

**State: ANDHRA PRADESH**

**Agriculture Contingency Plan for District: ADILABAD**

| 1.0 District Agriculture profile |   |   |   |  |
|----------------------------------|---|---|---|--|
| <b>1.1</b>                       | <b>Agro-Climatic/Ecological Zone</b>                          |   |   |  |
|                                  | Agro Ecological Region /Sub Region (ICAR)                     | Deccan Plateau, hot arid eco region (6.2)                                       |   |  |
|                                  | Agro-Climatic Region (Planning Commission)                    | Southern Plateau and Hills Region (X)   |   |  |
|                                  | Agro Climatic Zone (NARP)                                     | North Telangana Zone (AP-4)   |   |  |
|                                  | List the zones or part thereof falling under the NARP Zone    | Adilabad, Karimnagar, Nizamabad, parts of Warangal, Medak, Khammam and Nalgonda |   |  |
|                                  | Geographic coordinates of district                            | Latitude  | Longitude                                 | Altitude                                     |
|                                  |   | 19°40'0"N   | 78°46'60"E                                | 263 m  |
|                                  | Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS | RARS, Jagtial 505 321   |   |  |
|                                  | Mention the KVK located in the district                       | KVK, Adilabad dist-504 002  |   |  |
| <b>1.2</b>                       | <b>Rainfall</b>   | Average (mm)  | Normal Onset<br>( specify week and month) | Normal Cessation<br>(specify week and month) |
|                                  | SW monsoon (June-Sep):  | 902   | 2 <sup>nd</sup> week of June              | 3 <sup>rd</sup> week of October              |
|                                  | NE Monsoon(Oct-Dec):  | 97  | 2 <sup>nd</sup> week of October           | 1 <sup>st</sup> week of December             |
|                                  | Winter (Jan- March)   | 16  | -   | -  |
|                                  | Summer (Apr-May)  | 39  | -   | -  |
|                                  | Annual  | 1053  | -   | -  |

| <b>1.3</b> | <b>Land use pattern of the district</b> (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 |
|------------|---|-------------------|-------------|---------------------------------|--------------------|----------------------|--|------------------------------|-----------------|---------------|
|            | <b>Area ('000 ha)</b>                                       | 1610.5            | 689.5       | 60.7                            | 14.2               | 14.7                 | 13.0                                   | 43.9                         | 172.7           | 94.9          |

| <b>1.4</b> | <b>Major Soils</b>           | Area ('000 ha) | Percent (%) of total |
|------------|------------------------------|----------------|----------------------|
|            | 1. Red soils                 |                | 15                   |
|            | 2. Black soils               |                | 80                   |
|            | 3. Others                    |                | 5                    |
| <b>1.5</b> | <b>Agricultural land use</b> | Area ('000 ha) | Cropping intensity % |
|            | Net sown area                | 551.6          | 106.9%               |
|            | Area sown more than once     | 38.3           |                      |
|            | Gross cropped area           | 589.9          |                      |

|                                 |   |                |                |                  |  |
|---------------------------------|---|----------------|----------------|------------------|--|
| <b>1.6</b>                      | <b>Irrigation</b>                       | Area ('000 ha) | Percent (%)    |                  |  |
|                                 | Net irrigated area                      | 88.1           |                |                  |  |
|                                 | Gross irrigated area                    | 112.7          |                |                  |  |
|                                 | Rainfed area                            | 463.6          |                |                  |  |
|                                 | <b>Sources of Irrigation</b>            | Number         | Area ('000 ha) | % area           |  |
|                                 | Canals                                  |                | 4.7            | 7.3              |  |
|                                 | Tanks                                   |                | 8.9            | 13.8             |  |
|                                 | Tube wells & filter points              |                | 49.7           | 77.2             |  |
|                                 | Lift irrigation                         |                |                |                  |  |
|                                 | Other sources                           |                | 1.0            | 1.7              |  |
|                                 | Total                                   |                | 64.3           | 100.0            |  |
|                                 | Pumpsets                                |                |                |                  |  |
|                                 | Micro-irrigation                        |                |                |                  |  |
|                                 | <b>Groundwater availability and use</b> | No. of blocks  | % area         | Quality of water |  |
|                                 | Over exploited                          |                |                |                  |  |
|                                 | Critical                                |                |                |                  |  |
|                                 | Semi- critical                          |                |                |                  |  |
| Safe                            |   |                |                |                  |  |
| Wastewater availability and use |   |                |                |                  |  |

**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)*   |                |                  |                |               |              |
|-----|---|-------------------|----------------|------------------|----------------|---------------|--------------|
|     |   | <i>Kharif</i>     |                | <i>Rabi</i>      |                | <b>Summer</b> | <b>Total</b> |
|     |   | <i>Irrigated</i>  | <i>Rainfed</i> | <i>Irrigated</i> | <i>Rainfed</i> |               |              |
| 1   | Cotton                                  | -                 | 292            | -                | -              |               | 292          |
| 2   | Soybean                                 | -                 | 120            | -                | -              |               | 120          |
| 3   | Redgram                                 | -                 | 53             | 9                | -              |               | 62           |
| 4   | Paddy                                   | 20                | 1.93           | 8.9              | -              |               | 30.8         |
| 5   | Jowar                                   | -                 | 18             |                  | 29             |               | 47           |
| 6   | Bengal gram                             | -                 | -              |                  | 27             |               | 27           |
| 7   | Wheat                                   | -                 | -              | 4                | -              |               | 4            |
|     |   |                   |                |                  |                |               |              |
|     | <b>Horticulture crops - Fruits</b>      | <b>Total area</b> |                |                  |                |               |              |
| 1   | Mango                                   | 54.0              |                |                  |                |               |              |
| 2   | Orange & batavian                       | 1.0               |                |                  |                |               |              |
|     | <b>Horticultural crops - Vegetables</b> | <b>Total area</b> |                |                  |                |               |              |
| 1   | Tomato                                  | 14.7              |                |                  |                |               |              |
| 2   | Chillies                                | 4.7               |                |                  |                |               |              |
| 3   | Brinjal                                 | 2.7               |                |                  |                |               |              |
| 4   | Cabbage                                 | 2.2               |                |                  |                |               |              |
| 5   | Bhendi                                  | 2.1               |                |                  |                |               |              |
|     | <b>Spices and Plantation crops</b>      | <b>Total area</b> |                |                  |                |               |              |
| 1   | Turmeric                                | 8.5               |                |                  |                |               |              |
| 2   | Coriander                               | 3.0               |                |                  |                |               |              |

|  |                               |  |  |       |
|--|-------------------------------|--|--|-------|
|  | <b>Total fodder crop area</b> |  |  |       |
|  | <b>Grazing land</b>           |  |  | ----- |
|  | <b>Sericulture etc</b>        |  |  | 3.4   |
|  | <b>Others (Specify)</b>       |  |  |       |

| 1.8 | Livestock | Male ('000) | Female ('000) | Total ('000) |
|-----|-----------|-------------|---------------|--------------|
|-----|-----------|-------------|---------------|--------------|

|             |  |                               |                                  |                          |                                    |  |   |
|-------------|--|-------------------------------|----------------------------------|--------------------------|------------------------------------|--|---|
|             | Non descriptive Cattle (local low yielding)            | 529.4                         | 489.3                            | 1018.7                   |                                    |  |   |
|             | Crossbred cattle                                       | 1.5                           | 2.9                              | 4.4                      |                                    |  |   |
|             | Non descriptive Buffaloes (local low yielding)         | 65.7                          | 318.8                            | 384.5                    |                                    |  |   |
|             | Graded Buffaloes                                       |                               |                                  |                          |                                    |  |   |
|             | Goat   |                               |                                  | 579.3                    |                                    |  |   |
|             | Sheep  |                               |                                  | 428.1                    |                                    |  |   |
|             | Others (Camel, Pig, Yak etc.)                          |                               |                                  | 17.98                    |                                    |  |   |
|             | Commercial dairy farms (Number)                        |                               |                                  |                          |                                    |  |   |
| <b>1.9</b>  | <b>Poultry</b>   | <b>No. of farms</b>           | <b>Total No. of birds ('000)</b> |                          |                                    |  |   |
|             | Commercial   |                               | 334890                           |                          |                                    |  |   |
|             | Backyard   |                               | 1605331                          |                          |                                    |  |   |
| <b>1.10</b> | <b>Fisheries</b> (Data source: Chief Planning Officer) |                               |                                  |                          |                                    |  |   |
|             | <b>A. Capture</b>                                      |                               |                                  |                          |                                    |  |   |
|             | <b>i) Marine</b> (Data Source: Fisheries Department)   | <b>No. of fishermen</b>       | <b>Boats</b>                     |                          | <b>Nets</b>                        |  | <b>Storage facilities (Ice plants etc.)</b> |
|             |  |                               | Mechanized                       | Non-mechanized           | Mechanized (Trawl nets, Gill nets) | Non-mechanized (Shore Seines, Stake & trap nets) |   |
|             | <b>ii) Inland</b> (Data Source: Fisheries Department)  | <b>No. Farmer owned ponds</b> |                                  | <b>No. of Reservoirs</b> |                                    | <b>No. of village tanks</b>                      |   |
|             |  | 33                            | 3                                |                          | 342                                |  |   |
|             | <b>B. Culture</b>                                      |                               |                                  |                          |                                    |  |   |
|             |  | <b>Water Spread Area (ha)</b> |                                  | <b>Yield (t/ha)</b>      |                                    | <b>Production ('000 tons)</b>                    |   |
|             | <b>i) Brackish water</b>                               | -                             |                                  | 0.000                    |                                    |  |   |
|             | <b>ii) Fresh water</b>                                 | 32                            |                                  | 0.013                    |                                    | 0.415  |   |
|             | <b>Others</b>  |                               |                                  |                          |                                    | 12.304   |   |

|             |   |                     |                      |                     |                      |                     |                      |                     |                      |
|-------------|---|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|
| <b>1.11</b> | <b>Production and Productivity of major crops</b><br>(Average of last 5 years: 2004, 05,06, 07, 08) | <b>Kharif</b>       |                      | <b>Rabi</b>         |                      | <b>Summer</b>       |                      | <b>Total</b>        |                      |
|             |   | Production ('000 t) | Productivity (kg/ha) |

|  |                                  |      |      |      |      |   |   |      |      |
|--|----------------------------------|------|------|------|------|---|---|------|------|
|  | Cotton                           | 425  | 350  | -    | -    | - | - | 425  | 350  |
|  | Soybean                          | 42.7 | 595  | -    | -    | - | - | 42.7 | 595  |
|  | Redgram                          | 23   | 603  | 8.24 | 608  | - | - | 31.2 | 605  |
|  | Paddy                            | 123  | 2608 | 30   | 3370 | - | - | 153  | 2797 |
|  | Jowar                            | 42   | 1808 | 30   | 677  | - | - | 72   | 1076 |
|  | Bengal gram                      |      |      | 23   | 1386 |   |   | 23   | 1386 |
|  | Wheat                            | -    | -    |      |      |   |   | -    | -    |
|  | <b>Major Horticultural crops</b> |      |      |      |      |   |   | -    | -    |
|  | Turmeric                         | 59.8 |      | -    |      |   |   | 60   | -    |
|  | Chilles                          | 26.0 |      |      |      |   |   | 26   | -    |
|  | Onion                            | 10.6 |      |      |      |   |   | 11   | -    |
|  | Coriander                        |      |      |      |      |   |   | -    | -    |

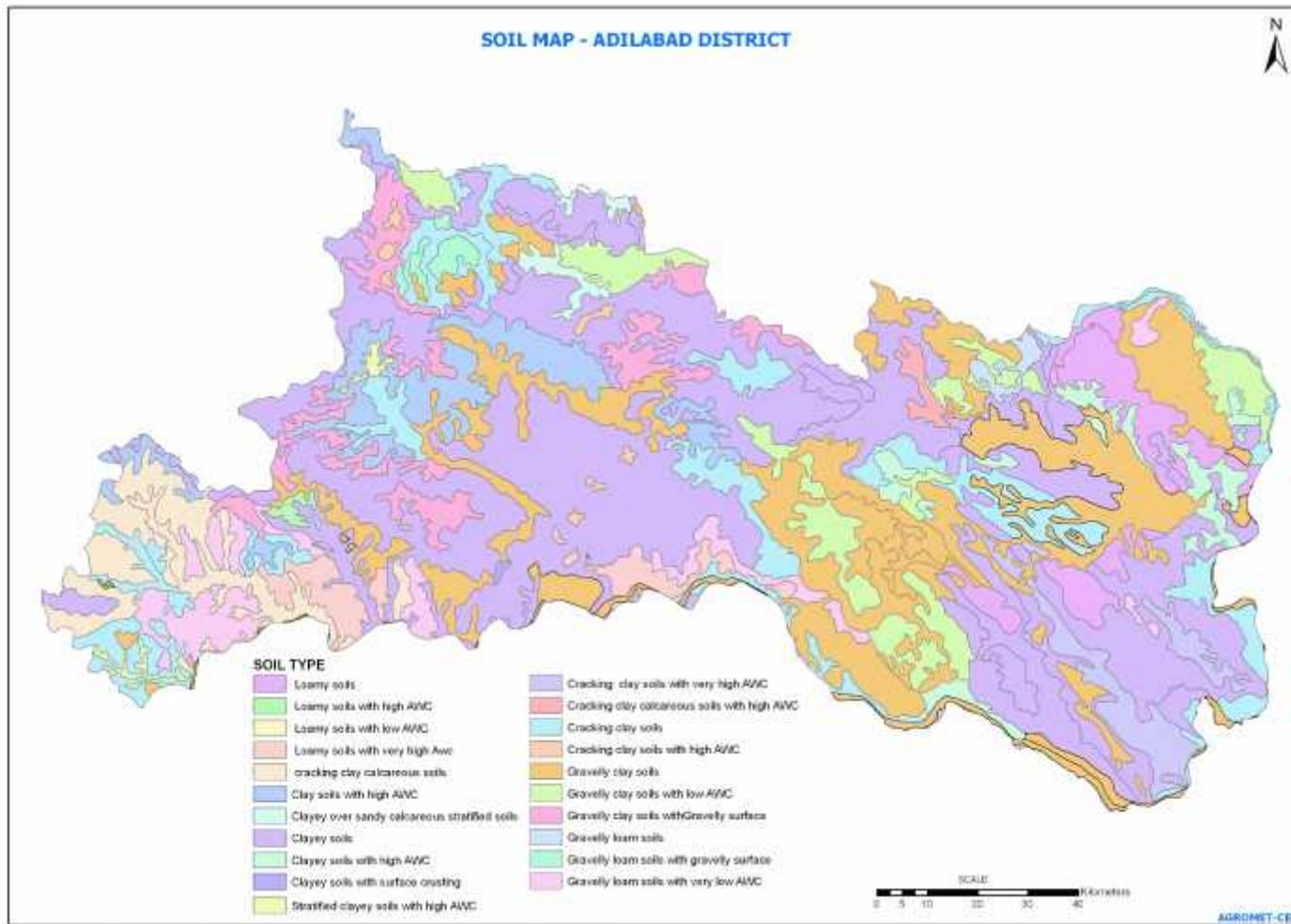
| <b>1.12</b> | <b>Sowing window for 5 major crops (start and end of sowing period)</b> | Cotton      | Soybean            | Redgram                                | Paddy       | Bengalgram  | Jowar     |
|-------------|---|-------------|--------------------|--|-------------|---|-----------|
|             | Kharif- Rainfed   | June – July | June 15 to July 15 | June 1 <sup>st</sup> week to last week | --          | ---   |           |
|             | Kharif-Irrigated  | ---         |                    | ---                                    | June – July | ---   |           |
|             | Rabi- Rainfed   | ---         | ---                | --                                     | --          | 2 <sup>nd</sup> F.N. of October to 1 <sup>st</sup> F.N. of November | September |
|             | Rabi-Irrigated  | --          | --                 | ---                                    | ---         | October – 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   |         |            | ✓    |
|      | High intense storms   |         |            | ✓    |
|      | Cyclone   |         | ✓          |      |
|      | Hail storm  |         | ✓          |      |
|      | Heat wave   |         |            | ✓    |
|      | Cold wave   |         | ✓          |      |
|      | Frost   |         |            | ✓    |
|      | Sea water inundation  |         |            | ✓    |
|      | Pests and diseases (specify)  | ✓       |            |      |

|      |  |   |                    |
|------|--|---|--------------------|
| 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 |







## 2.0 Strategies for weather related contingencies

### 2.1 Drought

#### 2.1.1 Rainfed situation

| Condition   | Major Farming situation | Crop normal /cropping system | Suggested Contingency measures                      |  |                           |   |                                 |
|---|-------------------------|------------------------------|---|--|---------------------------|---|---------------------------------|
|   |                         |                              | Change in crop/cropping system                      | Agronomic measures   | Remarks on Implementation |   |                                 |
| Delay by 2 weeks<br>(June 4 <sup>th</sup> week)   | Rainfed – black soils   | Cotton                       | No Change   | -  |                           |   |                                 |
|   |                         | Soybean                      |   |  |                           |   |                                 |
|   |                         | Redgram                      |   |  |                           |   |                                 |
| Delay by 4 weeks<br>(2 <sup>nd</sup> week July)   | Rainfed – black soils   | Cotton                       |   |  |                           |   |                                 |
|   |                         | Soybean                      |   |  |                           |   |                                 |
|   |                         | Redgram                      |   |  |                           |   |                                 |
| Delay by 6 weeks<br>(July 4 <sup>th</sup> week)   | Rainfed – black soils   | Cotton                       |   |  |                           |   |                                 |
|   |                         | Soybean                      |   |  |                           | Redgram ICPL-87119,<br>85063, LRG-38 and MRG-88 | Adopt closer spacing<br>(90x15) |
|   |                         | Redgram                      |   |  |                           | No Change                                       | Adopt closer spacing            |
| Delay by 8 weeks<br>(August 2 <sup>nd</sup> week) | Rainfed – black soils   | Cotton                       | Redgram   | Reduce row spacing to<br>90cm<br>Spray 2% urea solution<br>Apply booster dose of<br>nitrogen @ 50kg/ha after<br>receipt of rains |                           |   |                                 |
|   |                         | Redgram                      | No Change (Medium<br>duration PRG 100, ICP<br>8863) | Adopt closer spacing<br>(90x30cm)  |                           |   |                                 |
|   |                         | Soybean                      | Frequent spraying of 2% urea<br>solution            | Reduce row spacing to<br>90cm  |                           |   |                                 |

| Condition  | Major Farming situation | Crop/cropping system | Suggested Contingency measures  |   |                           |
|--|-------------------------|----------------------|---|---|---------------------------|
|  |                         |                      | Crop management   | Soil management   | Remarks on Implementation |
| Early season drought (Normal onset)  |                         |                      |   |   |                           |
| 15-20 days dry spell after sowing leading to poor germination/crop stand etc.) | Rainfed – black soils   | Cotton               | Gap fill with same cultivar. Delay the fertilizer application till sufficient soil moisture builds up through rains. Incidence of sucking pests may flare up. Take control measures. Since cotton is a major crop, a specific recommendation may be better. Can we specify as mealybugs and other sucking pests and what spray? | Frequent inter cultivation.<br><br>Foliar application of 2% urea solution, 2-3 times @ 10-15 days interval.<br>Apply 30 Kg N / ha immediately on receiving rains during vegetative stage. | -                         |
|  |                         | Soybean              | 2% urea foliar spray  | Frequent inter cultivation with push hoe to control weeds and conserve soil moisture.   |                           |
|  |                         | Redgram              |   |   |                           |

| Condition  | Major Farming situation | Crop/cropping system | Suggested Contingency measures  |   |                           |
|--|-------------------------|----------------------|---|---|---------------------------|
|  |                         |                      | Crop management   | Soil management   | Remarks on Implementation |
| Mid season drought (long dry spell, > 2 consecutive weeks rainless (>2.5 mm) period) |                         |                      |   |   |                           |
| At vegetative stage  | Rainfed – black soils   | Cotton               | <p>Delay the fertilizer application till sufficient soil moisture available.</p> <p>Incidence of sucking pests i.e. Aphids, Thrips may flare up. Spray Acephate @1.5g or Imidacloprid @0.4ml/lit of water.</p> <p>Foliar application of 2% urea solution + 1 to1.5% MOP. 2-3 times @ 10-15 days interval.</p> <p>Apply 30 Kg N / ha immediately on receiving rains during vegetative stage.</p> | Frequent inter cultivation keeps the crop weed free and conserve soil moisture. |                           |
|  |                         | Soybean              |   | Frequent inter cultivation  |                           |
|  |                         | Redgram              | Spray 2% urea solution and apply booster dose of urea 50 kg/ ha immediately after receipt of rains.   |   |                           |

| Condition                           | Major Farming situation | Crop/cropping system | Suggested Contingency measures  |                           |                           |
|-------------------------------------|-------------------------|----------------------|---|---------------------------|---------------------------|
|                                     |                         |                      | Crop management   | Soil management           | Remarks on Implementation |
| Mid season drought (long dry spell) |                         |                      |   |                           |                           |
| At reproductive stage               | Rainfed – black soils   | Cotton               | Alternate foliar application of 2% urea solution and 1% KNO <sub>3</sub> , 2-3 times @ 10 days interval.<br>Incidence of sucking pests i.e. Jassids, Aphids and Thrips will be more.<br><br>Spray application of Acephate @ 1.5g or Imidacloprid @ 0.4 ml/lit of water. | Frequent intercultivation |                           |
|                                     |                         | Soybean              | Foliar application of urea @ 2% at an interval of one week  |                           |                           |
|                                     |                         | Redgram              |   |                           |                           |

Comments same as above

| Condition        | Major Farming situation | Crop/cropping system | Suggested Contingency measures   |   |                           |
|------------------|-------------------------|----------------------|--|---|---------------------------|
|                  |                         |                      | Crop management  | Rabi crop planning  | Remarks on Implementation |
| Terminal drought | Rainfed – black soils   | Cotton               | Alternate foliar application of 2% urea solution and 1% KNO <sub>3</sub> 2-3 times @ 10 days interval. | Sesame or soybean for seed purpose is suggested wherever assured irrigation is there  |                           |
|                  |                         | Soybean              | Foliar application of 2% urea solution, 1 spray  | Bengalgram mustard / fenugreek is recommended wherever subsidiary irrigation is there |                           |
|                  |                         | Redgram              | Foliar application of 2% urea solution, 2 times at an interval of 5 days                               | Sesame is suggested wherever assured irrigation is there                              |                           |

## 2.1.2 Irrigated situation

| Condition   | Major Farming situation | Crop/cropping system | Suggested Contingency measures |  |                           |
|---|-------------------------|----------------------|--------------------------------|--|---------------------------|
|   |                         |                      | Change in crop/cropping system | Agronomic measures   | Remarks on Implementation |
| Delayed/ limited release of water in canals due to low rainfall | Black soils             | Paddy                | No Change                      | Take up transplanting of aged seedling with special management practices.<br>1. Short duration varieties like Erramallelu, Jagtiala Sannalu, WGL-44, JGL-3844, MTU-1010 and Tellahamsa |                           |

| Condition  | Major Farming situation | 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 | Black soils             | Paddy                | No Change                      | Alternate wetting and drying |                           |

| Condition  | Major Farming situation | Crop/cropping system | Suggested Contingency measures                        |                    |                           |
|--|-------------------------|----------------------|---|--------------------|---------------------------|
|  |                         |                      | Change in crop/cropping system                        | Agronomic measures | Remarks on Implementation |
| Non release of water in canals under delayed onset of monsoon in catchment | Black soils             | Paddy                | Greengram (MGG-295, LGG-460)<br><br>Redgram (PRG-100) |                    |                           |

| Condition  | Major Farming situation | Crop/cropping system | Suggested Contingency measures |  |                           |
|--|-------------------------|----------------------|--------------------------------|--|---------------------------|
|  |                         |                      | Change in crop/cropping system | Agronomic measures                           | Remarks on Implementation |
| Lack of inflows into tanks due to insufficient /delayed onset of monsoon | Shallow black soils     | Paddy                | Irrigated crops Maize, Jowar   | Irrigate available water in canals and tanks |                           |

| Condition   | Major Farming situation | Crop/cropping system | Suggested Contingency measures                   |                    |                           |
|---|-------------------------|----------------------|--|--------------------|---------------------------|
|   |                         |                      | Change in crop/cropping system                   | Agronomic measures | Remarks on Implementation |
| Insufficient groundwater recharge due to low rainfall | Black soils             | Paddy                | Short duration crops like Green gram, Balckgram, |                    |                           |

## 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 |  |  |   |  |
| Cotton  | <p>1. Excess water from the field to be drained out</p> <p>2. Intercultivate with gorru and apply a booster dose of 30kg urea+1% KNO<sub>3</sub> per acre</p> <p>Delay in intercultural operation may harm the crop</p> <p>3Gap filling should be done</p> <p>4. In water logged areas spray with urea 2%+ MgSO<sub>4</sub> (1%) followed by Annabhedi 5g+Citric acid 0.5g/l</p> <p>5.Spray and also drench with Copper oxychloride</p> <p>6. Take up timely control measures against the out break of pests and diseases like</p> | <p>1. Drain the excess water as early as possible</p> <p>2. Apply 30 kg N + 15 kg K /acre after draining excess water</p> <p>3. Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals</p> <p>5. Take up timely control measures against the out break of pests like Spodoptera, Helicoverpa etc.</p> | <p>1. Drain the excess water as early as possible</p> <p>2. To spray KNO<sub>3</sub> 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition</p> <p>3. Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals</p> <p>4. Take up timely control measures against the out break of pests like Spodoptera, Helicoverpa etc.</p> | <p>1.Dry the produce properly before packing and sending to market</p> |

|         |   |   |                        |   |
|---------|---|---|------------------------|---|
|         | Spodoptera, Helicoverpa and BLB (Black arm) etc.                |   |                        |   |
| Maize   | Drain out excess water<br><br>Take up plant protection measures | Drain out excess water<br><br>Timely plant protection measures are to be taken up | Drain out excess water | Shifting of cobs immediately after drying           |
| Redgram | Drain out excess water<br><br>Take up plant protection measures | Drain out excess water<br><br>Take up plant protection measures                   | Drain out excess water |   |
| Paddy   | Drain out excess water<br>Take up plant protection measures     | Drain out excess water<br><br>Take up plant protection measures                   | Drain out excess water | Spray salt solution to prevent germination of paddy |

**2.3 Floods**                    -NA-

2.5        Contingent strategies for Livestock, Poultry & Fisheries

2.5.1     Livestock

**General contingency measures**

|                         |                         |                        |
|-------------------------|-------------------------|------------------------|
| <b>Before the event</b> | <b>During the event</b> | <b>After the event</b> |
|-------------------------|-------------------------|------------------------|

| <b>Feed and fodder availability</b>  |   |   |
|--|---|---|
| <p>1.Conserving fodder/crop residues/ forest grass by silage / hay making either by individual or on community basis</p> <p>2. Preparing complete diets and storing in strategic locations</p> <p>3. Organize procurement of dry foddors / feed ingredients from surplus areas</p> <p>4. Establish fodder banks and feed banks</p> <p>5. Livestock relief camps during floods/cyclones must be planned in the vicinity of relief camps for people</p> <p>6. Capacity building and preparedness</p> | <p>1.Organise relief camps 2.Supply silage / hay to farmers with productive stock on subsidized rates</p> <p>3.Segregate old, weak and unproductive stock and send for slaughter</p> <p>4. Supply mineral mixture to avoid deficiencies</p> <p>5. Dry fodder must be offered to the livestock in little quantities for number of times</p> <p>6.Concentrate feed or complete feed must be offered to only productive and young stock only</p> | <p>1. Capacity building to stakeholders on drought /cyclone/flood mitigation in livestock sector</p> <p>2. Promote fodder cultivation.</p> <p>3. Flushing the stock to recoup</p> <p>4. Avoid soaked and mould infected feeds / foddors to livestock</p> <p>5. Replenish the feed and fodder banks</p> <p>6.Promote fodder preservation techniques like silage / hay making</p> |
| <b>Drinking water</b>  |   |   |
| <p>1.Construct drinking water tanks in herding places, village junctions and in relief camp locations</p> <p>2.Plan for sufficient number of tanks for water transportation</p> <p>3.Identify bore wells, which can sustain demand.</p> <p>4.Procure sufficient quantities of water Sanitizers</p>   | <p>1.Regular supply of clean drinking water to all tanks 2.Cleaning the tanks in regular intervals</p> <p>3.Keep the livestock away from contaminated flood/cyclone/stagnated waters</p> <p>3.Add water sanitizers</p>  | <p>1.Hand over the maintenance of the structures to panchayats</p> <p>2.Sensitize the farming community about importance of clean drinking water</p>  |
| <b>Health and disease Management</b>   |   |   |

|  |   |   |
|--|---|---|
| <p>1. Procure and stock emergency medicines and vaccines for important endemic diseases of the area</p> <p>2. All the stock must be immunized for endemic diseases of the area</p> <p>3. Carry out deworming to all young stock</p> <p>4. Keep stock of bleaching powder and lime</p> <p>5. Carry out Butax spray for control of external parasites</p> <p>6. Identify the Clinical staff and trained paravets and indent for their services as per schedules</p> <p>7. Identify the volunteers who can serve in need of emergency</p> | <p>1. Keep close watch on the health of the stock</p> <p>2. Sick animals must be isolated and treated Separately.</p> <p>3. Carry out deworming and spraying to all animals entering into relief camps</p> <p>4. Clean the animal houses regularly and apply disinfectants.</p> <p>5. Safe and hygienic disposal of dead animal carcasses</p> <p>6. Organize with community daily lifting of dung from relief camps</p> | <p>1. Keep close surveillance on disease outbreak.</p> <p>2. Undertake the vaccination depending on need</p> <p>3. Keep the animal houses clean and spray disinfectants</p> |
|--|---|---|

#### Detailed contingency measures for Livestock

|                              | Suggested contingency measures   |  |  |
|------------------------------|--|--|--|
|                              | Before the event   | During the event   | After the event  |
| <b>Drought</b>               |  |  |  |
| Feed and Fodder availability | <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</p> | <p>Harvest and use biomass of dried up crops (Sorghum, Bajra, Maize, Rice, Wheat, Horse gram, Groundnut) 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 &amp; mineral mixture should be transported to the needy areas from the reserves</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> |

|                |  |  |  |
|----------------|--|--|--|
|                | <p>production</p> <p>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 wheat straw and maize stover</p> <p>Harvesting and collection of perennial vegetation particularly grasses which grow during monsoon</p> <p>Proper drying, bailing 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>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 &amp; 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 the culled and unproductive animals</p> <p>Subsidized loans should be provided to the livestock keepers</p> |  |
| <b>Cyclone</b> | NA   |  |  |
| Floods         | <p>In case of early forewarning (EFW), harvest all the crops (Sorghum, Bajra, Maize, Rice, Wheat, Horse gram, Groundnut) 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 prone mandals, arrange for storing minimum required quantity of hay (25-50kg) and concentrates (25kgs) per animals in farmer / LS keepers house /</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,</p> |

|                               |   |   |  |
|-------------------------------|---|---|--|
|                               | <p>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>FMD and PPR</p> <p>Proper disposal 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> |
| Heat & Cold wave              | <p>In villages which are chronically prone to heat waves the following permanent measures are suggested</p> <ul style="list-style-type: none"> <li>i) Plantation of trees like Neem, Pipal, Subabul around the shed</li> <li>ii) Spreading of husk/straw/coconut leaves on the roof of the shed</li> <li>iii) Water sprinklers / foggers in the animal shed</li> <li>iv) Application of white reflector paint on the roof to reduce thermal radiation effect</li> </ul> <p><b>Cold wave :</b> Covering all the wire meshed walls / open area with gunny bags/ polyethylene sheets with a mechanism for lifting during the day time and closing during night</p> | <p>Allow the animals preferably early in the morning or late in the evening for grazing during heat waves</p> <p>Allow for grazing between 10AM to 3PM during cold waves</p> <p>Feed green fodder/silage / concentrates during day time and roughages / hay during night time in case of heat waves</p> <p>Add 25-50 ml of edible oil in concentrates per kg and fed to the animal during cold 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>Apply / sprinkle lime powder (5-10g per square feet) in the animal shed during cold waves to neutralize ammonia accumulation</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</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 especially for HS, BQ and FMD</p> <p>Conducting fertility camps</p> <p>Mass deworming camps</p>   |

|                |  |   |   |
|----------------|--|---|---|
|                | network to be established at Joint Director (Animal Husbandry) office in the district  |   |   |
| Insurance      | Encouraging insurance of livestock   | Listing out the details of the dead animals             | Submission for insurance claim and availing insurance benefit<br>Purchase of new productive animals |
| Drinking water | Identification of water resources<br>Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals) | Restrict wallowing of animals in water bodies/resources | Bleach (0.1%) drinking water / water sources<br>Provide clean drinking water                        |

**Vaccination programme for cattle and buffalo:**

| <b>Disease</b>                | <b>Age and season at vaccination</b> |
|-------------------------------|--------------------------------------|
| Anthrax                       | In endemic areas only, Feb to May    |
| Haemorrhagic septicaemia (HS) | May to June                          |
| Black quarter (BQ)            | May to June                          |
| Foot and mouth disease (FMD)  | July/August and November/December    |

**Vaccination schedule in small ruminants (Sheep & Goat)**

| <b>Disease</b>               | <b>Season</b>                 |
|------------------------------|-------------------------------|
| Foot and mouth disease (FMD) | Preferably in winter / autumn |

|                                  |                       |
|----------------------------------|-----------------------|
| Peste des Petits Ruminants (PPR) | Preferably in January |
| Black quarter (BQ)               | May / June            |
| Enterotoxaemia (ET)              | May                   |
| Haemorrhagic septicaemia (HS)    | March / June          |
| Sheep pox (SP)                   | November              |

### 2.5.2 Poultry

|                               | Suggested contingency measures  |  |   |
|-------------------------------|---|--|---|
|                               | Before the event  | During the event   | After the event   |
| <b>Drought</b>                |   |  |   |
| 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<br>Supplementation of shell grit (calcium) for laying birds<br>Culling of weak birds | Supplementation to all survived birds   |
| Drinking water                |   | Use water sanitizer or offer cool drinking water   |   |
| Health and disease management | Culling of sick birds.<br>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<br>Disposal of dead birds by burning / burying with lime powder in pit |
| <b>Floods</b>                 |   |  |   |
| Shortage of feed ingredients  | In case of early forewarning of floods, shift the birds to safer place<br>Storing of house hold grain like maize, broken rice, bajra etc, | Use stored feed as supplement<br>Don't allow for scavenging<br>Culling of weak birds   | Routine practices are followed<br>Deworming and vaccination against RD  |

|                                |   |   |   |
|--------------------------------|---|---|---|
|                                |   |   |   |
| Drinking water                 |   | Use water sanitizers or 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<br>Assure supply of electricity by generator or solar energy or biogas<br>Sprinkle lime powder to prevent ammonia accumulation due to dampness | Sanitation of poultry house<br>Treatment of affected birds Disposal of dead birds by burning / burying with lime powder in pit<br>Disposal of poultry manure to prevent protozoal problem<br>Supplementation of coccidiostats in feed<br>Vaccination against RD |
| <b>Cyclone</b>                 | NA  |   |   |
| <b>Heat wave and cold wave</b> |   |   |   |
| <b>Heat wave</b>               |   |   |   |
| Shelter/environment management | Provision of proper shelter with good ventilation   | In severe cases, foggers/water sprinklers/wetting of hanged gunny bags should be arranged<br>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<br>Provide cool and clean drinking water with electrolytes and vit. C (5-10 ml per litre)<br>In hot summer, add anti-stress probiotics in   | Routine practices are followed  |

|                                |  |  |                                |
|--------------------------------|--|--|--------------------------------|
|                                |  | drinking water or feed (Reestobal etc., 10-20ml per litre)   |                                |
| <b>Cold wave</b>               |  |  |                                |
| Shelter/environment management | Provision of proper shelter<br>Arrangement for brooding<br>Assure supply of continuous electricity | Close all openings with polythene sheets<br>In severe cases, arrange heaters<br>Don't allow for scavenging during early morning and late evening | Routine practices are followed |
| Health and disease management  | Arrangement for protection from chilled air  | Supplementation of grains<br>Antibiotics (Ampicilline/ Ampiclox etc., 10g in one litre) in drinking water to protect birds from pneumonia        | Routine practices are followed |

### 2.5.3 Fisheries/ Aquaculture:

|  | Suggested contingency measures  |  |   |
|--|---|--|---|
|  | Before the event  | During the event   | After the event   |
| <b>1) Drought</b>  |   |  |   |
| <b>A. Capture</b>  |   |  |   |
| Marine   |   |  |   |
| 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   | Immediate harvesting or changing the water quality by application of                 | Removal of top layer, deep ploughing  |

|  |  |  |   |
|--|--|--|---|
|  | geolites, soil probiotics, etc to maintain water quality   | sanitisers.  | of tank and application of lime   |
| (iii) Any other  |  |  |   |
| <b>B. Aquaculture</b>  |  |  |   |
| (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   | Frequent change of water with fresh water  | Frequent draining of the pond with fresh water, removal of top layers   |
| (iii) Any other  |  |  |   |
| <b>2) Floods</b>   |  |  |   |
| <b>A. Capture</b>  |  |  |   |
| 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 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 |
| <b>B. Aquaculture</b>                                 |  |   |  |
| (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          |
| (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  |  |   |  |
| <b>3. Cyclone / Tsunami</b>                           |  |   |  |
| 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>B. Aquaculture</b>  |   |  |   |
| (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 salinity levels by pumping in water from creeks. | Continuation of the same process.  | Restoration of physical and chemical parameters                                       |
| (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   |   |  |   |
| <b>4. Heat wave and cold wave</b>                                  |   |  |   |
| <b>A. Capture</b>  |   |  |   |
| Inland   | Monitoring dissolved oxygen levels  | Monitoring dissolved oxygen levels   | No intervention   |
| <b>B. Aquaculture</b>  |   |  |   |
| (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  |   |  |   |