

State: ANDHRA PRADESH

Agriculture Contingency Plan for District: MAHABUBNAGAR

| 1.0 District Agriculture profile | | | | | |
|----------------------------------|--|---|------------------------|--|---|
| 1.1 | Agro-Climatic/Ecological Zone | | | | |
| | Agro Ecological Sub Region (ICAR) | Deccan Plateau (Telangana) And Eastern Gh at (7.2) | | | |
| | Agro-Climatic Region (Planning Commission) | Southern plateau & Hill region (X) | | | |
| | Agro Climatic Zone (NARP) | Southern Telanagana Zone (AP-5) | | | |
| | List all the districts or part thereof falling under the NARP Zone | Mahabubnagar, parts of Ranga Reddy, Nalgonda, Medak and Warangal | | | |
| | Geographic coordinates of zone | Latitude | Longitude | Altitude | |
| | | 16°43'60" N | 77°58'60" E | 497m MSL | |
| | Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS | Regional Agril Research Station, Palem, Bijnepalle Mandal : Mahabubnagar, A.P | | | |
| | Mention the KVK located in the district | Youth for Action- KVK, Madanapuram Kothakota, Mahabubnagar (district) | | | |
| 1.2 | Rainfall | Normal RF(mm) | Normal Rainy days (no) | Normal Onset (specify week and month) | Normal Cessation (specify week and month) |
| | SW monsoon (June-Sep): | 519 | | 2 nd week of June | 2 nd week of October |
| | NE Monsoon(Oct-Dec): | 114 | | 2 nd week of October | End of December |
| | Winter (Jan- Feb) | 5 | | - | - |
| | Summer (Mar-May) | 54 | | - | - |
| | Annual | 692 | | | - |

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|------------|---|-------------------|-------------|---------------------------------|--------------------|----------------------|--|------------------------------|-----------------|---------------|
| 1.3 | Land use pattern of the district (latest statistics) | Geographical 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) | 1843.2 | 255.6 | 81.1 | 18.5 | 21.2 | 6.8 | 88.5 | 488.7 | 110.8 |

| | | | |
|------------|--|-----------------------|-----------------------------|
| 1.4 | Major Soils (common names like shallow red soils etc.,) | Area ('000 ha) | Percent (%) of total |
| | 1. Redsoils | 365.6 | 20 |
| | 2. Black soils | 182.8 | 10 |
| | 3. Chalka soils | 1279.6 | 70 |
| | Others (specify): | | |
| 1.5 | Agricultural land use | Area ('000 ha) | Cropping intensity % |
| | Net sown area | 722.7 | 107.2 % |
| | Area sown more than once | 52.4 | |
| | Gross cropped area | 775.1 | |

| | | | | |
|------------|------------------------------|-----------------------|-----------------------|---|
| 1.6 | Irrigation | Area ('000 ha) | | |
| | Net irrigated area | 156.3 | | |
| | Gross irrigated area | 194.7 | | |
| | Rainfed area | 566.4 | | |
| | Sources of Irrigation | Number | Area ('000 ha) | Percentage of total irrigated area |
| | Canals | 5 | 34.9 | 16.4 |
| | Tanks | 654 5538 | 8.0 | 3.8 |
| | Open wells | 29860 108200 | | |

| | | | |
|---|---------------------------------------|----------|-------|
| Bore wells | 784 | 161.4 | 76.0 |
| Lift irrigation | | | |
| Micro-irrigation | | | |
| Other sources | | 8.18 | 3.9 |
| Total Irrigated Area | 256.9 | 212.5 | 100.0 |
| Pump sets | | | |
| No. of Tractors | | | |
| Groundwater availability and use* (Data source: State/Central Ground water Department /Board) | No. of blocks/ Tehsils | (%) area | |
| Over exploited | | | |
| Critical | Collect from state ground water board | | |
| Semi- critical | | | |
| Safe | | | |
| Wastewater availability and use | | | |
| Ground water quality | | | |
| *over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70% | | | |

Area under major field crops & horticulture etc. (2004-09)

| 1.7 | | Major Field Crops cultivated | Area ('000 ha) | | | | | |
|-----|---|------------------------------|------------------|----------------|------------------|-------------------|--------|-------|
| | | | <i>Kharif</i> | | <i>Rabi</i> | | Summer | Total |
| | | | <i>Irrigated</i> | <i>Rainfed</i> | <i>Irrigated</i> | <i>Rainfed</i> | | |
| 1 | Maize | | 113 | 280 | | | 2920 | |
| 2 | Castor | | 139 | 0.4 | | | 139 | |
| 3 | Rice | 81 | | 42 | | | 123 | |
| 4 | Groundnut | | 35 | 54 | | | 89 | |
| 5 | Redgram | | 66 | 16 | | | 82 | |
| 6 | Jowar | | 56 | | 20 | | 76 | |
| 7 | Cotton | | 61 | | | | 61 | |
| | Horticulture crops - Fruits | | | | | Total area | | |
| 1 | Mango | | | | | 19.2 | | |
| 2 | Orange&Batavian | | | | | 15.2 | | |
| 3 | Lemon | | | | | 1.0 | | |
| | Horticultural crops - Vegetables | | | | | Total area | | |
| 1 | Chillies | | | | | 13.1 | | |
| 2 | Tomato | | | | | 4.0 | | |
| 3 | Onion | | | | | 3.6 | | |
| 4 | Bhendi | | | | | 1.0 | | |

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|--|-------------------------------------|------------------------|
| | Medicinal and Aromatic crops | Total area (ha) |
| | Spice and MAP | 4924 |
| | Plantation crops | Nil |
| | Fodder crops | |
| | Total fodder crop area | |
| | Grazing land | 3.0 |
| | Sericulture etc | |
| | Others (Specify) | |

| 1.8 | Livestock | Male ('000) | Female ('000) | Total ('000) | | |
|-------------|--|-------------------------|------------------------------------|---------------------|-------------|---|
| | Indigenous Cattle | 461.9 | 339.4 | 801.3 | | |
| | Exotic and Crossbred Cattle | 11.7 | 27.4 | 39.1 | | |
| | Buffaloes | 88.0 | 372.8 | 460.8 | | |
| | Goat | | | 685.7 | | |
| | Sheep | | | 4095.8 | | |
| | Others (Camel, Pig, Yak etc.) | | | 45.1 | | |
| | Commercial dairy farms (Number) | | | | | |
| 1.9 | Poultry | No. of farms | Total No. of birds (number) | | | |
| | Commercial | | 3960609 | | | |
| | Backyard | | 1534293 | | | |
| 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 | | |

| | | | | | | | |
|--|---|-------------------------------|--|--------------------------|--|-------------------------------|--|
| | | | | | | | |
| | ii) Inland (Data Source: Fisheries Department) | No. Farmer owned ponds | | No. of Reservoirs | | No. of village tanks | |
| | | 75 | | 3 | | 601 | |
| | 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) | 101 | | - | | - | |
| | Others | | | - | | 25.4 | |

| 1.11 | Production and Productivity of major crops (Average of last 5 years: 2004,05,06, 07, 08) | 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 to be identified based on total acreage) [2007-2008] | | | | | | | | | | |
| 1 | Rice | 216 | 2611 | 109 | 2567 | | | 325 | 2599 | |
| 2 | Castor | 84 | 724 | | | | | 84 | 724 | |
| 3 | Maize | 263 | 2334 | 14 | 4749 | | | 277 | 2394 | |
| 4 | Redgram | 30 | 463 | | | | | 30 | 463 | |
| 5 | Cotton | 89 | 250 | | | | | 89 | 250 | |
| 6 | Groundnut | | | 194 | 1966 | | | 194 | 1966 | |
| Major Horticultural crops (Crops to be identified based on total acreage) | | | | | | | | | | |
| Horticulture crops - Fruits | | | | | | | | | | |

| | | | | | | | | | | |
|---|--------------|--|--|--|--|------|--------|-------|-------|--|
| 1 | Acid lime | | | | | 15.0 | 14667 | | | |
| 2 | Sweet orange | | | | | | | 202.7 | 13300 | |
| 3 | Mango | | | | | 159 | 8237 | | | |
| Horticultural crops – Vegetables | | | | | | | | | | |
| 1 | Tomato | | | | | 76 | 19,000 | | | |
| 2 | Onion | | | | | 61 | 17,000 | | | |
| 3 | Okra | | | | | 14.7 | 14,333 | | | |
| 4 | Chillies | | | | | 4.3 | 10,000 | | | |
| Others | | | | | | | | | | |

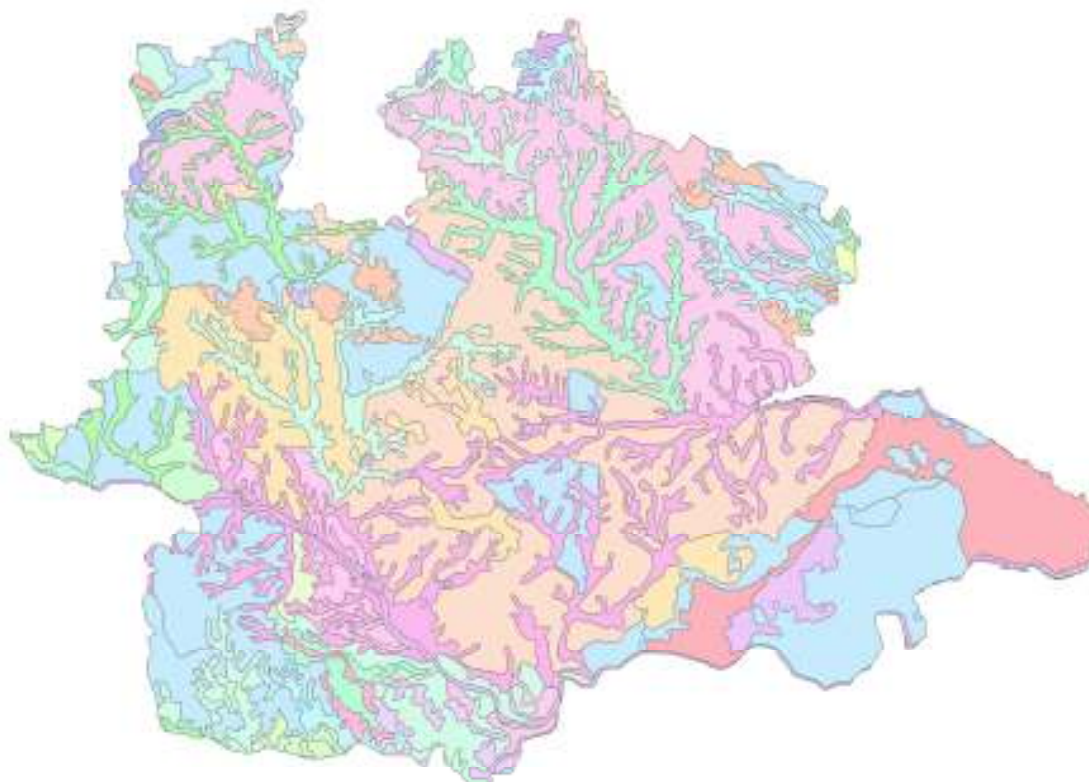
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|-------------|--|--|--|---|---|--|
| 1.12 | Sowing window for 5 major field crops (start and end of normal sowing period) | Castor | Maize | Rice | Jowar | Redgram |
| | Khariif- Rainfed | 2 nd fortnight of June to 1 st fortnight of July | 2 nd fortnight of June to 1 st fortnight of July | --- | 2 nd week of June to end of June | 2 nd fortnight of June to 1 st fortnight of July |
| | Khariif-Irrigated | --- | --- | 1 st week of June to last week of July | --- | --- |
| | Rabi- Rainfed | | --- | | | |
| | Rabi-Irrigated | | 15 October to 15 November | | | |

| | | | | |
|-------------|--|---------|------------|------|
| 1.13 | What is the major contingency the district is prone to? (Tick mark and mention years if known during the last 10 year period) | Regular | Occasional | None |
| | Drought | √ | | |
| | Flood | | | √ |
| | Cyclone | | | √ |
| | Hail storm | √ | | |
| | Heat wave | | | √ |
| | Cold wave | | √ | |
| | Frost | | | √ |

| | | | | |
|--|------------------------------|--|---|---|
| | Sea water intrusion | | | √ |
| | Pests and diseases (specify) | | <u>Rice</u> : BPH, False smut, Panicle mite <u>Cotton</u> : Leaf spots, Blackarm, Grey mildew <u>Groundnut</u> : Stem necrosis <u>Redgram</u> : Sterility mosaic, Maruca pod borer | |
| | Others (Fog) | | v | |

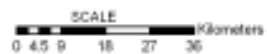
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|-------------|---|---|--------------------|
| 1.14 | Include Digital maps of the district for | Location map of district within State as Annexure I | Enclosed: Yes / No |
| | | Mean annual rainfall as Annexure 2 | Enclosed: Yes / No |
| | | Soil map as Annexure 3 | Enclosed: Yes / No |

SOIL MAP - MAHABUBNAGAR DISTRICT



SOIL TYPE

- Cracking clay soils
- Cracking clay soils with high AWC
- Loamy calcareous soils with illuvial water in
- Loamy over sandy calcareous stratified soils
- Loamy soils
- Loamy soils with high AWC
- Loamy soils with very high AWC
- Loamy stratified soils
- Cracking clay calcareous soils
- Calcareous clay soils
- Clay soils with high AWC
- Heavy calcareous soils
- Heavy soils
- Cracking clay soils with very high AWC
- Gravelly clay soils
- Heavy clay soils with low AWC
- Heavy clay soils with surface cracking
- Gravelly clay soils with very low AWC
- Gravelly loam soils
- Gravelly loam soils with generally surface
- Gravelly loam soils with low AWC
- Gravelly loam soils with stony surface
- Gravelly loam soils with very low AWC
- Stratified clayey soils with high AWC
- Stratified loamy soils



AGROMET-CELL

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

| Condition | Major Farming situation | Normal Crop/cropping system | Change in crop/cropping system | Suggested Contingency measures | |
|---|-------------------------|---|--------------------------------|--------------------------------|---------------------------|
| | | | | Agronomic measures | Remarks on Implementation |
| Early season drought (delayed onset) | | | | | |
| Delay by 2 weeks (3 rd week of June) | Rainfed Red Soils | Castor, Maize, Sorghum, Groundnut, Redgram, Sunflower | No change | | |
| | Rainfed Black soils - | Maize, Cotton, Sunflower, Ragi | | | |
| | | Redgram | | | |

| Condition | Major Farming situation | Normal Crop/cropping system | Change in crop/cropping system | Suggested Contingency measures | |
|---|-------------------------|-----------------------------|----------------------------------|--------------------------------|---------------------------|
| | | | | Agronomic measures | Remarks on Implementation |
| Early season drought (delayed onset) | | | | | |
| Delay by 4 weeks (1 st week of July) | Red soil – Rainfed | Castor | Castor + Redgram (1:1) | | |
| | | Maize, Sorghum | Castor +Redgram, Maize | | |
| | | Groundnut | Pearl millet | | |
| | | Redgram | Castor x Pearlmillet/ Ragi (1:1) | | |

| | | | | | |
|--|---------------------|--------------------------------|-----------|--|--|
| | Rainfed Black soils | Maize, cotton, sunflower, Ragi | No change | | |
| | | Redgram | | | |

| 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 (4 th week of July) | Red soil – Rainfed | Castor | No change | Adopt closer spacing 60x30 cm | |
| | | Maize, Sorghum | Redgram, Horsegram, Pearl millet | High seed rate, (10-12kg/ac) medium duration varieties with closer spacing PRG 158 (Redgram) | |
| | | Redgram | No change | High seed rate (10-12kg/ac) medium duration varieties (PRG 158) with closer spacing (90x45) | |
| | Black soils - Rainfed | Maize | No change | | |
| | | Redgram | Fodder sorghum | High seed rate (12kg/ac), PRG 158 | |
| | | Cotton | Redgram | | |
| | | Sunflower | Sunflower | | |

| 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 | Rainfed red chalka soil | Castor | Castor + Redgram intercropping (1:1) | Mulching, make dead furrow at 4.6m distance | |

| | | | | |
|--|---------------------|------------------------|--|---|
| (2nd week of August) | | Groundnut | Pearl millet | |
| | | Maize, Sorghum | Castor + Redgram intercropping (1:1) horsegram | |
| | | Redgram | Castor + Redgram intercropping (1:1) | Mulching, make dead furrow at 4.6m distance |
| | Rainfed Black soils | Maize, Cotton, Redgram | Castor + Redgram intercropping (1:1) | Sunflower |
| | | Sunflower | No change | |

| Condition | Major Farming situation | Normal Crop/cropping system | Suggested Contingency measures | | |
|---|--------------------------------|------------------------------------|--|--|----------------------------------|
| | | | Crop management | Soil nutrient & moisture conservation measues | Remarks on Implementation |
| Early season drought (Normal onset) | | | | | |
| Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc. | Rainfed Red soil | Castor | Gap filling if the population is low | As above | |
| | | Maize, Jowar | Re-sowing with Castor if the population is low | | |
| | | Groundnut + Redgram | | | |
| | Rainfed Black soils | Cotton sole crop | Gap filling , thinning | | |

| Condition | Major Farming situation | Normal Crop/cropping system | Suggested Contingency measures | | |
|--|--------------------------------|------------------------------------|---------------------------------------|---|---|
| | | | Crop management | Soil nutrient & moisture conservation measures | Remarks on Implementation |
| Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period) | | | | | |
| At vegetative stage | Rainfed Red soil | Castor | Frequent intercultivation | Opening dead furrows to conserve soil moisture (4.5m) | Top dressing with urea if possible, supplemental irrigation from farm ponds |
| | | Maize | | | |
| | | Sorghum | | | |
| | | Redgram | | | |
| | Rainfed Black soils | Cotton | | Adopt skip row | |

| | | | | | | |
|------------------------------|---------------------|-----------|--------------------------------------|------------------------------------|--|--|
| At reproductive stage | Rainfed Red soil | Sunflower | Supplemental irrigation if available | irrigation if (water) is available | | |
| | | Maize | | | | |
| | | Sorghum | | | | |
| | Rainfed Black soils | Redgram | 2% urea spray | | | |
| | Rainfed Black soils | Cotton | 2% urea spray/1% KNO ₃ | Skip row irrigation | | To dressing with urea and MOP after receipt of rains |
| | | Sunflower | 2% urea spray | | | |
| Redgram | | | | | | |

| Condition | Major Farming situation | Normal Crop/cropping system | Suggested Contingency measures | | |
|-------------------------|-------------------------|-----------------------------|--|--------------------|---|
| | | | Crop management | Rabi Crop planning | Remarks on Implementation |
| Terminal drought | Rainfed Red soil | Castor, Maize, Redgram | 2% urea spray | Fallow | Digging of farm pond for providing supplemental irrigation/ Application mechanism |
| | Black soils - Rainfed | Cotton, Redgram | 2% urea spray /KNO ₃ 1% spray | Bengalgram | |

2.1.2 Irrigated situation

| Condition | Major Farming situation | Normal Crop/cropping system | Suggested Contingency measures | | |
|--|-------------------------|-----------------------------|--|---|---------------------------|
| | | | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
| Delayed release of water in canals due to low rainfall | Tankfed/Canal irrigated | Rice | Rice short duration varieties (Tellaamsa, Kavya, MTU 1010) | Green manure crops preceding rice for gram as catch crop. | |
| | | Rice – Maize/ Pulses | Rice – maize / Pulses | Planting aged seedlings. Direct seedlings with short duration varieties over traditional varieties. Recommended management practices for aged seedlings | |

| Condition | Major Farming situation | Normal Crop/cropping system | Suggested Contingency measures | | |
|-----------|-------------------------|-----------------------------|--------------------------------|---|---------------------------|
| | | | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
| | | | | (closer spacing more no. of seedlings/hill, planting deep, one top dressing). | |

| Condition | Major Farming situation | Normal Crop/cropping system | Suggested Contingency measures | | |
|--|---------------------------------|--|---|--|---|
| | | | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
| Limited release of water in canals due to low rainfall | Canal irrigated - Redsoils | Rice | Groundnut Maize Sunflower | Irrigation at critical stage | Digging of farm pond for providing supplemental irrigation. |
| Non release of water in canals under delayed onset of monsoon in catchment | Canal | Rice | Maghi Jowar Greengram Bengalgram (black soils) | -- | |
| Lack of inflows into tanks due to insufficient /delayed onset of monsoon | NA | | | | |
| Insufficient groundwater recharge due to low rainfall | Red soils – Borewell irrigation | Sweet orange / Mango/ Papaya/ Pomegranate Rice – Groundnut/ Maize/ vegetables | No change | Adopt drip irrigation Adopt sprinkler irrigation for groundnut and drip irrigation for vegetables | |

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

| Condition | Suggested contingency measure | | | |
|---|--|--|---|--|
| | Vegetative stage | Flowering stage | Crop maturity stage | Post harvest |
| Continuous high rainfall in a short span leading to water logging | | | | |
| Rice | Drain out excess water Weeding Topdressing (30 kg urea +15 MOP) | Drain out excess water Top dressing 30 kg urea +15 MOP) | Drain out excess water | 2% salt spray If variety is non dormant |
| Redgram | Drain out excess water Followed by Inter cultivation | Drain out excess water | | |
| Maize | Drain out excess water followed by top dressing(40 kg urea) Monitoring pest /diseases | | | |
| Castor | Drain out excess water followed by top dressing (20 kg +10 kg MOP Monitoring pest /diseases | Drain out excess water followed by top dressing Monitoring pest /diseases | Drain out excess water Monitoring pest /diseases | |
| Cotton | | Drain out excess water followed by booster dose of urea+ MOP) Monitoring pest /diseases | Drain out excess water followed by booster dose of urea+ MOP (30 kg urea + 15 kg MOP Monitoring pest /diseases | |
| | | | | |

| Horticulture crops – Fruits | | | | |
|------------------------------------|--|---|---|---|
| Mango | <p>Drain the excess water as soon as possible Spray 1% KNO₃ or Urea 2% solution 2-3 times.</p> <p>Wind damaged branches should be pruned using disinfected secatures and cut ends must be smeared with Bordeaux paste</p> | <p>Drain the excess water as soon as possible</p> <p>Spray 1% KNO₃ or Urea 2% solution 2-3 times.</p> | <p>Drain the excess water as soon as possible</p> <p>Harvest the mature produce in a clear sunny day'</p> | <p>Store the fruits in well ventilated place temporarily before it can be marketed.</p> <p>Market the fruits as soon as possible.</p> |
| Sweet orange | <p>Drain the excess water as soon as possible.</p> <p>Spray 1% KNO₃ or Urea 2% solution 2-3 times.</p> | <p>Drain the excess water as soon as possible.</p> <p>Spray 1% KNO₃ or Urea 2% solution 2-3 times.</p> | | <p>Store the fruits in well ventilated place temporarily before it can be marketed.</p> <p>Market the fruits as soon as possible.</p> |
| Acid lime | <p>Foliar spray of micronutrient mixture is also to be taken up.</p> <p>Sand casting around the tree trunks should be removed up to the collar region of the tree to prevent fungal infections.</p> <p>If the tree age is above eight years a booster dose of 500 g of Urea and 750 g MOP per tree should be applied.</p> <p>Wind damaged branches should be pruned using disinfected secatures and cut ends must be smeared with Bordeaux paste</p> | <p>Foliar spray of micronutrient mixture is also to be taken up.</p> <p>Sand casting around the tree trunks should be removed up to the collar region of the tree to prevent fungal infections.</p> | | |

| | | | | |
|--------------------------------------|---|---|---|--|
| | | If the tree age is above eight years a booster dose of 500 g of Urea and 750 g MOP per tree should be applied. | | |
| Horticulture crops vegetables | | | | |
| Chillies | <p>Drain the excess water as soon as possible</p> <p>Spray Urea 2% solution 2-3 times.</p> <p>Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible.</p> <p>Gap filling may be taken up if the plants are two weeks old and sowing window is still available for the crop.</p> <p>In case of severe damage (considered as complete economical loss), and the contingency period is between June to August, sowing of best alternative crop must be taken up.</p> | <p>Drain the excess water as soon as possible</p> <p>Spray Urea 2% solution 2-3 times.</p> <p>Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible.</p> | <p>Drain the excess water as soon as possible</p> <p>Harvest the matured fruits in a clear sunny day.</p> | <p>Dry the pods on concrete floor immediately after the appearance of sunlight (or).</p> <p>Use poly house solar driers for quick drying</p> <p>Grade the pods and market as soon as possible. Do not store such produce for long periods.</p> |
| Tomato | <p>-do-</p> <p>Topdressing of booster dose of 12 kg MOP + 30 kg Urea per acre as soon as possible.</p> | <p>-do-</p> <p>Topdressing of booster dose of 10 kg MOP + 30 kg Urea per acre as</p> | | |

| | | | | |
|--------|---|---|--|--|
| | | soon as possible. | | |
| Onion | <p>Drain the excess water as soon as possible</p> <p>Spray Urea 2% solution 2-3 times.</p> | <p>Drain the excess water as soon as possible</p> <p>Spray Urea 2% solution 2-3 times.</p> <p>Topdressing of booster dose of 10 kg MOP + 30 kg Urea per acre as soon as possible.</p> | <p>Drain the excess water as soon as possible</p> <p>Harvest the mature produce in a clear sunny day</p> | <p>Dry the harvested onions in thin layers under shade in well ventilated places</p> <p>Store the produce in well ventilated place temporarily before it can be marketed.</p> <p>Market the produce as soon as possible.</p> |
| Bhendi | <p>Drain the excess water as soon as possible</p> <p>Spray Urea 2% solution 2-3 times.</p> <p>Topdressing of booster dose of 10 kg MOP + 30 kg Urea per acre as soon as possible.</p> <p>Gap filling may be taken up if the plants are two weeks old and sowing window is still available for the crop.</p> <p>In case of severe damage (considered as complete economical loss), and the contingency period is between June to July resow the same crop or further delayed go for alternate crop</p> | <p>Drain the excess water as soon as possible</p> <p>Spray Urea 2% solution 2-3 times.</p> <p>Topdressing of booster dose of 10 kg MOP + 30 kg Urea per acre as soon as possible.</p> | <p>Drain the excess water as soon as possible</p> <p>Spray Urea 2% solution once.</p> | <p>Harvest the mature fruits as soon as possible.</p> <p>Store the fruits in well ventilated place temporarily before it can be marketed.</p> <p>Market the fruits as soon</p> |

| | | | | |
|---|--|--|--|--------------|
| | | | | as possible. |
| Heavy rainfall with high speed winds in a short span | | | | |
| Outbreak of pests and diseases due to unseasonal rains | | | | |
| Rice | Gallmidge/Leaffolder/Blast/ | BPH/Leaffolder/Blast/BLB | BPH/Leaffolder/Blast/BLB/Falsesmut | |
| Cotton | Micro nutrient deficiencies, Black arm.Leafspots, Sucking pest | Micro nutrient deficiencies, Black arm.Leafspots, Sucking pest | Micro nutrient deficiencies, Black arm.Leafspots, Sucking pest | |
| Redgram | Wilt | Wilt | Wilt/Maruca | |
| Maize | Shoot borer | | | |
| Castor | Wilt | Botrytis | Capsule borer | |
| Horticulture | | | | |

2.3 Floods

| Condition | Suggested contingency measure | | | |
|--|--|---|--|--|
| | Seedling / nursery stage | Vegetative stage | Reproductive stage | At harvest |
| Transient water logging/ partial inundation | | | | |
| Castor | Drain out excess water | Drain out excess water. Application of urea and potash to boost the growth (30 kg urea + 15 kg MOP) | Drain out excess water. Application of urea and potash to boost the growth | Drain out excess water. |
| Rice | To drain out the excess water at the earliest Apply booster dose of 0.2 kg N/40 sq. m | To drain out the excess water at the earliest Take up gap filling either with available nursery or by splitting the tillers from the surviving hills | To drain out the excess water at the earliest Takeup need based plant protection measures | Drain out water .Spread sheaves loosely in field or field bunds where there is no water stagnation Spray common salt at 3% on |

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| | <p>Spray micronutrients like Zn, Fe two to three times at 4 -5 days interval</p> <p>Takeup proper weed control measures</p> | <p>Apply a booster dose of 20 kg N/acre</p> <p>Spray ZnSO₄ 0.2 % if it is less than 45 days after transplanting</p> <p>Takeup need based plant protection measures</p> | | <p>panicles to prevent germination and spoilage of straw from moulds</p> <p>Thresh after drying the sheaves properly</p> <p>Ensure proper grain moisture before storing</p> |
| Cotton | <p>To drain out the excess water at the earliest</p> <p>Take up the gap filling at the earliest</p> <p>Inter cultivate at optimum field moisture condition</p> <p>Apply 20 kg N + 10 kg K /acre after draining excess water</p> <p>To spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition</p> <p>Take up plant protection measures against possible pests and disease incidence</p> | <p>To drain out the excess water at the earliest</p> <p>Inter cultivate at optimum field moisture condition</p> <p>Apply 20 kg N + 10 kg K /acre after draining excess water</p> <p>To spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition</p> <p>Spray of micronutrients two times at 7-10 days interval</p> <p>Take up plant protection measures against possible pests and disease incidence</p> | <p>To drain out the excess water at the earliest</p> <p>To spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition</p> <p>Take up plant protection measures against possible pests and disease incidence</p> | <p>Kapas picking should be done carefully to prevent admixtures with waste plant material</p> |
| Redgram | To drain out the excess water at the earliest | To drain out the excess water at the earliest | To drain out the excess water at the earliest | To drain out the excess water at the earliest |

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| | <p>Takeup the gap filling at the earliest</p> <p>Inter cultivate at optimum field moisture condition</p> <p>Apply 4-5 kg N/acre after draining excess water</p> | <p>Takeup the gap filling at the earliest</p> <p>Inter cultivate at optimum field moisture condition</p> <p>Apply 4-5 kg N/acre after draining excess water</p> | <p>To spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition</p> <p>Take up plant protection measures against possible pests and disease incidence</p> | <p>Harvest the crop when the field condition permits</p> <p>Drying of bundles should be done on elevated places like filed bunds or drying floors</p> |
| Maize | <p>To drain out the excess water at the earliest</p> <p>Takeup weed control either mechanically or through weedicides</p> <p>Intercultivation and earthing up to be done</p> <p>Apply 20 kg N + 10 kg K /acre after draining excess water</p> <p>Take up plant protection measures against possible pests and disease incidence</p> | <p>To drain out the excess water at the earliest</p> <p>Takeup weed control either mechanically or through weedicides</p> <p>Intercultivation and earthing up to be done</p> <p>Apply 20 kg N + 10 kg K /acre after draining excess water</p> <p>Take up plant protection measures against possible pests and disease incidence</p> | <p>To drain out the excess water at the earliest</p> <p>Take up plant protection measures against possible pests and disease incidence</p> | <p>To drain out the excess water at the earliest</p> <p>Cob picking to be done after they are dried fully</p> |
| Horticulture crops – Fruits | | | | |
| Mango | <p>Drain the excess water as soon as possible</p> <p>Spray 1% KNO₃ or Urea 2% solution 2-3 times.</p> | <p>Drain the excess water as soon as possible</p> <p>Spray 1% KNO₃ or Urea 2% solution 2-3 times.</p> | <p>Drain the excess water as soon as possible</p> <p>Spray 1% KNO₃ or Urea 2% solution 2-3 times.</p> | <p>Drain the excess water as soon as possible.</p> <p>Harvest the mature fruits as soon as possible.</p> <p>Store the fruits in well</p> |

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| | | | | ventilated place temporarily before it can be marketed. Market the fruits as soon as possible. |
| Sweet orange | <p>Drain the excess water as soon as possible.</p> <p>Spray 1% KNO₃ or Urea 2% solution 2-3 times.</p> <p>Plant protection measures may be taken for control of insect vectors and diseases.</p> | <p>Drain the excess water as soon as possible.</p> <p>Spray 1% KNO₃ or Urea 2% solution 2-3 times.</p> <p>Foliar spray of micronutrient mixture is also to be taken up.</p> <p>Sand casting around the tree trunks should be removed up to the collar region of the tree to prevent fungal infections.</p> <p>If the tree age is above eight years a booster dose of 500 g of Urea and 750 g MOP per tree should be applied.</p> | <p>Drain the excess water as soon as possible.</p> <p>Spray 1% KNO₃ or Urea 2% solution 2-3 times.</p> <p>Foliar spray of micronutrient mixture is also to be taken up.</p> <p>Sand casting around the tree trunks should be removed up to the collar region of the tree to prevent fungal infections.</p> <p>If the tree age is above eight years a booster dose of 500 g of Urea and 750 g MOP per tree should be applied.</p> | <p>Drain the excess water as soon as possible.</p> <p>Harvest the mature fruits as soon as possible.</p> <p>Store the fruits in well ventilated place temporarily before it can be marketed.</p> <p>Market the fruits as soon as possible.</p> |
| Acid lime | <p>Drain the excess water as soon as possible.</p> <p>Spray 1% KNO₃ or Urea 2% solution 2-3 times.</p> | <p>Drain the excess water as soon as possible.</p> <p>Spray 1% KNO₃ or Urea 2% solution 2-3 times.</p> <p>Foliar spray of micronutrient mixture is also to be taken up.</p> <p>Sand casting around the tree trunks should be removed up to the collar region of the tree to prevent fungal infections.</p> | <p>Drain the excess water as soon as possible</p> <p>Spray 1% KNO₃ or Urea 2% solution 2-3 times.</p> | <p>Drain the excess water as soon as possible.</p> <p>Harvest the mature produce as soon as possible.</p> <p>Store the produce in well ventilated place temporarily before it can be marketed.</p> <p>Market the produce as soon as possible.</p> |

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| | | If the tree age is above eight years a booster dose of 500 g of Urea and 750 g MOP per tree should be applied. | | |
| Horticulture crops vegetables | | | | |
| Chillies | Drain the excess water as soon as possible | Drain the excess water as soon as possible Spray Urea 2% solution 2-3 times. Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible. Gap filling may be taken up if the plants are two weeks old and sowing window is still available for the crop. | Drain the excess water as soon as possible Spray Urea 2% solution 2-3 times. Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible. | Drain the excess water as soon as possible. Dry the pods on concrete floor/ tarpaulins. Spray any drying oil after the pods are free from surface moisture for quick drying. Use poly house solar driers for quick drying Remove the pest and disease infected pods. Market the produce as soon as possible |
| Tomato | Drain the excess water as soon as possible | Drain the excess water as soon as possible Spray Urea 2% solution 2-3 times. Topdressing of booster dose of 10 kg MOP + 30 kg Urea per acre as soon as possible. | Drain the excess water as soon as possible Spray Urea 2% solution once. | Drain the excess water as soon as possible. Harvest the mature produce as soon as possible. Store the produce in well ventilated place temporarily before it can be marketed. Market the produce as soon as possible. |
| Onion | Drain the excess water as soon as possible | Drain the excess water as soon as possible | Drain the excess water as soon as possible | Drain the excess water as soon as possible. |

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| | Soil drenching with COC 3g or redomil 2g in 1 lit of water to prevent damping off | Spray Urea 2% solution 2-3 times. Topdressing of booster dose of 10 kg MOP + 30 kg Urea per acre as soon as possible. Spray mancozeb 25g in 10 liters of water, 2-3 times against leaf spots. | Spray Urea 2% solution once. Spray mancozeb 25g in 10 liters of water, 2-3 times against leaf spots. | Harvest the mature produce as soon as possible. Store the produce in well ventilated place temporarily before it can be marketed. Market the produce as soon as possible. |
| Bhendi | Drain the excess water as soon as possible Spray Urea 2% solution 2-3 times. Topdressing of booster dose of 12 kg MOP + 30 kg Urea per acre as soon as possible. Gap filling may be taken up if the plants are two weeks old and sowing window is still available for the crop. | Drain the excess water as soon as possible Spray Urea 2% solution 2-3 times. Topdressing of booster dose of 10 kg MOP + 30 kg Urea per acre as soon as possible. Spray COC 30 g in 10 liters of water, 2-3 times against leaf spots | Drain the excess water as soon as possible Spray Urea 2% solution once. | Drain the excess water as soon as possible. Harvest the mature produce as soon as possible. Store the produce in well ventilated place temporarily before it can be marketed. Market the produce as soon as possible. |
| Continuous submergence for more than 2 days | | | | |
| Rice | Top dressing with 0.2 kg N/40 sq.m immediately after receding of flood water Spray of ZnSO ₄ [0.2%], FeSO ₄ [1-2 %] to correct micronutrient deficiencies Weed control through mechanical or Chemical measures | To drain out the excess water at the earliest Take up gap filling either with available nursery or by splitting the tillers from the surviving hills if the gaps are < 30% if more go for replanting Apply 20 kg N + 10 kg K /acre after draining excess water | To drain out the excess water at the earliest Takeup need based plant protection measures | Drain out water spread sheaves loosely in field or field bunds where there is no water stagnation Spray common salt at 3% on panicles to prevent germination and spoilage of straw from moulds Thresh after drying the sheaves |

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| | | <p>Proper weed control measures to be taken up</p> <p>Timely plant protection measures for pest and disease out break</p> | | <p>properly</p> <p>Ensure proper grain moisture before storing</p> |
| Cotton | <p>Mortality is most likely hence resowing to be taken up</p> <p>Select short duration hybrids (Private hybrids)</p> <p>Adopt closer spacing of 90X45 or 90X30 cm</p> | <p>To drain out the excess water at the earliest</p> <p>Apply 20 kg N + 10 kg K /acre after draining excess water</p> <p>Spray micronutrient mixture for 2 to 3 times at an interval of 7-10 days</p> <p>To spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition</p> <p>Intercultivate to smother weeds and to loosen and aerate the soil</p> <p>Need based plant protection measures to be taken up</p> | <p>To drain out the excess water at the earliest</p> <p>Spray micronutrient mixture for 2 to 3 times at an interval of 7-10 days</p> <p>To spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition</p> <p>Need based plant protection measures to be taken up</p> | <p>Drain out the water as early as possible</p> <p>To spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition</p> <p>Kapas picking should be done carefully to avoid admixtures with plant waste</p> |
| Redgram | <p>Takeup gap filling if the gaps are < 30 % and if more take up resowing</p> <p>After gap filling take up inter cultivation to smother the weeds and to aerate the soil</p> <p>Apply 20 kg N + 10 kg K /acre after draining excess water</p> | <p>After gap filling take up inter cultivation to smother the weeds and to aerate the soil</p> <p>Apply 20 kg N + 10 kg K /acre after draining excess water</p> | <p>Drain out excess water form the field</p> <p>Apply 20 kg N + 10 kg K /acre after draining excess water</p> <p>Need based plant protection measures to be taken up</p> | <p>Drain out excess water as early as possible</p> <p>Dry the bundles on field bunds and drying floors</p> |

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| Maize | To drain out the excess water at the earliest Re sow the crop if mortality is > 15 % Apply 20 kg N + 10 kg K /acre after draining excess water | To drain out the excess water at the earliest Apply 20 kg N + 10 kg K /acre after draining excess water Intercultivation to smother weeds and to loosen and aerate the soil To spray KNO ₃ @ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 @ 1% to support nutrition Need based plant protection measures to be taken up | To drain out the excess water at the earliest Apply 20 kg N + 10 kg K /acre after draining excess water To spray KNO ₃ @1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 @ 1% to support nutrition Need based plant protection measures to be taken up | To drain out excess water at the earliest Pick the cobs and dry them properly before threshing Dry the grain to optimum moisture content before storage or marketing |
| Horticulture | | | | |
| Sea water intrusion | | | | |

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 |
| Heat Wave | NA | | | |
| Horticulture | | | | |
| Horticulture crops - Fruits | | | | |
| Mango, Orange & Batavia Lemon Guava Sapota | Cover the newly planted plants with dry leaves Increase the frequency of irrigation. | Mulch the plant basins with dried leaves Increase the frequency of irrigation | Increase the frequency of irrigation. Provide irrigation at critical stages viz; peanut size and lemon size | Harvest the fruits either in the morning or in the evening Use ripening chambers for getting quality fruits |
| Horticultural crops - Vegetables | | | | |

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|-------------------|---|--|--|--|
| Vegetables | Provide shade to the newly planted /seedlings Irrespective of stage increase the frequency of irrigation. Use mulches Add bulky organic manures at the time of last ploughing | | | Harvest either in the morning or in the evening |
| Cold wave | | | | |
| Frost | | | | |
| Hailstorm | | | | |
| Cyclone | | | | |
| Castor | | Spray Carbendazim @ 1 gm per litre to control <i>Botrytis</i> . Apply booster dose of urea and potash | Spray Carbendazim @ 1 gm per litre to control <i>Botrytis</i> Apply booster dose of urea and potash | |
| Rice | To drain out excess water at the earliest Apply booster dose of 0.2 kg N/40 sq. m Spray micronutrients like (% ?)Zn, Fe 2-3 times at 4 -5 days interval Takeup proper weed control measures | To drain out excess water at the earliest Apply booster dose of 20 kg N/Acre Spray ZnSO ₄ 0.2 % if it is less than 45 days after transplanting Takeup need based plant protection measures | To drain out excess water at the earliest Takeup need based plant protection measures Lodged plants to be lifted and tied together to make them stand erect | Drain out water spread sheaves loosely in field or field bunds where there is no water stagnation Spray common salt at 3% to prevent germination of seed and spoilage of straw from moulds Thresh after drying the sheaves properly Ensure proper grain moisture before storing |
| Cotton | To drain out the excess water at the earliest Inter cultivate at optimum field moisture condition | To drain out the excess water at the earliest Inter cultivate at optimum field moisture condition | To drain out the excess water at the earliest To spray KNO ₃ @1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 @ 1% to support nutrition | Kapas picking should be done carefully to prevent admixtures with waste plant material |

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| | Apply 20 kg N + 10 kg K /acre after draining excess water | <p>Earthing up to be done to provide anchorage to plants</p> <p>Apply 20 kg N + 10 kg K /acre after draining excess water</p> <p>To spray KNO₃@1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 @ 1% to support nutrition</p> <p>Spray of micronutrients two times at 7-10 days interval</p> <p>Take up plant protection measures against possible pests and disease incidence</p> | <p>Earthing up to be done to provide anchorage to plants</p> <p>Spray of micronutrients two times at 7-10 days interval</p> <p>Take up plant protection measures against possible pests and disease incidence</p> | |
| Redgram | <p>To drain out excess water at the earliest</p> <p>Inter cultivate at optimum field moisture condition</p> <p>Apply 4-5 kg N/acre after draining excess water</p> | <p>To drain out excess water at the earliest</p> <p>Inter cultivate at optimum field moisture condition</p> <p>Apply 4-5 kg N/acre after draining excess water</p> | <p>To drain out excess water at the earliest</p> <p>To spray KNO₃@ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 @ 1% to support nutrition</p> <p>Take up plant protection measures against possible pests and disease incidence</p> | <p>To drain out excess water at the earliest</p> <p>Harvest the crop when the field condition permits</p> <p>Drying of bundles should be done on elevated places like filed bunds or drying floors</p> |
| Maize | <p>To drain out excess water at the earliest</p> <p>Intercultivation and earthing up to be done</p> <p>Apply 20 kg N + 10 kg K /acre after draining excess water</p> | <p>To drain out excess water at the earliest</p> <p>Takeup weed control either mechanically or through weedicides</p> <p>Intercultivation and earthing</p> | <p>To drain out excess water at the earliest</p> <p>Take up plant protection measures against possible pests and disease incidence</p> | <p>To drain out excess water at the earliest</p> <p>Cob picking to be done after they are dried fully</p> |

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|--------------------------------------|--|--|--|---|
| | Take up plant protection measures against possible pests and disease incidence | up to be done Apply 20 kg N + 10 kg K /acre after draining excess water | | |
| | | Take up plant protection measures against possible pests and disease incidence | | |
| Horticulture crops – Fruits | | | | |
| Mango | If the damage is severe, go for resowing | Trees fallen on ground may be lifted and earthed up | Tress fallen on ground may be lifted and earthed up | Drain the excess water as soon as possible. |
| | | Manuring and plant protection measures have to be taken up. | Manuring and plant protection measures have to be taken up. | Harvest the mature fruits as soon as possible. |
| | | Broken and damaged branches may be pruned and applied with Bordeaux paste | Broken and damaged branches may be pruned and applied with Bordeaux paste | Collect the fallen fruits and sell immediately or go for preparation of processed products. |
| Sweet orange | | Tress fallen on ground may be lifted and earthed up | Tress fallen on ground may be lifted and earthed up | If to store, store the produce in well ventilated place temporarily before it can be marketed. |
| Acid lime | | Manuring and plant protection measures have to be taken up. | Manuring and plant protection measures have to be taken up. | |
| | | Broken and damaged branches may be pruned and applied with Bordeaux paste | Broken and damaged branches may be pruned and applied with Bordeaux paste | Broken and damaged branches may be pruned and applied with Bordeaux paste |
| Horticulture crops vegetables | | | | |
| Chillies | Grow nursery on raised beds. | Uprooted plants may be lifted and earthed up | Uprooted plants may be lifted and earthed up | Drain the excess water as soon as possible. |
| | | Drain the excess water as soon as possible | Drain the excess water as soon as possible | Dry the pods on concrete floor/ tarpaulins immediately use poly house solar driers for quick drying |
| | | Gap filling must be done | Spray Urea 2% solution 2-3 times. Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible. | |

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| | | <p>immediately</p> <p>If damage is more go for replanting Spray Urea 2% solution 2-3 times.</p> <p>Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible.</p> | | <p>Remove the pest and disease infected pods.</p> |
| Tomato | <p>Grow nursery on raised beds. If damage is more go for resowing</p> | <p>Uprooted plants may be lifted and earthed up</p> <p>Drain the excess water as soon as possible Gap filling must be done immediately</p> <p>Spray Urea 2% solution 2-3 times.</p> <p>Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible.</p> <p>If damage is more ,go for replanting</p> | <p>Uprooted plants may be lifted and earthed up</p> <p>Drain the excess water as soon as possible</p> <p>Spray Urea 2% solution 2-3 times.</p> <p>Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible.</p> | <p>Drain the excess water as soon as possible.</p> <p>Harvest the mature produce as soon as possible.</p> <p>Store the produce in well ventilated place temporarily before it can be marketed.</p> <p>Market the produce as soon as possible.</p> |
| Onion | <p>Grow nursery on raised beds.</p> <p>Drench the nursery beds with COC 3 g per litre to prevent damping off</p> | <p>Drain the excess water as soon as possible</p> <p>Spray Urea 2% solution once.</p> <p>Spray COC 30 g in 10 liters of water once</p> | <p>Drain the excess water as soon as possible</p> <p>Spray Urea 2% solution once.</p> <p>Spray COC 30 g in 10 liters of water once</p> | <p>Drain the excess water as soon as possible.</p> <p>Harvest the mature produce as soon as possible.</p> <p>Store the produce in well ventilated place temporarily before it can be marketed.</p> |

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| | | | | Market the produce as soon as possible. |
| Bhendi | | <p>Uprooted plants may be lifted and earthed up</p> <p>Drain the excess water as soon as possible</p> <p>Spray Urea 2% solution 2-3 times.</p> <p>Topdressing of booster dose of 12 kg MOP + 30 kg Urea per acre as soon as possible.</p> <p>If damage is more ,go for resowing</p> | <p>Uprooted plants may be lifted and earthed up</p> <p>Drain the excess water as soon as possible</p> <p>Spray Urea 2% solution 2-3 times.</p> <p>Topdressing of booster dose of 12 kg MOP + 30 kg Urea per acre as soon as possible.</p> | <p>Drain the excess water as soon as possible.</p> <p>Harvest the mature fruits as soon as possible.</p> <p>Store the fruits in well ventilated place temporarily before it can be marketed.</p> <p>Market the fruits as soon as possible.</p> |

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

| Before the event | During the event | After the event |
|--|---|---|
| Feed and fodder availability | | |
| <ol style="list-style-type: none"> 1. Conserving fodder/crop residues/ forest grass by silage / hay making either by individual or on community basis 2. Preparing complete diets and storing in strategic locations 3. Organize procurement of dry fodders / feed ingredients from surplus areas 4. Establish fodder banks and feed banks 5. Livestock relief camps during floods/cyclones must be planned in the vicinity of relief camps for people 6. Capacity building and preparedness | <ol style="list-style-type: none"> 1. Organise relief camps 2. Supply silage / hay to farmers with productive stock on subsidized rates 3. Segregate old, weak and unproductive stock and send for slaughter 4. Supply mineral mixture to avoid deficiencies 5. Dry fodder must be offered to the livestock in little quantities for number of times 6. Concentrate feed or complete feed must be offered to only productive and young stock only | <ol style="list-style-type: none"> 1. Capacity building to stakeholders on drought /cyclone/flood mitigation in livestock sector 2. Promote fodder cultivation. 3. Flushing the stock to recoup 4. Avoid soaked and mould infected feeds / fodders to livestock 5. Replenish the feed and fodder banks 6. Promote fodder preservation techniques like silage / hay making |
| Drinking water | | |
| <ol style="list-style-type: none"> 1. Construct drinking water tanks in herding places, village junctions and in relief camp locations 2. Plan for sufficient number of tanks for water transportation 3. Identify bore wells, which can sustain demand. 4. Procure sufficient quantities of water Sanitizers | <ol style="list-style-type: none"> 1. Regular supply of clean drinking water to all tanks 2. Cleaning the tanks in regular intervals 3. Keep the livestock away from contaminated flood/cyclone/stagnated waters 3. Add water sanitizers | <ol style="list-style-type: none"> 1. Hand over the maintenance of the structures to panchayats 2. Sensitize the farming community about importance of clean drinking water |
| Health and disease Management | | |

| | | |
|---|--|--|
| <ol style="list-style-type: none"> 1. Procure and stock emergency medicines and vaccines for important endemic diseases of the area 2. All the stock must be immunized for endemic diseases of the area 3. Carry out deworming to all young stock 4. Keep stock of bleaching powder and lime 5. Carry out Butax spray for control of external parasites 6. Identify the Clinical staff and trained paravets and indent for their services as per schedules 7. Identify the volunteers who can serve in need of emergency | <ol style="list-style-type: none"> 1. Keep close watch on the health of the stock 2. Sick animals must be isolated and treated Separately. 3. Carry out deworming and spraying to all animals entering into relief camps 4. Clean the animal houses regularly and apply disinfectants. 5. Safe and hygienic disposal of dead animal carcasses 6. Organize with community daily lifting of dung from relief camps | <ol style="list-style-type: none"> 1. keep close surveillance on disease outbreak. 2. Undertake the vaccination depending on need 3. Keep the animal houses clean and spray disinfectants |
|---|--|--|

Mahboobnagar district regularly experience drought, mild heat wave and sporadically experience severe floods

Detailed contingency strategies for livestock

| | Suggested contingency measures | | |
|----------------|--------------------------------|------------------|-----------------|
| | Before the event | During the event | After the event |
| Drought | | | |

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| <p>Feed and Fodder availability</p> | <p>As the drought is regularly prone to drought , it should have reserves (feeding 5000 ACU (maintenance ration) for about 1-3 weeks period) of the following at any point of the year for mobilization to the needy areas</p> <p>Silage:20-50 t</p> <p>Urea molasses mineral bricks (UMMB):50-100 t</p> <p>Hay:100-250 t</p> <p>Concentrates: 20-50 t</p> <p>Minerals and vitamin supplements mixture:1-5 t</p> <p>Establishment of silvi-pastoral system in CPRs with <i>Stylosanthus hamata</i> and <i>Cenchrus ciliaris</i> as grass with <i>Leucaena leucocephala</i> as tree component (or suggest suitable similar system to your district)</p> <p>Top dressing of N in 2-3 split doses @ 20-25 kg N/ha in common property resources (CPRs) like temple lands, panchyat lands or private property resources (PPRs) like waste and degraded lands with the monsoon pattern for higher biomass production</p> <p>In chronically drought prone mandals promote cultivation of short duration fodder crops of sorghum/bajra/maize(UP chari, MP chari, HC-136, HD-2, GAIN T BAJRA, L-74, K-677, Ananad/African Tall, Kisan composite, Moti, Manjari, B1-7</p> <p>Chopping of fodder should be made as mandatory in every village through supply and establishment of good quality chaff cutters.</p> <p>Avoid burning of maize stover</p> <p>Harvesting and collection of perennial vegetation particularly grasses which grow during monsoon</p> | <p>Harvest and use biomass of dried up crops (Sorghum, Paddy, Maize, green gram etc.,) material as fodder.</p> <p>Harvest the tree fodder (Neem, Subabul, Acasia, Pipal etc) and unconventional feeds resources available and use as fodder for livestock (LS).</p> <p>Available feed and fodder should be cut from CPRs and stall fed in order to reduce the energy requirements of the animals</p> <p>UMMB, hay, concentrates and vitamin & mineral mixture should be transported to the needy areas from the reserves at the district level initially and latter stages from the near by districts. All the hay should be enriched with 2% Urea molasses solution or 1% common salt solution and fed to LS</p> <p>Herd should be split and supplementation should be given only to the highly productive and breeding animals</p> <p>Provision of emergency grazing/feeding (Cow-calf camps or other special arrangements to protect high productive & breeding stock)</p> <p>Available kitchen waste should be mixed with dry fodder while feeding</p> <p>Arrangements should be made for mobilization of small ruminants across the districts where no drought exits with subsidized road/rail transportation and temporary shelter provision for the shepherds</p> <p>Unproductive livestock should to be culled during severe drought</p> <p>Create transportation and marketing facilities for</p> | <p>Concentrates supplementation should be provided to all the animals.</p> <p>Short duration fodder crops of should be sown in unsown and crop failed areas where no further routine crop sowing is not possible</p> |
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| | <p>Proper drying, baling and densification of harvested grass from previous season</p> <p>Creation of permanent fodder, feed and fodder seed banks in all drought prone areas</p> | <p>the culled and unproductive animals</p> <p>Subsidized loans should be provided to the livestock keepers</p> | |
| Cyclone | NA | | |
| Floods | <p>In case of early forewarning (EFW), harvest all the crops (sorghum/Maize,/Rice/green gram) that can be useful as fodder in future (store properly)</p> <p>Don't allow the animals for grazing if severe floods are forewarned</p> <p>In regularly flood villages, arrange for storing minimum required quantity of hay (25-50kg) and concentrates (25kgs) per animals in farmer / LS keepers house / shed for feeding animals during floods</p> <p>Arrangement for transportation of animals from low lying area to safer places and also for rescue animal health workers to get involve in rescue operations</p> | <p>Transportation of animals to elevated areas</p> <p>Stall feeding of animals with stored hay and concentrates</p> <p>Proper hygiene and sanitation of the animal shed</p> <p>In severe floods, un-tether or let loose the animals</p> <p>Emergency outlet establishment for required medicines or feed in each village</p> <p>Spraying of fly repellants in animal sheds</p> | <p>Repair of animal shed</p> <p>Bring back the animals to the shed</p> <p>Cleaning and disinfection of the shed</p> <p>Bleach (0.1%) drinking water / water sources</p> <p>Deworming with broad spectrum dewormers</p> <p>Vaccination against possible disease out breaks like HS, BQ, FMD and PPR</p> <p>Proper disposable of the dead animals / carcasses by burning / deep burying (4-8 feet) with lime powder (1kg for small ruminants and 5kg for large ruminants) in pit</p> <p>Drying the harvested crop material and proper storage for use as fodder.</p> |

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| Heat wave | <p>In mandals which are chronically prone to heat waves the following permanent measures are suggested</p> <ul style="list-style-type: none"> i) Plantation of trees like Neem, Pipal, Subabul around the shed ii) Spreading of husk/straw/coconut leaves on the roof of the shed iii) Water sprinklers / foggers in the animal shed iv) Application of white reflector paint on the roof to reduce thermal radiation effect | <p>Allow the animals preferably early in the morning or late in the evening for grazing during heat waves</p> <p>Feed green fodder/silage / concentrates during day time and roughages / hay during night time in case of heat waves</p> <p>Put on the foggers / sprinklers during heat waves and heaters during cold waves in case of high productive animals</p> <p>In severe cases, vitamin 'C' (5-10ml per litre) and electrolytes (Electral powder @ 20g per litre) should be added in water during severe heat waves.</p> | <p>Feed the animals as per routine schedule</p> <p>Allow the animals for grazing (normal timings)</p> |
| Health and Disease management | <p>List out the endemic diseases (species wise) in that district and store vaccines for those diseases</p> <p>Timely vaccination (as per enclosed vaccination schedule) against all endemic diseases</p> <p>Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district</p> | <p>Constitution of Rapid Action Veterinary Force</p> <p>Procurement of emergency medicines and medical kits</p> <p>Performing ring vaccination (8 km radius) in case of any outbreak</p> <p>Restricting movement of livestock in case of any epidemic</p> <p>Rescue of sick and injured animals and their treatment</p> | <p>Conducting mass animal health camps</p> <p>Conducting fertility camps</p> <p>Mass deworming camps</p> |
| Insurance | Encouraging insurance of livestock | Listing out the details of the dead animals | <p>Submission for insurance claim and availing insurance benefit</p> <p>Purchase of new productive animals</p> |
| Drinking water | <p>Identification of water resources</p> <p>Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking</p> | Restrict wallowing of animals in water bodies/resources | <p>Bleach (0.1%) drinking water / water sources</p> <p>Provide clean drinking water</p> |

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| | water for animals) | | |
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2.5.2 Poultry

| | Suggested contingency measures | | |
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| | Before the event | During the event | After the event |
| Drought | | | |
| Shortage of feed ingredients | Storing of house hold grain like maize, broken rice, bajra etc, in to use as feed in case of severe drought | Supplementation only for productive birds with house hold grain Supplementation of shell grit (calcium) for laying birds Culling of weak birds | Supplementation to all survived birds |
| Drinking water | | Use water sanitizers or offer cool drinking water | |
| Health and disease management | Culling of sick birds. Deworming and vaccination against RD and fowl pox | Mixing of Vit.A,D,E, K and B-complex including vit C in drinking water (5ml in one litre water) | Hygienic and sanitation of poultry house Disposal of dead birds by burning / burying with lime powder in pit |
| Floods | | | |
| Shortage of feed ingredients | In case of early forewarning of floods, shift the birds to safer place Storing of house hold grain like maize, broken rice, bajra etc, | Use stored feed as supplement Don't allow for scavenging Culling of weak birds | Routine practices are followed Deworming and vaccination against RD |

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| Drinking water | | Use water sanitizers / offer cool drinking water | |
| Health and disease management | In case of EFW, add antibiotic powder (Terramycin/Ampicilline/ Ampiclox etc., 10g in one litre) in drinking water to prevent any disease outbreak | Prevent water logging surrounding the sheds through proper drainage facility Assure supply of electricity by generator or solar energy or biogas Sprinkle lime powder to prevent ammonia accumulation due to dampness | Sanitation of poultry house Treatment of affected birds Disposal of dead birds by burning / burying with lime powder in pit Disposal of poultry manure to prevent protozoal problem Supplementation of coccidiostats in feed Vaccination against RD |
| Cyclone | NA | | |
| Heat wave | | | |
| Shelter/environment management | Provision of proper shelter with good ventilation | In severe cases, foggers/water sprinklers/wetting of hanged gunny bags should be arranged Don't allow for scavenging during mid day | Routine practices are followed |
| Health and disease management | Deworming and vaccination against RD and fowl pox | Supplementation of house hold grain Provide cool and clean drinking water with electrolytes and vit. C (5-10 ml per litre) In hot summer, add anti-stress probiotics in | Routine practices are followed |

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| | | drinking water or feed (Reestobal etc., 10-20ml per litre) | |
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2.5.3 Fisheries/ Aquaculture

| | Suggested contingency measures | | |
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| | Before the event | During the event | After the event |
| 1) Drought | | | |
| A. Capture | | | |
| Inland | | | |
| (i) Shallow water depth due to insufficient rains/inflow | Stocking of advnced fingerlings in half or even less than the normal stocking density or stocking of common carp seed | Immediate harvesting or decreasing the density commensurate with the water quantity. | De weeding and deepening of tank to ensure retention of water for a longer period and provision of employment under MGNREGP |
| (ii) Changes in water quality | Regular monitoring of water quality parameters and application of geolites, soil probiotics, etc to maintain water qaulity | Immediate harvesting or changing the water quality by application of sanitisers. | Removal of top layer, deep ploughing of tank and application of lime |
| (iii) Any other | | | |
| B. Aquaculture | | | |
| (i) Shallow water in ponds due to insufficient rains/inflow | Crop holiday or going for stocking of yearlings by reducing the density according to availability of water | Harvesting of fish and leaving the pond fallow till next season | Removal of top layer, deep ploughing of tank and application of lime |
| (ii) Impact of salt load build up in ponds / change in water quality | Stocking of salinity tolerant fish / shrimp, application of geolites and other buffers | Frenquent change of water with fresh water | Frequent draining of the pond with fresh water, removal of top layers |
| (iii) Any other | | | |
| 2) Floods | | | |
| A. Capture | | | |

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| Marine | No intervention | No intervention | No intervention |
| Inland | | | |
| (i) Average compensation paid due to loss of human life | Shifting the people from low lying areas to relief camps | Deployment of specially trained persons for rescue operations by providing life bouys, jackets, ropes, boats, etc | Payment sufficient ex-gratia to the families |
| (ii) No. of boats / nets/damaged | Shifting and relocating boats and nets to safer places when warnings are issued, to avoid fishing, etc | Shifting and relocating boats and nets to safer places | Assessment of damages to boats and nets and provision of boats and nets for restoration of livelihoods |
| (iii) No.of houses damaged | Avoidance of construction of houses in flood prone ares, construction of pucca houses at elevated places, | Shifting of people by relief boats to the relief camps | Assessment of damages to houses and provision of compensation in case of partial damage and sanction house under existing schemes |
| (iv) Loss of stock | Avoidance of surface species like catla, silver carp since they are vulnerable in tanks prone to floods, erection of nets across the spill way or just beyond it | Erection of nets at spill ways | Taking up compensatory stocking |
| (v) Changes in water quality | | When dissolved oxygen levels go down, aerators, recirculation of water, etc are to be attempted to maintain DO levels, going for partial harvest, etc | |
| (vi) Health and diseases | Sometimes there may be heavy accumulation of nutrients and organic matter. | There may be break out of Heamorrhagic septicimea. Addition of antibiotics like Chloro Tetra Cycline or Oxy Tetra Cycline to the feed to constrol the disease | Removal of weeds, top layer of soil, deep ploughing of tank and application of lime, exposing to sun light |
| B. Aquaculture | | | |
| (i) Inundation with flood water | Raising and rivetting the bunds, construction of spill way to release excess water, erection of nets to avoid escape of fish | Continuous pumping of excess water, erection of nets low lying areas | Strengthening of bunds, excavating channels along the sides of the ponds for free escape of water |

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| (ii) Water continuation and changes in water quality | | When dissolved oxygen levels go down, aerators, recirculation of water, etc are to be attempted to maintain DO levels, going for partial harvest, etc | |
| (iii) Health and diseases | Sometimes there may be heavy accumulation of nutrients and organic matter. | There may be break out of Hemorrhagic septicemia. Addition of antibiotics like Chloro Tetra Cycline or Oxy Tetra Cycline to the feed to control the disease | Removal of weeds, top layer of soil, deep ploughing of tank and application of lime, exposing to sun light |
| (iv) Loss of stock and inputs (feed, chemicals etc) | Advance erection of nets, strengthening of bunds where they are prone to breaches, harvesting or reducing the density | Suspension of feeding, application of organic manures | Compensatory stocking, assessment of values and payment of subsidy on inputs |
| (v) Infrastructure damage (pumps, aerators, huts etc) | Insuring pond, accessories, etc., Shifting of aerators, pumps soon after warnings are issued | Relocating pumps, aerators to elevated places | Assessment of damages and provision of them on subsidy |
| (vi) Any other | | | |
| 3. Cyclone / Tsunami | | | |
| A. Capture | | | |
| Inland | Erection of protective nets across the surplus weir to prevent fish loss due to overflows | Continuous monitoring to prevent or minimise escape of fish along with surplus water | Compensatory stocking of seed |
| B. Aquaculture | | | |
| (i) Overflow / flooding of ponds | The design of the pond must be in such a manner as to bail out surplus water and to prevent loss of standing crop | Continuous monitoring to prevent or minimise escape of fish along with surplus water | Compensatory stocking of seed |
| (ii) Changes in water quality (fresh water / brackish water ratio) | Recirculation water to replenish and ensure sufficient dissolved oxygen levels in the pond. Maintenance of | Continuation of the same process. | Restoration of physical and chemical parameters |

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| | salinity levels by pumping in water from creeks. | | |
| (iii) Health and diseases | Removal of stress causing factors to maintain the health of the animal | Removal of stress causing factors to maintain the health of the animal | Restoration of physical and chemical parameters |
| (iv) Loss of stock and inputs (feed, chemicals etc) | Preventive nets must be erected to minimise loss of stock | Continuation of the same process. | Compensatory stocking of seed |
| (v) Infrastructure damage (pumps, aerators, shelters/huts etc) | Pumps, aerators, etc must be protected by moving them to safe locations | To avoid use of aerators, pumps and other appliances | Overhauling of the equipment to prevent from being damaged |
| (vi) Any other | | | |
| 4. Heat wave and cold wave | | | |
| A. Capture | | | |
| Marine | Avoidance of fishing | Avoidance of fishing | No intervention |
| Inland | Monitoring dissolved oxygen levels | Monitoring dissolved oxygen levels | No intervention |
| B. Aquaculture | | | |
| (i) Changes in pond environment (water quality) | Reduction of biomass by partial harvest in the event of heat as the DO levels will be very low. | Avoidance of fishing | Compensatory stocking of seed and restoration of all physical and chemical parameters |
| (ii) Health and Disease management | Removal of stress causing factors to maintain the health of the animal | Removal of stress causing factors to maintain the health of the animal | Compensatory stocking of seed and restoration of all physical and chemical parameters |
| (iii) Any other | | | |