suffocation.

EAST INDIA [JHARKHAND, BIHAR, ODISHA, WEST BENGAL & SIKKIM, ANDAMAN & NICOBAR ISLANDS]



Sugarcane



Jute



Onion



Land Preparation/Sowing

- **Realised Rainfall:** Rainfall occurred in Araria, Aurangabad, Banka, Begusarai, Bhabua, Bhagalpur, East Champaran, Gaya, Jahanabad, Jamui, Katihar, Khagaria, Kishanganj, Lakhisari, Monghyr, Nalanda, Purnea, Rohtas, Samastipur, Sheikhpura, Siwan, Vaishali and West Champaran districts of Bihar; all districts of Jharkhand except Ramgarh; South Andaman district of Andaman & Nicobar Islands; all districts of Gangetic West Bengal except Kolkata and Murshidabad; in all districts of Odisha; all districts of Sub- Himalayan West Bengal & Sikkim. Mainly dry weather prevailed over remaining parts of the region.
- **Weather Forecast:** Rain/thundershowers would occur at many places over Sub-Himalayan West Bengal & Sikkim during next 48 hours and at most places thereafter. Rain/thundershowers would occur at many places over Andaman & Nicobar Islands during the period. Rain/thundershowers would occur at a few places over Gangetic West Bengal during next 24 hours and over Bihar during next 48 hours and at many places thereafter. Rain/thundershowers would occur at isolated places over Odisha and Jharkhand during next 24 hours and at many places thereafter.
- **Weather Warning:** Heavy rainfall would occur at isolated places over Andaman & Nicobar Islands on 25th and 26th July and over Odisha on 27th July.
- **Weather Outlook:** Increase in rainfall activity over east India.
- **Advisories:**
 - **West Bengal:**
 - As rain/thundershowers would occur at many/ most places over Sub-Himalayan West Bengal and Sikkim during the period and over Gangetic West Bengal on 26th and 27th July, postpone irrigation, intercultural operations, application of plant protection measures and fertilizers in the standing crops.
 - In Sub Himalayan West Bengal, continue transplanting of *aman* rice utilizing the realised and expected rainfall.
 - Continue transplanting of *aman* rice in Coastal Saline Zone and New Alluvial Zone of West Bengal. Continue nursery raising of tomato, and brinjal.
 - In Laterite and Red Soil Zone, continue nursery sowing of *aman* rice. Complete dry seeding of Upland rice.
 - In Laterite and Red Soil Zone, there is a chance of the attack of white-fly and jassid in ladies finger. To control these insects, apply Imidachloprid 17.8 S. L. @ 4 ml per 10 litre of water against white fly and Thiamethoxon @ 1g/10 liter of water against jassid after current spells of rain. In the prevailing weather situation, there is a chance of attack of fruit borer in chilli. To control these insects, spray Dichlorovos @ 1.5 – 2.0 ml per litre of water after current spells of rain.
 - In Old Alluvial Zone of West Bengal, due to cloudy weather and high humidity, there is a chance of fruit and stem rot attack in chilli and brinjal. To manage this disease, spray Copper oxy Chloride 50WP @ 4g/litre water after current spells of rain.
 - **Andaman & Nicobar Islands:**
 - In Andaman & Nicobar Islands, undertake sowing of red gram under coconut plantation as intercrop.
 - **Odisha:**
 - As rain/thundershowers would occur at many places over Odisha on 26th and 27th July along with isolated heavy falls on 27th July, postpone irrigation, intercultural operations, application of plant protection measures and fertilizers in the standing crops. Provide adequate drainage in crop fields to remove excess water.
 - In East and South Eastern Coastal Plain Zone of Odisha, continue transplanting of *kharif* rice under SRI cultivation utilizing the realised and expected rainfall and beushening in 21 days old direct sown rice in low land areas. Also continue sowing of ragi, maize, groundnut and sesame. Complete sowing of early duration sesame, cowpea, green gram and black gram in upland.

- In North Central Plateau Zone of Odisha, taking the advantage of recent rains beushening operation should be completed soon in direct seeded rice. Apply 50%N after current spells of rain.
- In Western Undulating Zone of Odisha, undertake transplanting of rice with 3 week aged seedlings and complete nursery sowing within this week if not done. Continue sowing of maize, arhar and cotton in upland areas taking the advantage of the realised and expected rainfall.
- In North Eastern Plateatu Zone of Odisha, continue sowing of maize, groundnut, green gram and black gram, ragi, arhar, maize and sesame, sowing of okra and cluster bean in North Central Plateau Zone of Odisha. Also continue nursery raising of brinjal, tomato and chilli in upland areas.
- In North Eastern Coastal Plain Zone of Odisha, due to submergence, damping off disease is likely to appear in seedlings and young plants of vegetables. To control it, spray Ridomil MZ @1.5g/ l or Copper oxychloride@3g/l of water after current spells of rain.
- **Bihar:**
 - In Bihar, continue transplanting of rice varieties like Rajendra Bhagwati, Prabhat, Narandra 97, MTU-1010 and Rajendra Sweta in medium land and Swarna Sab-1, BPT-5204, MTU-7029, MTU-1001 and Rajshree in low land situation. Transplanting in upland areas should be avoided. Instead of that, sowing of Til (var. Krishna), intercropping of Maize (Suwan) + Urd (T-9, Pant U-31, Pant U-19) may be undertaken.
 - In North West Alluvial Plain Zone of Bihar, continue transplanting of rice in low and medium land areas with realised and expected rainfall. Continue sowing of arhar, urd and kulthi in upland areas. In upland and medium land areas, it is advised to plant brinjal, early tomato, chilli and onion in the ridge of main field and also sow cucurbit and cluster bean, radish, cumin and fenugreek.
 - In North East Alluvial Plain Zone of Bihar, complete sowing of *kharif* okra and early brinjal, chilli, cauliflower. Undertake transplanting of *Kharif* onion. Continue transplanting of 20-25 days old paddy seedling in low and medium land areas with realised rainfall. Undertake planting of Mango, Litchi, Guava and Papaya
- **Jharkhand:**
 - As rain/thundershowers would occur at many places over Jharkhand on 26th and 27th July, postpone irrigation, intercultural operations, application of plant protection measures and fertilizers in the standing crops.
 - In South Eastern Plateau Zone of Jharkhand, continue sowing of maize and pigeon pea, urad, moong, groundnut, soybean, sesame. Continue transplanting of rice in low and medium land areas with realised and expected rainfall.
 - In Western Plateau Zone of Jharkhand, continue transplanting of rice in low and medium land areas and transplanting of finger millet. Continue sowing of medium duration varieties of maize for green cob and early duration varieties for grain purpose. Undertake sowing of green gram, black gram and pigeon pea.
 - In Central & North Eastern Plateau Zone of Jharkhand, continue sowing of urad, til and groundnut and continue transplanting of rice and planting of mango, guava and litchi.
 - In South Eastern Plateau Zone of Jharkhand, weather is conducive for the attack of fruit and shoot borer in brinjal and okra and fruit fly in cucurbitaceous vegetables, spray Malathion @ 2 ml per liter of water for fruit and shoot borer and arrange Bait trap for control of fruit fly after current spells of rain.
 - Suitable varieties are given in Annexure III.
- **Animal Husbandry**
 - Keep the cattle in the sheds during heavy rainfall periods in Odisha.
 - Provide dry and clean shelter to dairy animals in Old Alluvial Zone of West Bengal. Clean and hygenic water should be provided to dairy animals. De-worming and FMD-HS-BQ vaccination should be done to protect the livestock animals.
 - In South Eastern Plateau Zone of Jharkhand, weather is favourable for the attack of FMD, HS, BQ Brucellosis and Anthrax in dairy animals. So, vaccination should be administered at earliest.
- **Poultry**
 - In Nicobar Islands, South, North and Middle Andaman, newly hatched chicks should be provided warm condition with electric bulbs under enclosed dry area with sufficient feeding and watering facility.

CENTRAL INDIA [M.P., CHHATTISGARH]



Sugarcane



Land Preparation/Sowing



Okra



Green Gram

- **Realised Rainfall:** Rainfall occurred in all districts of Madhya Pradesh and Chhattisgarh.
- **Weather Forecast:** Rain/thundershowers would occur at a few places over West Mdhya Pradesh during next 48 hours

and increase thereafter. Rain/thundershowers would occur at a few places over East Madhya Pradesh and at isolated places over Chhattisgarh during next 24 hours and increase thereafter.

- **Weather Warning:** Nil.
- **Weather Outlook:** Increase in rainfall activity over Central India adjoining to east India.
- **Advisories:**
 - **Madhya Pradesh:**
 - As rain/thundershowers would occur at many places over East Madhya Pradesh on 26th and 27th July and over West Madhya Pradesh on 27th July, postpone irrigation, intercultural operations, application of plant protection measures and fertilizers in the standing crops.
 - Continue transplanting of rice and sowing of maize, soybean in east Madhya Pradesh utilising the realised and expected rainfall.
 - Continue sowing of early maturing varieties of moong, urad and nursery sowing of vegetables in Satpura Plateau Zone of Madhya Pradesh utilizing the realised and expected rainfall
 - Undertake planting of orchard crops in already prepared pits in Bundelkand Zone of Madhya Pradesh.
 - In West Madhya Pradesh, continue sowing of early maturing varieties of maize (JVM 421, JM 12), red gram (UPAS 120, Pusa 9, TJT 501), sunflower (Modern, sesame variety TKG-8) and black gram (T 9, JU 86) utilizing realised and expected rainfall.
 - Due to cloudy and humid weather, there are chances of attack of aphids and jassids on vegetables in West Madhya Pradesh, spray Thiamethoxam @ 0.35 g per litre after current spells of rain.
 - **Chhattisgarh:**
 - In Chhattisgarh Plain Zone, continue transplanting of rice and continue sowing of maize, soybean, moong and urad and nursery sowing /transplanting of *kharif* vegetables utilising the realised and expected rainfall.
 - Continue transplanting /line sowing of rice and transplanting of tomato, brinjal, cauliflower, cabbage and chilli in North Hill Zone and continue nursery sowing of rice, sowing of maize and urad in Bastar Plateau Zone of Chhattisgarh.
 - In Plain Zone of Chhattisgarh, there are chances of blast disease in rice nursery. Spray Carbendazim @ 1g or Tricyclozole @ 0.6 g per liter of water after current spells of rain.
- **Animal Husbandry**
 - In Madhya Pradesh and Chhattisgarh, supplement cattle feeds with vitamins and energy food material along with calcium content to dairy animals. Vaccinate the milch cattle against H.F. and B.Q disease. Provide four to five hours of bulb light in Poultry Farms.

NORTH INDIA [JAMMU & KASHMIR, HIMACHAL PRADESH, UTTARAKHAND, PUNJAB, HARYANA, DELHI, UTTAR PRADESH & RAJASTHAN]



Land Preparation

Sugarcane

Bottle Gourd

Onion

- **Realised Rainfall:** Rainfall occurred in all districts of Himachal Pradesh except Kinnaur and Lahaul and Spiti; Gurdaspur, Hoshiarpur, Moga, Nawashahar, Patiala, Ropar and Mohali districts of Punjab; Ambala, Chandigarh, Faridabad, Gurgaon, Jhajar, Kurukshetra, Mewat, Panchkkula, Rewari, Sonapat and Yamunanagar districts of Haryana; all districts of Delhi except North West Delhi; Jammu, Kathua, Reasi and Samba districts of Jammu & Kashmir; all districts of Uttar Pradesh except Gorakhpur, Kushinagar, Maharajganj, Firozabad, Gautam Buddha Nagar, Ghaziabad and Jalaun; all districts of Rajasthan except Alwar, Sirohi, Bikaner, Hanumangarh, Jaisalmer and Sri Ganganagar; all districts of Uttarakhand. Mainly dry weather prevailed over remaining parts of the region.
- **Weather Forecast:** Rain/thundershowers would occur at many places over Jammu & Kashmir, Himachal Pradesh and Uttarakhand during the period. Rain/thundershowers would occur at a few places over East Uttar Pradesh during next 48 hours and increase thereafter. Rain/thundershowers would occur at isolated places over Punjab, Haryana & Delhi and West Uttar Pradesh during next 24 hours and increase thereafter. Rain/thundershowers would occur at a few places over West Rajasthan during next 24 hours and at many places thereafter. Rain/thundershowers would occur at many places over East Rajasthan during next 24 hours and at a few places thereafter.
- **Weather Warning:** Heavy rainfall would occur at isolated places over Jammu division of Jammu & Kashmir, Himachal Pradesh and Uttarakhand during the period
- **Weather Outlook:** Increase in rainfall activity over western Himalayan Region. Scattered rainfall activity would occur

over plains of northwest India.

- **Advisories:**

- As rain/thundershowers would occur at many places in Jammu & Kashmir, Himachal Pradesh and Uttarakhand along with heavy rainfall at isolated places during the period, postpone irrigation, intercultural operations and application of fertilizers and plant protection measures in standing crops. Provide adequate drainage in crop fields to remove excess water.

- **Jammu & Kashmir:**

- Continue sowing of pulses like mash (var. Pant U-19, T-9) and moong (var. PDM-54, PS-16, PS-17, ML-131) in Intermediate Zone of Jammu & Kashmir, utilizing realized and expected rainfall.
- Due to prevailing humid weather conditions, there are chances of fruit borer in turmeric and cucurbits in Sub Tropical Zone of Jammu & Kashmir. To control, spray Ridomil MZ @ 2.5 g per litre of water after current spells of rain.
- Due to humid condition there are chances of aphid attack on vegetables, in Cold Arid Zone of Jammu & Kashmir. To control, apply Chloropyriphos 20EC @ 2 ml/litre of water, after current spells of rain

- **Himachal Pradesh:**

- Continue transplanting of rice, and complete sowing of mash and kulthi, in Mid-Hills Sub-Humid Zone and Sub-Montane & Low Hills Sub-Tropical Zone of Himachal Pradesh utilizing the realised and expected rainfall
- Undertake nursery sowing of cauliflower and transplanting of cabbage in Bilaspur district of Mid-Hills Sub-Humid Zone of Himachal Pradesh.
- Due to prevailing humid weather conditions, there are chances of attack of fruit borer in brinjal and bhindi in Mid-Hills Sub-Humid Zone and Sub-Montane & Low Hills Sub-Tropical Zone of Himachal Pradesh. Spray Cypermethrin @ 565 ml (Ripcord 10EC) or Deltamethrin (Desis 2.8EC) in 750 ml of water per hectare after current spells of rain. To control the leaf spot and fruit rot diseases in tomato, brinjal, capsicum and chilli, spray Metamil/Redomil MZ @2.5 g per litre of water after current spells of rain and repeat after 15 days.
- Due to prevailing humid weather conditions, there are chances of scab infestation in apple orchards in Mild Hills Sub-Humid Zone of Himachal Pradesh. Spray Miclobutanil (boon) @ 80g per 200 litres of water after current spells of rain.

- **Uttarakhand:**

- Complete transplanting of rice and maintain optimum water level. Complete sowing of sorghum, millets, groundnut, soybean and pigeon pea in Bhabar & Tarai Zone of Uttarakhand. Complete sowing of direct seeded rice with short duration varieties like Pant-4, Narendra-359, and Saket-4 etc. in Sub Humid Sub tropic Zone of Uttarakhand.
- In Sub Humid Sub Tropic Zone of Uttarakhand, complete transplanting of late sown rice. To control weeds, apply Butachlor @ 3 liter or Anilophos @ 1 litre with 700-800 litre of water 7 DAT as post emergent herbicides after current spells of rain.

- **Punjab, Haryana and Delhi:**

- In Western Zone of Punjab complete transplanting of rice with 25 to 30 days old seedlings utilizing realised rainfall, continue nursery sowing of basmati rice and complete sowing of okra and cow pea.
- In Sub-Mountane and Undulating Plain Zone of Punjab, continue transplanting of rice and complete sowing of maize and continue sowing of mung, mash and til..
- In Central Plain Zone and in Western Plain Zone of Punjab, complete transplanting of rice and continue sowing of okra, radish and cucurbits.
- In Central Plain Zone of Punjab, high humidity is favourable for stem and fruit rot in chilli, spray Indofil M-45 @750 g in 250 litres of water after current spells of rain.
- Due to partly cloudy weather, there are chances to occurrence of sucking pest viz. white fly and jassid in cotton in Western Zone of Punjab. Monitor the crops and if pest population reaches ETL level, then spray Oberon @200ml/acre for white fly and Ulala @ 80 g/acre for the management of jassid after current spells of rain.
- In Eastern Zone of Haryana, transplant one month old rice seedlings with irrigation. Undertake sowing of guar, bajra and pulses with realised rainfall.
- In Western Zone of Haryana, undertake sowing of guar, bajra, pulses, fodder crops such as jowar mixed with cowpea to increase the nutritive value for continuous supply of green fodder and complete transplanting of rice by the end of this month.
- In Delhi, undertake transplanting of rice, early cauliflower and brinjal. Undertake transplanting of brinjal, chilli and early cauliflower if the seedlings are ready. Undertake sowing of pigeon pea, maize, guar, bajra, cluster bean, spinach, amaranths, okra, cucurbits sweet corn, baby corn and soybean during the week with realised rainfall.

- **Uttar Pradesh:**

- In Central Plain Zone of Uttar Pradesh, continue transplanting of rice and complete sowing of, jowar, urad and mung utilizing the realized and expected rainfall. After 25-30 days of sowing, undertake top dressing of Nitrogen @ 15-20 kg per ha in cucurbits and @ 35-40 kg per ha in ladies finger.
- Continue sowing of groundnut, arhar, jowar, urd, moong, maize and soybean and land preparation for planting of fruit crops like mango, papaya, guava, etc. in Bundelkhand Zone of Uttar Pradesh utilizing the realized and

expected rainfall.

- In Western Plain Zone of Uttar Pradesh, continue sowing of guar, bajra, jowar and moong as fodder crops in uplands utilizing realized rainfall.
- Due to humid weather condition, there are chances of attack of white fly, jassids, thrips in ladies finger in Bundelkhand Zone of Uttar Pradesh. Spray Dimethoate 30 EC @ 800 ml per 800 litres of water after current spells of rain.
- Due to humid weather condition, there are chances of attack of stem borer or leaf roller in Maize in Central Plain Zone of Uttar Pradesh. Spray Phenitrothion 50 E.C. @ 500-700 ml in 700-800 litres of water per hectare or Quinolphos 25 E.C. @ 2 litres in 700-800 litres of water per hectare after current spells of rain.

▪ **Rajasthan:**

- As rain/thundershowers would occur at many places over West Rajasthan on 26th & 27th and over West Rajasthan on 25th July, postpone irrigation, intercultural operations and application of fertilizers and plant protection measures in standing crops.
- Complete sowing of short duration varieties of *kharif* crops like pearl millet, cowpea, green gram, moth bean and urad bean etc. in Semi Arid Eastern Plain Zone and also complete sowing of bajra, til, moong, urad and also undertake sowing of tomato, brinjal, cucumber in Flood Prone Eastern Plain Zone of Rajasthan, utilizing the realised and expected rainfall.
- Continue sowing of short duration varieties of soybean in Southern Humid Plain Zone of Rajasthan, utilizing the realised and expected rainfall.
- Continue sowing soybean, moong, urad, til, groundnut and arhar in South Eastern Humid Plain Zone utilizing the realised and expected rainfall.
- Continue sowing of short duration varieties of *kharif* crops along with intercropping like Maize-Urad (2:2), Maize-Moong/Cowpea (1:1) or Maize- Cluster bean (2:2) in Sub Humid Southern Plain and Aravali Hill Zone of Rajasthan, utilizing the realised and expected rainfall.
- Continue sowing of bajra, moong, moth, guar and til in Irrigated North Western Plain Zone & Arid Western Plain Zone of Rajasthan utilizing the realised and expected rainfall.
- Due to warm and humid climate, there is chances of white fly in cotton in Irrigated North Western Plain Zone of Rajasthan. To control spray Dryzophose @ 40 EC in 2,5 ml or Ectamipride @ 20 S.P in 0.4 mg per litre of water, after current spells of rain
- In view of subdued rain for sowing of *kharif* crops in Rajasthan, detailed agricultural operations is mentioned in Annexure I.
- Suitable short duration varieties are given in Annexure III.

• **Floriculture**

- Due to prevailing humid weather condition there are chances of attack of blue beetle in balsam, zenia, cleome and rose in Mid-Hills Sub-Humid Zone and Sub-Montane & Low Hills Sub-Tropical Zone of Himachal Pradesh. For control, spray Cypermethrin @ 20 ml in 10 litres of water after current spells of rain. In poly houses attack of thrips and mites is also expected. For control spray Rogor @ 20 ml in 10 litres of water for thrips and for beetle spray Diclofol @ 20 ml in 10 litres of water. To control thrips in tagets spray Rogor @ 20 ml in 10 litres of water

• **Horticulture**

- Continue planting of mango, guava and lemon saplings in Bhabar and Tarai Zone of Uttarakhand, utilizing realised and expected rainfall.
- Due to prevailing humid weather condition, there are chances of attack of citrus canker in horticultural crops like peach, pear, plum, almonds, apricot and apple in Mid-Hills Sub-Humid Zone of Himachal Pradesh. Spray Malathion @ 10 ml or Metasystox @ 10 ml per 10 litres after current spells of rain. Keep the basins of the plants free from weeds and arrange for drainage.
- Due to prevailing humid weather condition there be chance of Black tip disease in mango crop, to control spray borax @ 1 % or other alkaline solutions like caustic 0.8 % or washing soda 0.5 % regularly at 10 days interval in Sub Humid Sub Tropic Zone of Uttarakhand, after current spells of rain.

• **Animal Husbandary:**

- Keep cattle indoors during heavy rainfall periods in Uttarakhand, Himachal Pradesh and East Rajasthan.

WEST INDIA [GOA, MAHARASHTRA, GUJARAT]



Land Preparation/ Sowing

Sugarcane

Rice Nursery

Okra

- **Realised Rainfall:** : Rainfall occurred in all districts of Konkan & Goa; all districts of Vidarbha; all districts of Madhya Maharashtra except Ahmednagar and Solapur; Aurangabad district of Marathwada; all districts of Gujarat State except Kutch.
- **Weather Forecast:** Rain/thundershowers would occur at most places over Saurashtra & Kutch during next 24 hours and decrease thereafter. Rain/thundershowers would occur at many places over Gujarat region during next 24 hours and at a few places thereafter. Rain/thundershowers would occur at many places over Konkan & Goa; at a few places over Madhya Maharashtra and at isolated places over Marathwada during the period. Rain/thundershowers would occur at isolated places over Vidarbha during next 48 hours and at a few places thereafter.
- **Weather Warning:** Heavy rainfall would occur at isolated places over Saurashtra & Kutch on 25th July and over Konkan & Goa on 25th and 26th July.
- **Weather Outlook:** Rain/thundershowers would occur at many places over northeastern states and at most places along west coast.
- **Advisories:**
 - **Maharashtra:**
 - As rain would occur at many places over Konkan during the period along with heavy spells at isolated places on 25th and 26th July, postpone irrigation, intercultural operations, application of plant protection measures and fertilizers in the standing crops. Provide adequate drainage in crop fields to remove excess water.
 - In Konkan, drain out excess water from rice, finger millet and vegetable fields and postpone fertilizer application. Complete transplanting with 20-22 days old seedlings of rice and finger millet. Maintain water level upto 2-3 cm in early transplanted rice.
 - In Madhya Maharashtra complete transplanting of rice in Western parts of Kolhapur, Pune and Nasik districts. In north Madhya Maharashtra (Dhule, Nandurbar, Jalgaon and Ahmednagar), continue sowing of contingency kharif crops like sunflower (Bhanu and Phule Raviraj), bajra (hybrid varieties shraddha, shanti, saburi and improved varieties ICTP-8203 and ICMV-133), red gram (Vipula), bean (Varun) and sesame. Intercropping of pearl millet + redgram in 2:1, sunflower + redgram in 2:1, and guar + redgram in 2:1 ratios. In South Madhya Maharashtra except in Solapur district continue sowing of contingency crops like sunflower, sesame, pearl millet, red gram, horse gram and moth bean. Intercropping of pearl millet+redgram in 2:1, sunflower+redgram in 2:1, and guar+redgram in 2:1 ratios.
 - In Marathwada, continue sowing of contingency kharif crops like cotton, red gram(BSMR-736, BSMR-853), bajra (GHB-558, Shraddha, AHB-166) and sunflower in Aurangabad, Jalna and Hingoli districts. Adopt intercropping systems like cotton + pigeon pea (6:1), bajra + pigeon pea (3:3), etc. for minimizing risk.
 - In west Vidarbha, continue sowing of sunflower, red gram (PKV-Tara) short duration improved varieties. Intercropping of sunflower + red gram may be undertaken. In east Vidarbha, continue transplanting of rice.
 - Prevailing humid weather in Pune region is congenial for the incidence of Buck Eye Rot in premature tomato fruits; collect and destroy the infested fruits and spray Metalaxyl 8 % + Mancozeb 64 % @ 20 g per 10 litres of water with sticker on a non rainy day.
 - **Gujarat:**
 - Due to non-receipt of rainfall in earlier weeks in most of the districts of Gujarat, normal *kharif* crops like cotton, pigeon pea, castor, pearl millet and other crops could not be sown. As there is improvement in rainfall during last two weeks over Gujarat and likely to continue during next fortnight, contingency plan for different regions of Gujarat may be undertaken as given in Annexure I.
 - **Gujarat region:**
 - Rain/thundershowers would occur at many places over Gujarat region on 25th and at most /many places over Saurashtra & Kutch on 25th and 26th July along with heavy rainfall at isolated places on 25th July, postpone irrigation, intercultural operations and application of fertilizers and plant protection measures in standing crops. Provide adequate drainage in standing crops to remove excess water.
 - Continue sowing of soybean (cv. GS-1,GS-2, JS-335), short duration varieties of Sunflower (cv. Modern and EC-68414 and Guj-1) and Sesame (cv. Guj. Tal 1,2, 10), black gram (cv. T-9, Guj. Udid-1), Green gram (cv. GM-4, K-851, Meha), Cowpea (cv. Guj. Cowpea 1,2,4, Pusa Falguni), grain sorghum (cv. GJ-35,36 and 37) and fodder

sorghum (cv. S-1049, C-10-2, Gundari, GFS 4,5) to overcome future fodder shortages in South and Middle Gujarat Zone with realised and expected rainfall.

- In North Gujarat Zone, continue sowing of sesame varieties like GT-1, GT-2,GT-10, sunflower varieties like Modern, EC 68414 and fodder sorghum varieties like S-1049, C-10-2 and cotton varieties Hy-8, 10, V-797, G. Cot 13,21, 23 with realised and expected rainfall.
- As sufficient rainfall occurred during last week, carry out sowing of Green gram (K-581 and Gujarat Mung-4), black gram (Guj. Black Gram-1 and T-9 varieties), sesame (Guj.til-1 and Guj.til-2) in Bhal and Coastal Zone.
- Continue transplanting of rice seedlings at 4-5 leaves stage in South Gujarat Heavy Rainfall Zone utilising the realised and expected rainfall; undertake planting of ornamental and horticulture crops; remove excess water from sugarcane, vegetable nursery and ornamental and horticulture crop fields. Take suitable short duration intercrops in new orchards. Conserve runoff water in farm ponds.
- As onset of monsoon was delayed in Gujarat region, detailed contingency measures are given in Annexure I.
 - **Saurashtra & Kutch:**
 - Continue sowing of short duration Spanish bunch varieties of groundnut like GG-2, GG-5, GG-7 and TG 37 A, blackgram (T-9, Guj. Udid-1) and Greengram (GM-4, K-851, Meha), sorghum (for fodder purpose cv. CSH-6 and CFS-4), sesame (cv. Purva-1), cotton (G. cot-13, 21, 23, V-797), pigeon pea (cv. BDN-2,ICPL-87,GT-100, GT-101, Vaishali) in Saurashtra region. For Kutch region, Guar cv. Guj. Gaur 1 and 2 is specially recommended.
 - Cloudy weather condition is favourable for outbreak of sucking pest in vegetables in South Gujarat Heavy Rainfall Zone. To control, spray Dimethoate (40%) or Methyl-o-Demonate (25%) @10 ml in 10 lit. of water after current spells of rain.
 - Due to delayed onset of monsoon in Saurashtra and Kutch region, crops recommended for sowing are given in Annexure I.
 - Suitable varieties are given in Annexure III.
- **Animal Husbandry**
- In Gujarat, clean animal byres and spray neon insecticide 1 to 1.5 ml per liter of water for control ecto parasites in animal house. Spray phenyl in the animal shed to avoid flies, mosquitoes. Make arrangement for artificial light to birds to maintain egg production. Keep fodder in safe place to avoid spoilage due to rainfall.

Districtwise realised rainfall and % departure for past three weeks is given below in Annexure II.

Annexure I Contingency measures for the meteorological subdivisions

Interior Karnataka

Subdivision	Districts	Normal crops	Contingency crops
North Interior Karnataka	Bidar Bagalkote Dharwad Belgaum Bellary Koppal	Rice, sorghum, red gram, maize, soybean, black gram, sugarcane, cotton, greengram, groundnut	In view of subdued rainfall activity over Interior Karnataka, sowing of green gram and black gram now is not recommended in North Interior Karnataka. Instead onion, sesame, maize, sunflower, niger, castor, bajra, groundnut (spreading), redgram, desi cotton, horsegram, cowpea may be taken up for North Interior Karnataka, sowing of intercrops like, pearl millet + pigeonpea (2:1), pearl millet + castor (2:1), kharif sorghum + redgram (5:1), redgram + sesame (1:2 or 2:4); redgram + horsegram (2:1) is suggested to minimize risk from prevailing rainfall situations.
SIK	Chamrajnagar, Mandya, Mysore, Tumkur	Rice, Ragi, Groundnut, Jowar, Maize, green gram, black gram	<ul style="list-style-type: none"> • In South Interior Karnataka, sowing was delayed due to inadequate rainfall in major parts of interior districts. The following medium duration varieties are suggested for sowings beyond 20th July.

			<ul style="list-style-type: none"> • Groundnut - TMV-2, JL-24 and Chintamani-2 • Finger millet - Indaf- 8, MR-1, MR-2 and MR-6 • Maize - Ganga, Deccan, Vijaya composite and Composite NAC • Sunflower: KBSH-42 and KBSH-44
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Gujarat State

Subdivision	Normal crops	Contingency crops
South and Middle Gujarat region	Rice, groundnut, cotton, maize, soyabean	<ul style="list-style-type: none"> • Prefer soybean cv. GS-1,GS-2, JS-335. • Prefer short duration varieties in Sunflower (cv. Modern and EC-68414 and Guj-1) and Sesame (cv. Guj. Tal 1,2, 10), blackgram (cv. T-9, Guj. Udid-1), Greengram (cv. GM-4, K-851, Meha), Cowpea (cv. Guj. Cowpea 1,2,4, Pusa Falguni). • Sowing of grain Sorghum (cv. GJ-35,36 and 37) and Fodder sorghum (cv. S-1049, C-10-2, Gundari, GFS 4,5) is recommended to overcome future fodder shortages. • In paddy, varieties like GR-8,9, Sathi 34-36, Ambica and Gurjari can be transplanted up to 25th July.
North Gujarat region	Cotton, Pearl millet green gram, castor, sesame,	<ul style="list-style-type: none"> • In sesame varieties like GT-1, GT-2,GT-10, in sunflower - Modern, EC 68414 and in fodder sorghum - S-1049, C-10-2 are suggested. In cotton Hy-8, 10, V-797, G. Cot 13,21, 23 can be taken up.
Saurashtra region	Groundnut, cotton, Pearl millet green gram, castor, sesame,	<ul style="list-style-type: none"> • In groundnut, short duration Spanish bunch varieties like GG-2, GG-5, GG-7 and TG 37 A are recommended. • In blackgram, T-9, Guj. Udid-1 and Greengram - GM-4, K-851, Meha are suggested. • For fodder purpose, sorghum cv. CSH-6 and CFS-4 are recommended. • In sesame cv. Purva-1, in cotton - G. cot-13, 21, 23, V-797, in pigeonpea - cv. BDN-2,ICPL-87,GT-100, GT-101, Vaishali may be preferred. • For Kutch region, Guar cv. Guj. Gaur 1 and 2 specially for Kutch region.

Maharashtra

Subdivision	Normal crops/cut off dates	Contingency crops
Madhya Maharashtra	Soybean – June end Cotton - 15 July Jowar – 15 July Bajra – 15 July Groundnut – 7 July	In north Madhya Maharashtra (Dhule, Nandurbar, Jalgaon and Ahmednagar) undertake short duration improved variety of pearl millet, red gram, sunflower. Intercropping of pearlmillet+redgram in 2:1, sunflower+redgram in 2:1, and guar+redgram in 2:1 ratios. In South Madhya Maharashtra except in Solapur district undertake sowing of contingency crops like sunflower, sesame, pearl millet, red gram, horse gram and moth bean. Intercropping of pearlmillet+redgram in

		2:1, sunflower+redgram in 2:1, and guar+redgram in 2:1 ratios.
Marathwada	Soybean – 15 July Cotton – 15 July Jowar – 15 July Bajra – 30 July Red gram – 30 July Green gram – 7 July	Undertake delayed sowing of soyabean, red gram and bajara with short duration improved varieties in Aurangabad, Jalna and Hingoli districts. Adopt intercropping systems like cotton + pigeon pea (6:1), soybean + pigeonpea (4:2), bajra + pigeon pea (3:3), etc. for minimizing risk. In case of soybean varieties viz., MAUS 71, JS 335 may be chosen.
Vidarbha	East Vidarbha normal crop rice, red gram	Drilled rice with early maturing variety
	West Vidarbha normal crop cotton, soyabean and red gram.	Undertake sowing of sunflower, red gram and soyabean short duration improved varieties. Intercropping of sunflower + red gram in soyabean + red gram 2:1.

West Madhya Pradesh

Subdivision	Normal crops	Contingency crops
West Madhya Pradesh	Soybean, Maize, Paddy, Black gram, Cotton	sowing of soybean varieties like JS-95 60, IS 93 05, maize varieties like JVM 421, JM 12, sorghum varieties like JJ-938, JJ-1022, bajra varieties like JVB 3, JBV-2, red gram varieties like UPAS 120, Pusa 9, TJT 501, sunflower variety Modern, sesame variety TKG-8 and instead of cotton, varieties of black gram like T 9, JU 86 are advised.

Rajasthan

Subdivision	Normal Crops	Contingency crops
West Rajasthan	Bajra , Moth bean, Cluster bean, Mungbean	short duration varieties of Bajra (HHB-67, Improved, RHB-121, RHB-90 and Raj-171) can be sown upto 20 th July as these varieties mature in 65-80 days.
East Rajasthan	Pearl millet, Sesame , Moth bean, Maize, Green gram, Cluster bean, Sesame	Maize-Urad (2:2), Maize-Moong/Cowpea (1:1) or Maize- Cluster bean (2:2), Sorghum varieties CSH – 6, CSH – 14, Pratap jowar 1430, CSV-17, CSV-15, CSH-13, CSV- 13, RJ – 96 may be used at 25 % higher seed rate.

Andhra Pradesh

Subdivision	Normal Crops	Contingency crops
Coastal Andhra Pradesh	rice, groundnut, castor and cotton	<p>Direct seeding of rice may be taken up with short duration varieties under dry conditions and later converted to wet paddy after receipt of good rainfall.</p> <p>In NSP command areas of Guntur, Krishna and Prakasam districts as there is no water in reservoirs and chances of release of water in canals are bleak, farmers are advised to go for rainfed crops like maize, cotton, redgram, greengram wherever feasible.</p> <p>In Prakasam districts, farmers are advised to adopt closure spacing for cotton and redgram sole crops and form dead furrows for moisture conservation.</p>
Telangana	<p>Red gram, green gram and castor- end of July.</p> <p>Cotton- middle of August</p>	Undertake sowing of cotton, maize, groundnut and pulses utilizing realised rainfall.
Rayalaseema	<p>Groundnut- 15th August</p> <p>Red gram –end of July</p> <p>Sunflower</p>	Undertake intercropping of red gram + groundnut, castor and cotton. In Anantpur district undertake sowing of groundnut and bajra.

Source: CRIDA, ICAR

Annexure II Week by week Rainfall Distribution

Sub-Divisions	09.07.14		16.07.14		23.07.14	
	Actual (mm)	% dep.	Actual (mm)	% dep.	Actual (mm)	% dep.
Arunachal Pradesh						
Anjaw	**	**	**	**	**	**
Changlang	122.0	16	34.3	-68	76.0	-28
Dibang Valley	0.0	-100	**	**	**	**
East Kameng	18.3	-77	5.9	-94	20.1	-76
East Siang	287.5	37	23.0	-91	127.2	-39
Kurung Kumey	**	**	**	**	**	**
Lohit	83.2	-34	15.4	-89	91.5	-50
Lower Dibang Valley	204.6	153	36.1	-19	130.3	133
Lower Subansari	**	**	**	**	**	**
Papumpara	118.4	-31	250.8	95	173.8	17
Tawang	85.0	-50	105.0	-50	142.0	1
Tirap	11.0	-93	109.6	-43	45.6	-77
Upper Siang	160.5	1	128.6	-12	68.6	-49
Upper Subansari	51.0	-10	58.0	-1	79.6	95
West Kameng	129.0	-24	64.0	-70	207.8	48

West Siang	92.7	-7	243.7	45	204.5	64
Assam&Meghalaya						
Assam						
Baksa	42.0	-81	48.2	-67	26.4	-84
Barpeta	97.3	-57	109.5	-24	100.2	-38
Bongaigaon	221.8	-2	89.7	-46	155.0	-9
Cachar	83.3	-26	165.2	39	60.4	-53
Chirang	217.9	-4	119.5	-29	185.9	9
Darrang	24.0	-71	56.0	-38	8.0	-88
Dhemaji	157.0	5	59.0	-61	39.0	-66
Dhubri	84.6	-23	32.9	-76	53.7	-53
Dibrugarh	26.3	-77	89.0	-28	35.8	-71
Goalpara	99.2	-18	163.3	47	63.4	-38
Golghat	30.1	-58	75.8	-1	64.7	-14
Hailakandi	51.7	-38	217.1	127	110.1	9
Jorhat	22.3	-77	55.3	-39	102.2	20
Kamrup(Rural)	11.0	-88	60.6	-26	6.2	-92
Kamrup(Metro)	28.1	-68	76.2	-7	12.3	-84
Karbi Anglong	54.5	-1	88.4	74	69.6	41
Karimganj	153.3	-1	108.8	-30	56.7	-57
Kokrajhar	98.4	-62	109.1	-25	155.9	-18
Lakhimpur	113.3	-25	156.0	3	146.7	28
Morigaon	16.0	-82	54.6	-41	16.8	-75
N.C.Hills	63.3	34	108.6	73	41.9	-21
Nowgong	39.3	-36	100.7	12	22.9	-70
Nalbari	108.0	-9	100.0	-16	54.5	-40
Sonitpur	52.5	-41	72.8	-23	74.4	-5
Sibsagar	24.0	-75	76.2	-9	100.5	42
Tinsukia	59.2	-44	44.8	-65	37.8	-67
Udalgiri	56.6	-31	48.6	-46	138.0	103
Meghalaya						
East Garo Hills	429.7	381	25.3	-76	52.4	-51
East Khasi Hills	676.5	85	153.8	-62	116.9	-63
Jaintia Hills	**	**	**	**	**	**
Ribhoi	51.7	-47	50.2	-37	4.1	-96
South Garo Hills	167.0	62	34.0	-69	117.0	13
West Garo Hills	48.0	-53	40.6	-63	44.8	-57
West Khasi Hills	**	**	**	**	**	**
NMMT						
Mizoram						
Aizwal	8.1	-90	207.2	76	23.9	-75
Champhai	**	**	**	**	**	**
Kolasib	**	**	**	**	**	**
Lawngtlai	**	**	**	**	**	**
Lunglei	**	**	**	**	**	**
Mamit	4.0	-95	**	**	**	**
Saiha	39.0	-58	85.0	-14	76.0	-17
Serchhip	12.0	-88	33.0	-69	31.8	-68
Manipur						

Bishnupur	**	**	**	**	**	**
Chandel	12.0	-91	32.0	-78	80.0	-26
Churachandpur	17.0	-80	19.0	-81	12.0	-86
Imphal east	20.5	-75	12.3	-84	32.0	-53
Imphal west	103.0	79	33.3	-41	163.9	208
Senapati	17.0	-78	4.0	-95	1.0	-99
Tamenglong	**	**	**	**	**	**
Thoubal	3.0	-91	**	**	**	**
Ukhrul	**	**	**	**	**	**
Nagaland						
Dimapur	23.4	-44	55.5	-5	37.4	64
Kephire	**	**	**	**	**	**
Kohima	24.8	-68	47.5	-41	117.0	42
Longleng	**	**	**	**	**	**
Mokokchung	24.0	-88	21.0	-78	6.0	-94
Mon	**	**	**	**	**	**
Paren	**	**	**	**	**	**
Phek	43	-44	5	-94	107	30
Tuensang	**	**	**	**	**	**
Wokha	**	**	**	**	**	**
Zunheboto	**	**	**	**	**	**
Tripura						
Dhalai	0.0	-100	84.5	6	20.0	-76
North tripura	37.3	-55	132.0	31	27.2	-70
South tripura	77.3	-37	28.7	-76	28.9	-74
West tripura	66.6	-25	33.0	-66	16.5	-82
Himachal Pradesh						
Bilaspur	35.9	-45	25.8	-59	54.1	-26
Chamba	21.5	-73	60.8	-55	31.9	-80
Hamirpur	24.7	-60	112.5	33	68.8	-31
Kangra	35.8	-62	196.1	42	51.3	-65
Kinnaur	0.0	-100	0.0	-100	23.4	14
Kullu	13.1	-58	17.6	-56	45.2	-17
Lahaul and Spiti	3.2	-89	14.2	-62	9.9	-75
Mandi	23.2	-66	91.1	2	87.3	-16
Shimla	25.4	-38	16.1	-70	109.3	77
Sirmaur	25.2	-73	125.5	5	154.5	23
Solan	42.1	-42	55.7	-35	137.9	39
Una	10.8	-86	87.7	10	103.5	31
Punjab						
Amritsar	0.8	-98	0.0	-100	23.0	-56
Barnala	0.0	-100	0.0	-100	5.9	-79
Bhatinda	41.0	161	0.0	-100	17.9	-42
Faridkot	17.5	-8	0.0	-100	2.0	-94
Fatehgarh Saheb	0.0	-100	0.0	-100	25.3	-34
Ferozpur	7.3	-67	0.0	-100	3.9	-88
Gurdaspur	11.6	-77	95.3	22	38.7	-54
Hoshiarpur	1.5	-97	44.6	-28	38.3	-43
Jalandhar	0.0	-100	1.8	-96	17.5	-66

Kapurthala	0.2	-99	0.0	-100	18.4	-59
Ludhiana	9.1	-78	0.1	-99	22.7	-50
Mansa	9.5	-46	0.0	-100	0.0	-100
Moga	2.1	-91	0.0	-100	44.0	91
Muktesar	57.7	224	0.0	-100	8.8	-74
Nawashahar	11.9	-84	1.2	-99	80.6	30
Patiala	0.0	-100	4.0	-94	32.2	-32
Ropar	8.8	-82	15.1	-80	34.3	-49
Sangrur	0.5	-98	0.4	-99	11.5	-66
Mohali	6.7	-87	2.0	-97	87.8	71
TarnTaran	0.3	-99	0.0	-100	17.1	-52
Haryana,Chd,Delhi						
Haryana						
Ambala	12.0	-81	12.6	-84	102.8	46
Bhiwani	8.3	-59	0.0	-100	20.0	-35
Chandigarh	9.7	-87	0.1	-99	74.8	41
Faridabad	10.5	-69	19.3	-68	115.8	152
Fatehabad	6.5	-64	0.0	-100	4.5	-81
Gurgaon	33.2	9	2.6	-95	55.6	35
Hissar	13.4	-36	0.0	-100	7.5	-76
Jhajar	21.6	-9	1.0	-98	54.0	52
Jind	14.2	-41	10.5	-77	18.5	-38
Katihai	4.9	-76	1.2	-97	16.3	-49
Karnal	7.2	-84	0.3	-99	29.3	-15
Kurukshetra	5.5	-87	1.0	-98	32.0	-36
Mahendragarh	7.9	-65	0.0	-100	26.7	-36
Mewat	13.9	-46	0.5	-99	75.2	85
Palwal	8.8	-72	0.0	-100	24.3	-37
Panchkkula	6.5	-90	3.7	-95	79.7	1
Panipat	2.4	-92	0.4	-99	21.1	-44
Rewari	28.6	51	0.0	-100	37.2	-18
Rohtak	1.8	-94	0.0	-100	12.0	-76
Sirsa	21.8	35	0.0	-100	0.4	-99
Sonepat	8.6	-72	0.0	-100	33.9	-28
Yamunanagar	3.5	-93	12.4	-81	131.6	64
Delhi						
Central Delhi	30.0	-29	3.0	-95	88.0	56
East Delhi	5.0	-88	10.0	-85	36.0	-36
New Delhi	20.5	-51	25.4	-62	60.1	6
North Delhi	41.9	0	2.1	-97	31.3	-45
North East Delhi	5.0	-88	60.0	-9	45.0	-20
North West Delhi	15.7	-63	0.0	-100	19.7	-65
South Delhi	12.2	-71	7.2	-89	66.7	18
South West Delhi	16.0	-62	7.5	-89	84.8	50
West Delhi	28.0	-33	0.0	-100	56.0	-1
Jammu & Kashmir						
Anantnag	20.3	37	4.6	-76	14.6	-30
Badgam	36.0	480	5.1	-68	10.6	-7
Bandipore	**	**	**	**	**	**

Baramula	17.5	2	11.2	-47	6.6	-67
Doda	2.8	-86	34.8	13	12.2	-67
Ganderbal	19.8	96	1.2	-92	13.2	-2
Jammu	2.7	-95	51.6	-37	39.7	-50
Kargil	**	**	**	**	**	**
Kathua	7.8	-89	73.8	4	38.2	-62
Kistwar	**	**	**	**	**	**
Kulgam	15.2	3	3.7	-80	4.0	-81
Kupwara	25.0	58	3.0	-72	12.2	-21
Ladakh(Leh)	4.3	77	0.0	-100	1.5	-57
Poonch	0.0	-100	7.8	-90	12.4	-87
Pulwama	12.7	10	13.0	-29	4.1	-75
Rajouri	20.4	-56	26.5	-50	27.5	-63
Ramban	13.1	-35	7.1	-77	9.6	-74
Reasi	29.4	-62	203.3	90	88.9	-30
Samba	28.9	-44	7.7	-91	35.9	-55
Shopian	20.0	74	9.0	-51	6.0	-63
Srinagar	37.7	273	6.6	-55	11.2	-17
Udhampur	5.2	-93	22.8	-79	28.4	-78
East Madhya Pradesh						
Anuppur	36.5	-62	93.6	-2	138.5	68
Balaghat	34.4	-66	83.3	-27	245.4	115
Chhatarpur	32.2	-53	49.0	-22	101.8	29
Chindwara	14.8	-80	50.7	-20	193.1	205
Damoh	16.2	-77	29.0	-64	100.7	19
Dindori	6.3	-94	92.2	-16	134.1	47
Jabalpur	2.5	-97	91.7	14	158.4	100
Katni	68.5	-9	28.6	-67	176.6	123
Mandla	8.0	-92	99.8	-2	194.9	105
Narsingpur	28.0	-66	99.6	27	194.4	143
Panna	21.3	-73	42.9	-44	91.4	-2
Rewa	63.4	11	20.6	-71	128.3	79
Sagar	24.1	-69	67.2	-17	134.9	62
Satna	64.1	1	27.8	-54	118.5	60
Seoni	15.8	-81	62.8	-27	222.5	191
Shahdol	21.0	-74	31.0	-59	64.0	-13
Sidhi	68.6	-7	20.2	-75	95.0	49
Singrauli	18.0	-61	1.0	-98	90.0	86
Tikamgarh	10.1	-82	53.0	-10	173.5	129
Umaria	19.5	-74	72.3	-11	55.6	-34
West Madhya Pradesh						
Alirajpur	0.0	-100	46.3	-21	80.5	16
Asoknagar	12.0	-81	87.5	49	109.8	16
Badwani	0.0	-100	65.9	53	68.9	44
Betul	40.4	-37	110.3	77	335.0	417
Bhind	5.0	-89	17.1	-67	37.3	-35
Bhopal	42.4	-43	57.5	-12	178.5	140
Burhanpur	25.8	-46	95.3	101	300.0	520
Datia	8.3	-83	45.2	-15	113.9	71

Dewas	0.0	-100	115.7	74	80.2	20
Dhar	0.0	-100	60.5	2	77.7	28
Guna	7.9	-89	46.4	-25	134.8	44
Gwalior	13.3	-74	49.0	-14	83.7	25
Harda	64.9	-6	88.5	18	88.2	12
Hosangabad	27.5	-70	114.7	22	150.8	68
Indore	0.9	-98	77.4	37	88.0	52
Jhabua	0.3	-99	83.7	81	36.5	-40
Khandwa	98.0	72	154.0	168	239.3	301
Khargone	5.4	-88	112.6	120	112.4	116
Mandsaur	1.1	-98	26.9	-52	114.1	87
Morena	6.3	-84	4.8	-90	35.3	-47
Neemuch	0.0	-100	86.1	65	49.8	-12
Raisen	12.7	-85	112.8	49	181.6	99
Rajgarh	1.1	-98	83.9	32	226.1	219
Ratlam	0.0	-100	49.7	-18	78.3	24
Sehore	23.9	-65	135.8	81	144.0	76
Shajapur	11.5	-81	84.4	45	107.9	65
Sheopur Kalani	7.0	-85	4.5	-94	97.5	50
Shivpuri	38.3	-26	36.3	-32	126.6	61
Ujjain	0.0	-100	90.3	67	90.8	65
Vidisha	12.6	-84	72.5	5	126.4	41
Chhattisgarh						
Bastar	31.2	-59	62.1	-17	195.7	128
Bijapur	32.9	-67	181.2	110	260.8	135
Bilaspur	55.8	-30	88.2	9	125.8	54
Dantewara	19.3	-78	140.6	55	154.7	39
Dhamtari	2.8	-96	37.0	-52	388.6	370
Durg	57.0	-31	122.7	94	278.3	285
Janjgir	32.7	-63	100.5	7	127.0	48
Jashpurnagar	20.2	-82	48.3	-45	72.4	-27
Kanker	80.7	3	119.4	48	393.8	333
Korba	24.3	-75	81.6	-15	142.5	63
Koriya	61.9	-28	120.5	21	135.7	62
Kawardha	18.7	-70	231.2	258	125.8	103
Mahasumund	4.8	-94	89.8	27	372.3	404
Narayanpur	18.7	-77	138.4	66	245.5	122
Raigarh	26.8	-71	116.9	39	160.9	88
Raipur	14.6	-82	108.6	31	232.7	201
Rajandgaon	25.2	-67	145.9	84	255.9	226
Surguja	29.3	-65	30.6	-69	90.2	-2
East Uttar Pradesh						
Allahabad	48.5	-5	14.5	-79	101.9	67
Ambedkar Nagar	134.3	138	12.0	-84	152.0	76
Azamgarh	40.2	-42	16.3	-80	89.3	-3
Bahraich	378.5	516	44.7	-50	79.2	-14
Ballia	65.2	14	7.6	-91	70.1	-5
Balrampur	122.9	119	82.1	-29	44.8	-56
Banda	6.2	-89	5.8	-91	46.9	-17

Barabanki	195.2	243	27.8	-68	68.2	-11
Basti	120.7	96	7.5	-90	112.9	20
Chandauli	36.4	-35	97.2	8	56.0	-22
Deoria	34.5	-40	9.5	-89	33.0	-58
Faizabad	89.1	41	1.5	-99	43.5	-53
Farrukhabad	12.0	-74	2.8	-96	42.7	-14
Fatehpur	32.4	-39	3.2	-96	83.7	60
Gazipur	58.6	5	33.5	-51	73.2	15
Gonda	95.9	69	2.6	-97	83.9	-8
Gorakhpur	67.6	2	14.7	-84	25.0	-75
Hardoi	16.8	-65	7.2	-90	42.2	-30
Jaunpur	58.9	-6	12.6	-85	78.2	6
Kannauj	8.5	-82	0.0	-100	66.2	33
Kanpur City	15.8	-59	40.8	-21	86.8	51
Kanpur Dehat	2.0	-94	5.8	-90	58.7	-9
Kaushambi	41.2	-19	0.0	-100	70.6	36
Kheri	155.1	115	86.0	15	77.2	16
Kushi nagar	32.8	-53	5.5	-95	7.5	-91
Lucknow	64.1	33	25.5	-63	180.1	213
Maharajganj	36.0	-53	4.0	-96	19.5	-82
Mau	32.0	-44	0.0	-100	49.5	-47
Mirzapur	74.7	23	2.3	-97	162.5	134
Pratapgarh	66.7	8	13.3	-80	156.3	122
RaiBareilly	140.6	166	1.2	-98	111.7	99
Sahuji Maharajnagar	16.7	-72	2.5	-96	56.5	-19
Sant Kabirnnagar	97.0	57	15.0	-85	42.0	-56
Sant Ravidas Nagar	50.0	-10	0.0	-100	238.0	231
Shrawasti	287.0	367	163.9	85	111.6	21
Sidharthnagar	70.5	18	18.5	-81	39.5	-58
Sitapur	136.8	146	17.1	-76	75.7	16
Sonbhadra	24.2	-61	14.8	-80	57.9	-11
Sultanpur	71.6	11	3.3	-96	86.5	21
Unnao	26.8	-41	22.8	-66	108.5	75
Varanasi	74.7	21	17.0	-81	219.6	185
West Uttar Pradesh						
Agra	9.4	-75	13.3	-77	40.9	-30
Aligarh	13.2	-69	1.3	-98	76.5	60
Auraiya	0.0	-100	23.5	-63	60.3	17
Badaun	2.2	-96	0.0	-100	56.0	11
Baghpat	13.2	-65	0.0	-100	54.9	41
Bareilly	21.8	-61	21.3	-72	121.8	100
Bijnor	3.6	-94	5.5	-93	262.2	224
Bulandsahar	0.0	-100	3.2	-94	60.4	20
Etah	0.5	-99	0.7	-99	52.0	15
Etawah	0.5	-99	13.9	-73	44.6	-18
Firozabad	10.0	-73	5.7	-90	21.1	-63
GBNagar	12.0	-64	0.0	-100	15.5	-65
Ghaziabad	0.0	-100	0.0	-100	25.1	-47
Hamirpur	9.0	-80	2.3	-96	65.8	0

Jalaun	4.2	-91	33.6	-39	20.6	-67
Jhansi	8.4	-86	26.5	-55	90.7	47
Jotiba Phule Nagar	0.5	-99	8.0	-89	106.5	106
Kanshiramnagar	0.0	-100	0.0	-100	57.5	14
Lalitpur	29.5	-52	43.0	-32	159.0	88
Mahamaya Nagar	11.5	-69	15.5	-76	47.0	4
Mahoba	3.0	-94	8.4	-83	64.4	5
Mainpuri	1.5	-97	22.8	-60	31.4	-34
Mathura	1.0	-97	0.0	-100	32.3	-36
Meerut	2.8	-95	0.0	-100	82.0	37
Moradabad	8.9	-86	10.0	-85	211.9	244
Muzzaffarnagar	1.0	-98	0.0	-100	104.7	107
Pilibhit	41.7	-39	13.2	-82	102.2	48
Rampur	2.4	-97	6.9	-91	94.6	42
Saharanpur	1.7	-97	0.0	-100	76.0	43
Shahjahanpur	55.3	-12	67.5	-3	71.2	10
Uttarakhand						
Almora	3.3	-95	75.5	11	249.4	274
Bageshwar	8.0	-87	148.7	119	254.9	282
Chamoli	35.9	-32	120.1	78	116.5	54
Champawat	45.5	-51	67.5	-45	397.5	272
Dehradun	66.5	-45	194.1	23	132.4	-26
Garhwal Pauri	1.9	-98	90.8	-21	135.3	36
Garhwal Tehri	16.5	-74	104.9	17	148.7	69
Haridwar	4.9	-93	35.7	-55	193.0	203
Nainital	25.8	-75	114.7	-16	486.7	327
Pithoragarh	27.3	-76	93.5	-18	218.6	71
Rudraprayag	42.1	-59	182.1	56	152.0	6
Udham Sing Nagar	70.5	-17	65.4	-42	226.6	198
Uttarkashi	45.1	-39	134.1	56	120.0	21
Bihar						
Araria	67.7	-18	36.8	-67	63.6	-42
Arwal	67.2	49	2.4	-97	25.5	-48
Aurangabad	107.3	79	4.0	-95	79.1	18
Banka	236.8	325	47.2	-39	105.0	88
Begusarai	285.0	338	0.0	-100	66.7	36
Bhabua	41.5	-34	30.0	-66	110.2	55
Bhagalpur	242.2	260	26.2	-64	56.8	0
Bhojpur	168.8	160	4.2	-96	6.0	-92
Buxar	27.3	-51	23.8	-72	11.2	-83
Darbhanga	122.3	92	24.4	-65	19.9	-65
East Champaran	81.4	23	5.3	-93	43.6	-53
Gaya	161.0	167	2.7	-97	64.7	1
Gopalganj	73.1	6	9.7	-88	6.4	-90
Jahanabad	103.5	84	2.3	-97	95.9	112
Jamui	238.4	238	19.5	-77	66.2	8
Kathihar	47.7	-40	10.7	-89	43.8	-36
Khagadia	207.5	202	41.2	-55	75.9	38
Kishanganj	90.3	-32	83.5	-40	59.6	-57

Lakhisarai	290.0	320	0.0	-100	50.0	-7
Madhepura	108.3	14	4.5	-96	14.1	-81
Madhubani	130.4	53	1.0	-99	15.8	-81
Monghyar	238.8	246	22.9	-72	90.1	67
Muzaffarpur	124.7	92	3.5	-95	14.4	-81
Nalanda	143.3	147	3.7	-95	54.1	-5
Nawada	146.4	98	4.5	-94	21.8	-66
Patna	112.6	58	15.8	-83	16.3	-76
Purnea	46.4	-49	21.5	-83	139.0	51
Rohtas	52.1	1	1.7	-98	91.2	70
Saharsha	138.0	10	0.0	-100	4.0	-96
Samstipur	170.4	187	6.7	-93	47.4	-29
Saran	92.7	13	5.3	-94	11.2	-82
Sheikpura	210.9	238	19.6	-79	53.0	14
Sheohar	126.6	45	0.0	-100	23.6	-71
Sitamarhi	75.0	-14	3.5	-95	9.3	-89
Siwan	101.8	42	6.3	-93	51.5	-24
Supaul	98.8	22	7.5	-92	19.8	-76
Vaishali	111.5	40	1.2	-99	32.6	-57
West Champaran	67.4	-22	53.2	-49	110.3	21
Jharkhand						
Bokaro	197.5	210	43.2	-36	96.4	17
Chatra	103.5	46	2.3	-97	45.0	-44
Deoghar	247.5	275	33.1	-53	166.3	126
Dhanbad	109.9	37	40.0	-41	67.7	-16
Dumka	118.6	72	16.9	-80	39.7	-48
East Singbhum	76.6	20	83.1	22	61.5	-13
Garhwa	26.8	-48	9.5	-86	60.8	-16
Giridih	206.0	184	27.7	-62	62.6	-30
Godda	160.2	150	9.8	-88	48.9	-22
Gumla	40.6	-56	52.3	-35	164.3	95
Hazaribagh	236.8	272	25.1	-66	64.0	-21
Jamtara	110.7	24	26.1	-65	44.1	-45
Khunti	56.0	-38	47.0	-42	164.5	101
Koderrna	272.9	297	34.5	-46	72.2	2
Latehar	86.9	26	4.6	-94	97.9	9
Lohardagga	44.4	-19	14.3	-78	87.4	3
Pakur	222.3	179	35.4	-67	92.9	12
Palamau	82.1	38	7.7	-90	106.7	38
Ramgarh	107.6	59	63.8	-4	23.2	-75
Ranchi	95.2	15	22.3	-74	49.5	-46
Sahebganj	183.6	95	58.2	-42	106.0	31
Saraikela	110.4	54	43.0	-35	104.0	25
Simdega	15.5	-84	63.6	-39	139.3	22
West Singbhum	65.2	-19	83.2	23	160.0	125
East Rajasthan						
Ajmer	0.0	-100	42.3	-7	46.1	-5
Alwar	21.6	-31	3.9	-92	28.7	-48
Banswara	0.0	-100	56.0	-9	63.9	10

Baran	3.7	-93	48.5	-20	195.9	121
Bharatpur	36.2	23	2.1	-96	57.4	19
Bhilwara	0.3	-99	54.1	5	33.2	-39
Bundi	0.0	-100	21.9	-61	56.2	-19
Chittorgarh	1.2	-97	56.3	1	55.9	-3
Dausa	16.8	-47	4.8	-93	60.6	-15
Dholpur	13.7	-62	0.0	-100	51.0	-2
Dungarpur	0.0	-100	78.8	52	72.5	67
Jaipur	9.1	-64	13.6	-75	64.8	-1
Jhalawar	1.6	-97	48.1	-9	122.3	60
Jhunjhunu	23.3	12	1.8	-95	57.3	12
Karauli	9.2	-67	8.6	-84	69.2	2
Kota	0.8	-98	47.4	-16	95.6	23
Pratapgarh	0.0	-100	44.2	-21	85.0	42
Rajsamand	0.0	-100	62.0	38	34.6	-14
Sawai Madhopur	2.9	-93	13.4	-77	79.1	5
Sikar	24.3	0	6.1	-84	83.3	45
Sirohi	0.0	-100	35.2	-47	23.6	-69
Tonk	2.1	-94	15.6	-72	69.4	6
Udaipur	0.0	-100	62.2	28	79.2	75
West Rajasthan						
Barmer	0.0	-100	0.4	-98	52.4	165
Bikaner	5.2	-64	0.4	-98	14.3	-48
Churu	13.4	-38	2.2	-93	73.9	90
Hanumangarh	13.9	-21	0.0	-100	28.9	1
Jaisalmer	0.0	-100	0.0	-100	8.8	-41
Jalore	0.0	-100	5.3	-85	56.5	75
Jodhpur	0.0	-100	5.2	-80	33.4	17
Nagaur	5.9	-73	11.6	-67	71.4	33
Pali	0.0	-100	40.8	4	38.8	-12
Sri Ganganagar	1.5	-89	0.0	-100	16.2	-32
Gujarat Region						
Ahmedabad	0.0	-100	18.8	-62	81.8	68
Anand	0.0	-100	27.8	-54	135.6	107
Banaskantha	0.0	-100	16.8	-67	47.0	8
Baroda	3.1	-96	36.7	-49	85.4	7
Broach	0.1	-99	24.9	-57	83.1	36
DNH	70.6	-64	204.1	5	318.0	56
Dahod	0.0	-100	30.4	-45	51.1	-16
Daman	74.6	-62	378.2	94	235.0	15
Dangs	19.0	-88	2.5	-98	163.0	4
Gandhinagar	0.0	-100	7.3	-88	64.6	-2
Kheda	0.0	-100	10.3	-85	58.6	-5
Mehsana	0.0	-100	15.1	-75	75.4	46
Narmada	1.4	-98	45.2	-51	73.4	-13
Navsari	49.8	-71	87.5	-47	147.2	-5
Panchmahal	0.0	-100	27.2	-63	78.3	23
Patan	0.0	-100	13.1	-73	36.9	-14
Sabarkantha	0.0	-100	47.3	-28	148.6	144

Surat	6.0	-95	16.9	-85	101.9	-7
Tapi	10.8	-92	4.0	-97	114.8	2
Valsad	52.3	-68	181.2	-2	244.7	44
S K & Diu region						
Amreli	1.2	-97	59.5	40	50.5	9
Bhavnagar	0.3	-99	28.7	-24	59.2	49
Diu	1.8	-98	60.8	3	154.9	142
Jamnagar	0.0	-99	27.4	-37	70.0	23
Junagarh	4.8	-94	84.4	29	78.5	-12
Kutch	0.2	-99	0.9	-98	18.7	-52
Porbandar	0.0	-100	99.6	64	41.6	-49
Rajkot	0.2	-99	31.7	-36	57.5	5
Surendranagar	0.0	-100	33.2	-1	53.7	15
Maharashtra & Goa						
Konkan & Goa						
Mumbai City	366.9	91	691.3	335	83.4	-54
Mumbai Suburban	403.9	110	522.6	229	135.4	-26
North Goa	149.5	-40	522.0	111	272.5	-4
Raigad	144.0	-49	449.6	82	313.9	16
Ratnagiri	160.4	-43	565.3	130	330.2	20
Sindhudurg	168.4	-30	646.5	191	249.5	-4
South Goa	164.7	-21	517.3	131	183.0	-26
Thane	111.4	-50	265.5	12	245.1	17
Madhya Maharashtra						
Ahmednagar	22.1	-2	6.9	-69	12.5	-45
Dhule	0.0	-100	33.2	-16	71.5	87
Jalgaon	7.6	-81	52.6	22	83.4	96
Kolhapur	27.5	-84	181.1	18	280.7	61
Nandurbar	0.0	-100	21.0	-70	77.5	12
Nasik	17.8	-74	23.1	-69	127.7	83
Pune	13.2	-82	34.5	-51	139.5	107
Sangli	23.0	-36	27.7	-13	74.9	109
Satara	12.1	-79	47.3	-15	130.1	114
Solapur	47.9	175	11.3	-46	6.2	-72
Marathwada						
Aurangabad	26.8	-11	37.3	13	35.2	0
Beed	60.6	121	9.6	-64	6.7	-78
Hingoli	12.7	-75	23.1	-57	29.6	-43
Jalna	23.8	-27	30.0	-14	23.9	-34
Latur	66.7	51	24.9	-37	7.9	-83
Nanded	17.8	-64	24.9	-49	16.5	-71
Usmanabad	73.7	135	32.7	21	3.9	-89
Parbhani	31.5	-29	20.4	-50	11.1	-76
Vidarbha						
Akola	22.5	-49	33.4	-38	154.8	153
Amraoti	21.2	-60	63.3	4	193.0	225
Bhandara	25.6	-70	85.2	-5	295.8	277
Buldhana	11.9	-69	34.2	-19	77.6	69
Chandrapur	25.6	-70	94.2	6	142.7	83

Gadchiroli	32.0	-66	128.7	20	213.4	100
Gondia	20.9	-79	123.0	29	345.9	271
Nagpur	11.3	-84	126.4	73	225.9	229
Wardha	11.3	-81	112.7	64	193.2	229
Washim	24.0	-53	25.6	-57	99.6	68
Yeotmal	13.6	-76	43.0	-34	101.3	60
Odisha						
Angul	67.4	-4	114.8	53	205.6	131
Balasore	29.4	-46	100.5	96	192.6	118
Bargarh	32.3	-60	160.9	103	244.8	193
Bhadrak	28.0	-53	102.3	63	137.0	104
Bolangir	30.4	-63	112.1	22	205.7	123
Boudh	49.9	-33	154.5	127	178.0	123
Cuttack	45.9	-38	130.7	89	202.8	159
Deogarh	52.7	-47	104.2	20	175.0	76
Dhenkanal	78.9	33	124.3	90	197.3	112
Gajapati	25.7	-24	118.8	118	115.4	61
Ganjam	32.5	2	47.5	-6	161.8	206
Jagatsingpur	48.7	9	117.5	83	210.4	171
Jajpur	30.1	-41	78.8	22	173.5	145
Jharsuguda	32.2	-67	112.4	21	160.4	61
Kalahandi	8.8	-89	85.4	8	259.4	172
Kandhamal	19.2	-74	130.3	92	270.3	239
Kendrapara	14.3	-76	67.3	16	192.0	212
Keonjhar	36.1	-32	62.8	4	250.9	238
Khurda	60.1	4	69.2	-1	162.1	98
Koraput	19.4	-75	190.6	122	95.0	1
Malkangiri	5.0	-94	279.4	225	96.6	-27
Mayurbhanj	72.1	20	85.5	19	145.4	46
Nawapara	46.4	-49	75.5	3	317.4	295
Nawarangpur	52.9	-50	139.9	93	290.1	123
Nayagarh	72.9	7	85.4	27	178.7	115
Puri	48.0	-20	96.4	84	191.4	229
Rayagada	8.3	-83	110.3	60	244.6	164
Sambalpur	34.7	-65	92.2	6	168.2	69
Sonepur	46.7	-42	153.6	106	261.5	192
Sundargarh	35.6	-56	79.6	-11	231.1	166
West Bengal & Andaman Nicobar Islands						
A & N ISLAND						
Nicobar	116.1	117	47.3	-26	4.3	-94
North & Middle Andaman	87.8	-12	268.2	149	27.5	-73
South Andaman	138.8	71	168.5	79	88.6	-14
GWB						
Bankura	116.4	53	70.2	6	67.5	-1
Birbhum	120.1	81	32.5	-63	92.9	33
Burdwan	80.1	31	38.0	-47	35.0	-53
East Midnapore	80.8	8	100.0	102	95.7	44
Hooghly	40.4	-44	52.6	-21	44.2	-43

Howrah	16.5	-79	31.5	-54	45.7	-48
Kolkata	66.7	-18	40.5	-48	26.4	-69
Murshidabad	88.4	19	24.0	-70	16.2	-77
Nadia	53.4	-12	43.5	-35	52.3	-23
24 Pargana (N)	66.1	-12	28.3	-62	71.1	-7
Purulia	72.4	-12	58.7	-13	64.1	-8
24 Pargana (S)	54.6	-53	70.0	-28	98.3	-9
West Midnapore	97.1	32	53.5	-22	32.4	-58
SHWB & Sikkim						
Cooch Behar	143.4	-35	35.7	-84	59.8	-66
Darjeeling	130.0	-11	117.0	-32	91.8	-51
East Sikkim	89.3	-10	121.3	4	107.1	-7
Jalpaiguri	141.5	-41	79.6	-61	73.0	-66
Malda	122.8	60	23.6	-69	42.9	-37
North Dinajpur	93.2	2			68.4	-6
North Sikkim	212.7	106	112.7	22	101.2	-9
South Dinajpur	79.7	-9	86.8	-4	46.9	-36
South Sikkim	82.7	-17	86.0	-26	104.2	-9
West Sikkim	12.0	-88	50.0	-46	73.0	-35
Karnataka						
Coastal Karnataka						
Dakshin Kannada	101.0	-62	470.0	76	268.0	-9
Udupi	115.1	-63	450.2	54	356.1	5
Uttar Kannada	71.9	-69	383.2	69	278.1	3
N I Karnataka						
Bagalkote	33.8	132	12.2	-22	12.1	-28
Belgaum	19.0	-61	51.6	12	89.8	86
Bidar	51.2	27	33.5	-8	5.8	-88
Bijapur	63.6	292	6.6	-63	8.6	-54
Dharwad	5.9	-82	25.2	-31	51.9	57
Gadag	51.9	293	20.8	22	18.8	24
Gulbarga	54.4	81	18.6	-36	3.2	-92
Haveri	2.4	-94	45.7	15	68.1	68
Koppal	45.6	297	31.6	107	5.9	-69
Raichur	42.7	111	11.2	-50	3.4	-86
Yadgir	34.2	32	12.1	-58	3.0	-92
S I Karnataka						
Bangalore Rural	26.9	86	31.5	57	1.7	-93
Bangalore Urban	7.1	-61	28.2	47	4.0	-84
Bellary	34.3	150	40.1	136	14.0	-15
Chamarajnagar	12.2	-30	17.9	47	3.4	-80
Chichballapur	15.4	-11	5.8	-71	6.5	-69
Chickmagalur	22.7	-86	205.5	41	289.8	98
Chitradurga	15.0	31	26.0	118	20.9	61
Davangere	18.7	-7	26.0	17	33.0	27
Hassan	11.6	-77	63.3	43	79.0	72
Kodagu	23.9	-89	376.3	99	307.6	61
Kolar	10.8	-31	13.0	-24	1.7	-91
Mandya	16.2	52	4.5	-56	4.2	-66

Mysore	26.0	6	38.2	101	15.5	-26
Ramnagara	16.8	-5	3.1	-80	1.9	-92
Shimoga	36.4	-75	282.6	107	370.9	147
Tumkur	18.2	35	9.8	-37	3.1	-82
Kerala						
Alappuzha	43.8	-70	143.2	18	79.7	-32
Kannur	54.3	-80	414.7	78	233.2	1
Ernakulam	25.7	-84	287.5	86	148.1	1
Idukki	42.5	-78	411.3	147	214.5	33
Kasaragod	62.1	-75	380.6	46	101.3	-61
Kollam	33.9	-67	116.3	34	66.8	-21
Kottayam	35.7	-76	184.9	34	130.3	2
Kozhikode	52.5	-77	440.4	103	300.8	46
Malappuram	17.9	-91	265.3	51	288.5	68
Palakkad	12.2	-92	211.6	61	172.1	35
Pathanamthitta	65.6	-54	158.5	25	85.5	-25
Thiruvananthapuram	13.1	-79	50.8	4	22.3	-55
Thrissur	32.1	-84	216.5	25	129.9	-21
Wayanad	41.6	-86	410.4	78	329.4	42
Tamil Nadu						
Ariyalur	49.3	307	0.0	-100	0.0	-100
Chennai	5.4	-74	18.2	-37	10.1	-49
Coimbatore	6.4	-49	90.7	854	61.9	544
Cuddalore	25.7	81	2.2	-85	0.0	-100
Dharmapuri	2.5	-85	0.0	-100	0.6	-97
Dindigul	4.9	-62	2.2	-81	0.7	-95
Erode	23.0	164	4.0	-55	0.0	-100
Kanchipuram	28.1	51	14.0	-49	1.6	-94
Kanyakumari	2.1	-94	20.4	-10	3.1	-87
Karikal	106.7	989	0.0	-100	0.0	-100
Karur	3.7	-53	0.0	-100	0.0	-100
Krishnagiri	3.6	-80	10.4	-36	1.1	-94
Madurai	5.7	-57	1.1	-93	0.0	-100
Nagapattinam	31.9	203	0.0	-100	0.0	-100
Namakkal	27.9	105	0.0	-100	0.0	-100
Nilgiris	21.3	-68	121.7	129	83.6	46
Perambalur	10.3	26	0.0	-100	0.0	-100
Puducherry	0.1	-99	10.3	-11	1.8	-93
Pudukottai	11.0	-31	1.9	-92	2.7	-83
Ramanathapuram	0.0	-100	0.0	-100	0.1	-99
Salem	2.6	-88	4.4	-79	4.1	-82
Sivaganga	10.0	-31	0.0	-100	0.0	-100
Thanjavur	33.3	114	1.3	-91	0.0	-100
Theni	7.3	-11	38.8	582	10.9	24
Tirunelveli	0.1	-99	8.6	15	2.0	-77
Tirupur	0.2	-98	1.9	-69	0.0	-100
Tiruvallur	34.9	54	28.9	10	2.4	-90
Tiruvannamalai	22.4	30	16.1	-24	0.0	-100
Tiruvarur	76.4	450	0.4	-97	0.0	-100

Toothukudi	0.9	-70	0.1	-96	0.0	-100
Trichy	8.9	-24	0.0	-99	0.0	-100
Vellore	37.3	74	15.8	-27	0.1	-99
Villupuram	11.1	-22	9.2	-38	1.8	-92
Virudhunagar	2.2	-73	0.3	-96	0.0	-100
Andhra Pradesh						
Coastal Andhra Pradesh						
East Godavari	42.1	-6	43.6	-1	18.3	-62
Guntur	42.7	31	6.3	-76	3.6	-90
Krishna	30.7	-37	16.1	-60	3.7	-93
Nellore	26.3	41	15.1	-19	2.9	-87
Prakasam	56.8	152	7.0	-58	3.2	-88
Sirkakulam	13.0	-60	108.1	139	68.6	49
Visakhapatnam	20.8	-39	51.0	42	27.8	-42
Vizianagram	25.7	-31	55.7	53	67.2	44
West Godavari	43.9	-15	46.6	-10	6.1	-89
Rayalaseema						
Anantapur	8.9	-35	18.5	35	2.0	-87
Chittoor	34.4	73	15.1	-34	0.6	-98
Cuddapah	19.4	-4	21.3	9	1.1	-96
Kurnool	36.7	47	45.6	97	6.4	-74
Telangana						
Adilabad	43.4	-32	28.1	-59	41.3	-47
Hyderabad	82.9	141	8.8	-73	11.5	-76
Karimnagar	47.1	-17	24.3	-56	27.4	-53
Khammam	14.5	-76	80.3	43	22.1	-68
Mehabubnagar	22.1	-30	45.6	56	3.8	-90
Medak	38.4	-15	19.7	-58	15.0	-73
Nalgonda	44.3	47	7.9	-71	1.9	-96
Nizamabad	27.4	-55	18.5	-67	16.5	-76
Rangareddy	39.8	-3	18.9	-49	4.5	-90
Warangal	34.3	-41	42.2	-23	22.9	-66

Legends

	(20% or more) excess rainfall		(-60 to -99 %) scanty rainfall
	(-19 to +19%) normal rainfall		(-100%) no rainfall
	(-20 to -59%) deficient rainfall	**	Data not available

Annexure III

List of varieties

Andhra Pradesh:

Castor: PCH-111, PCH-222, Kranti, GCH-4, Haritha

Irrigated groundnut: Kadiri-6, Kadiri-9, Narayani and dharani

Red gram: black soils LRG-41, ICPL-85063 and for red soils PRG-158, PRG-100.

Tamil Nadu:

Kuruvai rice : ADT 36, ADT 43, ADT 45 and ADT 47

Samba rice : CR 1009/Savithri/Ponmani and ADT 50

Karnataka:

Redgram : TTB -7, BRG -01, BRG- 02, HYD -3C, BSMR 736, TS-3R

Medium to Long Duration Varieties of redgram: PT-221, GS-1, ICP-8863 (Maruti), ICPL-87119 (Asha) WRP-1, **Short Duration Varieties of redgram:** ICPL-87(Pragati), Selection-31(irrigated areas), GCS-11-39

Ragi: GPU- 28,MR -01, 02 and 06, KMR-301

Green gram : Selection – 4, BGS-9, China mung, Pusa bisaki

Black gram : TAU – 1, DU – 1

Soybean : JS – 335

Jowar : DSV – 2, CSV-15, DSV-3, and DSV-6

Maize: Hybrid – DMH-2 and Arjun

Groundnut:

Bunch type – GPBD-4, JL-24 and TMV-2

Spreading type – DSG-1 and JSP-39

Cotton: DHH-11, NCH-145, NHH-44, DHB-105 and Sahana

Irrigated green gram: VBN 2, VBN 3 and CO (Gg) 7

Assam:

Sali rice: Ranjit, Bahadur, Vasundhara, Kushal, Piyoli, Moniram, Rangali, Bhogali, Ketkijah

Long duration varieties: Pankaj, Mashuri, Manohar Sali and other tall varieties.

Short duration varieties : Vivek Dhan 82

Groundnut : TG-1A, JL-24

Pigeon pea : T-21

Seasame : SP1181, GOURI, VINAYAK

Meghalaya:

Red gram : UPAS-120, ICPL 87 (short duration), WB 20, Pusa 9 & Sarita (long duration)

Odisha

Rice: Heera, ZHU-11-26, Pathara, Vandana, Khandagiri and Parijat

Ragi: Dibyasingh, Godavari, Subhra, Vairabi, Neelachala, Chilika

Maize: Navjot, Sakti-1, Decan-103, Ganga-5, Kargil

Groundnut: Smruti, TAG-26, TAG-24, ICGS-11, JL-24

Sesame: Kanak, Kalika, Uma, Usha, Tilotama, Nilima, Prachi

Greengram: K-851, PDM-11, PDM-54, OUM-11-5

Blackgram: T-9, Pant U-11, Pant U-19, Pant U-30

Cowpea: SEB-2, Pusa Barsati Niger: Deomali, Niger-1 and for Okra: Utkal Gourav.

West Bengal

Aman rice: BCC-17, BCC-33, BCC-02, BCC-01, BCC-09

Banana : Mortoman, Chapa, Kathali, Singapuri

Tomato: Avinash-2, 448

Bihar

Kharif Maize: Shaktiman 1, 2. Pusa agat sankar makka-3and ganga, hybrid: Shaktiman-1, Shaktiman-2, Pusa early hybrid maize-3, Ganga-11, and composite: Suawan and Devki.

Rice:short duration rice:Turanta, Prabhat, Richhariya, Saroj, Dhanlakshmi, Saketwork. Scented rice var. Sugandha, Kamini, Rajendra suwasini, Rajendra kasturi and Rajendra bhagwati

Kharif finger millet: GPU 45, 67, 28 and RAU 8

Pigeon Pea:arhar: Bahar, Pusa 9, Narendra Arhar 1

Urd: T-9, Pant U-19, Pant Urd 31, PDU-1

Jharkhand:

Rice: short duration: Birsa Dhan - 108, Birsa Vikas Dhan 109 & 110, Vandana etc.

Maize: short duration: Birsa maize-1, Birsa Vikas maize-2 etc
Pigeon Pea: Birsa Arhar-1, Narendra Arhar-1, Bahar, ICPH-2671
Groundnut: short duration: A.K.-12-24, Birsa Bol
Urd: T 9, Pant U 19, 30, 35 and Birsa urd 1
Moong: Pusa Vishal, S M L 668, K 885, P S 16, Pant Moong 2 and P D M 11.
Arhar: Birsa Arhar (210 days), Bahar (240 Days) and ICPH 2671 (210 days),
Soybean: Birsa soybean 1, Birsa safed soybean 2;

Madhya Pradesh

Rice: Short duration-JR-201, JRH -4, JRH-5, JRH -8
Medium- IR-36, IR-64, Pusa sugandha-5, MTU-1001, MTU-1010, MTU-81, Mahamaya
Late-Mahsuri, Safari-17, Syamla, Swarna
Maize: Short duration-JVM- 421, JM-12, JM-13, JM- 216, JS-20-29, JS-20-34.
Medium- Navjot, Arun, H-216, JM-13, Sartaj, Daccan 107
Late-Ganga-11, Prabhat, Trisulta, Daccan 103, Daccan 105
Soybean: Short duration-JS 95-60 (85 days), JS- 93-05(95 days), JS-97-52, JS-335,JS-20-29, JS-20-34
Medium-JS 335 (105 days), NRC 37(110 days)
Black gram: JU 86, JU- 3, T- 9
Jowar: Jawahar- 741, Jawahar -938, Jawahar- 1022
Arhar: Early: TJT-501, JKM-189,
Medium : ICPL-87-119, ICPL88039

Chhattisgarh

Rice - MTU 1010, Mahamaya, IR 36, IR 64
Maize - Pusa early, Navjot 3, Chandana 3
Ragi - JPU 28, JPU 45, JK 155

Uttar Pradesh

Urd: Uttara, Narendra urd-1, Pant Urd-30, Type-27,66, Shekhar-1,2,3, Azad-1,2,3, WBU-108
Moong: Pant-1,3,4, Samrat, Narendra Moong-1, Malaveey- Jyoti,-Janchetana, Janpriya, Jagruti, Jankalyani, Samrat,
Asha, Neha, Shweta, MH-215, IPM-23
Groundnut: TG-37A, Kaushal, Amber
Jowar: Bundela, CSV-13, 15,17; CSH-14, 16, 18, 23
Bajra: WCC-75, Raj-171, ICMB-155, Pusa-322, 23, ICMH-451
Maize: Azad Uttam, Shweta
Arhar: Upas-120, Narendra-1A, Bahar
Soybean: PK-472, JS-335, MAUS-47, NRC-37
Lobia: UPC-4200

Jammu & Kashmir:

Mash : Pant U-19, Uttra, T-9)
Moong : ML-131,PDM-54,SML-668, PS-16.
Maize : Vivek-25,Vivek QPM-9 HM-5 and HQPM-1

Maharashtra

Kharif jowar:- Hybrid- CSH5, CSH 9, CSH13, CSH14, CSH16, CSH17, CSH18, CSH2, Improved- SPV 462, CSV 13, CSV15, CSV17, PKV 801 for Pune region and CSH14, CSH16, CSH25 for Marathwada.
Kharif bajra:- Hybrid variety Shraddha (RHRBH 8609), Saburi (RHRBH 8924), Phule Shanti (RHRBH 9808) and Improved variety – ICTP 8203, ICMV – 155 for Pune region and GHB558, Shraddha, Saburi, Pratibha for Marathwada.
Kharif groundnut – SD 11, Phule Pragati, Phule Vyas, Phule Unnati, TPG 41, TG 26.
Red Gram – ICPL 87, Vipula, BSMR-853, BSMR-736, AKT8811, Amol for Madhya Maharashtra, ICPL-87119 (Asha), C-11 for Central Vidarbha and BSMR 736, BSMR 853, BDN 711 (for rain shadow area) for Marathwada.
Sunflower – EC-68414, SS-56 and Bhanu.
Soyabean – JS-335, Phule Kalyani (DS-228) for North Madhya Maharashtra, MAUS 71, JS-335 for Marathwada.
Kharif Rice – PKVHMT, PKV Khamang, PKV Makarand, PKV Ganesh, PKV Kisan, Sindewahi 2001, Sindewahi 1 for East Vidarbha.
Kharif Cotton: – Improved variety – AKA-5, AKA-7, AKA-8, American improved variety – AKH-081, PKV-Rajat, AKH-8828 and PKV DH-1 (hybrid) for Central Vidarbha Zone.
Green Gram: - Jalgaon 781, S8, Phule M2 for Western Maharashtra Scarcity Zone, BM-2002-1, BM 2003-2, AKM-4 and Green Gold for Marathwada.

Gujarat

Paddy: GR-3, GR-4, IR – 28, Gurjary.

Pearl millet: GHB-558,577,538,719,732,744.

Kharif groundnut: GG-20, GG-11,13, GG-7, GAUG-10, Semi spreading- GG-2, GG-5, TAG-24, TG-37 A, TPG-41, TLG-45, TG-26.

Cotton: GCH-4,6, GCH-8, Agritop-444, Solar-76, Beejdhan-2, Ajit-155, Mallika, RCH-II, Vikram-5, Sankar-4,6,8,10.

Green gram: GM-3, GM-4, K-851.

Black gram: T-9, GU-1.

Cowpea: Gujarat cowpea-1,2,4, pusa falguni.

Pigeon pea: BDN-2, GT-100, GTH-1.

Sesame: GT-1, GT-2 or GT-3 variety.

Soybean: Gujarat soyabean-1, 2, 3.

Castor: GAUCH-1, GCH-2,4,5,6,7 and GC-2,3.

Maize: Ganga safed-2, Ganga-5, African tall.

Okra: Gujarat Bhinda -2, Gujarat hybrid bhinda-1, Parbhani kranti

Brijal: PLR-1, PUSA hybrid-5,6 ,GBH-1,2.

Tomato: PUSA rubi, Gujarat Tameti-1,2, Hybrid-2,4, Pusa hybrid-2,4.