

National Agromet Advisory Service Bulletin

Friday 18th July 2014

(For the period 18th to 22nd July 2014)



Issued by

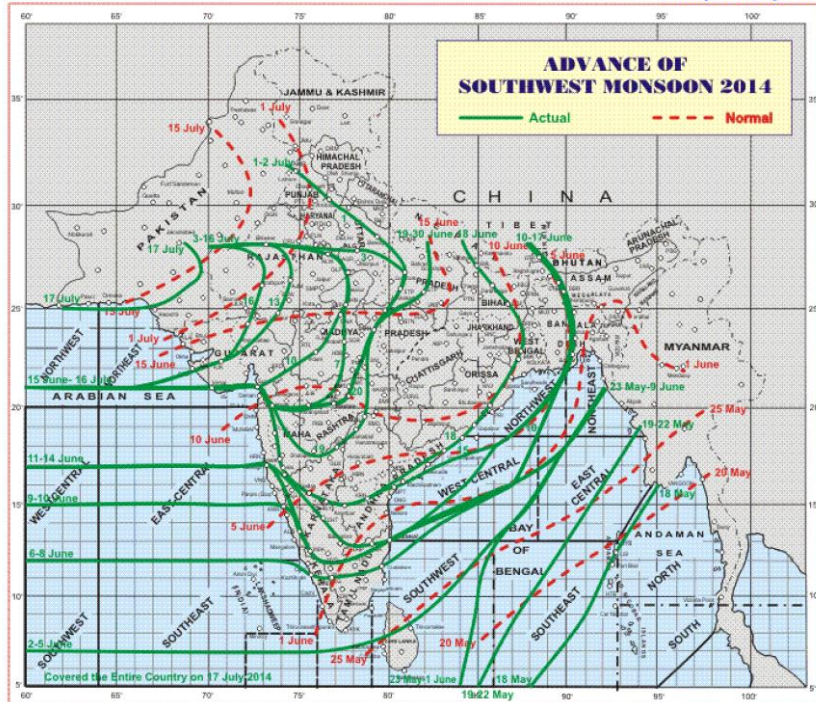
**National Agrometeorological Advisory Service Centre,
Agricultural Meteorology Division,
India Meteorological Department, Shivajinagar, Pune.**



Monsoon Watch

Northern Limit of Monsoon

Friday 18 July 2014



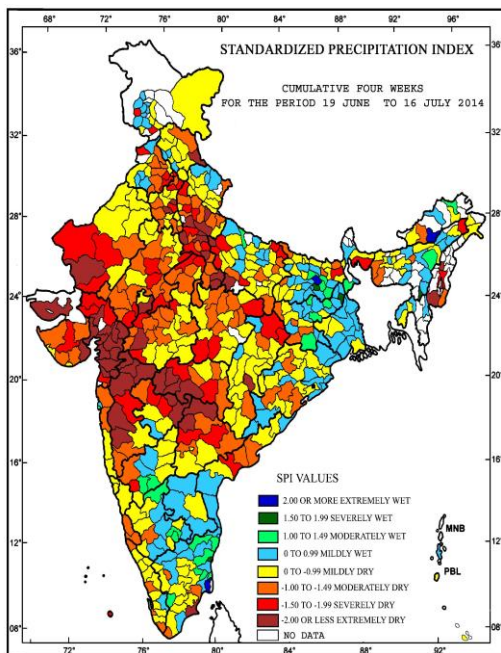
- Yesterday, the southwest monsoon further advanced into remaining parts of north Arabian sea, Saurashtra & Kutch, Gujarat region and west Rajasthan. Thus, it covered the entire country on 17th July 2014.

Standardised Precipitation Index

Four Weekly

for the Period 19th June to 16th July 2014

MINISTRY OF EARTH SCIENCES
INDIA METEOROLOGICAL DEPARTMENT
HYDROMET SECTION, PUNE

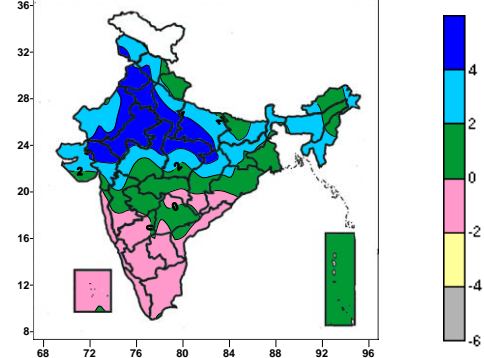
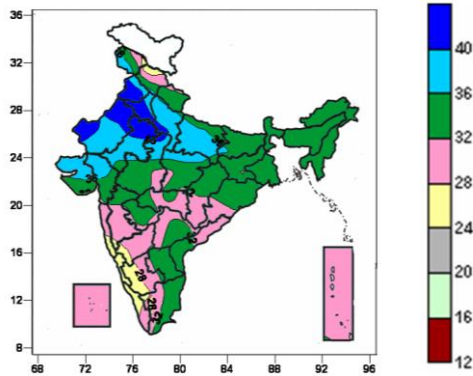


- Extremely/severely wet experienced in Begusarai, Lakhisarai districts of Bihar; Papumpara district of Arunachal Pradesh; Pakur district of Jharkhand; Nagapattinam and Tiruvarur districts of TamilNadu.
- Extremely/ moderately/ severely dry conditions experienced in most districts of Gujarat; many districts of Rajasthan, Uttar Pradesh, Madhya Pradesh, Maharashtra; few districts of North East, Punjab, Haryana, Telangana; Udhampur and Poonch districts of Jammu & Kashmir; Lahaul & Spitti and Kinnaur districts of Himachal Pradesh; Champawat and Pithoragarh districts of Uttarakhand; Purnea, Saharsa, Araria, West Champaran and Buxar districts of Bihar; Bastar, Dhamtari, Korba, Surguja and Jashpur districts of Chhattisgarh; Simdega, Khunti and Lohardaga districts of Jharkhand; Ganjam, Kandhamal and Kalahandi districts of Orissa; Belgaum, Dharwad, Udupi, Hassan and Dakshin Kannada districts of Karnataka; East Godavari, West Godavari and Krishna districts of Andhra Pradesh; Kanyakumari, Ramanathapuram, Pudukottai and Tiruppur districts of Tamil Nadu; Kasargod, Ernakulam, Alapuzha and Trivandrum districts of Kerala.
- 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 16.07.2014

Actual Mean Maximum Temperature (°C) in India for the week ending 16.07.2014

Mean Maximum Temperature (°C) Anomaly in India for the week ending 16.07.2014

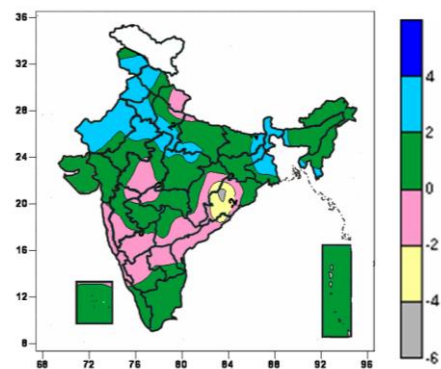
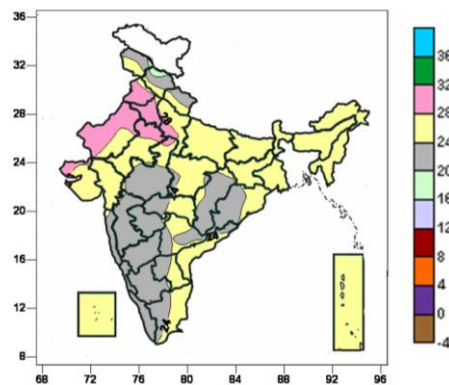


- 40 to 44°C over many parts of Punjab, Haryana, some parts of Rajasthan, West Uttar Pradesh, West Madhya Pradesh.
- 36 to 40°C over many parts of Uttar Pradesh, Rajasthan, Saurashtra & Kutch, some parts of Jammu & Kashmir, Punjab, Haryana, Delhi, Bihar, Madhya Pradesh, Gujarat region.
- 32 to 36°C over many parts of Uttarakhand, Bihar, Jharkhand, West Bengal, North East India, Odisha, Central India, Andhra Pradesh, Marathwada, Tamil Nadu, some parts of Jammu & Kashmir, Himachal Pradesh, Uttar Pradesh, Vidarbha, Madhya Maharashtra, Gujarat.
- 28 to 32°C over many parts of Vidarbha, Madhya Maharashtra, Konkan & Goa, Interior Karnataka, Lakshadweep, Andaman & Nicobar Islands, some parts of Jammu & Kashmir, Himachal Pradesh, Madhya Pradesh, Marathwada, Andhra Pradesh, Kerala and Tamil Nadu.
- 24 to 28°C over many parts of Coastal Karnataka, Goa, Kerala, some parts of Jammu & Kashmir, Himachal Pradesh, Interior Karnataka and Konkan.

- 4 to 6°C over many parts of East Rajasthan, Punjab, Haryana, Uttar Pradesh, some parts of Jammu & Kashmir, Himachal Pradesh, Madhya Pradesh, Chhattisgarh, Gujarat region, Odisha.
- 2 to 4°C over many parts of Jammu & Kashmir, Himachal Pradesh, Sub-Himalayan West Bengal & Sikkim, Jharkhand, Assam & Meghalaya, Mizoram, Tripura, Saurashtra & Kutch, some parts of Uttarakhand, Uttar Pradesh, West Rajasthan, Bihar, Arunachal Pradesh, Manipur, Odisha, Central India, Gujrat region, Madhya Maharashtra.
- 0 to 2°C over many parts of Uttarakhand, Bihar, Gangetic West Bengal, Nagaland, Odisha, Telangana, Vidarbha, Marathwada, Andaman & Nicobar Islands, some parts of Himachal Pradesh, Jharkhand, Assam & Meghalaya, Arunachal Pradesh, Manipur, Central India, Coastal Andhra Pradesh, North Interior Karnataka, Konkan, Madhya Maharashtra, Gujarat.
- -2 to 0°C over many places over Coastal Andhra Pradesh, Rayalaseema, Tamil Nadu, Kerala, Karnataka, Konkan & Goa, Lakshadweep Islands, some parts of Odisha, Chhattisgarh, Vidarbha, Telangana, Madhya Maharashtra, Marathwada.

Actual Mean Minimum Temperature (°C) in India for the week ending 16.07.2014

Mean Minimum Temperature (°C) Anomaly in India for the week ending 16.07.2014



- 28 to 32°C over many parts of Punjab, Haryana, Delhi, West Rajasthan, some parts of West Uttar Pradesh, West Madhya Pradesh, East Rajasthan and Saurashtra.
- 24 to 28°C over many parts of Uttar Pradesh, East Rajasthan, Bihar, Jharkhand, West Bengal & Sikkim, Northeast India, East Madhya Pradesh, Andhra Pradesh, Gujarat,

- 2 to 4°C over many parts of Jammu & Kashmir, Uttarakhand, Punjab, Haryana, West Rajasthan, West Bengal & Sikkim, some parts of Uttar Pradesh, Bihar, Jharkhand, Madhya Pradesh.
- 0 to 2°C over many parts of Uttar Pradesh, Bihar, Jharkhand, North East India, Madhya Pradesh,

Lakshadweep, Andaman & Nicobar Islands, some parts of Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Punjab, Haryana, West Rajasthan, West Madhya Pradesh, Chhattisgarh, Odisha, Vidarbha, Konkan and Tamil Nadu.

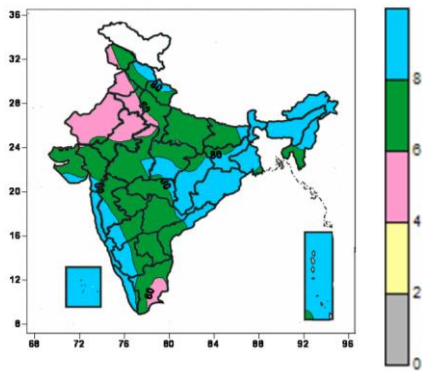
- 20 to 24⁰C over many parts of Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Odisha, Chhattisgarh, West Madhya Pradesh, Kerala, Karnataka, Konkan & Goa, Madhya Maharashtra, Marathwada, some parts of Andhra Pradesh, East Madhya Pradesh and Tamil Nadu.
- 16 to 20⁰C over some parts of Jammu & Kashmir, Himachal Pradesh.

Vidarbha, Marathwada, Gujarat, Tamil Nadu, Kerala, Madhya Maharashtra, Marathwada, Lakshadweep, Andaman & Nicobar Islands, some parts of Jammu & Kashmir, Himachal Pradesh, Haryana, Uttarakhand, Gangetic West Bengal, Odisha, Chhattisgarh, Telangana, Rayalaseema, Konkan and East Rajasthan.

- -2 to 0⁰C over many parts of Uttarakhand, West Madhya Pradesh, Andhra Pradesh, Karnataka, Konkan & Goa, some parts of Uttar Pradesh, Chhattisgarh, Odisha, Madhya Maharashtra, Marathwada, Vidarbha and Kerala.
- -4 to -2⁰C over many parts of Odisha, some parts of Chhattisgarh, Coastal Andhra Pradesh.

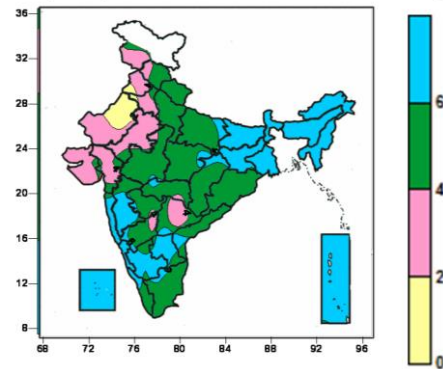
Contour maps for Relative Humidity, Cloud amount and Wind speed for the week ending on 16.07.2014

Relative Humidity (%) over India for the week ending 16.07.2014



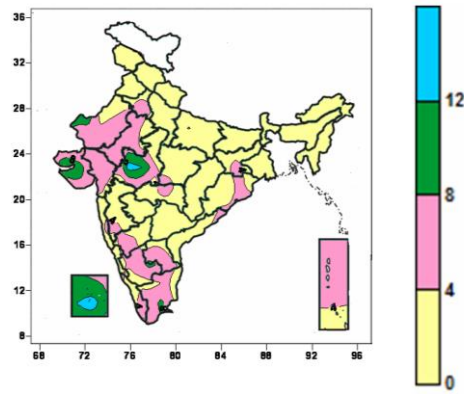
- 80 to 100% over many parts of North East India, West Bengal & Sikkim, Odisha, Chhattisgarh, Kerala, Coastal & North Interior Karnataka, Konkan & Goa, Lakshadweep and Andaman & Nicobar Islands, some parts of Himachal Pradesh, Uttarakhand, Bihar, Jharkhand, Madhya Pradesh, Madhya Maharashtra, Coastal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

Cloud amount (okta) over India for the week ending 16.07.2014



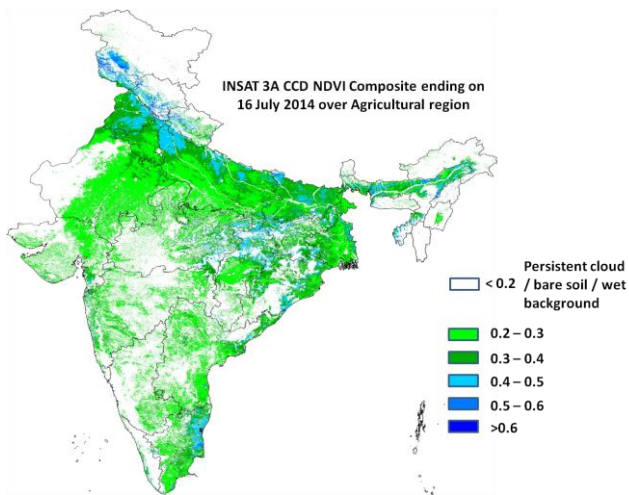
- 6 to 8 okta over many parts of Bihar, Jharkhand, North East India, West Bengal & Sikkim, Telangana, Coastal & North Interior Karnataka, Konkan & Goa, Madhya Maharashtra, Lakshadweep and Andaman & Nicobar Islands, some parts of East Uttar Pradesh, Central India, Madhya Maharashtra, Coastal Andhra Pradesh, Telangana, North Interior Karnataka, Tamil Nadu, Kerala, Marathwada and Vidarbha.
- 4 to 6 okta many parts of Himachal Pradesh, Uttarakhand, Uttar Pradesh, Central India, Odisha, Coastal Andhra Pradesh, Telangana, Tamil Nadu, Kerala, North Interior Karnataka, Marathwada, Vidarbha, some parts of Jammu & Kashmir, Haryana, East Rajasthan, Gujarat, Madhya Maharashtra, Konkan, Rayalaseema and North Interior Karnataka.
- 2 to 4 okta over many parts of Jammu & Kashmir, Punjab, Haryana, Delhi, Rajasthan, Gujarat, Telangana, some parts of Himachal Pradesh, North Interior Karnataka, Vidarbha and West Madhya Pradesh.
- 0 to 2 okta over many parts of West Rajasthan, some parts of Punjab and Haryana.

Wind speed (knots) over India for the week ending 16.07.2014



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

INSAT 3A CCD NDVI COMPOSITE OVER AGRICULTURAL REGION ending on 16th July 2014



Source: SAC, Ahmedabad

- Agricultural vigour is moderate over few pockets of western and north Uttar Pradesh, central and eastern Punjab, Coastal Odisha and Tamil Nadu and north Chhattisgarh as NDVI varied between 0.4 to 0.5 upto 16th July 2014. The NDVI over Punjab and parts of Haryana showed increase as compared to last week. The NDVI remained within the range of 0.2 to 0.3 over rest of India.

Weather Forecast

Weather Forecast for next 3 days (upto 0830 hours IST of 21st July, 2014)

- Rain/thundershowers would occur at many places over Andaman & Nicobar Islands during the period.
- Rain/thundershowers would occur at most places over Arunachal Pradesh, Assam & Meghalaya, Sub-Himalayan West Bengal & Sikkim and Bihar during next 48 hours and at many places thereafter.
- Rain/thundershowers would occur at many places over Nagaland, Manipur, Mizoram and Tripura during the period.
- Rain/thundershowers would occur at many places over Gangetic West Bengal and Jharkhand during the period.
- Rain/thundershowers would occur at a few places over Odisha during next 24 hours and over Chhattisgarh during next 48 hours and at many places thereafter.
- Rain/thundershowers would occur at most places over Himachal Pradesh and Uttarakhand during the period.
- Rain/thundershowers would occur at many places over Uttar Pradesh during next 24 hours and at most places thereafter.
- Rain/thundershowers would occur at many places over Jammu & Kashmir and Punjab during next 24 hours and over Haryana & Delhi, East Rajasthan and East Madhya Pradesh during next 48 hours and at a few places thereafter.
- Rain/thundershowers would occur at a few places over West Rajasthan during next 48 hours and at isolated places thereafter.
- Rain/thundershowers would occur at many places over West Madhya Pradesh during the period.
- Rain/thundershowers would occur at most places over Saurashtra & Kutch, Konkan & Goa during next 24 hours and at many places thereafter.
- Rain/thundershowers would occur at many places over Coastal Karnataka during next 24 hours and at most places thereafter.
- Rain/thundershowers would occur at many places over Gujarat region, at a few places over Madhya Maharashtra and Vidarbha and at isolated places over Marathwada during the period.
- Rain/thundershowers would occur at many places over Kerala, at a few places over Interior Karnataka and at isolated places over Telangana, Rayalaseema, Tamilnadu & Pudducherry during the period.
- Rain/thundershowers would occur at isolated places over Coastal Andhra Pradesh and Lakshadweep during next 24 hours and increase thereafter.
- Maximum temperatures would fall by 1-2°C over many parts of northwest India & adjoining central India.

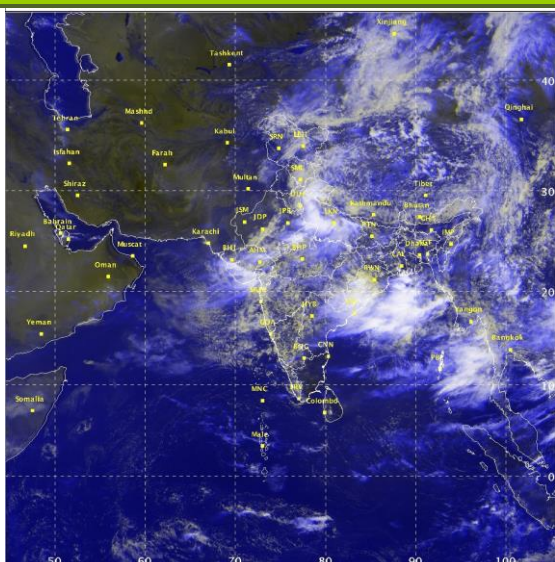
Weather Warning during next 3 days

- **18 July (Day 1):** Heavy to very heavy rainfall would occur at a few places with extremely heavy falls at isolated places over Uttarakhand and heavy to very heavy rainfall would occur at isolated places over Himachal Pradesh, east Rajasthan, Uttar Pradesh, Assam & Meghalaya and Konkan & Goa. Heavy rainfall would occur at isolated places over Bihar, Sub-Himalayan West Bengal & Sikkim, Arunachal Pradesh, Andaman & Nicobar Islands, Coastal & south interior Karnataka and Gujarat.
- **19 July (Day 2):** Heavy to very heavy rainfall would occur at a few places with extremely heavy falls at isolated places over Uttarakhand and heavy to very heavy rainfall would occur at isolated places over Himachal Pradesh and Uttar Pradesh. Heavy rainfall would occur at isolated places over Gangetic West Bengal, Assam & Meghalaya, Coastal & south interior Karnataka, Gujarat, Konkan & Goa and Kerala.
- **20 July (Day 3):** Heavy to very heavy rainfall would occur at a few places with extremely heavy falls at isolated places over Uttarakhand and heavy to very heavy rainfall would occur at isolated places over Himachal Pradesh and Uttar Pradesh. Heavy rainfall would occur at isolated places over Gangetic West Bengal, Assam & Meghalaya, Coastal & south interior Karnataka, Konkan & Goa and Kerala.

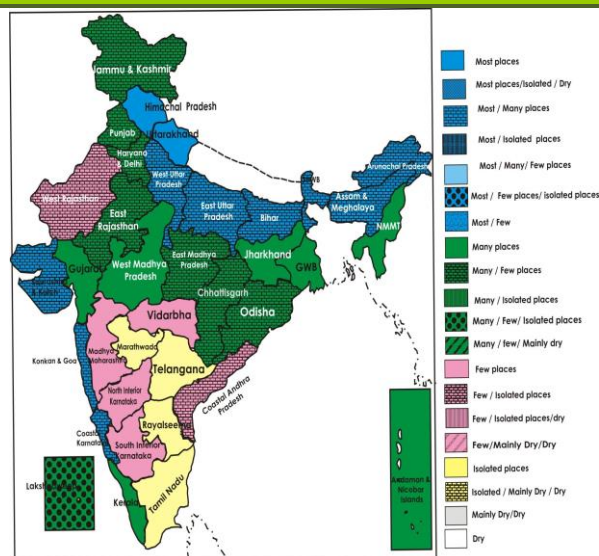
Weather Outlook for subsequent 4 days from 21st July to 25th July 2014.

- Rain/thundershowers would occur at many places over east, central & north peninsular India, Uttar Pradesh, Uttarakhand and along west coast.
- Subdued rainfall activity would continue over interior peninsular India.
- Rain/thundershowers would occur at a few places over rest parts of the country outside west Rajasthan, where mainly dry weather would occur.

Satellite image dated 18.07.2014, 0600 UTC



Weather Forecast Map (Valid upto 0830 hours of 21st July, 2014)



Salient Advisories

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 likely to continue during next fortnight, contingency plan for different regions of Gujarat may be undertaken as given below:

1. For South and Middle Gujarat region:

- Prefer short duration oilseeds crops for sowing like Sunflower (cv. Modern and EC-68414 and Guj-1) and Sesamum (cv. Guj. Tal 1,2, 10).
- Prefer pulse crops like: 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).
- Prefer grain Sorghum (cv. CSH-5,6,1, GJ-39, 40, 41) and Fodder sorghum (cv. S-1049, C-10-2, Gundari, GFS 4,5).
- Where canal water is available up to 20th July, Paddy: GR-8,9, Sathi 34-36, Ambica and Gurjari can be transplanted.

2. North Gujarat Region:

Sesamum (cv. Guj. Tal 1, 2, 10), Sunflower (cv. Modern, EC 68414), Fodder sorghum (cv. S-1049, C-10-2) are to be sown.
Cotton cv. Hy-8, 10, V-797, G. Cot 13, 21, 23 can be cultivated.

3. For Saurashtra region:

Groundnut: Erect variety (cv.GG-2, 5,7), Fodder sorghum(cv. S-1049, C-10-2), Sunflower(cv. Modern, EC 68414), Green gram (cv. GM-4, K-851, Meha), Black gram (cv. T-9, Guj. Udid-1) and Green gram (cv. GM-4, K-851, Meha) are preferred for sowing.
For risk reduction in groundnut follow mix cropping with castor or Tur in 3:1 row.

- In West **Madhya Pradesh**, 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.

- In **Madhya Maharashtra**, continue transplanting of rice in Western parts of Kolhapur, Pune and Nasik districts. Undertake sowing of contingency crops like sunflower, soybean, cotton, hybrid jowar, hybrid pearl millet, red gram, bean and sesame in all districts except Nandurbar, Nasik, Solapur and Ahmednagar. It is also advised to take up intercropping of pearl millet+red gram in 2:1, sunflower+red gram in 2:1, soybean+red gram in 3:1 and guar+red gram in 2:1 ratios. For sowing of red gram, use Vipula variety.
- In **Vidarbha**, undertake sowing of contingency kharif crops with the help of optimum soil moisture in the field. Three tier intercropping of cotton : jowar : red gram : jowar in 6:1:1:1, green gram / black gram : cotton in 1:1 ratio may be undertaken to minimize the risk. For sowing of red gram select variety PKV-Tara. Continue transplanting of 22-25 days old rice seedlings utilizing the realized rainfall in Eastern Vidarbha.
- Continue planting of banana in the Central and Northern Zones of **Kerala**.
- Continue transplanting of *kharif* rice in **Coastal Zone of Karnataka**, continue sowing of *kharif* crops like sorghum, pulses viz., cowpea, green gram, black gram and oilseed crops like sesamum and continue land preparation for transplanting of ragi in the Southern Dry Zone with realised/ expected rainfall.
- Continue nursery sowing and direct sowing of rice and planting of rainfed sugarcane in the North Coastal Zone of **Andhra Pradesh** with realised rainfall.
- In **Assam and Meghalaya**, continue transplanting of *Sali* rice and in **Arunachal Pradesh** continue sowing of *kharif* rice utilizing the realized and expected rainfall. Drain out excess water from rice nursery. Continue transplanting of *sali* rice with 25-30 day old seedlings.
- 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 continue transplanting of *kharif* rice in **Uttarakhand**.
- Undertake transplanting of rice and sowing of maize and soybean in **East Madhya Pradesh** utilizing the realized and expected rainfall.

Detailed Zonewise Agromet Advisories

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



Land preparation/ Sowing



Rice Nursery



Sugarcane



Okra

- **Realised Rainfall:** Rainfall occurred in all the districts of Kerala and Coastal Karnataka; Belgaum Bidar, Haveri and Koppal districts of North Interior Karnataka; Bangalore Rural, Bellary, Chikmagalur, Hassan, Kodagu, Mysore and Shimoga districts of South Interior Karnataka; East Godavari, Srikakulam, Visakhapatnam, Vizianagaram, Kurnool and West Godavari districts of Andhra Pradesh; Khammam, Mahbubnagar and Warangal districts of Telangana; Coimbatore, Nilgiris and Theni districts of Tamil Nadu. Mainly dry weather prevailed over remaining parts of the region.
- **Weather Forecast:** Rain/thundershowers would occur at many places over Kerala and at a few places over Interior Karnataka during the period. Rain/Thundershowers would occur at many places over Coastal Karnataka during next 24 hours and increase thereafter. Rain/Thundershowers would occur at isolated places over Coastal Andhra Pradesh and Lakshadweep during next 24 hours and increase thereafter. Rain/Thundershowers would occur at isolated places over Telangana, Rayalaseema, Tamil Nadu & Pudducherry during the period.
- **Weather Warning:** Heavy rainfall would occur at isolated places over Coastal & South Interior Karnataka during the period and over Kerala on 19th and 20th July.
- **Weather Outlook:** Rain/thundershowers would occur at many places over north peninsular India. Subdued rainfall activity would continue over interior peninsular India. Rain/thundershowers would occur at a few places over rest parts

of the region.

- **Advisories:**

- **Karnataka:**

- As rain/thundershowers would occur at most/ many places over Coastal Karnataka along with heavy rainfall at isolated places over Coastal Karnataka and heavy rainfall at isolated places over South Interior Karnataka during the period, postpone intercultural operations and application of fertilizers and plant protection measures in standing crops. Provide adequate drainage in standing crops to remove excess water.
- Continue transplanting of *kharif* rice in the Coastal Karnataka.
- Continue sowing of maize and cotton, transplanting of lowland and upland rice utilising the realized and expected rainfall in the Hill Zone of Karnataka.
- Crop sowing is delayed due to inadequate rainfall in major parts of South Interior Karnataka. Medium duration varieties of red gram -TTB-7, BRG-1 and BRG-2; 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 are suggested.
- Continue sowing of red gram, ragi, groundnut and maize in the Eastern Dry Zone of Karnataka. Continue sowing of maize, irrigated cotton, red gram and intercropping in places where bajra is grown and transplanting of chillies in Bellary, Gulbarga Yadgir and Raichur districts; sowing of tur, niger, castor, groundnut, bajra, sorghum individually or by intercropping with tur and sowing / dibbling of irrigated cotton in Gulbarga, Koppal and Yadgir districts in the North East Dry Zone of Karnataka utilizing the realized and expected rainfall.
- Continue sowing of pigeon pea, jowar and undertake sowing of black gram and green gram in the North East Transition Zone of Karnataka.
- Continue sowing of bajra, sunflower, pigeonpea, groundnut, sesamum, niger, foxtail millet, horsegram, castor, bajra + pigeonpea (2:1), bajra + castor (2:1), groundnut + pigeonpea (4:2) bajra + groundnut (2:4), bajra + pigeonpea (2:1) in North Dry Zone of Karnataka utilizing the realized and expected rainfall.
- Suitable varieties are given in Annexure III.

- **Kerala:**

- As rain/thundershowers would occur at many places along with heavy rainfall at isolated places on 19th and 20th July, postpone intercultural operations and application of fertilizers and plant protection measures in standing crops. Provide adequate drainage in standing crops to remove excess water.
- Continue direct sowing of rice in the Problem Area Zone of Kerala. Also continue mat nursery preparation in places where mechanized transplanting can be done, planting of Nendran banana and transplanting of brinjal and chilli.
- Undertake planting of Nendran bananas in the Northern Zone of Kerala.
- Due to humid weather conditions, there is chance of leaf folder and stem borer attack in rice in the Central Zone of Kerala. To manage them, 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 sigatoka disease in varieties of banana other than Nendran and sheath blight and sheath rot in rice in the Southern Zone of Kerala. Cut and remove all the badly affected leaves and apply Propiconazol @ 1ml / litre of water and Copper oxy Chloride @ 4 g/ litre of water alternately after current spells of rain at two weeks interval to manage sigatoka disease. Spray Bavistin @ 200 g/Tilt (Propiconazol) @ 150 ml/ 200 litre of water to manage sheath blight and sheath rot in rice after current spells of rain.

- **Andhra Pradesh:**

- Continue nursery sowing of rice, direct sowing of rice under aerobic conditions, planting of rainfed sugarcane and sowing of irrigated maize, green gram, black gram and red gram 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 rainfall.
- Continue sowing of direct seeded rice and chillies and pulses in upland areas and land preparation for cotton sowing in the Krishna Godavari Zone of Andhra Pradesh.
- Continue sowing of red gram and groundnut in the rainfed tracts in the Scarce Rainfall Zone of Andhra Pradesh. In rainfed areas in Kurnool district, intercropping of korra + red gram @ 5:1 and Groundnut + red gram 7:1 may be undertaken upto 3rd week of July. Continue sowing of castor, raising of onion nursery and planting of medium and long duration varieties of turmeric. Undertake sowing of rainfed red gram and castor, cotton in black soils and rainfed groundnut and bajra in Anantapur district utilizing realized rainfall.
- Continue sowing of groundnut, red gram and nursery sowing of rice in the Southern Zone of Andhra Pradesh.

- **Tamil Nadu:**

- Continue transplanting of *kuruvai* rice in the Cauvery Delta Zone of Tamil Nadu with irrigation.
- Undertake propping up of banana crop of more than five months to prevent lodging due to high wind speed in the Western and South Zone of Tamil Nadu.

- Prevailing partly cloudy condition with high humidity is congenial for incidence of sucking pest in cucurbits and transplanted rice in the Western Zone of Tamil Nadu. Monitor the incidence and take suitable plant protection measures, if noticed.
- Partly cloudy and moderate humid weather is conducive for the incidence of sigatoka leaf spot in banana in the South Zone of Tamil Nadu. Spray Carbendazim @ 1 g/ litre of water, if incidence is noticed.
- 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, Lower Dibang Valley, Papumpara, Tawang, Tirap, Upper Siang, Upper Subansari, West Kameng and West Siang districts of Arunachal Pradesh; all districts of Assam; East Khasi Hills, Ribhoi, South Garo Hills and West Garo Hills districts of Meghalaya; Aizwal, Saiha and Serchhip districts of Mizoram; Chandel and Imphal West districts of Manipur; Dimapur and Kohima districts of Nagaland; all districts of Tripura except South Tripura. Weather was mainly dry over remaining parts of the region.
- **Weather Forecast:** Rain/thundershowers would occur at most places over Arunachal Pradesh, Assam & Meghalaya during next 48 hours and at many places thereafter. Rain/thundershowers would occur at many places over Nagaland, Manipur, Mizoram and Tripura during the period.
- **Weather Warning:** Heavy to very heavy rainfall would occur at isolated places over Assam & Meghalaya on 18th July. Heavy rainfall would occur at isolated places over Arunachal Pradesh on 18th July and over Assam & Meghalaya on 19th and 20th July.
- **Weather Outlook:** Rain/thundershowers would occur at a few places over rest parts of the region.
- **Advisories:**
 - **Assam & Meghalaya, Arunachal Pradesh:**
 - As rain/thundershowers would occur at most /many places over Assam and Meghalaya along with isolated heavy spells during the period, 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, complete nursery sowing of *sali* rice. 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.
 - 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 Arunachal Pradesh, complete transplanting of local varieties and HYV of *Kharif* rice.
 - In Upper Bramhaputra Valley Zone and Central Bramhaputra Valley Zone of Assam, continue nursery sowing of medium duration (130-135 days) *sali* rice varieties like Satyaranjan, Basundhara, Jaya, IR 36 etc. Nurseries can be sown upto 20th July and 25-30 days old seedlings can be transplanted till 15-20 August. Continue land preparation and sowing of jute for seed purpose.
 - Continue sowing of arhar and sesame in Hill Zone and Central Bramhaputra Valley Zone of Assam, continue sowing of sesame and groundnut in Lower Bramhaputra Valley Zone of Assam.
 - In North Bank Plain Zone and Central Bramhaputra Valley Zone of Assam, as pesticide application is not feasible in rainy weather, so arrangement of Bamboo perch is an effective measure to control the hairy caterpillar and semi-looper in jute through predatory birds.
 - In Hill Zone of Assam, due to humid weather, there is chance of stem borer infestation in sugarcane, spray Phosphamidon @400-500ml in 800 litre of water after current spells of rain. Also undertake 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 after current spells of rain. Also there is chance of fruit flies in cucurbits, for control, spray Malathion @ 3ml per litre of water after

current spells of rain.

- Due to humid weather and increase in humidity, there is chance of attack of thrips, blast, Gundhi bug and stem borer in *ahu* rice in Temperate Sub Alpine Zone of Meghalaya. Spray Chloropyriphos @ 2ml/litre of water against thrips, Mancozeb @ 2 g/litre of water or Carbendazim @ 1 g/litre of water against blast, spray Malathion 5% dust @ 6.25 kg/ha against rice Gandhi bug and Chloropyriphos @ 0.02 % or Monocrotophos @ 0.04 % for stem borer after current spells of rain.

- **Nagaland, Manipur, Mizoram and Tripura:**

- In Mizoram, continue transplanting of rice utilizing the realized and expected rainfall.
- In Nagaland, continue sowing of soybean, groundnut and pulses like black gram, green gram utilizing the realized and expected rainfall. Continue transplanting of rice.
- Continue transplanting of main *kharif* rice and sowing of black gram in Manipur utilizing the realized and expected rainfall. Continue nursery raising of early cauliflower in raised beds.
- In Mild Tropical Plain Zone of Tripura, continue transplanting of *aman* rice and continue sowing of vegetables.
- As rain/thundershowers would occur at many places over Nagaland, Manipur, Mizoram and Tripura, postpone irrigation, intercultural operations, application of plant protection measures and fertilizers in the standing crops.
- In Tripura, due to cloudy and humid weather there is chance of infestation of sheath blight in *jhum* rice. Spray Surf @ 1g per litre of water. Also monsoon weather is conducive for Panama wilt disease in banana. Drench with Bavistin @ 1g per litter of water and Trichodermaviride and pseudomonas fluorescence may be incorporated in the soil after current spells of rain. Also cloudy and humid weather is conducive for the attack of leaf curl disease in summer brinjal, chilli etc. To manage the attack, apply Imidachloprid @ 2ml per litre of water after current spells of rain.
- In Nagaland, cloudy weather is conducive for thrips in chilli, spray 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.
- 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 all districts of Andaman & Nicobar Islands; all districts except Murshidabad and North 24 Parganas in Gangetic West Bengal; all districts except Malda and North Dinajpur in Sub Himalayan West Bengal & Sikkim; in all districts of Odisha; in Araria, Banka, Bhabua, Khagaria, Kishanganj and West Champaran districts of Bihar; in Bokaro, Deogarh, Dhanbad, East Singhbhum, Gumla, Khunti, Koderma, Pakur, Ramgarh, Sahebganj, Saraikela, Simdega and West Singhbhum districts of Jharkhand. Weather was mainly dry over remaining parts of the region.
- **Weather Forecast:** Rain/thundershowers would occur at most places over Sub-Himalayan West Bengal and Bihar during next 48 hours and at many places thereafter. Rain/thundershowers would occur at many places over Andaman & Nicobar Islands during the period. Rain/thundershowers would occur at many places over Gangetic West Bengal and Jharkhand during the period. Rain/Thundershowers would occur at a few places over Odisha during next 24 hours and increase thereafter.

- **Weather Warning:** Heavy rainfall would occur at isolated places over Bihar, Sub-Himalayan West Bengal & Sikkim, Andaman & Nicobar Islands on 18th July and over Gangetic West Bengal on 19th and 20th July.
- **Weather Outlook:** Rain/thundershowers would occur at many places over east India.
- **Advisories:**
 - **West Bengal:**
 - As rain/thundershowers would occur at most/many places over West Bengal and Sikkim during the period along with heavy spells at isolated places over Gangetic West Bengal on 19th and 20th July, postpone intercultural operations, application of plant protection measures and fertilizers in the standing crops. Provide adequate drainage in crop fields to remove excess water.
 - In Sub Himalayan West Bengal, continue transplanting of *aman* rice utilizing the realised and expected rainfall.
 - Complete sowing of direct seeded *aman* rice in Coastal Saline Zone.
 - In New Alluvial Zone of West Bengal, continue planting of banana and complete sowing of direct seeded upland rice and continue nursery sowing of *aman* rice in Laterite and Red Soil Zone.
 - In New Alluvial Zone of West Bengal, due to cloudy and humid weather, there is a chance of curling of top leaves in chilli. Spray 5% Fipronil @ 1.5ml/litre of water. Also apply Spinosad 45 SC @ 1ml / 5 litre of water or Carbosulfan 25 EC @ 2 ml / litre of water against fruit or shoot borer attack in Brinjal after current spells of rain.
 - In Laterite and Red Soil Zone of West Bengal there is a chance of the attack of jassid, white-fly, shoot and fruit borer in brinjal. To control these insects, apply 0.75 gram Cartap hydrochloride 50 S.P. 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, drain out excess water from rice nurseries and vegetable crop fields.
 - **Odisha:**
 - 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. Undertake sowing of early duration arhar, green gram and black gram in upland.
 - In Western Undulating Zone of Odisha, continue sowing of maize, arhar and cotton in upland areas taking the advantage of the realised and expected rainfall.
 - In North Eastern Plateau 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.
 - Fruit and shoot borer in brinjal has been found in East and South Eastern Coastal Plain Zone of Odisha. To control it install Pheromone traps and spray Sevin WP @ 4 g or Malathion @ 2 ml in 1 litre water alternatively. Drying of fruit and stem of brinjal has been occurred. Spray 2 g Saaf or Sixer or Companion in 1 litre water. Root rot of pointed gourd. Spray 10 g Plantomycine along with 20 g Blitox 50 in 10 litre water. Fruit fly in cucurbit and bitter gourd. Spray 3 ml Sevin WP in 1 litre water after current spells of rain.
 - **Bihar:**
 - As rain/thundershowers would occur at most places over Bihar during the period, postpone irrigation, intercultural operations, application of plant protection measures and fertilizers in the standing crops.
 - 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 are recommended. 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) is advised.
 - 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 South Bihar Alluvial Zone, continue transplanting of long or medium duration rice variety which is 21-25 days old and planting of Mango, Litchi, Guava and Papaya.
 - In North East Alluvial Plain Zone of Bihar, continue transplanting of 20-25 days old paddy seedling in low and medium land areas with realised rainfall. Continue nursery sowing of chilli. Prepare drainage channels to drain out excess water from field of vegetables, jute and elephant foot yam.
 - **Jharkhand:**
 - As rain/thundershowers would occur at many places over Jharkhand during the period, postpone irrigation, intercultural operations, application of plant protection measures and fertilizers in the standing crops.
 - In South Eastern Plateau Zone of Jharkhand, complete sowing of direct seeded upland rice and 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.

- 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.
- Suitable varieties are given in Annexure III.
- **Animal Husbandry**
- Keep the cattle in the sheds during heavy rainfall periods in Sub-Himalayan West Bengal.
- Provide dry and clean shelter to dairy animals in Old Alluvial Zone of West Bengal. Clean and hygienic water should be provided to dairy animals.
- In South Bihar Alluvial Zone, carry out vaccination of animals against *Anthrax*, *Black Quarter (Dakaha)*, *Galgotu* disease to protect them during rainy season.
- **Poultry**
- In Nicobar Islands, South, North and Middle Andaman, egg laying poultry birds should be provided with extra light during night as well as cloudy days through electric bulb or through other lamp to about 16 to 17 hours to maintain egg production.

CENTRAL INDIA [M.P., CHHATTISGARH]



Sugarcane

Land Preparation/Sowing

Okra

Green Gram

- **Realised Rainfall:** Rainfall occurred in all districts of East Madhya Pradesh except, Damoh, Katni, Rewa, Satna, Sidhi and Singrauli; in all districts of West Madhya Pradesh except, Bhind, Mandasaur, Morena and Sheopur; in all districts of Chhattisgarh. Weather was mainly dry over remaining parts of the region.
- **Weather Forecast:** Rain/thundershowers would occur at many places over East Madhya Pradesh during next 48 hours and at a few places thereafter. Rain/thundershowers would occur at many places over West Madhya Pradesh during the period. Rain/thundershowers would occur at a few places over Chhattisgarh during next 48 hours and at many places thereafter.
Maximum temperatures would fall by 1-2°C over many parts of central India adjoining to northwest India.
- **Weather Warning:** Nil.
- **Weather Outlook:** Rain/thundershowers would occur at many places over central India.
- **Advisories:**
 - **Madhya Pradesh:**
 - Undertake transplanting of rice and sowing of maize, soybean in east Madhya Pradesh utilizing the realized and expected rainfall.
 - Undertake sowing of early maturing varieties of moong, urad and nursery sowing of vegetables in Satpura Plateau Zone of Madhya Pradesh utilizing the realized and expected rainfall.
 - Continue sowing of early maturing varieties of maize, soybean, sorghum and barely, nursery sowing of *kharif* vegetables in west Madhya Pradesh utilizing the realized and expected rainfall.
 - Continue transplanting of rice, undertake sowing of soybean, maize, urad, jowar and groundnut in Bundelkhand Zone and continue sowing of cotton in Nimar Valley Zone of Madhya Pradesh utilizing the realized and expected rainfall.
 - As rain/thundershowers would occur at many places over Madhya Pradesh during the period, postpone irrigation, inter-cultural operations, application of plant protection measures and fertilizers in the standing crops.
 - Due to partly cloudy weather, there is possibility of attack of fruit and stem borer in brinjal and tomato in Bundelkhand Zone of Madhya Pradesh. For control, spray Malathion 50 E.C. @ 1.0 ml per litre of water after current spells of rain.
 - In West Madhya Pradesh, 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.
 - Suitable varieties are given in Annexure III.
 - **Chhattisgarh:**
 - In Chhattisgarh Plain Zone, continue nursery sowing of rice and sowing of maize, soybean, moong and urad

- utilizing the realized and expected rainfall and also continue nursery sowing /transplanting of *kharif* vegetables.
- Undertake 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 utilizing the realized and expected rainfall.

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 Uttarakhand; Chamba, Hamirpur, Kangra, Mandi, Sirmour, Solan, Una districts of Himachal Pradesh; Gurdaspur and Hoshiarpur districts of Punjab; North East Delhi district of Delhi; Doda, Jammu, Kathua and Reasi districts of Jammu & Kashmir; Bahraich, Balrampur, Chandauli, Gazipur, Kanpur City, Kheri, Shrawasti, Jalaun, Lalitpur and Shahjahanpur districts of Uttar Pradesh; Ajmer, Banswara, Baran, Bhilwara, Chittorgarh, Dungarpur, Jhalawar, Kota, Pratapgarh, Rajsamand, Sirohi, Udaipur and Pali districts of Rajasthan. Weather was mainly dry over remaining parts of the region.
- **Weather Forecast:** Rain/thundershowers would occur at most places over Himachal Pradesh and Uttarakhand during the period. Rain/thundershowers would occur at many places over Uttar Pradesh during next 24 hours and at most places thereafter. Rain/thundershowers would occur at many places over Jammu & Kashmir and Punjab during next 24 hours and over Haryana & Delhi and East Rajasthan during next 48 hours and at a few places thereafter. Rain/thundershowers would occur at a few places over West Rajasthan during next 48 hours and at isolated places thereafter. Maximum temperatures would fall by 1-2°C over many parts of northwest India.
- **Weather Warning:** Heavy to very heavy rainfall would occur at a few places with extremely heavy falls at isolated places over Uttarakhand and heavy to very heavy rainfall would occur at isolated places over Himachal Pradesh, east Rajasthan, Uttar Pradesh, during the period. Heavy to very heavy rainfall would occur at isolated places over east Rajasthan on 18th July.
- **Weather Outlook:** Rain/thundershowers would occur at many places over Uttar Pradesh, Uttarakhand. Rain/thundershowers would occur at a few places over rest parts of the region outside west Rajasthan, where mainly dry weather would occur.
- **Advisories:**
 - **Jammu & Kashmir:**
 - Complete transplanting of rice and sowing of maize in Intermediate Zone and also complete sowing of moong, sunflower in Valley Temperate Zone of Jammu & Kashmir, utilizing the realised and expected rainfall.
 - Due to prevailing humid weather conditions, there are chances of fruit borer in bhindi and brinjal in Sub Tropical Zone of Jammu & Kashmir. To control, spray Actara (Thiomethoxam) @1 pouch/15 litre water at an interval of 15 days after current spells of rain.
 - Due to prevailing humid weather condition, there are chances of scab in apple in Valley Temperate Zone of Jammu & Kashmir, to control spray with Flusilazole 40 EC @ 20 ml per 100 litre of water or Penconazole 10 EC @ 50 ml per 100 litre of water, after current spells of rain.
 - **Himachal Pradesh:**
 - As rain/thundershowers would occur at most places along with heavy to very heavy rainfall at isolated places over Himachal Pradesh during the period, postpone intercultural operations and application of fertilizers and plant protection measures in standing crops. Provide adequate drainage in standing crops to remove excess water.
 - Continue transplanting of rice and sowing of cucurbits like cucumber, bitter gourd, bottle guard and summer squash; tomato, chilli, *capsicum* and brinjal in Mid-Hills Sub-Humid Zone and Sub-Montane & Low Hills Sub-Tropical Zone of Himachal Pradesh utilizing the realised and expected rainfall. Complete sowing of maize.
 - Due to prevailing humid weather conditions, there are chances of attack of cut worms and white grubs in maize in Mid-Hills Sub-Humid Zone and Sub-Montane & Low Hills Sub-Tropical Zone of Himachal Pradesh. Apply Chloropyriphos 20 EC @ 2 litres mixed with 25 kg of sand per hectare after current spells of rain.
 - Due to prevailing humid weather conditions, there are chances of attack of red pumpkin beetle and fruit fly in cucurbits in Mid-Hills Sub-Humid Zone and Sub-Montane & Low Hills Sub-Tropical Zone of Himachal Pradesh. Spray Malathion 50EC @ 1ml per litre of water after current spells of rain.

- 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:**
- As rain/thundershowers would occur at most places along with heavy to very heavy rainfall at a few places with isolated extremely heavy spells over Uttarakhand during the period, postpone intercultural operations and application of fertilizers and plant protection measures in standing crops. Provide adequate drainage in standing crops to remove excess water.
- Complete transplanting of rice and maintain optimum water level. Continue sowing of sorghum, millets, groundnut, soybean and pigeon pea in Bhabar & Tarai Zone of Uttarakhand, after current spells of heavy rainfall.
- 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.
- **Punjab, Haryana and Delhi:**
- In Western Zone of Punjab complete transplanting of rice with 25 to 30 days old seedlings utilizing realised and expected 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.
- 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 expected 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 with expected rainfall and transplanting of rice.
- In Delhi, continue nursery preparation 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 expected rainfall.
- **Uttar Pradesh:**
- As rain/thundershowers would occur at many places along with heavy to very heavy rainfall at isolated places over Uttar Pradesh during the period, 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.
- In Central Plain Zone of Uttar Pradesh, continue transplanting of rice and sowing of arhar, jowar, maize, groundnut, urad, mung, cucurbits like bottle guard, cucumber, bitter guard, tinda and planting of fruit crops utilizing the realised and expected rainfall. Undertake nursery sowing of cauliflower, sowing of soybean and sunflower, transplanting of brinjal and chilli and land preparation for planting of banana.
- Undertake sowing of groundnut, arhar, jowar and soybean in Bundelkhand Zone of Uttar Pradesh utilizing the realised and expected rainfall. Undertake land preparation for planting of fruit crops like mango, papaya, guava, etc.
- In Western Plain Zone of Uttar Pradesh, continue direct sowing of rice in lowland areas and undertake sowing of guar, bajra, jowar and moong as fodder crops in uplands utilizing the realised and expected 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 aphids in Anola orchard in Central Plain Zone of Uttar Pradesh. Spray Monocrotophos @ 1 litre per 800 litres of water for control after current spells of rain. Spray Monocrotophos 0.04% for control after current spells of rain.
- Due to humid weather condition, there are chances of red beetle in bottle guard in Bundelkhand Zone of Uttar Pradesh. Spray Monocrotophos @ 1 litre per 800 litres of water for control after current spells of rain.
- **Rajasthan:**
- Continue 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 undertake sowing of bajra, til, moong , urad in Flood Prone Eastern Plain Zone of Rajasthan, utilizing the realised and expected rainfall.
- Undertake sowing of short duration varieties of maize, soybean in Southern Humid Plain Zone of Rajasthan, utilizing the realised and expected rainfall.
- Continue sowing of maize, jowar, soybean, moong, urad, til, groundnut and arhar in South Eastern Humid Plain Zone utilizing the realised and expected rainfall.
- Undertake 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 rainfall.
- Continue land preparation and sowing of bajra, moong, moth, guar and til in Irrigated North Western Plain Zone & Arid Western Plain Zone of Rajasthan.
- In view of subdued rain for sowing of *kharif* crops in Rajasthan, following agricultural operations may be undertaken as given in Annexure I.
- Suitable short duration varieties are given in Annexure III.
- **Floriculture**
- Due to prevailing humid weather condition there are chances of incidence of gladiolus blight in gladiolus in Mid-Hills Sub-Humid Zone and Sub-Montane & Low Hills Sub-Tropical Zone of Himachal Pradesh. Spray Dithane M45 (Mancozeb) @ 25 g in 10 litres of water after current spells of rain.
- **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.
- 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 and Himachal Pradesh.

WEST INDIA [GOA, MAHARASHTRA, GUJARAT]



Land Preparation/ Sowing

Sugarcane

Rice Nursery

Okra

- **Realised Rainfall:** Rainfall occurred in all districts of Konkan & Goa; in all districts of Vidarbha except Washim; Dhule, Jalgaon, Pune, Kolhapur and Satara districts of Madhya Maharashtra; Aurangabad, Jalna & Osmanabad districts of Marathwada; Baroda, Dahod, Narmada, Navsari, Sabarkantha and Valsad districts of Gujarat region; Amreli, Diu, Junagadh, Porbandar, Rajkot and Surendranagar districts of Saurashtra & Kutch region. Weather was mainly dry over remaining parts of the region.
- **Weather Forecast:** Rain/thundershowers would occur at most places over Saurashtra & Kutch, Konkan & Goa during next 24 hours and at many places thereafter. Rain/thundershowers would occur at many places over Gujarat region, at a few places over Madhya Maharashtra and Vidarbha and at isolated places over Marathwada during the period.
- **Weather Warning:** Heavy to very heavy rainfall would occur at isolated places over Konkan & Goa on 18th July and heavy rainfall would occur at isolated places over Konkan & Goa on 19th and 20th July.
- **Weather Outlook:** Rain/thundershowers would occur at many places over along west coast.
- **Advisories:**
 - **Maharashtra:**
 - In Konkan, as rain is expected at most/ many places with heavy to very heavy spells at isolated places, drain out excess water from rice, finger millet and vegetable fields and postpone fertilizer application. Continue transplanting with 20-22 days old seedlings of rice and finger millet.
 - In Madhya Maharashtra, continue transplanting of rice in Western parts of Kolhapur, Pune and Nasik districts. Undertake sowing of contingency crops like sunflower, soybean, cotton, hybrid jowar, hybrid pearl millet, red gram, bean and sesame in all districts except Nandurbar, Nasik, Solapur and Ahmednagar. It is also advised to take up intercropping of pearl millet+red gram in 2:1, sunflower+red gram in 2:1, soybean+red gram in 3:1 and guar+red gram in 2:1 ratios. For sowing of red gram, use Vipula variety.
 - In Marathwada (in Aurangabad, Jalna & Osmanabad districts), continue sowing of *kharif* crops like cotton, soybean, red gram, bajra (GHB-558, Shraddha, AHB-166) and sunflower with optimum soil moisture in the field and expected rainfall. Instead of sowing sole crops, adopt intercropping of cotton + soybean, cotton + red gram 6:2 by selecting short duration and improved varieties. Sowing of soybean may be undertaken upto 25th July.
 - In Vidarbha, undertake sowing of contingency kharif crops with the help of optimum soil moisture in the field. Three tier intercropping of cotton : jowar : red gram : jowar in 6:1:1:1, green gram / black gram : cotton in 1:1 ratio

may be undertaken to minimize the risk. For sowing of red gram select variety PKV-Tara. Continue transplanting of 22-25 days old rice seedlings utilizing the realized rainfall in Eastern Vidarbha. Direct sowing of early maturing and mid late maturing rice varieties may be done by wet seeding method wherever the nursery is not prepared due to subdued monsoon.

- Due to humid weather in Pune region, there may be incidence of anthracnose in custard apple; spray 1 % Bordeaux mixture 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 week 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:**

- Undertake transplanting of mid maturing varieties of rice and sowing of pearl millet, groundnut, cotton and pigeon pea utilising the realised and expected rainfall; select short duration and late sowing crop varieties for sowing of *kharif* crops in Middle Gujarat Zone.
- In North Gujarat Zone, undertake sowing of bajra with moderate duration variety GHB-744 and early maturity varieties GHB-558, GHB-538, GHB-719 and undertake sowing of green gram and black gram utilising the realised and expected rainfall.
- Carry out sowing of pearl millet and vegetable crops with irrigation if irrigation facilities are available; carryout weeding, intercultural operation and mulching in already sown cotton crop to conserve soil moisture in Bhal and Coastal Zone. Take green gram, pigeon pea, guar as an intercrop. Prepare the pits for horticulture crops.
- Continue transplanting of tomato, brinjal, chilli and other vegetables and transplanting of rice seedlings at 4-5 leaves stage in South Gujarat Heavy Rainfall Zone utilising the expected rainfall. Take suitable short duration intercrops in new orchards.
- As rain is expected at many places, postpone intercultural operations, application of fertiliser and plant protection measures in standing crops.
- As onset of monsoon was delayed in Gujarat, detailed contingency measures and moisture conservation measures for alternate crops recommended for July first fortnight is given in Annexure I.

▪ **Saurashtra & Kutch:**

- As rain /thundershowers would occur, continue sowing of pearl millet, pulses, sesame and castor, prefer bunch varieties of groundnut (GG-2, GG-5, TAG-24, TG-37 A, TPG-41, TLG-45) and short to medium duration BG-II cotton varieties for sowing in North Saurashtra Zone.
- In North West Zone, sowing of groundnut with varieties like GAU-10, GG-20, GG- 11,12,13, pearl millet (prefer downey mildew resistant variety & high yielding varieties like GHB-15, 235, 316, MH-169, GHB-27), green gram, black gram and castor and sowing of maize, sorghum, lucern –bajara and cowpea for green fodder may be undertaken after receipt of sufficient rain.
- Prepare nursery for *kharif* vegetables like brinjal, tomato, chilli etc. in South Saurashtra Zone utilising the realised rainfall. Carry out intercultural operations, hand weeding and gap filling in already sown cotton, groundnut and soybean crops.
- Weather conditions are favourable for infestation of thrips in cotton in South Gujarat Zone. Spray Profenophos @ 10 ml / 10 liter of water for control.
- **Due to delayed onset of monsoon, crops recommended for sowing is given in Annexure I.**
- Detailed contingency measures given in Annexure I.
- Suitable varieties are given in Annexure III.

• **Animal Husbandry**

- In Gujarat, HF vaccination is recommended in cattle if not done earlier during the season. 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

1. North Interior Karnataka

- Bajra, Pigeonpea, Groundnut, Sesamum, Niger, Faxtail millet, Horsegram, , Castor, Bajra + Pigeonpea (2:1), Bajra + castor (2:1), Groundnut + pigeonpea (4:2) Bajra + groundnut (2:4), Bajra + pigeonpea (2:1). Sow the crops across the slope.
- Soak the seeds for recommended time in Calcium Chloride solution before sowing.
- Select short duration, drought resistant crops and variety.
- Take up sowing of crops in wider rows to overcome moisture stress and to get higher yields

Contingency planning for North Interior Karnataka

Meteorological subdivision	Districts	Major crops	District wise Contingency planning for crops if monsoon delayed by 4 weeks
North Interior Karnataka	Bidar	Jowar, red gram, soybean, black gram	Red gram, soybean and bajra.
	Bagalkote	Sorghum, sugarcane, maize, greengram, groundnut	Pearl millet, sunflower
	Dharwad	Maize, rice, soybean, groundnut , cotton	Maize+Redgram (4:2), Groundnut + Redgram (4:2)
	Belgaum	Sugarcane, maize, cotton, soybean, groundnut	Short duration varieties of Groundnut
	Bellary	Rice, maize, sorghum, sunflower, groundnut	Bajra, pigeonpea, groundnut or sunflower
	Koppal	Sunflower, rice, bajra, sorghum, groundnut	Sesamum and castor

2. Gujarat Region and Saurashtra & Kutch

1. For South and Middle Gujarat region:

- Prefer short duration oilseeds crops for sowing like Sunflower (cv. Modern and EC-68414 and Guj-1) and Sesamum (cv. Guj. Tal 1,2, 10).
- Prefer pulse crops like: 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).
- Prefer grain Sorghum (cv. CSH-5,6,1, GJ-39, 40, 41) and Fodder sorghum (cv. S-1049, C-10-2, Gundari, GFS 4,5).
- Where canal water is available up to 20 th July
- Paddy: GR-8,9, Sathi 34-36, Ambica and Gurjari can be transplanted.

2. North Gujarat Region:

Sesamum (cv. Guj. Tal 1, 2, 10), Sunflower (cv. Modern, EC 68414), Fodder sorghum (cv. S-1049, C-10-2) are to be sown.
Cotton cv. Hy-8, 10, V-797, G. Cot 13, 21, 23 can be cultivated.

3. For Saurashtra region:

Groundnut: Erect variety (cv.GG-2, 5,7), Fodder sorghum(cv. S-1049, C-10-2), Sunflower(cv. Modern, EC 68414), Green gram (cv. GM-4, K-851, Meha), Black gram (cv. T-9, Guj. Udid-1) and Green gram (cv. GM-4, K-851, Meha) are preferred for sowing.
For risk reduction in groundnut follow mix cropping with castor or Tur in 3:1 row.

3. Maharashtra

Contingency planning for Madhya Maharashtra, Marathwada and Vidarbha

Subdivision	District	Contingency crops if monsoon is delayed by 6-8 weeks
Madhya Maharashtra	Madhya Maharashtra except Western Ghat Region	Sunflower, Soybean, Cotton, hybrid Jowar, hybrid pearl millet, Red gram short duration, Groundnut short duration variety. intercropping of pearl millet+redgram in 2:1, sunflower+redgram in 2:1, soybean+redgram in 3:1 and guar+redgram in 2:1 ratios.
Marathwada	Marathwada	Soybean + tur 4:2 Cotton + tur 6:2 Jowar + tur 4:2 Same/Soybean + tur 4:2 Soybean + tur 4:2
Vidarbha	East Vidarbha	Drilled rice with early maturing variety Instead of soybean, cotton and red gram, take early rabi jowar, sesamum, linseed, maize
	West Vidarbha	Three tier intercropping of cotton:sorghum:pigeonpea:sorghum in 6:1:1:1 or 3:1:1:1 ratio is recommended.
		Red gram

4. Madhya Pradesh

If soybean, maize and sorghum could not be sown due to subdued rainfall in West Madhya Pradesh, sowing of pigeonpea, greengram, blackgram, sesame in place of soybean, maize and Sorghum may be undertaken. Recommended varieties for Pigeonpea- Pragati, Jagriti, Asha, Number-148, JKM-7, JA-4, Type-21-Pusa- 855, ICPL-85063 (Laxmi), JKM-189, for Greengram- Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2, Tarme-1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139, for Blackgram – JU-2, JU-3, JU-86, T- 9, JBG-623, LBG684, TAU- 1, Berkha and for Sesame - TKG -306, TKG-35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1

5. Rajasthan

1. Dry sowing of maize should be done after 10th July.
2. Intercropping of maize + black gram (2:2) or maize + green gram (1:1) in maize growing region should be done.
3. Seed priming of maize (0.1 % thiourea) for 6 hrs should be done before sowing.
4. Intercropping of Groundnut variety JL-24 or Pratap mungphali-2 with sesamum at 6:2 row ratio under present situation.
5. 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.
6. In eastern and western parts, only short duration varieties of Bajra (HHB-67, Improved, RHB-121, RHB-90 and Raj-171) can be sown upto 20th July as these varieties mature in 65-80 days.

Annexure II
Week by week Rainfall Distribution

Sub-Divisions	02.07.14		09.07.14		16.07.14	
	Actual (mm)	% dep.	Actual (mm)	% dep.	Actual (mm)	% dep.
Arunachal Pradesh						
Anjaw	**	**	**	**	**	**
Changlang	44.9	-63	122.0	16	34.3	-68
Dibang Valley	10.0	-91	0.0	-100	**	**
East Kameng	13.2	-85	18.3	-77	5.9	-94
East Siang	287.8	44	287.5	37	23.0	-91
Kurung Kumey	**	**	**	**	**	**
Lohit	91.0	-37	83.2	-34	15.4	-89
Lower Dibang Valley	205.5	94	204.6	153	36.1	-19
Lower Subansari	**	**	**	**	**	**
Papumpara	286.2	63	118.4	-31	250.8	95
Tawang	97.0	-45	85.0	-50	105.0	-50
Tirap	64.6	-63	11.0	-93	109.6	-43
Upper Siang	307.6	85	160.5	1	128.6	-12
Upper Subansari	47.8	-52	51.0	-10	58.0	-1
West Kameng	75.6	-57	129.0	-24	64.0	-70
West Siang	89.7	-35	92.7	-7	243.7	45
Assam&Meghalaya						
Assam						
Baksa	44.0	-75	42.0	-81	48.2	-67
Barpeta	34.6	-80	97.3	-57	109.5	-24
Bongaigaon	70.4	-61	221.8	-2	89.7	-46
Cachar	101.2	-20	83.3	-26	165.2	39
Chirang	84.9	-53	217.9	-4	119.5	-29
Darrang	44.0	-51	24.0	-71	56.0	-38
Dhemaji	135.0	-3	157.0	5	59.0	-61
Dhubri	38.6	-67	84.6	-23	32.9	-76
Dibrugarh	88.4	-20	26.3	-77	89.0	-28
Goalpara	13.7	-91	99.2	-18	163.3	47
Golghat	64.1	0	30.1	-58	75.8	-1
Hailakandi	121.6	27	51.7	-38	217.1	127
Jorhat	111.0	38	22.3	-77	55.3	-39
Kamrup(Rural)	106.4	39	11.0	-88	60.6	-26
Kamrup(Metro)	74.3	-3	28.1	-68	76.2	-7
Karbi Anglong	117.8	167	54.5	-1	88.4	74
Karimganj	91.6	-36	153.3	-1	108.8	-30
Kokrajhar	104.3	-58	98.4	-62	109.1	-25
Lakhimpur	161.5	16	113.3	-25	156.0	3
Morigaon	60.6	-29	16.0	-82	54.6	-41
N.C.Hills	118.2	65	63.3	34	108.6	73

Nowgong	124.9	91	39.3	-36	100.7	12
Nalbari	25.4	-75	108.0	-9	100.0	-16
Sonitpur	36.6	-60	52.5	-41	72.8	-23
Sibsagar	134.0	68	24.0	-75	76.2	-9
Tinsukia	82.7	-20	59.2	-44	44.8	-65
Udalgiri	86.3	-3	56.6	-31	48.6	-46
Meghalaya						
East Garo Hills	115.6	22	429.7	381	25.3	-76
East Khasi Hills	258.5	-28	676.5	85	153.8	-62
Jaintia Hills	**	**	**	**	**	**
Ribhoi	37.9	-64	51.7	-47	50.2	-37
South Garo Hills	134.0	15	167.0	62	34.0	-69
West Garo Hills	42.4	-64	48.0	-53	40.6	-63
West Khasi Hills	**	**	**	**	**	**
NMMT						
Mizoram						
Aizwal	131.5	21	8.1	-90	207.2	76
Champhai	**	**	**	**	**	**
Kolasib	**	**	**	**	**	**
Lawngtlai	**	**	**	**	**	**
Lunglei	**	**	**	**	**	**
Mamit	22.0	-80	4.0	-95	**	**
Saiha	85.0	-16	39.0	-58	85.0	-14
Serchhip	29.0	-69	12.0	-88	33.0	-69
Manipur						
Bishnupur	**	**	**	**	**	**
Chandel	12.0	-87	12.0	-91	32.0	-78
Churachandpur	1.0	-99	17.0	-80	19.0	-81
Imphal east	16.1	-81	20.5	-75	12.3	-84
Imphal west	74.9	5	103.0	79	33.3	-41
Senapati	46.0	-53	17.0	-78	4.0	-95
Tamenglong	**	**	**	**	**	**
Thoubal	11.0	-80	3.0	-91	**	**
Ukhrul	**	**	**	**	**	**
Nagaland						
Dimapur	15.8	-46	23.4	-44	55.5	-5
Kephire	**	**	**	**	**	**
Kohima	40.3	-51	24.8	-68	47.5	-41
Longleng	**	**	**	**	**	**
Mokokchung	49.0	-63	24.0	-88	21.0	-78
Mon	**	**	**	**	**	**
Paren	**	**	**	**	**	**
Phek	16	-81	43	-44	5	-94
Tuensang	**	**	**	**	**	**
Wokha	**	**	**	**	**	**
Zunheboto	**	**	**	**	**	**
Tripura						
Dhalai	34.0	-56	0.0	-100	84.5	6
North tripura	62.2	-29	37.3	-55	132.0	31

South tripura	57.0	-47	77.3	-37	28.7	-76
West tripura	57.1	-33	66.6	-25	33.0	-66
Himachal Pradesh						
Bilaspur	99.1	104	35.9	-45	25.8	-59
Chamba	16.3	-72	21.5	-73	60.8	-55
Hamirpur	61.4	-13	24.7	-60	112.5	33
Kangra	50.3	-34	35.8	-62	196.1	42
Kinnaur	0.7	-93	0.0	-100	0.0	-100
Kullu	16.2	-31	13.1	-58	17.6	-56
Lahaul and Spiti	4.0	-78	3.2	-89	14.2	-62
Mandi	76.2	12	23.2	-66	91.1	2
Shimla	60.5	73	25.4	-38	16.1	-70
Sirmaur	77.1	7	25.2	-73	125.5	5
Solan	105.1	88	42.1	-42	55.7	-35
Una	62.9	43	10.8	-86	87.7	10
Punjab						
Amritsar	21.7	-3	0.8	-98	0.0	-100
Barnala	9.6	-47	0.0	-100	0.0	-100
Bhatinda	10.0	-50	41.0	161	0.0	-100
Faridkot	24.0	49	17.5	-8	0.0	-100
Fatehgarh Saheb	16.3	-29	0.0	-100	0.0	-100
Ferozpur	18.4	27	7.3	-67	0.0	-100
Gurdaspur	44.4	24	11.6	-77	95.3	22
Hoshiarpur	36.5	-12	1.5	-97	44.6	-28
Jalandhar	48.9	84	0.0	-100	1.8	-96
Kapurthala	41.1	90	0.2	-99	0.0	-100
Ludhiana	34.8	35	9.1	-78	0.1	-99
Mansa	1.5	-87	9.5	-46	0.0	-100
Moga	24.2	114	2.1	-91	0.0	-100
Muktesar	1.0	-93	57.7	224	0.0	-100
Nawashahar	51.9	16	11.9	-84	1.2	-99
Patiala	22.9	-11	0.0	-100	4.0	-94
Ropar	49.2	25	8.8	-82	15.1	-80
Sangrur	9.7	-63	0.5	-98	0.4	-99
Mohali	65.2	114	6.7	-87	2.0	-97
TarnTaran	18.8	57	0.3	-99	0.0	-100
Haryana,Chd,Delhi						
Haryana						
Ambala	41.6	-1	12.0	-81	12.6	-84
Bhiwani	0.2	-98	8.3	-59	0.0	-100
Chandigarh	62.2	27	9.7	-87	0.1	-99
Faridabad	4.0	-76	10.5	-69	19.3	-68
Fatehabad	6.0	-65	6.5	-64	0.0	-100
Gurgaon	10.4	-43	33.2	9	2.6	-95
Hissar	0.0	-100	13.4	-36	0.0	-100
Jhajar	0.6	-97	21.6	-9	1.0	-98
Jind	0.7	-97	14.2	-41	10.5	-77
Katihah	22.9	82	4.9	-76	1.2	-97
Karnal	45.6	64	7.2	-84	0.3	-99

Kurukshetra	16.4	-31	5.5	-87	1.0	-98
Mahendragarh	4.3	-76	7.9	-65	0.0	-100
Mewat	0.0	-100	13.9	-46	0.5	-99
Palwal	0.0	-100	8.8	-72	0.0	-100
Panchkkula	21.0	-59	6.5	-90	3.7	-95
Panipat	6.9	-69	2.4	-92	0.4	-99
Rewari	0.0	-100	28.6	51	0.0	-100
Rohtak	0.0	-100	1.8	-94	0.0	-100
Sirsa	10.8	-4	21.8	35	0.0	-100
Sonepat	4.6	-80	8.6	-72	0.0	-100
Yamunanagar	36.5	-27	3.5	-93	12.4	-81
Delhi						
Central Delhi	24.0	-16	30.0	-29	3.0	-95
East Delhi	6.0	-79	5.0	-88	10.0	-85
New Delhi	30.8	7	20.5	-51	25.4	-62
North Delhi	10.2	-64	41.9	0	2.1	-97
North East Delhi	8.0	-72	5.0	-88	60.0	-9
North West Delhi	15.3	-47	15.7	-63	0.0	-100
South Delhi	24.6	-14	12.2	-71	7.2	-89
South West Delhi	4.4	-85	16.0	-62	7.5	-89
West Delhi	1.0	-97	28.0	-33	0.0	-100
Jammu & Kashmir						
Anantnag	6.8	-53	20.3	37	4.6	-76
Badgam	7.4	-10	36.0	480	5.1	-68
Bandipore	**	**	**	**	**	**
Baramula	14.7	10	17.5	2	11.2	-47
Doda	18.6	35	2.8	-86	34.8	13
Ganderbal	7.6	-4	19.8	96	1.2	-92
Jammu	14.6	-45	2.7	-95	51.6	-37
Kargil	0.0	-100	**	**	**	**
Kathua	90.0	144	7.8	-89	73.8	4
Kistwar	**	**	**	**	**	**
Kulgam	8.5	-41	15.2	3	3.7	-80
Kupwara	15.3	70	25.0	58	3.0	-72
Ladakh(Leh)	0.0	-100	4.3	77	0.0	-100
Poonch	1.6	-95	0.0	-100	7.8	-90
Pulwama	3.1	-64	12.7	10	13.0	-29
Rajouri	32.3	55	20.4	-56	26.5	-50
Ramban	4.0	-71	13.1	-35	7.1	-77
Reasi	47.8	-3	29.4	-62	203.3	90
Samba	32.5	23	28.9	-44	7.7	-91
Shopian	18.0	109	20.0	74	9.0	-51
Srinagar	10.0	27	37.7	273	6.6	-55
Udhampur	29.3	-40	5.2	-93	22.8	-79
East Madhya Pradesh						
Anuppur	10.2	-85	36.5	-62	93.6	-2
Balaghat	14.0	-83	34.4	-66	83.3	-27
Chhatarpur	1.4	-97	32.2	-53	49.0	-22
Chindwara	24.5	-59	14.8	-80	50.7	-20

Damoh	21.5	-69	16.2	-77	29.0	-64
Dindori	**	**	6.3	-94	92.2	-16
Jabalpur	2.3	-96	2.5	-97	91.7	14
Katni	0.5	-99	68.5	-9	28.6	-67
Mandla	53.3	-29	8.0	-92	99.8	-2
Narsingpur	3.6	-93	28.0	-66	99.6	27
Panna	0.0	-100	21.3	-73	42.9	-44
Rewa	47.0	-28	63.4	11	20.6	-71
Sagar	23.0	-62	24.1	-69	67.2	-17
Satna	8.2	-88	64.1	1	27.8	-54
Seoni	23.6	-63	15.8	-81	62.8	-27
Shahdol	8.0	-86	21.0	-74	31.0	-59
Sidhi	11.2	-81	68.6	-7	20.2	-75
Singrauli	0.8	-99	18.0	-61	1.0	-98
Tikamgarh	7.0	-88	10.1	-82	53.0	-10
Umaria	2.5	-96	19.5	-74	72.3	-11
West Madhya Pradesh						
Alirajpur	0.0	-100	0.0	-100	46.3	-21
Asoknagar	0.0	-100	12.0	-81	87.5	49
Badwani	0.0	-100	0.0	-100	65.9	53
Betul	6.0	-89	40.4	-37	110.3	77
Bhind	9.4	-71	5.0	-89	17.1	-67
Bhopal	0.0	-100	42.4	-43	57.5	-12
Burhanpur	0.0	-100	25.8	-46	95.3	101
Datia	1.8	-95	8.3	-83	45.2	-15
Dewas	0.0	-100	0.0	-100	115.7	74
Dhar	0.0	-100	0.0	-100	60.5	2
Guna	0.0	-100	7.9	-89	46.4	-25
Gwalior	8.4	-79	13.3	-74	49.0	-14
Harda	0.3	-99	64.9	-6	88.5	18
Hosangabad	14.7	-80	27.5	-70	114.7	22
Indore	0.0	-100	0.9	-98	77.4	37
Jhabua	0.0	-100	0.3	-99	83.7	81
Khandwa	0.0	-100	98.0	72	154.0	168
Khargone	0.0	-100	5.4	-88	112.6	120
Mandsaur	0.0	-100	1.1	-98	26.9	-52
Morena	14.3	-60	6.3	-84	4.8	-90
Neemuch	0.0	-100	0.0	-100	86.1	65
Raisen	10.8	-82	12.7	-85	112.8	49
Rajgarh	0.0	-100	1.1	-98	83.9	32
Ratlam	0.0	-100	0.0	-100	49.7	-18
Sehore	3.2	-94	23.9	-65	135.8	81
Shajapur	0.0	-100	11.5	-81	84.4	45
Sheopur Kalani	0.0	-100	7.0	-85	4.5	-94
Shivpuri	5.5	-88	38.3	-26	36.3	-32
Ujjain	0.0	-100	0.0	-100	90.3	67
Vidisha	17.1	-67	12.6	-84	72.5	5
Chhattisgarh						
Bastar	80.6	9	31.2	-59	62.1	-17

Bijapur	3.2	-95	32.9	-67	181.2	110
Bilaspur	9.7	-88	55.8	-30	88.2	9
Dantewara	25.4	-61	19.3	-78	140.6	55
Dhamtari	11.8	-84	2.8	-96	37.0	-52
Durg	33.4	-58	57.0	-31	122.7	94
Janjgir	30.0	-63	32.7	-63	100.5	7
Jashpurnagar	85.9	-4	20.2	-82	48.3	-45
Kanker	12.7	-85	80.7	3	119.4	48
Korba	26.7	-70	24.3	-75	81.6	-15
Koriya	24.3	-70	61.9	-28	120.5	21
Kawardha	23.4	-56	18.7	-70	231.2	258
Mahasumund	72.9	17	4.8	-94	89.8	27
Narayanpur	17.0	-76	18.7	-77	138.4	66
Raigarh	59.8	-13	26.8	-71	116.9	39
Raipur	51.1	-31	14.6	-82	108.6	31
Rajandgaon	31.2	-55	25.2	-67	145.9	84
Surguja	36.6	-53	29.3	-65	30.6	-69
East Uttar Pradesh						
Allahabad	0.8	-98	48.5	-5	14.5	-79
Ambedkar Nagar	80.0	91	134.3	138	12.0	-84
Azamgarh	4.7	-91	40.2	-42	16.3	-80
Bahraich	27.3	-56	378.5	516	44.7	-50
Ballia	22.6	-52	65.2	14	7.6	-91
Balrampur	12.7	-77	122.9	119	82.1	-29
Banda	4.3	-92	6.2	-89	5.8	-91
Barabanki	11.9	-78	195.2	243	27.8	-68
Basti	85.3	55	120.7	96	7.5	-90
Chandauli	5.0	-87	36.4	-35	97.2	8
Deoria	50.0	-18	34.5	-40	9.5	-89
Faizabad	21.8	-61	89.1	41	1.5	-99
Farrukhabad	0.3	-99	12.0	-74	2.8	-96
Fatehpur	0.0	-100	32.4	-39	3.2	-96
Gazipur	28.8	-32	58.6	5	33.5	-51
Gonda	9.1	-84	95.9	69	2.6	-97
Gorakhpur	41.3	-37	67.6	2	14.7	-84
Hardoi	5.6	-89	16.8	-65	7.2	-90
Jaunpur	3.0	-94	58.9	-6	12.6	-85
Kannauj	0.0	-100	8.5	-82	0.0	-100
Kanpur City	4.8	-88	15.8	-59	40.8	-21
Kanpur Dehat	1.5	-96	2.0	-94	5.8	-90
Kaushambi	0.0	-100	41.2	-19	0.0	-100
Kheri	20.1	-57	155.1	115	86.0	15
Kushi nagar	46.0	-34	32.8	-53	5.5	-95
Lucknow	15.5	-68	64.1	33	25.5	-63
Maharajganj	52.5	-28	36.0	-53	4.0	-96
Mau	15.0	-71	32.0	-44	0.0	-100
Mirzapur	5.3	-88	74.7	23	2.3	-97
Pratapgarh	10.7	-79	66.7	8	13.3	-80
RaiBareilly	3.3	-92	140.6	166	1.2	-98

Sahuji Maharaj Nagar	8.0	-87	16.7	-72	2.5	-96
Sant Kabir Nagar	109.5	120	97.0	57	15.0	-85
Sant Ravidas Nagar	0.0	-100	50.0	-10	0.0	-100
Shrawasti	36.4	-42	287.0	367	163.9	85
Sidharth Nagar	47.8	-3	70.5	18	18.5	-81
Sitapur	7.9	-83	136.8	146	17.1	-76
Sonbhadra	21.9	-64	24.2	-61	14.8	-80
Sultanpur	6.1	-86	71.6	11	3.3	-96
Unnao	2.3	-95	26.8	-41	22.8	-66
Varanasi	8.3	-85	74.7	21	17.0	-81
West Uttar Pradesh						
Agra	0.0	-100	9.4	-75	13.3	-77
Aligarh	0.0	-100	13.2	-69	1.3	-98
Auraiya	0.0	-100	0.0	-100	23.5	-63
Badaun	12.6	-63	2.2	-96	0.0	-100
Baghpat	48.7	115	13.2	-65	0.0	-100
Bareilly	43.1	1	21.8	-61	21.3	-72
Bijnor	53.9	25	3.6	-94	5.5	-93
Bulandshahr	8.5	-72	0.0	-100	3.2	-94
Etah	0.0	-100	0.5	-99	0.7	-99
Etawah	0.7	-98	0.5	-99	13.9	-73
Firozabad	0.0	-100	10.0	-73	5.7	-90
GB Nagar	0.0	-100	12.0	-64	0.0	-100
Ghaziabad	39.3	72	0.0	-100	0.0	-100
Hamirpur	0.3	-99	9.0	-80	2.3	-96
Jalaun	2.8	-93	4.2	-91	33.6	-39
Jhansi	3.7	-93	8.4	-86	26.5	-55
Jotiba Phule Nagar	7.0	-77	0.5	-99	8.0	-89
Kanshiram Nagar	6.0	-80	0.0	-100	0.0	-100
Lalitpur	0.0	-100	29.5	-52	43.0	-32
Mahamaya Nagar	1.0	-96	11.5	-69	15.5	-76
Mahoba	0.0	-100	3.0	-94	8.4	-83
Mainpuri	0.0	-100	1.5	-97	22.8	-60
Mathura	2.2	-92	1.0	-97	0.0	-100
Meerut	27.8	-14	2.8	-95	0.0	-100
Moradabad	34.7	-19	8.9	-86	10.0	-85
Muzaffarnagar	35.8	1	1.0	-98	0.0	-100
Pilibhit	7.4	-85	41.7	-39	13.2	-82
Rampur	25.6	-37	2.4	-97	6.9	-91
Saharanpur	47.0	-7	1.7	-97	0.0	-100
Shahjahanpur	10.5	-78	55.3	-12	67.5	-3
Uttarakhand						
Almora	20.9	-46	3.3	-95	75.5	11
Bageshwar	20.0	-49	8.0	-87	148.7	119
Chamoli	22.0	-51	35.9	-32	120.1	78
Champawat	10.5	-88	45.5	-51	67.5	-45
Dehradun	25.7	-73	66.5	-45	194.1	23
Garhwal Pauri	26.9	-60	1.9	-98	90.8	-21
Garhwal Tehri	6.5	-89	16.5	-74	104.9	17

Haridwar	141.7	200	4.9	-93	35.7	-55
Nainital	60.5	-25	25.8	-75	114.7	-16
Pithoragarh	21.8	-80	27.3	-76	93.5	-18
Rudraprayag	40.7	-52	42.1	-59	182.1	56
Udham Sing Nagar	13.2	-75	70.5	-17	65.4	-42
Uttarkashi	38.1	-31	45.1	-39	134.1	56
Bihar						
Araria	82.6	-13	67.7	-18	36.8	-67
Arwal	7.5	-88	67.2	49	2.4	-97
Aurangabad	14.2	-72	107.3	79	4.0	-95
Banka	89.6	63	236.8	325	47.2	-39
Begusarai	209.4	270	285.0	338	0.0	-100
Bhabua	31.0	-49	41.5	-34	30.0	-66
Bhagalpur	63.6	-15	242.2	260	26.2	-64
Bhojpur	20.9	-64	168.8	160	4.2	-96
Buxar	6.6	-87	27.3	-51	23.8	-72
Darbhanga	62.6	-11	122.3	92	24.4	-65
East Champaran	40.6	-42	81.4	23	5.3	-93
Gaya	21.3	-68	161.0	167	2.7	-97
Gopalganj	27.1	-59	73.1	6	9.7	-88
Jahanabad	21.9	-52	103.5	84	2.3	-97
Jamui	63.9	-20	238.4	238	19.5	-77
Kathihar	48.1	-42	47.7	-40	10.7	-89
Khagadia	105.9	38	207.5	202	41.2	-55
Kishanganj	144.9	10	90.3	-32	83.5	-40
Lakhisarai	101.0	50	290.0	320	0.0	-100
Madhepura	47.9	-29	108.3	14	4.5	-96
Madhubani	67.3	-16	130.4	53	1.0	-99
Monghyar	111.4	65	238.8	246	22.9	-72
Muzaffarpur	50.7	-31	124.7	92	3.5	-95
Nalanda	33.4	-44	143.3	147	3.7	-95
Nawada	42.5	-40	146.4	98	4.5	-94
Patna	34.3	-45	112.6	58	15.8	-83
Purnea	9.2	-89	46.4	-49	21.5	-83
Rohtas	13.7	-71	52.1	1	1.7	-98
Saharsha	9.4	-92	138.0	10	0.0	-100
Samstipur	113.3	58	170.4	187	6.7	-93
Saran	35.3	-46	92.7	13	5.3	-94
Sheikpura	48.6	-36	210.9	238	19.6	-79
Sheohar	69.2	-23	126.6	45	0.0	-100
Sitamarhi	25.6	-71	75.0	-14	3.5	-95
Siwan	65.3	-10	101.8	42	6.3	-93
Supaul	56.6	-14	98.8	22	7.5	-92
Vaishali	45.1	-34	111.5	40	1.2	-99
West Champaran	57.5	-39	67.4	-22	53.2	-49
Jharkhand						
Bokaro	16.3	-72	197.5	210	43.2	-36
Chatra	46.1	-42	103.5	46	2.3	-97
Deoghar	92.3	56	247.5	275	33.1	-53

Dhanbad	49.8	-34	109.9	37	40.0	-41
Dumka	137.1	89	118.6	72	16.9	-80
East Singbhum	71.8	-3	76.6	20	83.1	22
Garhwa	21.0	-67	26.8	-48	9.5	-86
Giridih	23.5	-70	206.0	184	27.7	-62
Godda	36.2	-40	160.2	150	9.8	-88
Gumla	138.9	80	40.6	-56	52.3	-35
Hazaribagh	38.2	-49	236.8	272	25.1	-66
Jamtara	78.5	0	110.7	24	26.1	-65
Khunti	17.5	-79	56.0	-38	47.0	-42
Koderrna	31.5	-46	272.9	297	34.5	-46
Latehar	37.4	-41	86.9	26	4.6	-94
Lohardagga	46.5	-31	44.4	-19	14.3	-78
Pakur	155.3	139	222.3	179	35.4	-67
Palamau	14.5	-75	82.1	38	7.7	-90
Ramgarh	14.4	-80	107.6	59	63.8	-4
Ranchi	37.7	-55	95.2	15	22.3	-74
Sahebganj	152.8	49	183.6	95	58.2	-42
Saraikela	39.0	-50	110.4	54	43.0	-35
Simdega	45.0	-46	15.5	-84	63.6	-39
West Singbhum	119.2	75	65.2	-19	83.2	23
East Rajasthan						
Ajmer	0.0	-100	0.0	-100	42.3	-7
Alwar	13.6	-39	21.6	-31	3.9	-92
Banswara	0.0	-100	0.0	-100	56.0	-9
Baran	3.4	-91	3.7	-93	48.5	-20
Bharatpur	24.9	9	36.2	23	2.1	-96
Bhilwara	0.0	-100	0.3	-99	54.1	5
Bundi	0.2	-99	0.0	-100	21.9	-61
Chittorgarh	0.0	-100	1.2	-97	56.3	1
Dausa	5.8	-82	16.8	-47	4.8	-93
Dholpur	2.3	-93	13.7	-62	0.0	-100
Dungarpur	0.0	-100	0.0	-100	78.8	52
Jaipur	1.9	-93	9.1	-64	13.6	-75
Jhalawar	0.0	-100	1.6	-97	48.1	-9
Jhunjhunu	4.5	-76	23.3	12	1.8	-95
Karauli	6.7	-76	9.2	-67	8.6	-84
Kota	0.8	-98	0.8	-98	47.4	-16
Pratapgarh	0.0	-100	0.0	-100	44.2	-21
Rajsamand	0.0	-100	0.0	-100	62.0	38
Sawai Madhopur	2.4	-92	2.9	-93	13.4	-77
Sikar	9.9	-55	24.3	0	6.1	-84
Sirohi	0.0	-100	0.0	-100	35.2	-47
Tonk	4.6	-85	2.1	-94	15.6	-72
Udaipur	0.0	-100	0.0	-100	62.2	28
West Rajasthan						
Barmer	0.0	-100	0.0	-100	0.4	-98
Bikaner	11.1	0	5.2	-64	0.4	-98
Churu	9.0	-39	13.4	-38	2.2	-93

Hanumangarh	24.6	71	13.9	-21	0.0	-100
Jaisalmer	0.0	-100	0.0	-100	0.0	-100
Jalore	0.0	-100	0.0	-100	5.3	-85
Jodhpur	0.0	-100	0.0	-100	5.2	-80
Nagaur	1.7	-91	5.9	-73	11.6	-67
Pali	0.0	-100	0.0	-100	40.8	4
Sri Ganganagar	12.3	8	1.5	-89	0.0	-100
Gujarat Region						
Ahmedabad	0.0	-100	0.0	-100	18.8	-62
Anand	0.0	-100	0.0	-100	27.8	-54
Banaskantha	0.3	-99	0.0	-100	16.8	-67
Baroda	0.0	-100	3.1	-96	36.7	-49
Broach	0.2	-99	0.1	-99	24.9	-57
DNH	6.9	-95	70.6	-64	204.1	5
Dahod	0.0	-100	0.0	-100	30.4	-45
Daman	1.5	-99	74.6	-62	378.2	94
Dangs	0.0	-100	19.0	-88	2.5	-98
Gandhinagar	0.3	-99	0.0	-100	7.3	-88
Kheda	0.0	-100	0.0	-100	10.3	-85
Mehsana	0.0	-100	0.0	-100	15.1	-75
Narmada	0.0	-100	1.4	-98	45.2	-51
Navsari	0.0	-100	49.8	-71	87.5	-47
Panchmahal	0.0	-100	0.0	-100	27.2	-63
Patan	0.0	-100	0.0	-100	13.1	-73
Sabarkantha	0.0	-100	0.0	-100	47.3	-28
Surat	0.8	-99	6.0	-95	16.9	-85
Tapi	0.0	-100	10.8	-92	4.0	-97
Valsad	2.8	-98	52.3	-68	181.2	-2
S K & Diu region						
Amreli	0.2	-99	1.2	-97	59.5	40
Bhavnagar	0.0	-100	0.3	-99	28.7	-24
Diu	0.0	-100	1.8	-98	60.8	3
Jamnagar	0.0	-99	0.0	-99	27.4	-37
Junagarh	0.5	-99	4.8	-94	84.4	29
Kutch	0.2	-99	0.2	-99	0.9	-98
Porbandar	1.3	-98	0.0	-100	99.6	64
Rajkot	0.2	-99	0.2	-99	31.7	-36
Surendranagar	0.3	-99	0.0	-100	33.2	-1
Maharashtra & Goa						
Konkan & Goa						
Mumbai City	25.0	-88	366.9	91	691.3	335
Mumbai Suburban	13.9	-93	403.9	110	522.6	229
North Goa	10.8	-97	149.5	-40	522.0	111
Raigad	22.7	-92	144.0	-49	449.6	82
Ratnagiri	8.8	-97	160.4	-43	565.3	130
Sindhudurg	21.7	-92	168.4	-30	646.5	191
South Goa	11.1	-96	164.7	-21	517.3	131
Thane	10.1	-95	111.4	-50	265.5	12
Madhya Maharashtra						

Ahmednagar	2.3	-90	22.1	-2	6.9	-69
Dhule	0.0	-100	0.0	-100	33.2	-16
Jalgaon	0.0	-100	7.6	-81	52.6	22
Kolhapur	1.8	-99	27.5	-84	181.1	18
Nandurbar	0.0	-100	0.0	-100	21.0	-70
Nasik	1.6	-97	17.8	-74	23.1	-69
Pune	4.3	-93	13.2	-82	34.5	-51
Sangli	1.1	-97	23.0	-36	27.7	-13
Satara	1.7	-97	12.1	-79	47.3	-15
Solapur	2.7	-86	47.9	175	11.3	-46
Marathwada						
Aurangabad	0.0	-100	26.8	-11	37.3	13
Beed	0.7	-97	60.6	121	9.6	-64
Hingoli	0.1	-99	12.7	-75	23.1	-57
Jalna	1.0	-97	23.8	-27	30.0	-14
Latur	4.4	-89	66.7	51	24.9	-37
Nanded	4.4	-92	17.8	-64	24.9	-49
Usmanabad	4.1	-86	73.7	135	32.7	21
Parbhani	2.3	-95	31.5	-29	20.4	-50
Vidarbha						
Akola	4.6	-91	22.5	-49	33.4	-38
Amraoti	7.1	-86	21.2	-60	63.3	4
Bhandara	13.5	-82	25.6	-70	85.2	-5
Buldhana	2.3	-95	11.9	-69	34.2	-19
Chandrapur	14.5	-82	25.6	-70	94.2	6
Gadchiroli	10.5	-88	32.0	-66	128.7	20
Gondia	7.9	-91	20.9	-79	123.0	29
Nagpur	21.5	-66	11.3	-84	126.4	73
Wardha	3.1	-95	11.3	-81	112.7	64
Washim	0.3	-99	24.0	-53	25.6	-57
Yeotmal	6.0	-90	13.6	-76	43.0	-34
Odisha						
Angul	42.0	-23	67.4	-4	114.8	53
Balasore	91.1	30	29.4	-46	100.5	96
Bargarh	35.9	-49	32.3	-60	160.9	103
Bhadrak	76.4	39	28.0	-53	102.3	63
Bolangir	34.6	-54	30.4	-63	112.1	22
Boudh	17.8	-73	49.9	-33	154.5	127
Cuttack	72.7	10	45.9	-38	130.7	89
Deogarh	46.7	-44	52.7	-47	104.2	20
Dhenkanal	51.8	-24	78.9	33	124.3	90
Gajapati	26.9	-33	25.7	-24	118.8	118
Ganjam	19.5	-53	32.5	2	47.5	-6
Jagatsingpur	101.1	79	48.7	9	117.5	83
Jajpur	113.1	79	30.1	-41	78.8	22
Jharsuguda	65.1	-1	32.2	-67	112.4	21
Kalahandi	21.0	-74	8.8	-89	85.4	8
Kandhamal	16.9	-74	19.2	-74	130.3	92
Kendrapara	143.5	154	14.3	-76	67.3	16

Keonjhar	87.3	50	36.1	-32	62.8	4
Khurda	49.1	-4	60.1	4	69.2	-1
Koraput	65.8	-11	19.4	-75	190.6	122
Malkangiri	25.0	-71	5.0	-94	279.4	225
Mayurbhanj	102.6	29	72.1	20	85.5	19
Nawapara	62.2	-13	46.4	-49	75.5	3
Nawarangpur	105.6	25	52.9	-50	139.9	93
Nayagarh	32.0	-34	72.9	7	85.4	27
Puri	92.1	103	48.0	-20	96.4	84
Rayagada	25.7	-44	8.3	-83	110.3	60
Sambalpur	35.3	-57	34.7	-65	92.2	6
Sonepur	5.8	-92	46.7	-42	153.6	106
Sundargarh	44.7	-35	35.6	-56	79.6	-11
West Bengal & Andaman Nicobar Islands						
A & N ISLAND						
Nicobar	22.3	-66	116.1	117	47.3	-26
North & Middle Andaman	33.8	-65	87.8	-12	268.2	149
South Andaman	12.1	-87	138.8	71	168.5	79
GWB						
Bankura	38.7	-44	116.4	53	70.2	6
Birbhum	97.2	28	120.1	81	32.5	-63
Burdwan	124.4	92	80.1	31	38.0	-47
East Midnapore	88.9	29	80.8	8	100.0	102
Hooghly	105.0	32	40.4	-44	52.6	-21
Howrah	110.5	37	16.5	-79	31.5	-54
Kolkata	225.8	185	66.7	-18	40.5	-48
Murshidabad	92.1	11	88.4	19	24.0	-70
Nadia	54.7	-22	53.4	-12	43.5	-35
24 Pargana (N)	158.2	123	66.1	-12	28.3	-62
Purulia	22.6	-69	72.4	-12	58.7	-13
24 Pargana (S)	61.7	-30	54.6	-53	70.0	-28
West Midnapore	108.3	51	97.1	32	53.5	-22
SHWB & Sikkim						
Cooch Behar	55.4	-72	143.4	-35	35.7	-84
Darjeeling	314.1	87	130.0	-11	117.0	-32
East Sikkim	105.4	-8	89.3	-10	121.3	4
Jalpaiguri	113.4	-46	141.5	-41	79.6	-61
Malda	209.0	195	122.8	60	23.6	-69
North Dinajpur	30.5	-65	93.2	2		
North Sikkim	160.3	36	212.7	106	112.7	22
South Dinajpur	72.2	-10	79.7	-9	86.8	-4
South Sikkim	64.6	-43	82.7	-17	86.0	-26
West Sikkim	53.3	-55	12.0	-88	50.0	-46
Karnataka						
Coastal Karnataka						
Dakshin Kannada	61.6	-80	101.0	-62	470.0	76
Udupi	80.1	-75	115.1	-63	450.2	54
Uttar Kannada	12.5	-95	71.9	-69	383.2	69

N I Karnataka						
Bagalkote	0.0	-100	33.8	132	12.2	-22
Belgaum	1.0	-98	19.0	-61	51.6	12
Bidar	19.3	-50	51.2	27	33.5	-8
Bijapur	3.6	-81	63.6	292	6.6	-63
Dharwad	0.0	-99	5.9	-82	25.2	-31
Gadag	16.3	-9	51.9	293	20.8	22
Gulbarga	5.5	-82	54.4	81	18.6	-36
Haveri	0.0	-100	2.4	-94	45.7	15
Koppal	2.6	-79	45.6	297	31.6	107
Raichur	4.5	-74	42.7	111	11.2	-50
Yadgir	4.3	-84	34.2	32	12.1	-58
S I Karnataka						
Bangalore Rural	29.1	242	26.9	86	31.5	57
Bangalore Urban	54.2	502	7.1	-61	28.2	47
Bellary	5.5	-60	34.3	150	40.1	136
Chamarajnagar	11.4	-11	12.2	-30	17.9	47
Chichballapur	12.9	31	15.4	-11	5.8	-71
Chickmagalur	7.5	-95	22.7	-86	205.5	41
Chitradurga	2.4	-74	15.0	31	26.0	118
Davangere	5.4	-75	18.7	-7	26.0	17
Hassan	15.8	-64	11.6	-77	63.3	43
Kodagu	44.6	-80	23.9	-89	376.3	99
Kolar	31.9	314	10.8	-31	13.0	-24
Mandya	19.5	315	16.2	52	4.5	-56
Mysore	24.6	29	26.0	6	38.2	101
Ramnagara	15.0	89	16.8	-5	3.1	-80
Shimoga	15.0	-90	36.4	-75	282.6	107
Tumkur	14.1	66	18.2	35	9.8	-37
Kerala						
Alappuzha	51.7	-64	43.8	-70	143.2	18
Kannur	70.1	-75	54.3	-80	414.7	78
Ernakulam	66.4	-65	25.7	-84	287.5	86
Idukki	96.7	-53	42.5	-78	411.3	147
Kasaragod	70.2	-75	62.1	-75	380.6	46
Kollam	54.0	-50	33.9	-67	116.3	34
Kottayam	125.4	-25	35.7	-76	184.9	34
Kozhikode	41.3	-84	52.5	-77	440.4	103
Malappuram	57.5	-73	17.9	-91	265.3	51
Palakkad	16.4	-90	12.2	-92	211.6	61
Pathanamthitta	71.4	-48	65.6	-54	158.5	25
Thiruvananthapuram	20.3	-71	13.1	-79	50.8	4
Thrissur	72.8	-65	32.1	-84	216.5	25
Wayanad	35.0	-88	41.6	-86	410.4	78
Tamil Nadu						
Ariyalur	31.3	366	49.3	307	0.0	-100
Chennai	84.7	500	5.4	-74	18.2	-37
Coimbatore	16.1	85	6.4	-49	90.7	854
Cuddalore	23.9	199	25.7	81	2.2	-85

Dharmapuri	38.1	486	2.5	-85	0.0	-100
Dindigul	18.9	190	4.9	-62	2.2	-81
Erode	11.3	213	23.0	164	4.0	-55
Kanchipuram	65.7	457	28.1	51	14.0	-49
Kanyakumari	4.3	-88	2.1	-94	20.4	-10
Karikal	7.3	356	106.7	989	0.0	-100
Karur	5.4	239	3.7	-53	0.0	-100
Krishnagiri	40.6	588	3.6	-80	10.4	-36
Madurai	24.9	168	5.7	-57	1.1	-93
Nagapattinam	31.1	402	31.9	203	0.0	-100
Namakkal	6.1	22	27.9	105	0.0	-100
Nilgiris	31.9	-47	21.3	-68	121.7	129
Perambalur	39.4	1026	10.3	26	0.0	-100
Puducherry	97.6	2069	0.1	-99	10.3	-11
Pudukottai	1.3	-84	11.0	-31	1.9	-92
Ramanathapuram	0.0	-100	0.0	-100	0.0	-100
Salem	30.9	143	2.6	-88	4.4	-79
Sivaganga	16.5	126	10.0	-31	0.0	-100
Thanjavur	17.5	317	33.3	114	1.3	-91
Theni	9.6	75	7.3	-11	38.8	582
Tirunelveli	1.9	-82	0.1	-99	8.6	15
Tirupur	0.0	-100	0.2	-98	1.9	-69
Tiruvallur	34.7	131	34.9	54	28.9	10
Tiruvannamalai	62.1	590	22.4	30	16.1	-24
Tiruvarur	43.0	778	76.4	450	0.4	-97
Toothukudi	4.7	365	0.9	-70	0.1	-96
Trichy	10.4	226	8.9	-24	0.0	-99
Vellore	55.8	422	37.3	74	15.8	-27
Villupuram	66.5	631	11.1	-22	9.2	-38
Virudhunagar	10.8	441	2.2	-73	0.3	-96
Andhra Pradesh						
Coastal Andhra Pradesh						
East Godavari	10.4	-78	42.1	-6	43.6	-1
Guntur	12.1	-57	42.7	31	6.3	-76
Krishna	7.9	-83	30.7	-37	16.1	-60
Nellore	22.0	55	26.3	41	15.1	-19
Prakasam	8.5	-49	56.8	152	7.0	-58
Sirkakulam	29.5	-35	13.0	-60	108.1	139
Visakhapatnam	17.7	-55	20.8	-39	51.0	42
Vizianagram	37.0	-18	25.7	-31	55.7	53
West Godavari	7.2	-86	43.9	-15	46.6	-10
Telangana						
Adilabad	3.3	-95	43.4	-32	28.1	-59
Hyderabad	9.8	-72	82.9	141	8.8	-73
Karimnagar	3.4	-94	47.1	-17	24.3	-56
Khammam	6.5	-86	14.5	-76	80.3	43
Mehabubnagar	13.0	-55	22.1	-30	45.6	56
Medak	7.2	-84	38.4	-15	19.7	-58

Nalgonda	13.6	-58	44.3	47	7.9	-71
Nizamabad	4.7	-92	27.4	-55	18.5	-67
Rangareddy	10.2	-72	39.8	-3	18.9	-49
Warangal	8.8	-83	34.3	-41	42.2	-23
Rayalaseema						
Anantapur	8.4	10	8.9	-35	18.5	35
Chittoor	26.8	139	34.4	73	15.1	-34
Cuddapah	3.9	-65	19.4	-4	21.3	9
Kurnool	13.7	-23	36.7	47	45.6	97

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

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

Sesame : 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

Onion: Rupsa, Sukhsagar.

Sunflower: Surya (90-95days), Pack(104days)KBSH(90-95 days).

Green Gram: Sonali, T44,Samrat,PDM-84, Basanti.

Sesame: Tilottoma, B-64, B-14.

Mango: Himsagar, Mallicka, Langra.

Coconut: Eastcoastal, Hazari.

Moong : Sonali (B-1), Panna (B-105), Pusa-Baishakhi.

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

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-11for 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.