# State: Jharkhand

# Agriculture Contingency Plan for District: Deoghar

| 1.0 District Agriculture profile | | | | |
|---|---|---|---|---|
| **1.1** | **Agro-Climatic/Ecological Zone** | | | |
| | Agro Ecological Sub Region (ICAR) | Eastern plateau (chotanagpur) And Eastern Ghats, Hot Sub humid Eco-Region (12.3) | | |
| | Agro-Climatic Zone (Planning Commission) | Eastern Plateau And Hills Region (VII) | | |
| | Agro Climatic Zone (NARP) | Central And North Eastern Plateau Zone (BI-4) | | |
| | List all the districts falling under the NARP Zone* (*>50% area falling in the zone) | Bokaro, Chatra, Deogarh, Dhanbagh, Giridh, Godda, Hazaribagh, Jamtara, Khunthi | | |
| | Geographic coordinates of district headquarters | Latitude | Longitude | Altitude |
| | | $24.53^0$ N | $86.7^0$ E | 254 m |
| | Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS | Zonal Research Station (ZRS), Dumka, Birsa Agricultural University, Ranchi | | |
| | Mention the KVK located in the district with address | Krishi Vigyan Kendra, Deoghar, Krishi Vigyan Kendra, Sujani, PO. Ghorlash, Distt. Deoghar-814152, State- Jharkhand | | |
| | Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone | Zonal Research Station, Dumka | | |

| **1.2** | **Rainfall** | **Normal RF(mm)** | **Normal Rainy days (number)** | **Normal Onset ( specify week and month)** | **Normal Cessation (specify week and month)** |
|---|---|---|---|---|---|
| | SW monsoon (June-Sep) | 1265 | | $3^{rd}$ week of June | $3^{rd}$ week of September |
| | NE Monsoon(Oct-Dec) | 132 | | | |
| | Winter (Jan- Feb) | 24 | | - | - |
| | Summer (Mar-May) | 84 | | - | - |

| | | | | | |
|---|---|---|---|---|---|
| | Annual | 1505 | | - | - |

| 1.3 | **Land use pattern of the district** (latest statistics) | Geographical area | Cultivable area | Forest area | Land under non-agricultural use | Permanent pastures | Cultivable wasteland | Land under Misc. tree crops and groves | Barren and uncultivable land | Current fallows | Other fallows |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Area ('000 ha) | 247.9 | 108.3 | 20.3 | - | - | - | | 29.5 | 38.7 | 53.0 |

| 1. 4 | **Major Soils** | **Area ('000 ha)** | **Percent (%) of total** |
|---|---|---|---|
| | Red Lateritic soils | 525 | 18.3 |
| | Loam soils | 137 | 4.8 |
| | Fine Loam soils | 110 | 3.8 |
| | Fine Mixed Loam soils | 200 | 7.0 |

| 1.5 | **Agricultural land use** | **Area ('000 ha)** | **Cropping intensity %** |
|---|---|---|---|
| | Net sown area | 108.3 | 120% |
| | Area sown more than once | - | |
| | Gross cropped area | - | |

| 1.6 | **Irrigation** | **Area ('000 ha)** | | |
|---|---|---|---|---|
| | Net irrigated area | 16.185 | | |
| | Gross irrigated area | - | | |
| | Rainfed area | - | | |
| | **Sources of Irrigation** | Number | Area ('000 ha) | Percentage of total irrigated area |
| | Canals | 3 | 3.2 | |
| | Tanks | 249 | 6.1 | |
| | Open wells | 2712 | 4.2 | |

| | | | | |
|---|---|---|---|---|
| | Bore wells | | | |
| | Lift irrigation schemes | | | |
| | Micro-irrigation | | | |
| | Other sources (Check Dam) | 136 | 2.844 | |
| | Total Irrigated Area | | | |
| | Pump sets | | | |
| | No. of Tractors | | | |
| | **Groundwater availability and use* (Data source: State/Central Ground water Department /Board)** | No. of blocks/ Tehsils | (%) area | Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc) |
| | Over exploited | | | |
| | Critical | | | |
| | Semi- critical | | | |
| | Safe | | | |
| | Wastewater availability and use | | | |
| | Ground water quality | | | |
| *over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70% | | | | |

### 1.7 Area under major field crops & horticulture

| 1.7 | Major field crops cultivated | Area ('000 ha) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | *Kharif* | | | *Rabi* | | | | |
| | | **Irrigated** | **Rainfed** | **Total** | **Irrigated** | **Rainfed** | **Total** | **Summer** | **Grand total** |
| | Rice | | | 98.6 | | | | | 98.6 |
| | Maize | | | 11.9 | | | 0.3 | | 12.2 |
| | Pigeonpea | | | 1.9 | | | | | 1.9 |
| | Blackgram | | | 0.4 | | | | | 0.4 |
| | Greengram | | | 0.1 | | | | | 0.1 |
| | Groundnut | | | 0.2 | | | | | 0.2 |
| | Wheat | | | | | | 3.8 | | 3.8 |
| | Chick pea | | | | | | 1.1 | | 1.1 |
| | Pea | | | | | | 0.5 | | 0.5 |
| | Lentil | | | | | | 0.5 | | 0.5 |
| | Mustard | | | | | | 1.1 | | 1.1 |

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| | **Horticulture crops - Fruits** | **Area ('000 ha)** | | |
|---|---|---|---|---|
| | | **Total** | **Irrigated** | **Rainfed** |
| | **Horticulture crops - Vegetables** | | | |
| | Cauliflower | 1.7 | | |
| | Cabbage | 1.3 | | |
| | Tomato | 1.0 | | |
| | Brinjal | 0.5 | | |
| | Chilli | 0.1 | | |
| | Ladies finger | 0.4 | | |
| | Bottle gourd | 0.4 | | |
| | Bitter gourd | 0.5 | | |
| | Cucumber | 0.9 | | |
| | Ridge gourd | 0.3 | | |
| | Sponge gourd | 0.5 | | |
| | French bean | 0.1 | | |
| | **Medicinal and Aromatic crops** | | | |

| | | | | |
|---|---|---|---|---|
| | **Plantation crops** | | | |
| | **Fodder crops** | | | |
| | **Total fodder crop area** | | | |
| | **Grazing land** | | | |
| | **Sericulture etc** | | | |

| **1.8** | **Livestock** | **Male ('000)** | **Female ('000)** | **Total ('000)** |
|---|---|---|---|---|
| | Non descriptive Cattle (local low yielding) | | | 396.35 |
| | Improved cattle | | | |
| | Crossbred cattle | | | |
| | Non descriptive Buffaloes (local low yielding) | | | |
| | Descript Buffaloes | | | 53.9 |
| | Goat | | | 200.2 |
| | Sheep | | | 36.7 |
| | Others (Camel, Pig, Yak etc.) | | | 28.7 |
| | Duckery | | | |
| | Commercial dairy farms (Number) | | | |
| **1.9** | **Poultry** | **No. of farms** | **Total No. of birds ('000)** | |
| | Commercial | | | |
| | Backyard | | 322.6 | |

**1.10** **Fisheries** (Data source: Chief Planning Officer)

**A. Capture**

| **i) Marine** (Data Source: Fisheries Department) | **No. of fishermen** | **Boats** | | **Nets** | | **Storage facilities (Ice plants etc.)** |
|---|---|---|---|---|---|---|
| | | Mechanized | Non-mechanized | Mechanized (Trawl nets, Gill nets) | Non-mechanized (Shore Seines, Stake & trap nets) | |
| | | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | **ii) Inland** (Data Source: Fisheries Department) | **No. Farmer owned ponds** | **No. of Reservoirs** | **No. of village tanks** | |
| | | | | | |
| | **B. Culture** | | | | |
| | | | **Water Spread Area (ha)** | **Yield (t/ha)** | **Production ('000 tons)** |
| | i) **Brackish water** (Data Source: MPEDA/ Fisheries Department) | | | | |
| | ii) **Fresh water** (Data Source: Fisheries Department) | | | | |

**1.11 Production and Productivity of major crops**

| 1.11 | Name of crop | **Kharif** | | **Rabi** | | **Summer** | | **Total** | | **Crop residue as fodder** ('000 tons) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) | |
| **Major Field crops (Crops identified based on total acreage)** | | | | | | | | | | |
| | Rice | 260.5 | 2649 | | | | | 260.5 | 2649 | |
| | Maize | 17.6 | 1477 | 0.641 | 1654 | | | 17.6 | 1565 | |
| | Pigeonpea | 1.9 | 1000 | | | | | 1.9 | 1000 | |
| | Blackgram | 0.2 | 600 | | | | | 0.2 | 600 | |
| | Greengram | 0.1 | 580 | | | | | 0.1 | 580 | |
| | Wheat | | | 6.5 | 1700 | | | 6.5 | 1700 | |
| | Chick pea | | | 0.9 | 940 | | | 0.9 | 940 | |
| | Pea | | | 0.3 | 630 | | | 0.3 | 630 | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Lentil | | | 0.4 | 780 | | | 0.4 | 780 | |
| | Mustard | | | | | | | 0.4 | 242.7 | |
| **Major Horticultural crops (Crops identified based on total acreage)** | | | | | | | | | | |
| | Cauliflower | 34.7 | 0.2 | | | | | 34.7 | 0.2 | |
| | Cabbage | 30.7 | 0.3 | | | | | 30.7 | 0.3 | |
| | Tomato | 22.8 | 0.2 | | | | | 22.8 | 0.2 | |
| | Brinjal | 16.4 | 0.3 | | | | | 16.4 | 0.3 | |
| | Chilli | 0.4 | 0.1 | | | | | 0.4 | 0.1 | |
| | Ladies finger | 6.2 | 0.1 | | | | | 6.2 | 0.1 | |
| | Bottle gourd | 78.0 | 0.2 | | | | | 78.0 | 0.2 | |
| | Bitter gourd | 98.7 | 0.2 | | | | | 98.7 | 0.2 | |
| | Cucumber | 19.8 | 0.2 | | | | | 19.8 | 0.2 | |
| | Ridge gourd | 41.1 | 0.1 | | | | | 41.1 | 0.1 | |
| | Sponge gourd | 6.3 | 0.2 | | | | | 6.3 | 0.2 | |
| | French bean | 11.4 | 0.1 | | | | | 11.4 | 0.1 | |

| **1.12** | **Sowing window for 5 major field crops** (start and end of normal sowing period) | **Rice** | **Blackgram** | **Pigeonpea** | **Maize** | **Wheat** |
|---|---|---|---|---|---|---|
| | Kharif- Rainfed | 4$^{th}$ week of June to 4$^{th}$ week of July | 3$^{rd}$ week of June to 4$^{th}$ week of June | 3$^{rd}$ week of June to 2$^{nd}$ week of July | 3$^{rd}$ week of June to 4$^{th}$ week of July | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Kharif-Irrigated | 2nd week of June to 3rd week of June | | | | |
| | Rabi-Rainfed | | | | | 3rd week of October to 4th week of October |
| | Rabi-Irrigated | | | | | 3rd week of November to 4th week of December |

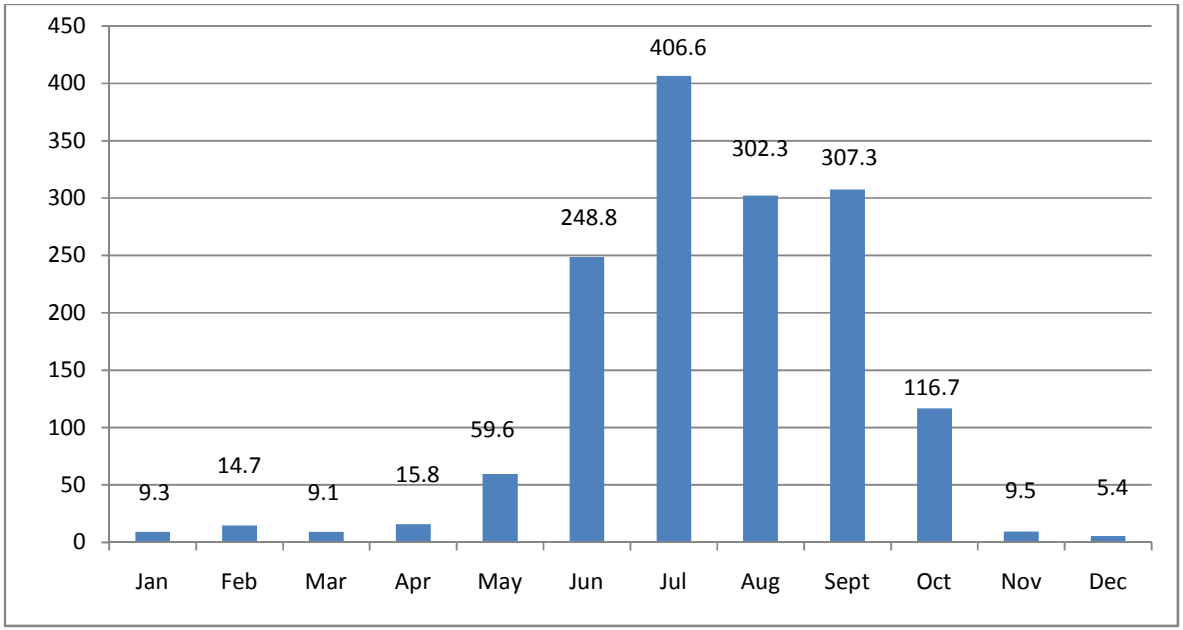
| 1.13 | **What is the major contingency the district is prone to?** (Tick mark) | **Regular** | **Occasional** | **None** |
|---|---|---|---|---|
| | Drought | ✓ | | |
| | Flood | | | ✓ |
| | Cyclone | | | ✓ |
| | Hail storm | | | ✓ |
| | Heat wave | | ✓ | |
| | Cold wave | | ✓ | |
| | Frost | | ✓ | |
| | Sea water intrusion | | | ✓ |
| | Pests and disease outbreak | | ✓ | |

| 1.14 | **Include Digital maps of the district for** | Location map of district within State as Annexure I | Enclosed: Yes |
|---|---|---|---|
| | | Mean annual rainfall as Annexure II | Enclosed: Yes |
| | | Soil map as Annexure III | Enclosed: Yes |

**Annexure I**


Bihar
Bihar
Bihar
SAHIBGANJ
GODDA
PAKUR
KODERMA
GIRIDIH
DEOGHAR
DUMKA
PLALAMAU
CHATRA
GARHWA
LATEHAR
HAZARIBAGH
BOKARO
DHANBAD
JAMTARA
West Bengal
LOHARDAGA
Ghattisgarh
RANCHI
GUMLA
SARAIKELA
West Bengal
SIMDEGA
W.SINGHBHUM
E.SINGHBHUM
Orissa
Orissa

**Annexure II**


450
400
350
300
250
200
150
100
50
0
9.3
14.7
9.1
15.8
59.6
248.8
406.6
302.3
307.3
116.7
9.5
5.4
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sept
Oct
Nov
Dec

## Annexure III


**Legend Information:-**

16-Very deep, imperfectly drained fine soils

19-Shallow, excessively drained, gravelly loamy soils

23-Very deep, moderately well drained fine loamy soils

26- Deep, Well Drained, Fine Soils.

27-Deep, moderately well drained, fine loamy soils.

30- Deep, well drained gravelly loamy soils

31- Deep, Well Drained, fine loamy soils

32 - Deep, moderately well drained, coarse loamy soils.

34- Very deep, well drained, fine loamy soils with severe erosion

40- Deep, moderately well drained, fine loamy soils

**Source: SAMETI, Jharkhand**

**2.0 Strategies for weather related contingencies**

**2.1 Drought**

**2.1.1 Rainfed situation**

| **Condition** | | | **Suggested Contingency measures** | | |
|---|---|---|---|---|---|
| **Early season drought (delayed onset)** | **Major Farming situation** | **Normal Crop / Cropping system** | **Change in crop / cropping system including variety** | **Agronomic measures** | **Remarks on Implementation** |
| Delay by 2 weeks 1st week of July | Red Sandy lateritic soils<br><br>Upland | Direct sown rice<br>Pigeonpea ,<br>Maize,<br>Groundnut ,<br>Cucurbits,<br>Ladiesfinger,<br>Maize + Ladiesfinger,<br>Pigeonpea +Blackgram/<br>Greengram | Direct sown rice,<br>Pigeonpea,<br>Maize,<br>Groundnut,<br>Maize+ Ladiesfinger,<br>Pigeonpea + Blackgram,<br>Blackgram + Greengram ,<br>Cucurbits/Ladiesfinger/Cowpea /<br>Dolichosbean | | |

| **Condition** | | | **Suggested Contingency measures** | | |
|---|---|---|---|---|---|
| **Early season drought (delayed onset)** | **Major Farming situation** | **Normal Crop/cropping system** | **Change in crop/cropping system** | **Agronomic measures** | **Remarks on Implementation** |
| Delay by 4 weeks 3rd week of July | Red Sandy lateritic soils | Direct sown rice<br>Pigeonpea ,<br>Maize,<br>Groundnut ,<br>Cucurbits,<br>Ladiesfinger,<br>Maize + Ladiesfinger,<br>Pigeonpea +Blackgram/<br>Greengram | **Direct sown rice** (Vandana, Birsa Vikas dhan-109 ),<br>**Pigeonpea** (Birsa Arhar-1, ICPH2671),<br>**Maize (**Kanchan, Birsa Makai-1),<br>**Groundnut(**Birsa mungfali-2),<br>Maize+ Ladiesfinger,<br>Pigeonpea + Blackgram,<br>Blackgram (T-9/Pant U-19/Birsa urd-1) + Greengram (Pusa Vishal ) | Alternate row irrigation<br>Use micro irrigation system<br>Irrigation at only critical stage of crop | Supply of seed through NFSM |

| | | | | | |
|---|---|---|---|---|---|
| | | | Cucurbits/Ladiesfinger/Cow pea / Dolichosbean | | |

| **Condition** | | | **Suggested Contingency measures** | | |
|---|---|---|---|---|---|
| **Early season drought (delayed onset)** | **Major Farming situation** | **Normal Crop/cropping system** | **Change in crop/cropping system** | **Agronomic measures** | **Remarks on Implementation** |
| Delay by 6 weeks<br>1st week of August | Sandy lateritic acidic soils | Direct sown rice,<br>Pigeonpea ,<br>Maize,<br>Maize+ Ladiesfinger,<br>Pigeonpea + Blackgram ,<br>Blackgram + Greengram,<br>Groundnut / Cucurbits/ Ladiesfinger/Cow pea /Dolichosbean | Pigeonpea + Horsegram,<br>Pigeonpea + Sesame,<br>French Bean,<br>Dolichosbean,<br>Pigeonpea + Maize,<br>**Pigeonpea** (UPAS-120)<br>**Horse gram** (Birsa Kulthi-1)<br>**Sesame** (Kanke Safed, Krishna)<br>**French bean** (Swarna Priya, Arka Komal)<br>**Dolichos bean** (Swarna utkrista) | **1.** Ridge Furrow method should be followed for proper germination<br>**2.** Conservation of soil moisture.<br>**3.** Mechanical weeding<br>**4.** Staking for Dolichos bean. | Supply of seed through NFSM |

| **Condition** | | | **Suggested Contingency measures** | | |
|---|---|---|---|---|---|
| **Early season drought (delayed onset)** | **Major Farming situation** | **Normal Crop/cropping system** | **Change in crop/cropping system** | **Agronomic measures** | **Remarks on Implementation** |
| Delay by 8 weeks<br>3rd week of August | Red Sandy lateritic soils | Pigeonpea + Horsegram,<br>Pigeonpea + Sesame<br>Frenchbean,<br>Dolichosbean,<br>Pigeonpea + Maize | Pigeonpea + Horsegram,<br>Pigeonpea + Sesame | **1.** Ridge Furrow method should be followed for proper germination<br>**2.** Conservation of soil moisture.<br>3.Mechanical weeding.<br>4.Micro irrigation system. | Supply of seed through NFSM |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Early season drought (delayed onset)** | **Major Farming situation[a]** | **Normal Crop / Cropping system[b]** | **Change in crop / cropping system[c] including variety** | **Agronomic measures[d]** | **Remarks on Implementation[e]** |
| Delay by 2 weeks 1st week of July | Sandy loam soils<br><br>MID LAND | Rice | **Rice** - IR-64, IR-36, Lalat, Naveen, Sahbhagi, Arize-6444, Birsamati | Rice cultivation through SRI method or plastic drum seeder.<br>Proper bunding for water retention.<br>Use of cono weeder for weeding. | |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Early season drought (delayed onset)** | **Major Farming situation** | **Normal Crop/cropping system** | **Change in crop/cropping system** | **Agronomic measures** | **Remarks on Implementation** |
| Delay by 4 weeks 3rd week of July | Sandy loam soils | Rice | **Rice** – IR-36, IR-64, Lalat, Naveen, Birsamati, Arise 6444, Sahbhagi | 1.Transplanting through SRI method.<br>2. Proper bunding for water retention.<br>3. Use of cono weeder for weeding. | |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Early season drought (delayed onset)** | **Major Farming situation[a]** | **Normal Crop/cropping system[b]** | **Change in crop/cropping system[c]** | **Agronomic measures[d]** | **Remarks on Implementation[e]** |
| Delay by 6 weeks 1st week of August | Sandy soils | Rice | **Rice** – IR-36, IR-64, Lalat, Naveen, Birsamati, Arise 6444, Sahbhagi | 1.Transplanting through SRI method.<br>2. Proper bunding for water retention.<br>3. Use of cono weeder for weeding. | |

| **Condition** | | | **Suggested Contingency measures** | | |
|---|---|---|---|---|---|
| **Early season drought (delayed onset)** | **Major Farming situation** | **Normal Crop/cropping system** | **Change in crop/cropping system** | **Agronomic measures** | **Remarks on Implementation** |
| Delay by 8 weeks 3rd week of August | Sandy loam soils | Rice, Maize, Pigeonpea Blackgram Greengram, Finger millet, Brinjal Frenchbean, Tomato, Rice bean, Sweet Potato, Radish, Cauliflower, Chilies | Direct sown rice, Pigeonpea, Maize, **Horsegram** – Birsa Kulthi-1 **Brinjal** – Swarna Pratibha, Swarna Abhilamb, Swarna Ajay, Swarna Sobha, Swarna Nilima. **French Bean –** Swarna Priya, Arka Komal, Swarna Lata) **Tomato –** Arka Abha, Swarna Sampada, Swarna Vijay. **Rice Bean** – RBL-1. **Sweet Potato –** Kalmegh. **Radish –** Japaneese White. **Cauliflower –** Early Kunwari, Hajipur extra early. **Chilies –** Pusa Jwala, Capsicum Bharat, Indra**.** | Proper bunding of Rice fields. Sowing of pulses along the slope. | Seed cum fertilizer drill supplied by RKVY scheme. |
| **Condition** | | | **Suggested Contingency measures** | | |
| **Early season drought (delayed onset)** | **Major Farming situation[a]** | **Normal Crop / Cropping system[b]** | **Change in crop / cropping system[c] including variety** | **Agronomic measures[d]** | **Remarks on Implementation[e]** |
| Delay by 2 weeks 1st week of July | LOW LAND Sandy clay loam solis | Rice | **Rice** (Rajshree, Arise-6444, MTU-7029) | 1. . Direct sowing of rice with drum seeder 2. Proper bunding for water retention. | |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Early season drought (delayed onset)** | **Major Farming situation[a]** | **Normal Crop/cropping system[b]** | **Change in crop/cropping system[c]** | **Agronomic measures[d]** | **Remarks on Implementation[e]** |
| Delay by 4 weeks 3rd week of July | Sandy clay loam solis | Rice | Rice (Arise-6444, Rajshree) | 1. Direct sowing of rice with drum seeder<br>2. Proper bunding for water retention. | 1. Supply of SRI marker and cono weeder through RKVY. |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Early season drought (delayed onset)** | **Major Farming situation[a]** | **Normal Crop/cropping system[b]** | **Change in crop/cropping system[c]** | **Agronomic measures[d]** | **Remarks on Implementation[e]** |
| Delay by 6 weeks 1st week of August | Sandy clay loam solis | Rice | Rice (Arise-6444, Rajshree) | 1. Direct sowing of rice with drum seeder<br>2. Proper bunding for water retention. | Supply of SRI marker, cono weeder and drum kit through RKVY |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Early season drought (delayed onset)** | **Major Farming situation[a]** | **Normal Crop/cropping system[b]** | **Change in crop/cropping system[c]** | **Agronomic measures[d]** | **Remarks on Implementation[e]** |
| Delay by 8 weeks 3rd week of August | Sandy clay loam solis | Rice | Rice (Anjali, Birsa Dhan-201, Birsa Dhan-202, Vandana, Sahbhagi). | 1. Direct sowing of rice with drum seeder.<br>3. Proper bunding for water retention.<br>4. Life saving irrigation. | Supply of seed & drum seeder through NFSM & RKVY. |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| Early season drought **(Normal onset)** | **Major Farming situation[a]** | **Normal Crop/cropping system[b]** | **Crop management[c]** | **Soil nutrient & moisture conservation measures[d]** | **Remarks on Implementation[e]** |

| | | | | | |
|---|---|---|---|---|---|
| Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc. | Upland<br><br>Sandy lateritic red soils | Direct sown rice (Gora),<br>Pigeonpea ,<br>Maize<br>Pigeonpea + Maize<br>Maize + Ladiesfinger<br>Pigeonpea +Blackgram / Greengram<br>Groundnut/ Cucurbits/ Ladiesfinger | 1. Thinning and gap filling in the existing crop.<br><br>2. Inter culturing to check evaporation.<br>3. Life saving irrigation | 1. Intercultivation<br>2. Conservation furrow<br>3. Thinning<br>4. Spray of anti transpirant. | 1. Supply of inter cultural implements through RKVY.<br>2. Seeds supplied through NFSM |

| **Condition** | | | **Suggested Contingency measures** | | |
|---|---|---|---|---|---|
| **Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)** | **Major Farming situation[a]** | **Normal Crop/cropping system[b]** | **Crop management[c]** | **Soil nutrient & moisture conservation measues[d]** | **Remarks on Implementation[e]** |
| At vegetative stage | Sandy lateritic red soils | Direct sown rice<br>Pigeonpea ,<br>Maize<br>Pigeonpea + Maize<br>Maize + Ladiesfinger<br>Pigeonpea +Blackgram / Greengram<br>Groundnut/ Cucurbits/ Ladiesfinger | Thinning<br>Postponement of top dressing<br>Life saving irrigation<br>Earthing up in Groundnut. | Conservation furrow<br>Spray of anti transparentss | 1. Supply of inter cultural implements through RKVY.<br>2. Farm ponds through NREGA. |

| **Condition** | | | **Suggested Contingency measures** | | |
|---|---|---|---|---|---|
| **Mid season drought (long dry spell)** | **Major Farming situation[a]** | **Normal Crop/cropping system[b]** | **Crop management[c]** | **Soil nutrient & moisture conservation measures[d]** | **Remarks on Implementation[e]** |

| | | | | | |
|---|---|---|---|---|---|
| At flowering/ fruiting stage | Sandy soils | Direct sown rice (Gora),<br>Pigeonpea ,<br>Maize<br>Pigeonpea + Maize<br>Maize + Ladiesfinger<br>Pigeonpea +Blackgram / Greengram<br>Groundnut/ Cucurbits/ Ladiesfinger | Life saving irrigation,<br>In-situ mulching<br>Postponement of top dressing. | Spray of anti transparent | Farm ponds through NREGA. |

| **Condition** | | | **Suggested Contingency measures** | | |
|---|---|---|---|---|---|
| **Terminal drought** (Early withdrawal of monsoon) | **Major Farming situation**[a] | **Normal Crop/cropping system**[b] | **Crop management**[c] | **Rabi Crop planning**[d] | **Remarks on Implementation**[e] |
| | Sandy loam soils | Direct sown rice (Gora),<br>Pigeonpea ,<br>Maize<br>Pigeonpea + Maize<br>Maize + Ladiesfinger<br>Pigeonpea +Blackgram / Greengram<br>Groundnut/ Cucurbits/ Ladiesfinger | Life saving irrigation,<br>Pigeonpea harvested for vegetable purpose,<br>Harvest at physiological maturity stage | Cow pea,<br>French Bean,<br><br>**Irrigated vegetables-** Potato, Cole crops, Root crops etc. if irrigation source is available. | 1. Farm pond through NREGA.<br>2. Supply of threshing implements through RKVY.<br>3. Groundnut digger and plucker through RKVY. |

| **Condition** | | | **Suggested Contingency measures** | | |
|---|---|---|---|---|---|
| Early season drought **(Normal onset)** | **Major Farming situation** | **Normal Crop/cropping system** | **Crop management** | **Soil nutrient & moisture conservation measures** | **Remarks on Implementation** |

| | | | | | |
|---|---|---|---|---|---|
| Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc. | Sandy loam soils<br><br>Midland | Rice | 1. Re sowing or re-transplanting through plastic drum seeder.<br>2. Life saving irrigation<br>3. Replacement of crop with short duration leguminous crop like Greengram, Blackgram, Horsegram, Sesame & Niger. | 1. Weeding<br>2. Postponement of top dressing<br>3. Proper bunding<br>4. Strip cropping of re sown crops<br>5. Spray of anti transpirants. | Supply of SRI marker and cono weeder from RKVY scheme. |
| **Condition** | | | **Suggested Contingency measures** | | |
| **Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)** | **Major Farming situation** | **Normal Crop/cropping system** | **Crop management** | **Soil nutrient & moisture conservation measures** | **Remarks on Implementation** |
| At vegetative stage | Sandy loam soils | Rice (Lalat, IR-64, IR-36, Arize-6444) | 1. Re sowing through plastic drum seeder.<br>2. Life saving irrigation may be given if possible.<br>3. Replacement of crop with short duration legume crops like Greengram, Blackgram, Horse gram, Sesame & Niger.<br>**Greengram** (Pusa Vishal)<br>**Blackgram** (Pant U-19, Birsa Urd-1)<br>**Horse gram** (Birsa Kulthi-1)<br>**Sesame** (Kanke Safed, TC-25)<br>**Niger** (Birsa Niger-1,2) | 1. Weeding<br>2. Postponement of top dressing<br>3. Proper bunding<br>4. Spray of anti transparent. | Supply of SRI marker and cono weeder through RKVY scheme. |

| | | | | | |
|---|---|---|---|---|---|
| **Condition** | | | **Suggested Contingency measures** | | |
| **Mid season drought (long dry** | **Major Farming situation** | **Normal Crop/cropping system** | **Crop management** | **Soil nutrient & moisture conservation** | **Remarks on Implementation** |

| **spell)** | | | | **measues** | |
|---|---|---|---|---|---|
| At flowering/ fruiting stage | Sandy loam soils | **Rice** (Lalat, IR-64, IR-36, Arise-6444) | 1. Life saving irrigation if available.<br>2. Sowing of early Rabi crops like Mustard/Linseed/ Lentil/Pea.<br>3. Postponment of top dressing.<br><br>**Mustard** (Shivani)<br>**Linseed** (T-397, Sweta)<br>**Lentil** (PL-406, 639)<br>**Pea** (Swarna Rekha) | Spray of anti transparent. | |

| **Condition** | | | **Suggested Contingency measures** | | |
|---|---|---|---|---|---|
| **Terminal drought** (Early withdrawal of monsoon) | **Major Farming situation** | **Normal Crop/cropping system** | **Crop management** | **Rabi Crop planning** | **Remarks on Implementation** |
| | | **Rice** – Naveen, IR-36, IR-64, Lalat, Birsamati. | **1.** Harvest at physiological maturity stage.<br>2. Life saving irrigation. | **Chick pea – (**Pant G-114, Radhey, BG-256, KPG-59.<br>**Pea** – (Swarna Rekha/Arkel)<br>**Linseed** – Sweta/T-397)<br>**Lentil** – (PL-406, PL-639).<br>**Mustard** – (Shivani) | |

| **Condition** | | | **Suggested Contingency measures** | | |
|---|---|---|---|---|---|
| Early season drought **(Normal onset)** | **Major Farming situation** | **Normal Crop/cropping system** | **Crop management** | **Soil nutrient & moisture conservation measues** | **Remarks on Implementation** |

| | | | | | |
|---|---|---|---|---|---|
| Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc. | **Lowland**<br><br>Sandy clay loam soils | Rice | 1. Life saving irrigation may be applied if any water resource is available.<br>2. Gap filling should be done.<br>3. Re sowing or re transplanting through plastic drum seeder or SRI method respectively if heavy damage is occurs. | 1. Weeding<br>2. Proper bunding for water retention. | SRI marker & cono weeder and drum seeder through RKVY. |

| **Condition** | | | **Suggested Contingency measures** | | |
|---|---|---|---|---|---|
| **Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)** | **Major Farming situation[a]** | **Normal Crop/cropping system[b]** | **Crop management[c]** | **Soil nutrient & moisture conservation measures[d]** | **Remarks on Implementation[e]** |
| **At vegetative stage** | Sandy clay loam soils | **Rice** (MTU-7029, Sita, BPT-5204, Arise-6444) | 1. Life saving irrigation.<br>2. Re sowing through drum seeder or SRI methods respectively. | 1. Weeding<br>2. Postponement of top dressing.<br><br>3. Proper bunding of field. | Supply of SRI marker & cono weeder, plastic drum seeder through RKVY. |

| **Condition** | | | **Suggested Contingency measures** | | |
|---|---|---|---|---|---|
| **Mid season drought (long dry spell)** | **Major Farming situation[a]** | **Normal Crop/cropping system[b]** | **Crop management[c]** | **Soil nutrient & moisture conservation measues[d]** | **Remarks on Implementation[e]** |
| **At flowering/ fruiting stage** | Sandy clay loam soils | **Rice** (MTU-7029, Sita, BPT-5204, Arise-6444) | 1. Life saving irrigation.<br>2. Sowing of early Rabi crops. | 1. Spraying of anti transparent.<br>2. Postponement of top dressing. | |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Terminal drought** (Early withdrawal of monsoon) | **Major Farming situation** | **Normal Crop/cropping system** | **Crop management** | **Rabi Crop planning** | **Remarks on Implementation** |
| | Sandy clay loam soils | **Rice** (MTU-7029, Sita, BPT-5204, Arise-6444) | 1. Life saving irrigation.<br>2. Harvesting at physiological maturity stage. | Chick pea (Pant G-114)<br>Linseed (T-397)<br>Wheat (C-306, K-8962, DL-788-2)<br>Barley (Ratna) | **1.** Farm pond through NREGA.<br>2. Threshing implements through RKVY.<br>3. Seed supply of Rabi crops through NFSM |

### 2.1.2 Drought - Irrigated situation

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| | **Major Farming situation[f]** | **Normal Crop/cropping system[g]** | **Change in crop/cropping system[h]** | **Agronomic measures[i]** | **Remarks on Implementation[j]** |
| Limited release of water in canals due to low rainfall | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **Condition** | | | **Suggested Contingency measures** | | |
| | **Major Farming situation[f]** | **Normal Crop/cropping system[g]** | **Change in crop/cropping system[h]** | **Agronomic measures[i]** | **Remarks on Implementation[j]** |
| Non release of water in canals under delayed onset of monsoon in catchment | | | | | |
| Lack of inflows into tanks due | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| to insufficient /delayed onset of monsoon | | | | | |
| Insufficient groundwater recharge due to low rainfall | | | | | |

**2.2 Unusual rains (untimely, unseasonal etc)** (for both rainfed and irrigated situations)

| **Condition** | **Suggested contingency measure** | | | |
|---|---|---|---|---|
| **Continuous high rainfall in a short span leading to water logging** | **Vegetative stage[k]** | **Flowering stage[l]** | **Crop maturity stage[m]** | **Post harvest[n]** |
| Pigeonpea | Ridge making | Provide drainage | | |
| Blackgram | Ridge making | Provide drainage | | |
| Rice | Bund making | Provide drainage | Provide drainage | |
| **Horticulture** | | | | |
| Cucurbits | Staking | Provide drainage | Provide drainage | |
| Vegetables | Sowing on ridge | | | |

| | | | | |
|---|---|---|---|---|
| **Outbreak of pests and diseases due to unseasonal rains** | | | | |
| Pulses | Leaf hoper/caterpillar<br>Control- Monocrotophos @ 1 ml/lit | | | |
| Maize | Stem borer<br>Control- Phorate 10G@ 20 kg/ha | Sheath blight<br>Control- Hexaconazole 1.0 lit in 500 lit water/ha | | |

| | | | | |
|---|---|---|---|---|
| Rice | | Blast diseases<br>Control- Tricyclazole (0.05 %) | False Smut<br>Control- Propiconazole 0.1 % or Copper oxy chloride - 50 (2 kg/ha) | |
| Bhendi | | YVM<br>Control- Carbofuran 3G @ 3 gm/$m^2$ | | |
| French bean | Rust disease<br>Control- Mancozeb 2.5 kg/ ha | | | |

**2.3 Floods**

| **Condition** | **Suggested contingency measure[o]** | | | |
|---|---|---|---|---|
| **Transient water logging/ partial inundation[1]** | **Seedling / nursery stage** | **Vegetative stage** | **Reproductive stage** | **At harvest** |
| **Continuous submergence for more than 2 days[2]** | | Not Applicable | | |
| **Sea water intrusion[3]** | | | | |

**2.4 Extreme events: Heat wave / Cold wave/Frost/ Hailstorm /Cyclone**

| **Extreme event type** | **Suggested contingency measure** | | | |
|---|---|---|---|---|
| | **Seedling / nursery stage** | **Vegetative stage** | **Reproductive stage** | **At harvest** |
| **Hailstorm** | Not applicable | | | |
| **Heat Wave** | | | | |
| Wheat | Life saving irrigation | Life saving irrigation | Life saving irrigation (Terminal heat) | |
| **Cold wave** | | | | |
| Wheat | Irrigation | Light irrigation | Irrigation, fertilizer | |

| | | | | |
|---|---|---|---|---|
| | Balanced fertilizer application<br>Foliar spray of nutrients | Mulching with crop residue \ weeds<br>Fertilizer application | application | |
| Vegetables | Raising of seedling in Poly house, re sowing if damaged | Light irrigation<br>Mulching with crop residue \ weeds<br>Disease and pest control, care for chilling injury or replanting | Quick harvesting | Grading, quick disposal for marketing |
| Pigeonpea | | Light irrigation<br>Mulching with crop residue \ weeds | | |
| **Frost** | | | | |
| Wheat | | Light irrigation<br>Mulching with crop residue \ weeds | | |
| Pigeonpea | Exposure of crop to smoke by burning waste material during night time | Exposure of crop to smoke by burning waste material during night time<br>Light sprinkler irrigation | Exposure of crop to smoke by burning waste material during night time<br>Light sprinkler irrigation | Exposure of crop to smoke by burning waste material during night time |
| Tomato & Potato | | Earth up, Irrigation Intercultivation,<br>Mulching with weeds | | Harvest in dry weather |
| Horticultural crops (fruit crops) | Light frequent irrigation may be practiced wherever irrigation facilities are available, mulching, thatching and creating smoke screens and lighting of fire is also practiced where irrigation facilities are not available | | | |
| **Cyclone** | Not applicable | | | |

## 2.5 Contingent strategies for Livestock, Poultry & Fisheries

### 2.5.1 Livestock

| | Suggested contingency measures | | |
|---|---|---|---|
| | **Before the event[s]** | **During the event** | **After the event** |
| **Drought** | | | |
| Feed and fodder availability | Preservation of surplus fodder, encourage fodder cultivation and tree plantation and also encourage supply of molasses to cattle feed plants. | Arrangement of feeds and fodder from adjoining areas, exploitation of non conventional feed resources, use of urea treated straw and feed blocks. | Promotion of fodder seed production, cultivation and storage, establishment of fodder block making machines in fodder surplus areas. |
| Drinking water | Repairs of tube wells, clear off the sludge in the canals and local water catchments and clean the water tanks, large ponds and lakes | Harnessing water through the existing reservoirs and exploitation of groundwater. | To strengthen reservoirs by promoting recharging of water and rain water harvesting during rainy season. |
| Health and disease management | Mass vaccination and deworming | Provide shades to animals and water as much as possible. Treatment of diseased animals and proper disposal of carcasses. | Treatment of diseased animals and provide vitamin and mineral supplement to regain strength and vigour. |

[s] based on forewarning wherever available

### 2.5.2 Poultry

| | Suggested contingency measures | | | Convergence/linkages with ongoing programs, if any |
|---|---|---|---|---|
| | **Before the event[a]** | **During the event** | **After the event** | |
| **Drought** | | | | |
| Shortage of feed ingredients | Storage of feed | Provide non conventional feed, supplement anti oxidant and anti stress | | |
| Drinking water | Storage of water in tanks | Add vit-C and other anti stress ingredients with water | | |
| Health and disease | Regular vaccination | Vaccination and treatment of | Disposal of dead birds | |

| | | | | |
|---|---|---|---|---|
| management | | diseased one | | |

[a] based on forewarning wherever available

### 2.5.3 Fisheries/ Aquaculture

| | Suggested contingency measures | | |
|---|---|---|---|
| | **Before the event[a]** | **During the event** | **After the event** |
| **1. Drought** | | | |
| Aquaculture | | | |
| (i) Shallow water in ponds due to insufficient rains/inflow | Plough the pond and apply lime @ 250kg/ha | Reduce the stocking density from 25000 fry (1 inches size) to 10000-15000/ha | Remove the fishes of bigger size(0.5 kg) |
| (ii) Impact of salt load build up in ponds / change in water quality | | Apply lime @ 50 kg on every 15-30 days. Aerate the water as per need | Apply lime as per need @ 50 kg/ha |
| **2. Heat wave and cold wave** | | | |
| Aquaculture | | | |
| (i) Changes in pond environment (water quality) | Reduce application of organic manure and supplementary feeds | Reduce/stop application of feed | Harvest the bigger fishes, reduce/stop application of supplementary feed. Apply lime @ 50 kg/ha and potassium permanganate in perforated plastic ball 5-10g in each ball |
| (ii) Health and Disease management | Apply lime | Apply lime/salt as per need | Apply lime/salt as per need. |

[a] based on forewarning wherever available