# State: TAMILNADU

# Agriculture Contingency Plan for District: TIRUCHIRAPALLI

| 1.0 District Agriculture profile | | | | |
|---|---|---|---|---|
| **1.1** | **Agro-Climatic/Ecological Zone** | | | |
| | Agro Ecological Region / Sub Region (ICAR) | East ghat (TN uplands), hot semi arid ecosystem (8.3) | | |
| | Agro-Climatic Region (Planning Commission) | Southern plateau and hills region (X) | | |
| | Agro Climatic Zone (NARP) | Cauvery Delta Zone and AZ 127 High altitude and hilly zone (TN-5, TN-4 and TN-2) | | |
| | List all the districts or part thereof falling under the NARP Zone | Cauvery Delta Zone : Thuraiyur, Musiri, Kulithalai, Lalgudi and Trichy blocks<br>High altitude and hilly zone : Kollimalai | | |
| | Geographic coordinates of district | Latitude | Longitude | Altitude |
| | | 10° 15’ and 11°2’ N | 78° 10’ to 79° 5’ ’ E | 90 m |
| | Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS | A.D.Agricultural College and Research Institute, Trichy, | | |
| | Mention the KVK located in the district | ICAR-KVK, Siruganmani, Tiruchirappalli District | | |
| **1.2** | **Rainfall** | Average (mm) | Normal Onset ( specify week and month) | Normal Cessation (specify week and month) |
| | SW monsoon (June-Sep): | 273.3 | I$^{st}$ Week of June | 1$^{st}$ week of October |
| | NE Monsoon(Oct-Dec): | 394.8 | 2$^{nd}$ week of October | 4$^{st}$ week of December |
| | Winter (Jan- Feb) | 40.5 | | |
| | Summer (March-May) | 134.0 | | |
| | Annual | 842.6 | | |

| 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)** | 440.4 | 36.8 | 85.0 | 0.7 | 7.4 | 2.0 | 12.8 | 27.4 | 94.2 |

| 1. 4 | **Major Soils** | Area ('000 ha) | Percent (%) of total |
|---|---|---|---|
| | Deep black soil | 141.9 | 32.2 |
| | Deep red soil | 74.1 | 16.8 |
| | Moderately deep black soil | 47.0 | 10.7 |
| | Moderately deep red soil | 110.2 | 25.1 |
| | Shallow black soil | 25.4 | 5.8 |
| | Shallow red soil | 96.6 | 22.0 |
| **1.5** | **Agricultural land use** | Area ('000 ha) | Cropping intensity % |
| | Net sown area | 182.7 | 104.9 |
| | Area sown more than once | 8.9 | |
| | Gross cropped area | 191.6 | |

| | | | | |
|---|---|---|---|---|
| **1.6** | **Irrigation** | Area (‘000 ha) | Percent (%) | |
| | Net irrigated area | 108.8 | 58.7 | |
| | Gross irrigated area | 116.2 | 57.9 | |
| | Rainfed area | 73.9 | 41.3 | |
| | | | | |
| | **Sources of Irrigation** | Number | Area (‘000 ha) | |
| | | | | % |
| | Canals | 135 | 38.6 | 37.8 |
| | Tanks | 1767 | 4.7 | 4.6 |
| | Open wells | 6192 | 13.6 | 7.4 |
| | Bore wells | 477 | 7.6 | 50.3 |
| | Lift irrigation | --- | - | |
| | Other sources | -- | - | |
| | Total | | 102.3 | 100.0 |
| | Pumpsets | -- | | |
| | Micro-irrigation | -- | | |
| | **Groundwater availability and use** | No. of blocks | % area | Quality of water |
| | Over exploited | 3 | - | 64 % Good water, 16 % Marginally saline, 8 % saline, 2 % High SAR saline, 4 % marginally alkaline, 5 % alkali, 1 % Highly alkali |
| | Critical | 2 | - | |
| | Semi- critical | 5 | - | |
| | Safe | 4 | - | |
| | Wastewater availability and use | Data not available | - | |
| | *over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70% | | | |

**Area under major field crops & horticulture etc.**

*If break-up data (irrigated, rainfed) is not available, give total area

| 1.7 | | **Major Field Crops cultivated** | **Area ('000 ha)** | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | ***Kharif*** | | ***Rabi*** | | **Summer** | **Total** |
| | | | ***Irrigated*** | ***Rainfed*** | ***Irrigated*** | ***Rainfed*** | | |
| | 1 | Rice | 5.1 | | 52.7 | 0.6 | 3.0 | 61.3 |
| | 2. | Sorgum | 0.3 | 26.8 | 0.7 | 1.0 | | 28.7 |
| | 3. | Groundnut | 0.4 | 8.9 | 4.7 | 0.1 | | 14.1 |
| | 4. | Black gram | 0.1 | 1.0 | 0.3 | 8.0 | | 9.4 |
| | 5. | Sugarcane | | | | | | 6.8 |
| | 6. | Maize | 0.3 | 6.9 | 0.5 | 0.1 | | 7.8 |
| | 7. | Sunflower | 1.2 | 1.3 | 4.4 | 0.2 | | 7.2 |
| | | **Horticulture crops - Fruits** | **Total area** | | **Irrigated** | | **Rainfed** | |
| | 1 | Banana | 9.2 | | 9.2 | | 0 | |
| | 2 | Mango | 2.4 | | 0.8 | | 1.6 | |
| | 3 | Guava | 0.2 | | 0.2 | | 0.0 | |
| | | **Horticultural crops - Vegetables** | ***Kharif*** | | **Irrigated** | | **Total** | |
| | 1 | Onion | | | | | 4.0 | |
| | 2 | Brinjal | | | | | 0.1 | |
| | 3 | Bhendi | | | | | 0.1 | |
| | 4 | Tomato | | | | | 0.2 | |

| | | | | | |
|---|---|---|---|---|---|
| | | **Medicinal and Aromatic crops** | **Total area** | **Irrigated** | **Rainfed** |
| | 1 | Medicinal and Aromatic crops | | | |
| | 2 | Betal wine | 0.103 | 0.103 | |
| | 3 | Vasambu | 0.002 | 0.002 | |
| | 4 | Mozhikizhangu | 0.003 | 0.003 | |
| | 5 | Kanvazhikizhangu | 0.011 | 0.007 | |
| | 6 | Vasanaipul | 0.010 | 0.009 | |
| | | **Plantation crops** | **Total area** | **Irrigated** | **Rainfed** |
| | 1 | Coconut | 6.4 | | |
| | 2 | Palm oil | 0.2 | | |
| | | **Fodder crops** | **Total area** | **Irrigated** | **Rainfed** |
| | 1 | Sorghum | 4.0 | 0.1 | 3.923 |
| | 2 | Subha grass | 0.1 | 0.04 | 0.14 |
| | 3 | Fodder gross | 0.0 | 0.0 | 0 |
| | | **Total fodder crop area** | 4.1 | 0.1 | 4.0 |
| | | **Grazing land** | | | |
| | | **Sericulture etc** | | | |
| | | **Others (Specify)** | | | |
| | | Flowers | 0.916 | | |

| **1.8** | **Livestock** | **Male (number)** | **Female (number)** | **Total (number)** |
|---|---|---|---|---|
| | Non descriptive Cattle (local low yielding) | 44.5 | 67.6 | 112.1 |
| | Crossbred cattle | 52.9 | 264.6 | 317.6 |
| | Non descriptive Buffaloes (local low yielding) | - | - | 46.9 |
| | Graded Buffaloes (incl. Murrah) | - | - | |
| | Goat | | | 486.7 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Sheep | | | | | 212.7 |
| | Others (Camel, Pig, Yak etc.) | | | 34.0 | 25.4 | 14.1 |
| | Commercial dairy farms (Number) | | | | | 25 |
| **1.9** | **Poultry** | | | **No. of farms** | **Total No. of birds (number)** | |
| | Commercial | | | 15 | 56.7 | |
| | Backyard | | | - | 221.7 | |
| **1.10** | **Fisheries** | | | | | |
| | A. Capture | | | | | |
| | i. Marine (Data Source: Fisheries Department) | No. of fishermen | Boats | | Nets | Storage facilities (Ice plants etc.,) |
| | | 19673 | Mechanized | Non-mechanized | Mechanized (Trawl nets, Gill nets) | Non-mechanized (Shore Seines, Stake & trap nets) |
| | | | 2 | 1229 | 12307 | 683 (Cast nets)<br>Drag Net : 185<br>Other Nets: 63 |
| | ii. Inland (Data Source: Fisheries Department) | No. Farmers owned ponds | | No. of Reservoirs | No. of village tanks | |
| | | 20 | | | | |
| | B.Culture | | | | | |
| | | Water Spread Area (ha) | | Yield (t/ha0 | Production (*000 tons) | |
| | i. Brackish water (Data Source: MPEDA/Fisheries | | | | | |

| | | | | |
|---|---|---|---|---|
| | Department) | | | |
| | ii. Fresh water(Data Source:<br><br>Fisheries Department) | | | |
| | Others | | | |

| 1.11 | **Production and Productivity of major crops** (Average of last 5years: 2006, 07, 08,09.2010) | **Kharif** | | **Rabi** | | **Summer** | | **Total** | |
|---|---|---|---|---|---|---|---|---|---|
| | | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) |
| 1 | Paddy | 23.9 | 4131 | 178.1 | 3687 | 13.6 | 3371 | 215.6 | 3709 |
| 2 | Sorghum | | | | | | | 17.9 | 511 |
| 3 | Bajra | | | | | | | 1.7 | 477 |
| 4 | Ragi | | | | | | | 0.2 | 1856 |
| 5 | Maize | | | | | | | 16.1 | 2631 |
| 6 | Black gram | | | | | | | 1.7 | 368 |
| 7 | Bengal gram | | | | | | | 0.0 | 596 |
| 8 | Redgram | | | | | | | 0.6 | 432 |
| 9 | Sugarcane | | | | | | | 572.0 | 113 |
| 10 | Ground nut | | | | | | | 27.1 | 1845 |
| 11 | Gingelly | | | | | | | 0.3 | 574 |
| | **Major Horticultural crops** | AV | Production | | | | | | |
| 1 | Chillies | | | | | | | 1.4 | 611 |
| 2 | Turmeric | | | | | | | 2.7 | 5348 |
| 3 | Onion | | | | | | | 31.2 | 10215 |
| 4 | Brinjal | | | | | | | 1.1 | 10011 |
| 5 | Tomato | | | | | | | 4.3 | 20085 |
| 6 | Banana | | | | | | | 400.2 | 42926 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Others | | | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **1.12** | **Sowing window for 5 major crops (start and end of sowing period)** | Groundnut | Paddy | Sugarcane | Cotton | Black gram | Maize |
| | Kharif- Rainfed | July – August | - | - | - | - | June – July |
| | Kharif - Irrigated | April - May | June - July | - | - | July August | April- May |
| | Rabi – rainfed | November | - | - | Sep.- Oct. | - | September.- October, |
| | Rabi - irrigated | November | August, September., December | December,, January, February March | January ,February. | December., January.– February. | January.- February |

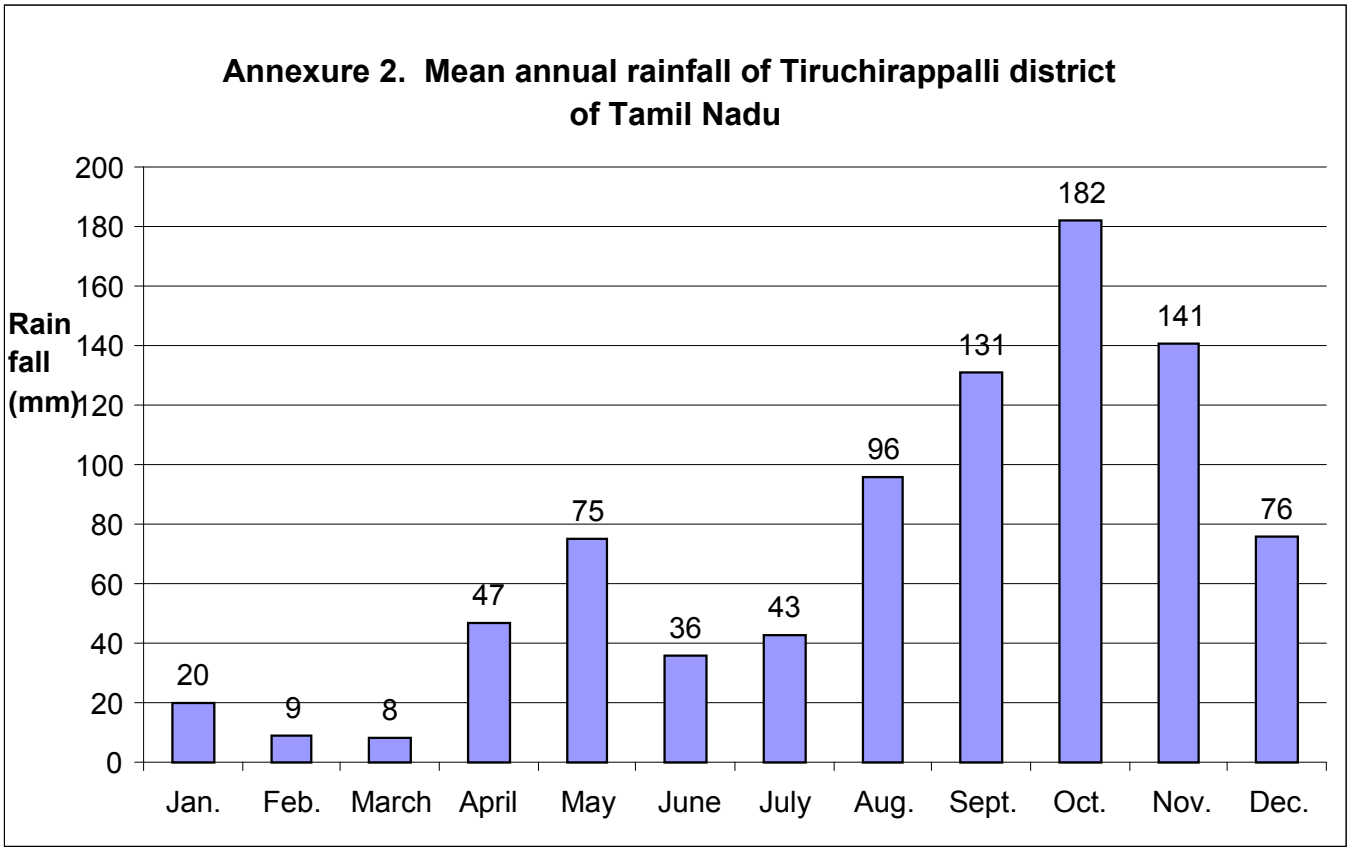
| | | | | |
|---|---|---|---|---|
| **1.13** | **What is the major contingency the district is prone to? (Tick mark and mention years if known during the last 10 year period)** | Regular | Occasional | None |
| | Drought | | √ | |
| | Flood | | √ | |
| | Cyclone | | √ | |
| | Hail storm | | | √ |
| | Heat wave | | | √ |
| | Cold wave | | | √ |
| | Frost | | | √ |
| | Sea water inundation | | | √ |
| | Pests and diseases (specify) | | | |
| | Rice – Stem borer | √ | | |
| | Rice – Leaf folder | | √ | |

| | | | | |
|---|---|---|---|---|
| | Rice – Blast | √ | | |
| | Rice – Cut warm | | √ | |
| | Rice – False smut | √ | | |
| | Rice - mite | | √ | |
| | Black Gram - yellow mosaic | | √ | |

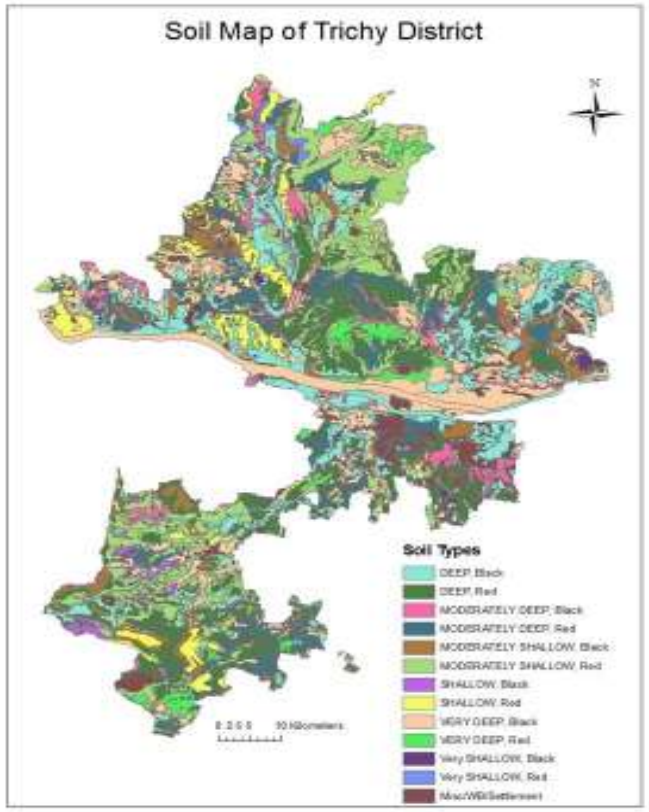
| | | | |
|---|---|---|---|
| **1.14** | **Include Digital maps of the district for** | Location map of district within State as Annexure I | Enclosed: Yes / No |
| | | Mean annual rainfall as Annexure 2 | Enclosed: Yes / No |
| | | Soil map as Annexure 3 | Enclosed: Yes / No |

**Annexure 1. Location map of Tiruchirappalli district in Tamil Nadu**


**Annexure 2. Mean annual rainfall of Tiruchirappalli district of Tamil Nadu**



**Annexure 3. Soil map of Tiruchirappalli district**



## 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** | **Crop/cropping system** | **Change in crop/cropping system** | **Agronomic measures** | **Remarks on Implementation** |
| Delay by 2 weeks (Specify month) October | Red, Black and laterite soils | Groundnut (TMV 7, VRI 2, CO 2) + redgram (APK 1, VBN (RG) 3) | No change | | |
| | | Cluster bean / Bhendi | | | |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Early season drought (delayed onset)** | **Major Farming situation** | **Crop/cropping system** | **Change in crop/cropping system** | **Agronomic measures** | **Remarks on Implementation** |
| Delay by 4 weeks (Specify month) October | Red, Black and laterite soils | Groundnut (TMV 7, VRI 2, CO 2) + redgram (APK 1, VBN (RG) 3) | No change | In situ SWC measures in fallow: opening up of ridges and furrows Spraying 0.5% Potassium chloride during flowering and pod development stages will aid to mitigate the ill effects of drought. | Linkage with NREGA for SWC measures; Agro industry Schemes for Ridger, bund former, MB plough through state Department of Agriculture |
| | | Cluster bean / Bhendi | No change | | |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Early season drought (delayed onset)** | **Major Farming situation** | **Crop/cropping system** | **Change in crop/cropping system** | **Agronomic measures** | **Remarks on Implementation** |
| Delay by 6 weeks (Specify month) October | Red, Black and laterite soils | Groundnut (TMV 7, VRI 2, CO 2) + redgram (APK 1, VBN (RG) 3) | Sorghum (K Tall, CO 26, CO (S) 28, BSR 1)/ millets + pulses(black gram VBN 1, VBN 2, VBN 3, VBN(BG) 4, ADT 3,) (Green Gram Paiyur 1, CO 6, VBN 1, VBN (Gg) 2) /<br><br>Gingelly (CO 1, TMV 3, TMV 5, SVPR 1, VRI(SV) 2)/ cucurbits | In situ SWC measures in fallow: opening up of ridges and furrows<br>For sorghum<br>Spraying 3% Kaolin (30 g in one litre of water) during periods of stress. This should be done before 75% of soil moisture is lost from available water.<br><br>While sowing rainfed pulses sowing harden the greengram seeds for 3 hrs in aqueous solution of manganese sulphate @ 100 ppm / (0.1 g/lit) at 1/3 volume of seeds and quickly air-dry in shade to their<br>original moisture content. For blackgram, zinc sulphate @ 100 ppm may be used for<br>hardening. | - |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Early season drought (delayed onset)** | **Major Farming situation** | **Crop/cropping system** | **Change in crop/cropping system** | **Agronomic measures** | **Remarks on Implementation** |
| Delay by 8 weeks (Specify month) August 1 st week | Red, Black and laterite soils | Groundnut (TMV 7, VRI 2, CO 2) + redgram (APK 1, VBN (RG) 3) | Fodder sorghum (K 7) / minor millets / fodder / coriander | In situ SWC measures in fallow: opening up of ridges and furrows | |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Early season drought (Normal onset, followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.)** | **Major Farming situation** | **Crop/cropping system** | **Crop management** | **Soil nutrient and moisture conservation measures** | **Remarks on Implementation** |
| | Red, Black and laterite soils | Groundnut (TMV 7, VRI 2, CO 2) + redgram (APK 1, VBN (RG) 3) | 1. Thinning of 30 – 50 % of population<br>2. In case of poor germination, resowing with same crop with short duration varieties. | 1.Opening of conservation furrows at an interval of 15-20m<br>2.Mulching<br>3.Spraying 1 % KCl | - |
| | | Cluster bean / Bhendi | do | | |
| | | Sorghum (K Tall, CO 26, CO (S) 28, BSR 1)/ millets + pulses(black gram VBN 1, VBN 2, VBN 3, VBN(BG) 4,ADT 3,) (Green Gram Paiyur 1, CO 6, VBN 1, VBN (Gg) 2) / gingelly (CO 1, TMV 3, TMV 5, SVPR 1, VRI(SV) 2)/ cucurbits | Thinning, Intercultivation | Spraying 2 % potassium dihydrogen phosphate | |
| | | Fodder sorghum (K7) / minor millets / fodder / coriander | | | |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Mid season drought (long dry spell)** | **Major Farming situation** | **Crop/cropping system** | **Crop management** | **Soil nutrient and moisture conservation measures** | **Remarks on Implementation** |
| **At vegetative stage** | Red, Black and laterite soils | Groundnut (TMV 7, VRI 2, CO 2) + redgram (APK 1, VBN (RG) 3) | Thinning of 33-50 % population<br>Repeated intercultivation and weeding | Opening of conservation furrows at an interval of 15-20 m<br>Mulching<br>Antitransipant spray (Spraying 1 % KCl) | |
| | | Cluster bean / Bhendi | | | |
| | | Sorghum / millets + pulses/ gingelly/ cucurbits | | | |
| | | Fodder sorghum / minor millets / fodder / coriander | | | |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Mid season drought (long dry spell)** | **Major Farming situation** | **Crop/cropping system** | **Crop management** | **Soil nutrient and moisture conservation measures** | **Remarks on Implementation** |
| **At reproductive stage** | Red, Black and laterite soils | Groundnut (TMV 7, VRI 2, CO 2) + redgram (APK 1, VBN (RG) 3) | Thinning, Life saving irrigation from rain water harvest ponds, Weeding and Weed mulching<br>Harvest for fodder purpose<br>Anti transpirant spray<br>Harvesting at physiological maturity | 1 % KCl spray will give drought tolerance | Opening of farm ponds through IWMP and NREGS as a long term drought proofing measure. |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Mid season drought (long dry spell)** | **Major Farming situation** | **Crop/cropping system** | **Crop management** | **Soil nutrient and moisture conservation measures** | **Remarks on Implementation** |
| | | Cluster bean / Bhendi | Life saving irrigation if available. Weeding and Weed mulching<br>Harvest for fodder purpose | Mulching<br>Antitransipant spray<br>Spraying 1 % KCl | Opening of farm ponds through IWMP and NREGS as a long term drought proofing measure. |
| | | Sorghum / millets + pulses/ gingelly/ cucurbits | Harvest for fodder purpose and rationing with subsequent rains | | |
| | | Fodder sorghum / minor millets / fodder / coriander | Could be harvested for fodder purpose | | |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Terminal drought** | **Major Farming situation** | **Crop/cropping system** | **Crop management** | **Soil nutrient and moisture conservation measures** | **Remarks on Implementation** |
| | Red, Black and laterite soils | Groundnut (TMV 7, VRI 2, CO 2) + redgram (APK 1, VBN (RG) 3) | Life saving irrigation if available<br>Harvest at physiological maturity stage | | Opening of farm ponds through IWMP and NREGS as a long term drought proofing measure. |
| | | Cluster bean / Bhendi | Life saving irrigation | | |
| | | Sorghum / millets + pulses/ gingelly/ cucurbits | | | |
| | | Fodder sorghum / minor millets / fodder / coriander | | | |

## 2.1.2 Irrigated situation

| Condition | | Suggested Contingency measures | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Major Farming situation | Crop/cropping system | | | Change in crop/cropping system | | | Agronomic measures | Remarks on Implementation |
| Delayed/ limited release of water in canals due to low rainfall | Alluvial soils | Kharif | Rabi | Summer | Kharif | Rabi | Summer | 1.Limited irrigation<br>2. Alternate furrow irrigation/ drip irrigation for upland crops<br><br>In case of aged rice seedling, to encourage the tiller production, enhance the basal N application by 50% from the Recommended and thereafter follow the normal schedule recommended for other stages.<br>In canal command area, conjunctive use of surface and ground water may be resorted to for<br>Judicious use of water.<br>For cotton, KCI 1% spray, twice on 50 and 70 DAS for delayed sowing (first fortnight of March) of summer irrigated cotton | 1.Seeds through NSC and NFSM |
| | | Rice ADT 36, IR 50, IR 64, ASD 16, ADT 37, ASD 18, ADT 42, ADT 43, CO 47, ADT (R) 45 TRY (R)2*, ADTRH 1, ADT (R) 47 | Rice IR20, White Ponni, ADT39, CO43, TRY1, ASD19, ADT(R)46 , | pulses / gingelly | Maize (CO 1, COH (M) 4, COH (M) 5, COBC 1/ Pulses (Black gram T 9, VBN 1, VBN 2, VBN 3, VBN(Bg) 4) (Green Gram CO 4, CO 6, KM 2, Paiyur 1, VBN 1, VBN(Gg) 2)/ Vegetables | Rice IR20, White Ponni, ADT39, CO43, TRY1, ASD19, ADT(R) 46 | Pulses/ cotton (MCU 7, SVPR 3, Anjali)/ gingelly (TMV 3, TMV 4, TMV 6, CO 1, VRI(SV) 1, SVPR 1, VRI(SV) 2)/ sunflower | | |
| | | Sugarcane- ratoon sugarcane (Two years rotation) (varieties based on factories requirements ) | | | No change | | | Alternate Furrow irrigation<br>Drip irrigation<br>Trash mulching | - |

| Condition | | | | | Suggested Contingency measures | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Major Farming situation** | **Crop/cropping system** | | | **Change in crop/cropping system** | | | **Agronomic measures** | **Remarks on Implementation** |
| Non release of water in canals under delayed onset of monsoon in catchment | Alluvial soils | Kharif | Rabi | Summer | Kharif | Rabi | Summer | 1.Limited irrigation<br>2.Alternate furrow irrigation/ drip irrigation for upland crops<br>3.In canal command area, conjunctive use of surface and ground water may be resorted to for judicious use of water. | 1.Seeds through NSC and NFSM |
| | | Rice | Rice | pulses / gingelly | Maize / vegetables/ pulses/ sesame/ green manures | Rice / upland rice | Pulses / senna | | |
| | | - | Rice / groundnut | Gingelly | Coleus / Vincea rosea/ senna | | | 1Limited irrigation<br>2 Alternate furrow irrigation/ drip irrigation for upland crops<br>3. For groundnut Sprinkler irrigation will save water to the tune of about 30%.Borderstrip irrigation is recommended in command areas in light textured soils. Composted coir pith increases moisture availability and better drainage in heavy textured soil. | |
| | | Sugarcane- ratoon sugarcane (Two years rotation) | | | No change | | | Soak the setts in lime solution (80 kg Kiln lime in 400 lit) for one hour.<br>ii. Plant in deep furrows of 30 cm depth.<br>iii. Spray potash and urea each at 2.5 per cent during moisture stress period at 15 days interval.<br>iv. Spray Kaolin (60 g in 1 ltr. of water) to alleviate the water stress.<br>v. Under water scarcity | - |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| | **Major Farming situation** | **Crop/cropping system** | **Change in crop/cropping system** | **Agronomic measures** | **Remarks on Implementation** |
| | | | | condition, alternate furrow and skip furrow method of irrigation is advised..<br>vi. Apply 125 kg of MOP additionally at 120 day of planting.<br>vii. Basal incorporation of coir waste @ 25 tonnes/ha at the time of last ploughing.<br>viii.Removal of dry trash at 5th month and leave it as mulch, in the field.<br>ix. Mulching<br>x. Antitranspirant spray | |

| Condition | | | | | Suggested Contingency measures | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Major Farming situation** | **Crop/cropping system** | | | **Change in crop/cropping system** | | | **Agronomic measures** | **Remarks on Implementation** |
| Lack of inflows into tanks due to insufficient /delayed onset of monsoon | Alluvial soils | Kharif | Rabi | Summer | Kharif | Rabi | Summer | 1.Limited irrigation<br>2. Alternate furrow irrigation/ drip irrigation for upland crops 4. For rice,<br>3.Spray Cycocel 1000 ppm (1 ml of commercial product in one lit. of water) under water deficit<br>situations to mitigate ill-effects.<br>4.Foliar spray of Kaolin 3% or KCl 1% to overcome moisture stress at different physiological | 1.Seeds through NSC and NFSM |
| | | Rice | Rice | pulses / gingelly | Fallow | Rice / upland rice | Pulses / senna | | |

| Condition | | Suggested Contingency measures | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Major Farming situation** | **Crop/cropping system** | | | **Change in crop/cropping system** | | | **Agronomic measures** | **Remarks on Implementation** |
| | | | | | | | | stages of rice. | |
| | | - | Rice / groundnut | Gingelly | Coleus / *Vincea rosea*/ senna | | | 1Limited irrigation<br>2. Alternate furrow irrigation/ drip irrigation for upland crops<br>3.Trash mulching<br>Composted coir pith increases moisture availability and better drainage in heavy textured soil. | Do |
| | | Sugarcane- ratoon sugarcane (Two years rotation) | | | No change | | | Soak the setts in lime solution (80 kg Kiln lime in 400 lit) for one hour.<br>ii. Plant in deep furrows of 30 cm depth.<br>iii. Spray potash and urea each at 2.5 per cent during moisture stress period at 15 days interval.<br>iv. Spray Kaolin (60 g in 1 ltr. of water) to alleviate the water stress.<br>v. Under water scarcity condition, alternate furrow and skip furrow method is beneficial.<br>vi. Apply 125 kg of MOP additionally at 120 day of planting.<br>vii. Basal incorporation of coir waste @ 25 tonnes/ha at | - |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| | **Major Farming situation** | **Crop/cropping system** | **Change in crop/cropping system** | **Agronomic measures** | **Remarks on Implementation** |
| | | | | the time of last ploughing.<br>viii.Removal of dry trash at 5th month and leave it as mulch, in the field. | |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| | **Major Farming situation** | **Crop/cropping system** | **Change in crop/cropping system** | **Agronomic measures** | **Remarks on Implementation** |
| Insufficient groundwater recharge due to low rainfall | Well/ Tube well red, laterite, black and alluvial soils | • Rice (Aug. – Jan.)- Groundnut ( Jan- April)<br>• Vegetables (June – Sep.)- rice (Oct. – Feb.)<br>• Banana (Jan- Dec.)- Ratoon banana (Jan- Dec) – rice (Dec. – April)<br>• Vegetables / onion (June- sep.) – rice (Oct. – Jan.)- maize/ pulse (Feb- April)<br>• Rice (Aug. – Jan.) -Groundnut ( Jan.- April) | • Maize (Aug.-Dec.) – Sesame / soybean (Dec. –Mar.)<br>• Fodder / pulses/ Green manure (Aug. – Dec.)- Gingelly / groundnut/ sunflower/ sorghum / pearl millet (Dec. – Mar.)<br>• Clusterbean/Lab-Lab/ Bhendi(July-Dec.) – Water melon/ cluster bean / Cucumber (Jan- April) | 1.Limited irrigation<br>2. Alternate Furrow irrigation<br>3. Drip irrigation<br>4. Mulching<br>5. Antitransirant spray | - |
| Any other condition (specify) | | | | | |

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**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, Heavy rainfall with high speed winds in a short span** | **Vegetative stage** | **Flowering stage** | **Crop maturity stage** | **Post harvest** |
| Rice | In water logged condition, form open drains, about 60cm in depth and 45cm width across the field | Drain out excess water through drainage channel | Drain out excess water<br>Harvesting at physiological maturity | Proper drying and storage of grains<br>Use mechanical drier |
| Groundnut + Red gram | Drain out excess water | Drainage | Drain out<br>Harvesting at physiological maturity stage | Shift to safe place, dry in shade and turn frequently |
| Black gram / green gram | | | Drain out<br>Harvest for vegetable purpose | Proper drying and storage of grains<br>Use mechanical drier |
| Gingelly | | | Drain out | Proper drying and storage of grains<br>Use mechanical drier |
| Maize / sorghum | | Drain out excess water, earthingup, fertilizer application. | Drain out excess water, Harvesting and drying the cobs | Proper drying and storage of grains |
| Sunflower | Drain out excess water, weeding and top dressing with urea | Drain out excess water, earthingup, fertilizer application / foliar spray (1 % 19 ;19 :19) | Drain out excess water, Harvesting and drying of ear heads | Proper drying and storage of grains |
| Sugarcane | Drain out excess water, weeding and top dressing of fertilizers, earthingup, propping, Detrashing | - | - | - |

| | | | | |
|---|---|---|---|---|
| **Horticulture** | | | | |
| Vegetables/Bhendi/ clusterbean | Drain out excess water, weeding and top dressing of fertilizers, earthingup, | Drain out excess water, earthingup, fertilizer application / foliar spray (1 % 19 ;19 :19) | - | - |
| Banana | Drain out excess water, weeding and top dressing of fertilizers, earthingup, | Drain out excess water, weeding and top dressing of fertilizers, earthingup, stalking | Harvesting of bunches and marketing | |

| | | | | |
|---|---|---|---|---|
| **Outbreak of pests and diseases due to unseasonal rains** | The control measures may be taken up as per package of practices | | | |
| Rice | Brown planthopper<br>Drain the water before use of insecticides and direct the spray towards<br>the base of the plants.<br>Monocrotophos @ 500 ml/ ac. (or) Acephate 200 g / ac | Brown plant hopper<br>Drain water before use of insecticides and direct the spray towards<br>the base of the plants.<br>Monocrotophos @ 500 ml/ ac. (or) Acephate 200 g / ac.<br><br>Blast: Spray after observing initial infection of the disease, Carbendazim WP 250 g or Tricyclozole<br>75 WP 500 g or Iprobenphos (IBP) 500ml/ha. | BPH<br>Cut worm : Prolonged dry spell followed by heavy downpour leads to cutworm outbreak. Spray Chloropyriphos 2.5 ml / lit or Thiodicarb 75 WP 1.25 g / lit.<br>False smut : Spray cuprous hydroxide 0.25 % | |
| Sunflower | - | Head rot: Spray Fenthion 1 ml/l + mancozeb 2 g/l at flowering stage twice at 10 days interval | Head rot : spray mancozeb 0.2 % | - |
| Sorghum | - | - | Grain mold: Spray Captan 2g/l + Aureofungin 0.2 g/l or Propiconazole 1.0 ml/l at grain formation stage immediately after cessation of rains | - |
| Black gram / green gram | Wilt in low lying water logged patches: | Root rot: Soil drenching with carbendazim 0.1 % | - | - |

| | | | | |
|---|---|---|---|---|
| | Drench Carbendazim 1.0 g/l at the base of plants | Powdery mildew:<br>Spray carbendazim 0.1 % | | |
| Sorghum/Pearl millet | | Rust: Spray mancozeb 0.2 % | - | - |
| Maize | - | - | - | - |
| Red gram | Wilt in low lying patches in field or field border: Drench Carbendazim 1.0 g/l at the base of plants | Maruca leaf and pod webber:<br>Spray Quinalphos 2 ml/l | - | - |
| Sugarcane | Sett rot:<br>1. Sett treatment with Carbendazim before planting (Carbendazim 50 WP @ 0.05% or Carbendazim 25 DS @ 0.1% along with 1.0% Urea for 5 minutes)<br>2. Proper drainage and planting of setts in 1-2 cm depth. | - | - | - |
| Onion | | Purple blotch: Spray mancozeb 0.2 % / Tebuconazole 0.15 % / zineb 0.2 %<br>Thrips : spray profenophos 2 ml / lit or Acephate 1 g / lit | | |

## 2.3 Floods

| **Condition** | **Suggested contingency measure** | | | |
|---|---|---|---|---|
| **Transient water logging/ partial inundation** | **Seedling / nursery stage** | **Vegetative stage** | **Reproductive stage** | **At harvest** |
| Rice | Drain out excess water | | | Drain out excess water |
| Sunflower | Drain out excess water, Gap filling and drenching with fungicides (0.5 % carbendazim or 0.25 % copper oxy chloride) | Drain out excess water, Weeding and top dressing with urea | Drain out excess water, Earthing up | Drain out excess water, Harvesting and drying of earheads |
| Sorghum | Drain out excess water, Gap filling | | Drain out excess water | Drain out excess water, Tying up of lodged plants, drying of earheads and Harvesting |
| Black gram/ Green Gram | Drain out excess water, Gap filling and drenching with fungicides (0.5 % carbendazim or 0.25 % copper oxy chloride) | | Drain out excess water | Drain out excess water, Harvesting and drying of plants |
| Sorghum/Pearl millet | Drain out excess water | | Drain out excess water | Drain out excess water, Tying up of lodged plants, drying of earheads and Harvesting |
| Maize | Drain out excess water, Gap filling | | Drain out excess water, Earthing up | Drain out excess water, Harvesting and drying of cobs |
| Red gram | Drain out excess water, Gap filling and drenching with fungicides (0.5 % carbendazim or 0.25 % copper oxy chloride) | | Drain out excess water, Spraying with NAA@ 25 ppm | Drain out excess water, Harvesting and drying of plants |
| **Continuous submergence for more than 2 days** | | | | |
| Sunflower | Drain out excess water, Resowing with seed treatment in case of more than 50% mortality; otherwise gap filling and drenching with fungicides (0.5 % carbendazim or 0.25 % copper oxy chloride) | Drain out excess water, Weeding and top dressing with urea; Replacing mortalilty with sorghum (K)/chickpea ( R) | Drain out excess water, Earthing up; Spray borax (0.5%) to the earhead | Drain out excess water, Harvesting and drying of earheads |
| Sorghum | Drain out excess water, | Drain out excess | Drain out excess water, Tying | Drain out excess water, Tying up of lodged |

| | | | | |
|---|---|---|---|---|
| | Gap filling ;<br>Resowing with seed treatment in case of more than 50% mortality | water,<br>Weeding and top dressing with urea | up of lodged plants | plants<br>drying of earheads and Harvesting |
| Black gram/ Green gram | Drain out excess water,<br>Gap filling and drenching with fungicides (0.5 % carbendazim or 0.25 % copper oxy chloride);<br>Resowing (in case of more than 50% mortality | Drain out excess water,<br>Weeding and top dressing with urea; | Drain out excess water,<br>Spraying with NAA@ 25 ppm | Drain out excess water, Harvesting and drying of plants |
| Sorghum / Pearl millet | Drain out excess water | Drain out excess water,<br>Weeding and top dressing with urea | Drain out excess water; Tying up of lodged plants | Drain out excess water, Tying up of lodged plants<br>drying of earheads and Harvesting |
| Maize | Drain out excess water,<br>Gap filling | | Drain out excess water,<br>Earthing up; Tying up of lodged plants | Drain out excess water, Harvesting and drying of cobs |
| Red gram | Drain out excess water,<br>Gap filling and drenching with fungicides (0.5 % carbendazim or 0.25 % copper oxy chloride) | | Drain out excess water,<br>Spraying with NAA@ 25 ppm | Drain out excess water, Harvesting and drying of plants |
| Sugarcane | Drain out excess water,<br>weeding and top dressing of fertilizers, earthingup, propping, Detrashing | -- | -- | -- |

## 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 | Not applicable for Tiruchirappali district | | | |
| Cold wave | | | | |
| Frost | | | | |
| Hailstorm | Not applicable for Tiruchirappali district | | | |
| Cyclone | | | | |

## 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** | ○ **As managed**<br>○ **Feed may be stored for emergency in a special go down**<br>○ **Rapid mobile veterinary team (RMVT)may be formed**<br>○ **Community animal shelter** | ○ **Subsistence feed allowance may be given**<br>○ **Water in water troughs**<br>○ **RMVT may be pressed in to Service** | ○ **As managed**<br>○ **Feed may be stored for emergency in a special go down**<br>○ **Rapid mobile veterinary team (RMVT)may be kept available**<br>○ **Community animal shelter may be** |
| Feed and fodder availability | | | |
| Drinking water | | | |
| Health and disease management | | | |
| **Floods** | | | |
| Feed and fodder availability | | | |
| Drinking water | | | |

| | | | |
|---|---|---|---|
| Health and disease management | **may be constructed**<br>○ **Required vaccines may be stored** | | **constructed** |
| **Cyclone** | | | |
| Feed and fodder availability | | | |
| Drinking water | | | |
| Health and disease management | | | |
| **Heat wave and cold wave** | | | |
| Shelter/environment management | | | |
| Health and disease management | | | |

[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** | |
| | ○ **As managed**<br>○ **Feed may be stored for emergency in a special go down**<br>○ **Rapid mobile veterinary team (RMVT)may be formed**<br>○ **Community bird shelter may be constructed** | ○ **Subsistence feed allowance may be given**<br>○ **RMVT may be pressed** | ○ **As managed**<br>○ **Feed may be stored for emergency in a special go down**<br>○ **Rapid mobile veterinary team (RMVT)may** | - |
| **Drought** | | | | |
| Shortage of feed ingredients | | | | |
| Drinking water | | | | |
| Health and disease management | | | | |
| **Floods** | | | | |
| Shortage of feed ingredients | | | | |

| | | | | |
|---|---|---|---|---|
| Drinking water<br>Health and disease management<br>**Cyclone**<br>Shortage of feed ingredients<br>Drinking water<br>Health and disease management<br>**Heat wave and cold wave**<br>Shelter/environment management<br>Health and disease management | ○ **Required vaccines may be stored** | **in to Service** | **be kept available**<br>○ **Community bird shelter may be constructed**<br>○ **Immunization may be carried out** | |

[a] based on forewarning wherever available

### 2.5.3 Fisheries/ Aquaculture

| Suggested contingency measures | | | |
|---|---|---|---|
| | Before the event * | During the event | After the event |
| **1. Drought** | | | |
| **Capture** | | | |
| **Inland:**<br>Shallow water depth due to in sufficient rains / in flow | * Rain water harvesting.<br>* Check dams.<br>* Deepening / Desilting of existing water bodies.<br>* Strengthening of pond embankments. | * Shallow areas of direct water bodies can be used for raising table sized fishes using stunted fish seeds, Tilapia.<br>* Murrel and Pungasius sp culture can be carried out.<br>* Temporarily raising the height of the enclosures may be done to prevent loss of | * Due to water shortage farmers have to harvest fish<br>* Adoption of short term culture. |

| | | | |
|---|---|---|---|
| | | stock in the event. | |
| (i) Shallow water depth due to<br><br>insufficient rains/inflow | | | |
| (ii) Changes in water quality | | * Reduced water volume in the pond / local water bodies lower its buffering capacity, reduced manuring should be done to prevent algal bloom and water quality change. | |
| (iii) Any other | | * Production of stunted major carps can be carried out.<br><br>* Ornamental fish rearing can be done.<br><br>* Conditioning of ponds. | |
| **B. Aquaculture** | | | |
| (i) Shallow water in ponds due to insufficient rains/inflow | * Further loss of water due to seepage should be prevented by to polythene sheet lining of ponds murrel culture / cat fish farming can be tried.<br><br>* Short term fish farming should be planned.<br><br>* Preparations should be made to preserve / maintains the brood stock for the forth coming season.<br><br>* The summer crop and the culture area can be minimized based on the availability of water. | * The stocking density or the stocks in pond should be reduced and marketed or stored in other pond.<br><br>* Culture of cat fish can be curred out.<br><br>* Minimize use of feed fertilizers and chemicals to maintain water quality.<br><br>* Strict observation should be carried out to carry out spread of fdisease due to high density and high temperature.<br><br>* Vegelable crops / short term crops / Low water requirement plants / fodder can be grown in the ponds / types as source of income. | * The ponds can be prepared for the next crop. |

| | | | |
|---|---|---|---|
| (ii) Impact of salt load build up in ponds / change in water quality | Deepening and desilting of existing water bodies. | Application of feed and manures should be minimized. | |
| (iii) Any other | The quality and quantity of water has to be monitored. | * Recirculatory system can be adopted to as to used mineral water.<br>* Use of aerators to overcome thermal stratifications and ammonia build up.<br>* Regular training to the farmers on fish culture, integrated farming and management of drought.<br>* Seed banks / Brood stock banks of Government fish farm should hotel the breeders / seeds for next season. | * The government should provide quality seeds for the farmers for starting culture |
| **2) Floods** | | | |
| **A. Capture** | | | |
| Aquaculture | * Strengthening of bunds.<br>* Clearing of near by water channels for easy flow of water without entering the ponds.<br>* The main inlet provision in the farm should be maintained.<br>* The farmers / entrepreneurs should be trained to manage flood situation.<br>* The stocks in low lying products of ponds prone to flooding should be transferred to other pond. | * Water storage to the maximum level should be taken.<br>* Entry of flood water in to the pond should be prevented as to reduce silt and mortality and spread of disease.<br>* Nets at every possible ways should be placed pe of fished. | |
| (i) Average compensation paid | | | |

| | | | |
|---|---|---|---|
| due to loss of human life | | | |
| (ii) No. of boats / nets / damaged | | | |
| (iii) No. of houses damaged | | | |
| (iv) Loss of stock | T h crop duration should be reduced<br><br>The cropping area should be reduced | *The loss should be reported to the fisheries departme nt | New stock has to be procured<br><br>*Disease free stock should be maintained |
| Change in water quality | | | |
| Health and diseases | | | |
| **B.Aquaculture** | | | |
| Inundation with flood water | i. Avoid culture of fishes requiring longer duration of culture.<br><br>ii. Initiating fish culture in advance in areas frequently prone mto flooding. | | |
| Water exchange and changes in water quality | | | |
| Health and diseases | | | |
| Loss of stock and inputs (feed, chemicals etc., | | | |
| Infrastructure damage(pumps, aerators, huts etc) | i. Initiating fish culture in advance in areas frequently prone to flooding to prevent damage to the infrastructure | | |

| | | | |
|---|---|---|---|
| Any other | | | |
| **3. Cyclone** | Before the event | During the event | After the event |
| **A. Capture** | | | |
| Average compensation paid due to loss of fishermen lives | | | |
| Average no of boats / nets / damaged | | | |
| Average no of houses damaged | | | |
| Inland | | | |
| **B. Aquaculture** | Before the event | During the event | After the event |
| Overflow / flooding of ponds | i. Planting trees like casuarinas. | | |
| Changes in water quality(fresh water / brackish water ratio) | Stocking fishes which can tolerate wide salinity changes eg. milkfish, pearl spot etc., | | |
| Health and diseases | | | |
| Loss of stock and inputs (feed, chemicals etc.,) | | | |
| Infrastructure damage(pumps, aerators,shelters/huts etc., | | | |

| | | | |
|---|---|---|---|
| Any other | Training programmes for stakeholders including resource users, planners and policy makers on coastal regulations, shoreline protection and environmental awareness. | | |
| **Heat wave and cold wave** | Before the event | During the event | After the event |
| **A. Capture** | | | |
| **Inland** | | | |
| B.Aquaculture | Before the event | During the event | After the event |
| Changes in pond environment (water quality) | | | |
| Health and Disease management | | | |
| Any other | | | |