

# State: Uttar Pradesh

## Agriculture Contingency Plan for District: Pilibhit

| <b>District Agriculture profile</b>  |   |   |                             |          |
|--|---|---|-----------------------------|----------|
| <b>1.1</b>   | <b>Agro-Climatic/Ecological Zone</b>  |   |                             |          |
|  | Agro Ecological Sub Region (ICAR)   | Northern Plain, Hot Subhumid (Dry) Eco-Region (9.2)                                   |                             |          |
|  | Agro-Climatic Zone (Planning Commission)  | UPPER GANGETIC PLAIN REGION (V)   |                             |          |
|  | Agro Climatic Zone (NARP)   | MID WESTERN PLAIN ZONE (UP-4)   |                             |          |
|  | List all the districts falling under the NARP Zone*<br>(*>50% area falling in the zone) | Pilibhit, Bareilly, Muradabad, Shahjampur, Badaun, Bijnor, Rampur, Jyotibaphule Nagar |                             |          |
|  | Geographic coordinates of district headquarters   | Latitude  | Longitude                   | Altitude |
|  |   | 28 <sup>o</sup> 33' 31.824" N   | 78 <sup>o</sup> 3' 13.018"E | 171 mt.  |
|  | Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS                           | Nil   |                             |          |
|  | Mention the KVK located in the district with address                                    | K.V.K, Tanda Bijesi New Aria Pilibhit of S.V.P.U. A & T, Meerut                       |                             |          |
| Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone | I.V.R.I. Bareilly & G.B.P. University Pantnagar   |   |                             |          |

| <b>1.2</b> | <b>Rainfall</b>        | <b>Normal RF(mm)</b> | <b>Normal Rainy days (number)</b> | <b>Normal Onset ( specify week and month)</b> | <b>Normal Cessation (specify week and month)</b> |
|------------|------------------------|----------------------|-----------------------------------|---|--|
|            | SW monsoon (June-Sep): | 1085.4               | 70                                | 2 <sup>nd</sup> week of June                  | 3 <sup>rd</sup> week of Sept                     |
|            | NE Monsoon(Oct-Dec):   | 50.7                 | 14                                | 3 <sup>rd</sup> week of Dec                   | 2 <sup>nd</sup> week of Jan                      |
|            | Winter (Jan- March)    | 74                   | 16                                | -   | -  |
|            | Summer (Apr-May)       | 31.9                 | 7                                 | -   | -  |

|  |        |      |     |   |   |
|--|--------|------|-----|---|---|
|  | Annual | 1242 | 107 | - | - |
|--|--------|------|-----|---|---|

|            |   |                   |                 |             |                                 |                    |                      |  |                              |                 |               |
|------------|---|-------------------|-----------------|-------------|---------------------------------|--------------------|----------------------|--|------------------------------|-----------------|---------------|
| <b>1.3</b> | <b>Land use pattern of the district</b> (latest statistics) | Geographical area | Cultivable area | Forest area | Land under non-agricultural use | Permanent pastures | Cultivable wasteland | Land under Misc. tree crops and groves | Barren and uncultivable land | Current fallows | Other fallows |
|            | <b>Area ('000 ha)</b>                                       | 378.315           | 239.014         | 80.010      | 41.535                          | 0.259              | 3.250                | 4.482                                  | 6.881                        | 1.097           | 1.787         |

|            |                    |                       |                             |
|------------|--------------------|-----------------------|-----------------------------|
| <b>1.4</b> | <b>Major Soils</b> | <b>Area ('000 ha)</b> | <b>Percent (%) of total</b> |
|            | 1. Sandy loam      | 25.69                 | 10.75                       |
|            | 2. Loam            | 68.26                 | 28.56                       |
|            | 3. Clay loam       | 101.46                | 42.45                       |
|            | 4. Silt loam       | 41.23                 | 17.25                       |

|            |                              |                       |                             |
|------------|------------------------------|-----------------------|-----------------------------|
| <b>1.5</b> | <b>Agricultural land use</b> | <b>Area ('000 ha)</b> | <b>Cropping intensity %</b> |
|            | Net sown area                | 239.014               | 167.56%                     |
|            | Area sown more than once     | 161.478               |                             |
|            | Gross cropped area           | 400.492               |                             |

|            |                                |                       |                       |   |
|------------|--------------------------------|-----------------------|-----------------------|---|
| <b>1.6</b> | <b>Irrigation</b>              | <b>Area ('000 ha)</b> |                       |   |
|            | Net irrigated area             | 231.439               |                       |   |
|            | Gross irrigated area           | 387.109               |                       |   |
|            | Rainfed area                   | 7.575                 |                       |   |
|            | <b>Sources of Irrigation</b>   | <b>Number</b>         | <b>Area ('000 ha)</b> | <b>Percentage of total irrigated area</b> |
|            | Canals                         |                       | 40.492                | 18.41%                                    |
|            | Tanks                          |                       | 0.100                 | 0.04%                                     |
|            | Open wells                     |                       | 0.545                 | 0.248%                                    |
|            | Bore wells                     |                       | 178.600               | 81.21%                                    |
|            | Lift irrigation schemes        | NIL                   | -                     | -   |
|            | Micro-irrigation               |                       | -                     | -   |
|            | Other sources (please specify) |                       | 0.176                 | 0.08%                                     |
|            | Total Irrigated Area           |                       | 219.913               |   |
|            | Pump sets                      |                       |                       |   |

|  |                                      |          |   |
|--|--------------------------------------|----------|---|
| No. of Tractors  |                                      |          |   |
| <b>Groundwater availability and use* (Data source: State/Central Ground water Department /Board)</b> | No. of blocks/<br>Tehsils<br>Block-7 | (%) area | Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc) |
| Over exploited   | -                                    | -        | Not reported  |
| Critical   | -                                    | -        | do  |
| Semi- critical   | 2                                    | -        | do  |
| Safe   | 5                                    | -        | do  |
| Wastewater availability and use  | -                                    | -        | do  |
| Ground water quality   |                                      |          |   |

\*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%

### 1.7 Area under major field crops & horticulture (as per latest figures, 2008-09)

| 1.7       | Major field crops cultivated | Area ('000 ha) |         |         |             |         |       |         |             |
|-----------|------------------------------|----------------|---------|---------|-------------|---------|-------|---------|-------------|
|           |                              | <i>Kharif</i>  |         |         | <i>Rabi</i> |         |       | Summer  | Grand total |
|           |                              | Irrigated      | Rainfed | Total   | Irrigated   | Rainfed | Total |         |             |
| Rice      | 154.810                      | -              | 154.810 | -       | -           | -       | -     | 154.810 |             |
| Wheat     | -                            | -              | -       | 155.015 | -           | 155.015 | -     | 155.015 |             |
| Sugarcane | -                            | -              | -       | 52.083  | -           | 52.083  | -     | 52.083  |             |
| Sesame    | -                            | 1.307          | 1.307   | -       | -           | -       | -     | 1.307   |             |
| Mustard   | -                            | -              | -       | -       | 9.552       | 9.552   | -     | 9.552   |             |
| Toria     | -                            | -              | --      | 13.995  | -           | 13.995  | -     | 13.995  |             |
| Lentil    | -                            | -              | -       | -       | 2.558       | 2.558   | -     | 2.558   |             |
| Blackgram | -                            | 0.169          | 0.169   | -       | -           | -       | -     | 0.169   |             |

| Horticulture crops - | Area ('000 ha) |           |         |
|----------------------|----------------|-----------|---------|
|                      | Total          | Irrigated | Rainfed |
| <b>Fruits</b>        |                |           |         |
| <b>Mango</b>         | 1.481          | 0.888     | 0.592   |

|  |              |                  |                |
|--|--------------|------------------|----------------|
| <b>Muskmelon</b>                       | 0.166        | 0.099            | 0.0664         |
| <b>Horticulture crops - Vegetables</b> | <b>Total</b> | <b>Irrigated</b> | <b>Rainfed</b> |
| Potato                                 | 0.638        | 0.638            | -              |
| Pea                                    | 0.240        | 0.240            | -              |
| <b>Medicinal and Aromatic crops</b>    | <b>Total</b> | <b>Irrigated</b> | <b>Rainfed</b> |
| <b>Plantation crops</b>                | <b>Total</b> | <b>Irrigated</b> | <b>Rainfed</b> |
| Poplar                                 | 15.856       | 15.856           | -              |
| Eucliptus                              | 2.75         | -                | 2.75           |
| Eg., industrial pulpwood crops etc.    |              |                  |                |
| <b>Fodder crops</b>                    | <b>Total</b> | <b>Irrigated</b> | <b>Rainfed</b> |
| Sorghum                                | 36.365       | 16.152           | 20.204         |
| Pearl millet                           | 3.218        | -                | 3.218          |
| Berseem                                | 4.892        | 4.892            | -              |
| <b>Total fodder crop area</b>          | 44.466       | 21.044           | 23.442         |
| <b>Grazing land</b>                    | -            | -                | -              |
| <b>Sericulture etc</b>                 | -            | -                | -              |
| <b>Others (specify)</b>                | -            | -                | -              |

|             |  |                         |                                  |                     |
|-------------|--|-------------------------|----------------------------------|---------------------|
| <b>1.8</b>  | <b>Livestock</b>                                       | <b>Male ('000)</b>      | <b>Female ('000)</b>             | <b>Total ('000)</b> |
|             | Non descriptive Cattle (local low yielding)            | 64.686                  | 168.692                          | 233.378             |
|             | Crossbred cattle & Improved cattle                     | 2.957                   | 7.935                            | 10.892              |
|             | Non descriptive Buffaloes (local low yielding)         | 51.713                  | 149.072                          | 200.786             |
|             | Descript Buffaloes                                     | 22.163                  | 63.883                           | 86.051              |
|             | Goat   | 25.841                  | 64.024                           | 89.865              |
|             | Sheep( Indigenous + Exotic )                           | .688+.015               | 1.167+.070                       | 1.940               |
|             | Others (Camel, Pig, Yak etc.)                          |                         |                                  | 486.746             |
|             | Commercial dairy farms (Number)                        |                         |                                  |                     |
| <b>1.9</b>  | <b>Poultry</b>   | <b>No. of farms</b>     | <b>Total No. of birds ('000)</b> |                     |
|             | Commercial   | 0                       | 0                                |                     |
|             | Backyard   |                         | 22.051+28.158=50.209             |                     |
| <b>1.10</b> | <b>Fisheries (Data source: Chief Planning Officer)</b> |                         |                                  |                     |
|             | <b>A. Capture</b>                                      |                         |                                  |                     |
|             | <b>i) Marine (Data Source:</b>                         | <b>No. of fishermen</b> | <b>Boats</b>                     | <b>Nets</b>         |
|             |  |                         |                                  | <b>Storage</b>      |

|   |                               |                               |                     |                                    |  |                                     |
|---|-------------------------------|-------------------------------|---------------------|------------------------------------|--|-------------------------------------|
| Fisheries Department)   |                               | Mechanized                    | Non-mechanized      | Mechanized (Trawl nets, Gill nets) | Non-mechanized (Shore Seines, Stake & trap nets) | <b>facilities (Ice plants etc.)</b> |
|   |                               | -                             | -                   | -                                  | -  | -                                   |
| <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>        |  |                                     |
|   |                               |                               |                     |                                    |  |                                     |
| <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> (Data Source: MPEDA/ Fisheries Department) |                               | -                             | -                   | -                                  |  |                                     |
| <b>ii) Fresh water</b> (Data Source: Fisheries Department)          |                               | -                             | -                   | -                                  |  |                                     |

### 1.11 Production and Productivity of major crops (Average of last 5 years: 2008-09)

| 1.11   | Name of crop | Kharif              |                      | Rabi                |                      | Summer              |                      | Total               |                      | Crop residue as fodder ('000 tons) |
|--|--------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|------------------------------------|
|  |              | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) |                                    |
| <b>Major Field crops (Crops to be identified based on total acreage)</b>         |              |                     |                      |                     |                      |                     |                      |                     |                      |                                    |
|  | Rice         | 403.280             | 2605                 | -                   | -                    | -                   | -                    | 403.280             | 2605                 | 515.84                             |
|  | Wheat        | -                   | -                    | 564.565             | 3642                 | -                   | -                    | 564.565             | 3642                 | 677.478                            |
|  | Sugarcane    | -                   | -                    | 3010.397            | 57800                | -                   | -                    | 3010.397            | 57800                | 451.545                            |
|  | Sesame       |                     | 97                   | -                   | -                    | -                   | -                    | 0.127               | 97                   | -                                  |
|  | Mustard      | -                   | -                    | 8.469               | 887                  | -                   | -                    | 8.469               | 887                  | -                                  |
|  | Toria        | -                   | -                    | 12.846              | 918                  | -                   | -                    | 12.846              | 918                  | -                                  |
| <b>Major Horticultural crops (Crops to be identified based on total acreage)</b> |              |                     |                      |                     |                      |                     |                      |                     |                      |                                    |
|  | Pea          | -                   | -                    | 14.335              | 22469                | -                   | -                    | 14.335              | 22469                | -                                  |
|  | Potato       | -                   | -                    | 3.612               | 15050                | -                   | -                    | 3.612               | 15050                | -                                  |
|  | Mango        | -                   | -                    | -                   | -                    | -                   | -                    | 7.798               | 5265                 |                                    |

|  |           |   |   |   |   |   |   |       |       |  |
|--|-----------|---|---|---|---|---|---|-------|-------|--|
|  | Muskmelon | - | - | - | - | - | - | 4.316 | 26000 |  |
|--|-----------|---|---|---|---|---|---|-------|-------|--|

|             |   |           |         |             |                    |           |         |
|-------------|---|-----------|---------|-------------|--------------------|-----------|---------|
| <b>1.12</b> | <b>Sowing window for 5 major field crops</b><br>(start and end of normal sowing period) | Rice      | Wheat   | Sugarcane   | Sesame & Blackgram | Toria     | Mustard |
|             | Kharif- Rainfed   | July      | -       | -           | -                  | -         | -       |
|             | Kharif-Irrigated  | June-July | -       | -           | July               | -         | -       |
|             | Rabi- Rainfed   | -         | Nov-Dec | March-April | -                  | September | Oct     |
|             | Rabi-Irrigated  | -         | Nov-Dec | March-April | -                  | September | Oct-Nov |

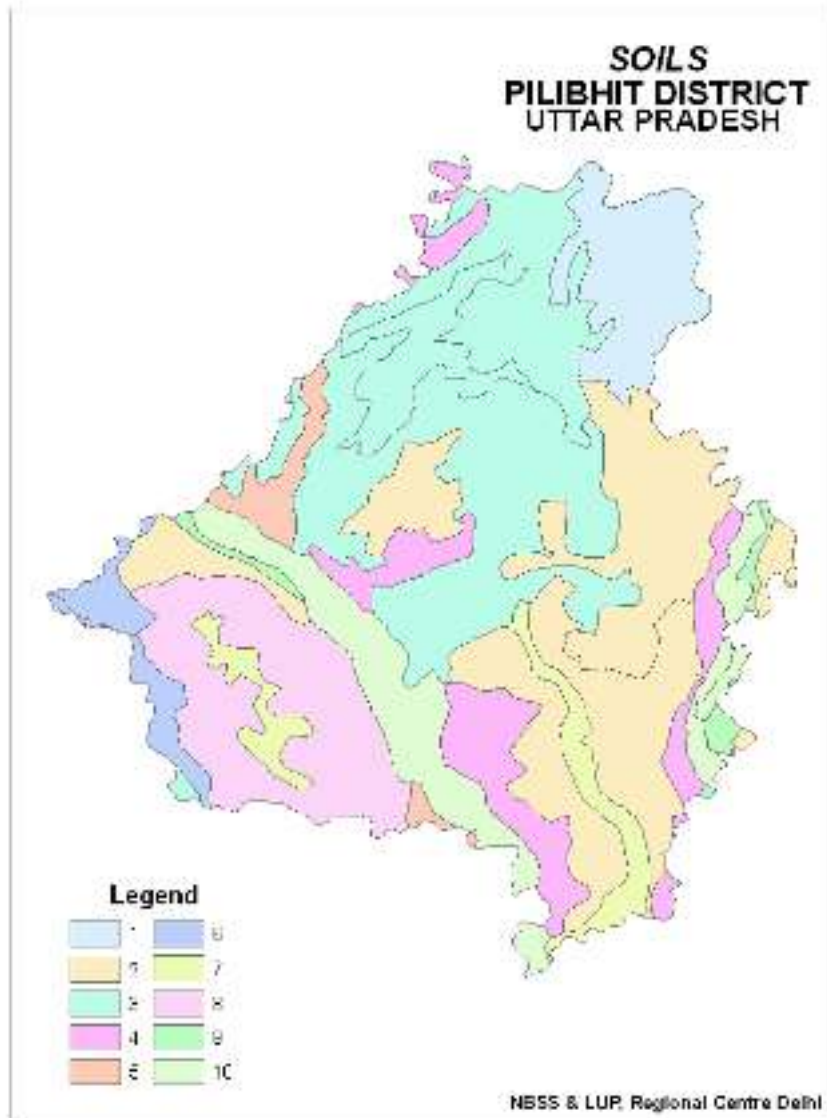
|             |   |                |                   |             |
|-------------|---|----------------|-------------------|-------------|
| <b>1.13</b> | <b>What is the major contingency the district is prone to? (Tick mark)</b>                      | <b>Regular</b> | <b>Occasional</b> | <b>None</b> |
|             | Drought   | x              | √                 | x           |
|             | Flood   | x              | √                 | x           |
|             | Cyclone   | x              | x                 | √           |
|             | Hail storm  | x              | √                 | x           |
|             | Heat wave   | x              | √                 | x           |
|             | Cold wave   | x              | √                 | x           |
|             | Frost   | x              | √                 | x           |
|             | Sea water intrusion   | x              | x                 | √           |
|             | Pests and disease outbreak (specify) Sheath blight, Stem borer, Pyrrilla, Rust, Loose smut etc. | √              | x                 | x           |
|             | Others (specify) Fog  | √              | x                 | x           |

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

# Annexure I



## Soil map



1. Deep, loamy soils and silty soils
2. Deep, loamy soils.
3. Deep, loamy soils and silty soils .
4. Deep, fine soils and loamy soils .
5. Deep, loamy soils and loamy soils
6. Deep, loamy soils and sandy soils
7. Deep, loamy soils (moderate water logging and slight salinity) and fine soils(slightly water logging) .
8. Deep, loamy soils (severely flooding and slight salinity/sodicity).
9. Deep, sandy soils (moderate flooding) and loamy soils(slight flooding)
10. Deep, stratified loamy soils, with moderate flooding associated with sandy soils with moderate flooding .



## 2.0 Strategies for weather related contingencies

### 2.1 Drought

#### 2.1.1 Rain fed situation (Rain fed area is negligible, so there is no need of contingencies)

| Condition  |                         |                               | Suggested Contingency measures                     |                    |                           |
|--|-------------------------|-------------------------------|--|--------------------|---------------------------|
| Early season drought (delayed onset)             | Major Farming situation | Normal Crop / Cropping system | Change in crop / cropping system including variety | Agronomic measures | Remarks on Implementation |
| Delay by 2 weeks                                 |                         |                               |  |                    |                           |
| Condition  |                         |                               | Suggested Contingency measures                     |                    |                           |
| Early season drought (delayed onset)             | Major Farming situation | Normal Crop/cropping system   | Change in crop/cropping system                     | Agronomic measures | Remarks on Implementation |
| Delay by 4 weeks<br>4 <sup>th</sup> week of June |                         |                               |  |                    |                           |
| Condition  |                         |                               | Suggested Contingency measures                     |                    |                           |
| Early season drought                             | Major Farming situation | Normal Crop/cropping system   | Change in crop/cropping system                     | Agronomic measures | Remarks on Implementation |
| Delay by 6 weeks<br>2 <sup>nd</sup> week of July |                         |                               |  |                    |                           |
| Condition  |                         |                               | Suggested Contingency measures                     |                    |                           |
| Early season drought                             | Major Farming situation |                               | Change in crop/cropping system                     | Agronomic measures | Remarks on Implementation |
| Delay by 8 weeks<br>4 <sup>th</sup> week of July |                         |                               |  |                    |                           |

| <b>Condition</b>   |                               |                               | <b>Suggested Contingency measures</b> |  |                              |
|--|-------------------------------|-------------------------------|---------------------------------------|--|------------------------------|
| Early season drought<br>(Normal onset)   | Major<br>Farming<br>situation | Normal Crop / Cropping system | Crop management                       | Soil nutrient &<br>moisture conservation<br>measures | Remarks on<br>Implementation |
| Normal onset<br>followed by 15-20<br>days dry spell after<br>sowing leading to<br>poor<br>germination/crop<br>stand etc. |                               |                               |                                       |  |                              |
| <b>Condition</b>   |                               |                               | <b>Suggested Contingency measures</b> |  |                              |
| Mid season drought<br>(long dry spell,<br>consecutive 2 weeks<br>rainless (>2.5 mm)<br>period)                           | Major<br>Farming<br>situation | Normal Crop/cropping system   | Crop management                       | Soil nutrient &<br>moisture conservation<br>measures | Remarks on<br>Implementation |
| At vegetative stage  |                               |                               |                                       |  |                              |
| <b>Condition</b>   |                               |                               | <b>Suggested Contingency measures</b> |  |                              |
| Mid season drought<br>(long dry spell)   | Major<br>Farming<br>situation | Normal Crop/cropping system   | Crop management                       | Soil nutrient &<br>moisture conservation<br>measures | Remarks on<br>Implementation |
| At flowering/ fruiting<br>stage  |                               |                               |                                       |  |                              |
| <b>Condition</b>   |                               |                               | <b>Suggested Contingency measures</b> |  |                              |
|  | Major<br>Farming<br>situation | Normal Crop/cropping system   | Crop management                       | Rabi crop planning                                   | Remarks on<br>Implementation |
| Terminal drought<br>(Early withdrawal of<br>monsoon)   |                               |                               |                                       |  |                              |

### 1.1.2. Drought Irrigated situation

| Condition  | Major Farming situation  | Normal Crop/ cropping system          | Change in crop/cropping system                    | Suggested Contingency measures  |   |  |  |
|--|--------------------------|---------------------------------------|---|---|---|--|--|
|  |                          |                                       |   | Agronomic measures  | Remarks on Implementation   |  |  |
| Delayed release of water in canals due to low rainfall | Up land sandy loam soils | Rice (Basmati)-Wheat                  | Replace rice with maize or aerobic rice           | <ul style="list-style-type: none"> <li>Use short duration varieties<br/><b>Rice:</b> PS 4, 5, PB 1, PRH 10<br/><b>Maize:</b> Kanchan, Sweta, Navin, Surya<br/><b>Pearl millet:</b> Wcc-75, Raj-171, Pusa-23, Pusa-322</li> <li>Light irrigation with tube well water</li> <li>Follow alternate wetting and drying schedule of irrigation in rice</li> <li>Alternate Furrow irrigation</li> <li>Mulching in sugarcane / maize</li> </ul> | <ul style="list-style-type: none"> <li>Seed through KSSC and NFSM</li> <li>Adequate supply of electricity/ diesel should be ensured by the Govt. agencies.</li> </ul> |  |  |
|  |                          | Sorghum (Fodder) /Maize-Potato/ Wheat | Pearl millet/Greengram/ Blackgram - Potato/ Wheat |   |   |  |  |
|  |                          | Sugarcane +Cucurbits – Ratoon-Wheat   | No change   |   |   |  |  |
|  | Low land clay loam soils | Rice-wheat                            | Basmati rice -Wheat                               |   |   | <ul style="list-style-type: none"> <li>Use short duration varieties e.g.<br/><b>Rice:</b> PS 4, 5, PB1, PRH 10<br/><b>Maize:</b> Kanchan, Sweta, Navin, Surya<br/><b>Pearl millet (Fodder):</b> Wcc-75, Raj-171, Pusa-23, Pusa-322</li> <li>Light irrigation with tube well water</li> <li>Follow alternate wetting and drying schedule of irrigation in rice</li> <li>Alternate Furrow irrigation</li> <li>Mulching in sugarcane</li> </ul> | <ul style="list-style-type: none"> <li>Seed through KSSC and NFSM</li> <li>Adequate supply of electricity/diesel should be ensured by the Govt. agencies.</li> </ul> |
|  |                          | Sorghum Fodder-Wheat                  | Pearl millet-Wheat                                |   |   |  |  |
|  |                          | Sugarcane-Ratoon-Wheat                | No change required                                |   |   |  |  |

| Condition  | Major Farming situation  | Normal Crop/cropping system           | Change in crop/cropping system | Suggested Contingency measures   |   |
|--|--------------------------|---------------------------------------|--------------------------------|--|---|
|  |                          |                                       |                                | Agronomic measures   | Remarks on Implementation   |
| Limited release of water in canals due to low rainfall | Up land sandy loam soils | Rice (Basmati)-Wheat                  | No change                      | <ul style="list-style-type: none"> <li>Light irrigation with tube well water at critical stages only e.g CRI, Tillering &amp;.Flowering stage</li> <li>Follow alternate wetting and</li> </ul> | <ul style="list-style-type: none"> <li>Adequate supply of electricity/ diesel should be ensured by</li> </ul> |
|  |                          | Sorghum (Fodder)/ Maize-Potato/ Wheat | No change                      |  |   |
|  |                          | Sugarcane +cucurbits –Ratoon-         | No change                      |  |   |

| Condition                | Suggested Contingency measures |                             |                                |  |   |
|--------------------------|--------------------------------|-----------------------------|--------------------------------|--|---|
|                          | Major Farming situation        | Normal Crop/cropping system | Change in crop/cropping system | Agronomic measures   | Remarks on Implementation   |
| Low land clay loam soils |                                | Wheat                       |                                | drying schedule of irrigation in rice<br>• Alternate Furrow irrigation<br>• Mulching in sugarcane/ maize   | the Govt. agencies.   |
|                          |                                | Rice-wheat                  | No change                      | • Light irrigation with tube well water at critical stages only e.g CRI, Tillering & Flowering stage<br>• Follow alternate wetting and drying schedule of irrigation in rice<br>• Alternate Furrow irrigation<br>• Mulching in sugarcane | • Supply of inter cultural implements through RKV<br>• Adequate supply of electricity/diesel should be ensured by the Govt. agencies. |
|                          |                                | Sorghum Fodder-Wheat        | No change                      |  |   |
|                          |                                | Sugarcane-Ratoon-Wheat      | No change                      |  |   |

| Condition  | Suggested Contingency measures                    |                             |                                   |   |   |
|--|---|-----------------------------|-----------------------------------|---|---|
|  | Major Farming situation                           | Normal 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 | Up land tube well irrigated canal sandy loam soil | Basmati rice                | Maize/Arabic Rice                 | • Limited irrigation<br>• Alternate Furrow irrigation<br>• Drip irrigation<br>• Mulching                                  | • Seed through KSSC and NFSM<br>• Supply of inter cultural implements through RKVY<br>• |
|  |   | Sorghum/ Maize              | Pearl millet /Pigeonpea/Blackgram |   |   |
|  |   | Sugarcane +cucurbits        | Sugarcane                         |   |   |
|  | Low land tube well irrigated canal clay loam soil | Rice                        | Pearl millet/Blackgram/Greengram  | • Limited irrigation<br>• Alternate Furrow irrigation<br>• Drip irrigation<br>• Mulching<br>• Alternate furrow irrigation | • Seed through KSSC and NFSM<br>• Harvesting and threshing implements through RKVY      |
|  |   | Sorghum Fodder              | Pearl millet/Sorghum Fodder       |   |   |
|  |   | Sugarcane + cucurbits       | Sugarcane                         |   |   |
| Condition  | Major Farming situation                           | Normal Crop/cropping system | Change in crop/cropping system    | Agronomic measures  | Remarks on Implementation   |

| Condition  | Suggested Contingency measures |                             |                                |                    |                           |
|--|--------------------------------|-----------------------------|--------------------------------|--------------------|---------------------------|
|  | Major Farming situation        | Normal 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 | 1) Farming situation:          | Cropping system 1:          | NA                             | NA                 | NA                        |

| Condition   | Suggested Contingency measures                   |                             |   |   |   |
|---|--|-----------------------------|---|---|---|
|   | Major Farming situation                          | Normal Crop/cropping system | Change in crop/cropping system                                | Agronomic measures  | Remarks on Implementation   |
| Insufficient groundwater recharge due to low rainfall | Upland tube well irrigated canal sandy loam soil | Basmati rice                | Maize/Arabic Rice /Vegetables (Tomato, Brinjal, cucrbits etc) | <ul style="list-style-type: none"> <li>Limited irrigation</li> <li>Alternate Furrow irrigation</li> <li>Drip irrigation</li> <li>Mulching</li> </ul>                                      | <ul style="list-style-type: none"> <li>Seed through KSSC and NFSM</li> <li>Harvesting and threshing implements through RKVY</li> </ul>  |
|   |  | Sorghum/Maize               | Pearl millet /Pigeonpea/Blackgram                             |   |   |
|   |  | Sugarcane +cucurbits        | Sugarcane   |   |   |
|   | Lowland tube well irrigated canal clay loam soil | Rice                        | Pearl millet/Blackgram/Greengram                              | <ul style="list-style-type: none"> <li>Limited irrigation</li> <li>Alternate Furrow irrigation</li> <li>Drip irrigation</li> <li>Mulching</li> <li>Alternate furrow irrigation</li> </ul> | <ul style="list-style-type: none"> <li>Seed through KSSC and NFSM</li> <li>Micro/drip/sprinkler irrigation under govt. schemes</li> <li>Supply of inter cultural implements through RKVY</li> </ul> |
|   |  | Sorghum Fodder              | Pearl millet/Sorghum Fodder                                   |   |   |
|   |  | Sugarcane + cucurbits       | Sugarcane   |   |   |

## 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 |                               |                  |   |                      |
| Maize + Blackgram /Greengram /cucurbits                           | Provide drainage              | Provide drainage | Drain out & Harvesting at physiological maturity stage                                | Shift to safer place |
| Sugarcane +Cucurbits  | Provide drainage              | Provide drainage | Drain out & Harvesting at physiological maturity stage and Picking of cucurbits crop. | Shift to safer place |

|   |   |                                     |   |   |
|---|---|-------------------------------------|---|---|
| Blackgram or Greengram                                      | Provide drainage  | Provide drainage                    | Drain out & Harvesting at physiological maturity stage.                               | Safe storage against storage pest and disease |
| <b>Horticulture</b>   |   |                                     |   |   |
| Okra  | Provide drainage  | Provide drainage                    | Picking of vegetables at physiological maturity stage                                 | Shift to safer place                          |
| Cucurbits   | Provide drainage  | Provide drainage                    | Drain out & Harvesting at physiological maturity stage and picking of cucurbits crop. | Shift to safer place                          |
| Brinjal   | Provide drainage  | Provide drainage                    | Picking at physiological maturity stage   | Shift to safer place                          |
| Tomato  | Provide drainage  | Provide drainage                    | Picking at physiological maturity stage   | Shift to safer place                          |
| Mango   | -   | -                                   | Spray of 2% urea+fungicide  | -   |
| Muskmelon   | -   | -                                   | Spray of 2% urea+fungicide  | -   |
| <b>Heavy rainfall with high speed winds in a short span</b> |   |                                     |   |   |
| Sugarcane   | <ul style="list-style-type: none"> <li>• Earthing</li> <li>• Tying</li> <li>• Use Wind breaks</li> </ul>                        | Provide drainage<br>Use Wind breaks | Drain out & Harvesting at physiological maturity stage<br>Use Wind breaks             | Shift to safer place                          |
| Maize/Sorghum   | Provide drainage<br>Use Wind breaks   | Provide drainage<br>Use Wind breaks | Drain out & Harvesting at physiological maturity stage<br>Use Wind breaks             | Shift to safer place                          |
| Blackgram/ Greengram  | Provide drainage<br>Use Wind breaks   | Provide drainage<br>Use Wind breaks | Drain out & Harvesting at physiological maturity stage<br>Use Wind breaks             | Shift to safer place                          |
| Rice basmati  | Provide drainage<br>Use Wind breaks   | Provide drainage<br>Use Wind breaks | Drain out & Harvesting at physiological maturity stage<br>Use Wind breaks             | Shift to safer place                          |
| Pigeonpea   | <ul style="list-style-type: none"> <li>• Provide drainage</li> <li>• Sowing on raised bed</li> <li>• Use Wind breaks</li> </ul> | Provide drainage<br>Use Wind breaks | Drain out & Harvesting at physiological maturity stage<br>Use Wind breaks             | Shift to safer place                          |
| <b>Horticulture</b>   |   |                                     |   |   |
| Okra  | <ul style="list-style-type: none"> <li>• Provide drainage</li> <li>• Sowing on raised bed</li> <li>• Use Wind breaks</li> </ul> | Provide drainage<br>Use Wind breaks | Drain out & Harvesting at physiological maturity stage<br>Use Wind breaks             | Shift to safer place                          |
| Brinjal   | <ul style="list-style-type: none"> <li>• Provide drainage</li> <li>• Sowing on raised bed</li> <li>• Use Wind breaks</li> </ul> | Provide drainage<br>Use Wind breaks | Drain out & Harvesting at physiological maturity stage<br>Use Wind breaks             | Shift to safer place                          |
| Tomato  | <ul style="list-style-type: none"> <li>• Provide drainage</li> </ul>  | Provide drainage                    | Drain out & Harvesting at physio-   | Shift to safer place                          |

|   |   |  |   |                      |
|---|---|--|---|----------------------|
|   | <ul style="list-style-type: none"> <li>• Sowing on raised bed</li> <li>• Use Wind breaks</li> </ul>                             | Use Wind breaks                                  | logical maturity stage<br>Use Wind breaks                                 |                      |
| Cauliflower   | <ul style="list-style-type: none"> <li>• Provide drainage</li> <li>• Sowing on raised bed</li> <li>• Use Wind breaks</li> </ul> | Provide drainage<br>Use Wind breaks              | Drain out & Harvesting at physiological maturity stage<br>Use Wind breaks | Shift to safer place |
| Cucurbits   | <ul style="list-style-type: none"> <li>• Provide drainage</li> <li>• Sowing on raised bed</li> <li>• Use Wind breaks</li> </ul> | Provide drainage<br>Use Wind breaks              | Drain out & Harvesting at physiological maturity stage<br>Use Wind breaks | Shift to safer place |
| Mango   | Use Wind breaks   | Use of NAA spray<br>Use Wind breaks              | Use of NAA spray<br>Use Wind breaks                                       | -                    |
| Muskmelon   | Use Wind breaks   | Use of NAA spray<br>Use Wind breaks              | Use of NAA spray<br>Use Wind breaks                                       | -                    |
| <b>Outbreak of pests and diseases due to unseasonal rains</b> |   |  |   |                      |
| Rice basmati  | Need based plant protection IPDM for Rice/pluses  | Need based plant protection IPDM for Rice/pluses | Do not use Hazardous pesticide at maturity stage                          | Shift to safer place |
| Sugarcane   |   |  |   |                      |
| Sorghum fodder  |   |  |   |                      |
| Blackgram/ Greengram  |   |  |   |                      |
| Pigeonpea   |   |  |   |                      |
| <b>Horticulture</b>   |   |  |   |                      |
| Okra  | Need based plant protection IPDM for Rice/pluses  | Need based plant protection IPDM for Rice/pluses | Do not use Hazardous pesticide at maturity stage                          | Shift to safer place |
| Brinjal   |   |  |   |                      |
| Tomato  |   |  |   |                      |
| Cucurbits   |   |  |   |                      |
| Cauliflower   |   |  |   |                      |

## 2.3 Floods

| Condition  | Suggested contingency measure  |  |  |                      |
|--|--|--|--|----------------------|
|  | Seedling / nursery stage   | Vegetative stage   | Reproductive stage   | At harvest           |
| <b>Transient water logging/<br/>partial inundation</b> |  |  |  |                      |
| Rice basmati   | <ul style="list-style-type: none"> <li>• Re sowing of nursery</li> <li>• Direct sowing of rice</li> <li>• Sowing of nursery on raised bed</li> </ul> | <ul style="list-style-type: none"> <li>• Provide drainage</li> </ul> | <ul style="list-style-type: none"> <li>• Provide drainage</li> </ul> | Shift to safer place |
| Sugarcane  | <ul style="list-style-type: none"> <li>• Direct sowing</li> </ul>  | <ul style="list-style-type: none"> <li>• Provide drainage</li> </ul> | <ul style="list-style-type: none"> <li>• Provide drainage</li> </ul> | Shift to safer place |

|  |  |                    |                         |                      |
|--|--|--------------------|-------------------------|----------------------|
|  |  |                    | •                       |                      |
| Sorghum fodder                                     | • Direct sowing  | • Provide drainage | • Provide drainage<br>• | Shift to safer place |
| Blackgram Greengram                                | • Direct sowing  | • Provide drainage | • Provide drainage<br>• | Shift to safer place |
| Pigeonpea  | • Direct sowing  | • Provide drainage | • Provide drainage      | Shift to safer place |
| <b>Horticulture</b>                                |  |                    |                         |                      |
| Okra   | • Re sowing of nursery<br>• Sowing of nursery on raised bed<br>• Re transplanting      | • Provide drainage | • Provide drainage      | Shift to safer place |
| Brinjal  | • Re sowing of nursery<br>• Sowing of nursery on raised bed<br>• Re transplanting      | • Provide drainage | • Provide drainage      | Shift to safer place |
| Tomato   | • Re sowing of nursery<br>• Sowing of nursery on raised bed<br>• Re transplanting      | • Provide drainage | • Provide drainage      | Shift to safer place |
| <b>Continuous submergence for more than 2 days</b> |  |                    |                         |                      |
| <b>Rice</b>  | • Re sowing of nursery<br>• Direct sowing of rice<br>• Sowing of nursery on raised bed | • Provide drainage | • Provide drainage      | Shift to safer place |
| <b>Horticulture</b>                                |  |                    |                         |                      |
| Okra   | • Re sowing of nursery<br>• Sowing of nursery on raised bed<br>• Re transplanting      | • Provide drainage | • Provide drainage      | Shift to safer place |
| Brinjal  | • Re sowing of nursery<br>• Sowing of nursery on raised bed<br>• Re transplanting      | • Provide drainage | • Provide drainage      | Shift to safer place |
| Tomato   | • Re sowing of nursery<br>• Sowing of nursery on raised bed<br>• Re transplanting      | • Provide drainage | • Provide drainage      | Shift to safer place |
| Mango  | • Re sowing of nursery<br>• Sowing of nursery on raised bed<br>• Re transplanting      | • Provide drainage | • Provide drainage      | Shift to safer place |
| <b>Sea water intrusion<sup>3</sup></b>             | NA   | NA                 | NA                      | NA                   |



## 2.4 Extreme events: Heat wave / Cold wave/Frost/ Hailstorm /Cyclone/Fog

| Extreme event type   | Suggested contingency measure   |   |   |                               |
|----------------------|---|---|---|-------------------------------|
|                      | Seedling / nursery stage  | Vegetative stage  | Reproductive stage  | At harvest                    |
| <b>Heat Wave</b>     |   |   |   |                               |
| Rice basmati         | <ul style="list-style-type: none"> <li>• Re sowing of nursery</li> <li>• Light and frequent irrigation during night</li> </ul>  | <ul style="list-style-type: none"> <li>• Irrigation interval should be decreased</li> </ul> | <ul style="list-style-type: none"> <li>• Irrigation interval should be decreased</li> </ul> | Light and frequent irrigation |
| Sugarcane            | <ul style="list-style-type: none"> <li>• Mulching</li> </ul>  | <ul style="list-style-type: none"> <li>• Irrigation interval should be decreased</li> </ul> | <ul style="list-style-type: none"> <li>• Irrigation interval should be decreased</li> </ul> | Light and frequent irrigation |
| Sorghum fodder       | <ul style="list-style-type: none"> <li>• Re sowing</li> </ul>   | <ul style="list-style-type: none"> <li>• Irrigation interval should be decreased</li> </ul> | <ul style="list-style-type: none"> <li>• Irrigation interval should be decreased</li> </ul> | Make silage                   |
| Blackgram /Greengram | <ul style="list-style-type: none"> <li>• Re sowing</li> <li>• Mulching</li> </ul>   | <ul style="list-style-type: none"> <li>• Light irrigation for survival</li> </ul>           | <ul style="list-style-type: none"> <li>•Light irrigation for survival</li> </ul>            | •Pod picking                  |
| Pigeonpea            | <ul style="list-style-type: none"> <li>• Re sowing</li> <li>• Mulching</li> </ul>   | <ul style="list-style-type: none"> <li>• Light irrigation for survival</li> </ul>           | <ul style="list-style-type: none"> <li>•Light irrigation for survival</li> </ul>            | •Pod picking                  |
| <b>Horticulture</b>  |   |   |   |                               |
| Okra                 | <ul style="list-style-type: none"> <li>• Re sowing of nursery</li> <li>• Re transplanting</li> <li>• Mulching</li> <li>• Light watering during night</li> </ul>                   | <ul style="list-style-type: none"> <li>• Light irrigation for survival</li> </ul>           | <ul style="list-style-type: none"> <li>•Light irrigation for survival</li> </ul>            | •Harvesting of fruits         |
| Brinjal              | <ul style="list-style-type: none"> <li>• Re sowing of nursery</li> <li>• Re transplanting</li> <li>• Mulching</li> <li>• Light watering during night</li> </ul>                   | <ul style="list-style-type: none"> <li>• Light irrigation for survival</li> </ul>           | <ul style="list-style-type: none"> <li>•Light irrigation for survival</li> </ul>            | •Harvesting of fruits         |
| Tomato               | <ul style="list-style-type: none"> <li>• Re sowing of nursery</li> <li>• Re transplanting</li> <li>• Mulching of nursery beds</li> <li>• Light irrigation during night</li> </ul> | <ul style="list-style-type: none"> <li>• Light irrigation for survival</li> </ul>           | <ul style="list-style-type: none"> <li>•Light irrigation for survival</li> </ul>            | •Harvesting of fruits         |
| Mango                | <ul style="list-style-type: none"> <li>• Spray of water</li> </ul>  | <ul style="list-style-type: none"> <li>•Spray of water</li> </ul>                           | <ul style="list-style-type: none"> <li>•Spray of water</li> </ul>                           | -                             |
| Muskmelon            | <ul style="list-style-type: none"> <li>• Spray of water</li> </ul>  | <ul style="list-style-type: none"> <li>•Spray of water</li> </ul>                           | <ul style="list-style-type: none"> <li>•Spray of water</li> </ul>                           | -                             |
| <b>Cold wave</b>     |   |   |   |                               |
| Wheat                | Light irrigation  | Light irrigation  | Light irrigation  | Light irrigation              |
| Sugarcane            | <ul style="list-style-type: none"> <li>• Mulching</li> </ul>  | <ul style="list-style-type: none"> <li>•Light irrigation for survival</li> </ul>            | --  | •Harvesting of cane           |
| <b>Horticulture</b>  |   |   |   |                               |
| Tomato               | Grow some inter crop  | <ul style="list-style-type: none"> <li>• Light Sprinkler irrigation</li> </ul>              | --  | •Harvesting of fruits         |

|                                |   |   |   |  |
|--------------------------------|---|---|---|--|
| Pea                            | Grow some inter crop  | • Light Sprinkler irrigation  | --  | •Harvesting of fruits  |
| <b>Potato</b>                  | Grow some inter crop  | • Light Sprinkler irrigation  | --  | •Harvesting  |
| <b>Frost</b>                   |   |   |   |  |
| Sugarcane                      | • Light irrigation  | •Light irrigation   | •Light irrigation   | •Harvesting of cane  |
| Pigeonpea                      | • Grow as inter crop<br>• Smoke at night  | • Light Sprinkler irrigation<br>• Smoke at night  | • Light irrigation for survival<br>• Smoke at night   | Smoke at night   |
| <b>Horticulture</b>            |   |   |   |  |
| Potato                         | •Light irrigation for survival<br>•Smoke at night   | •Light irrigation for survival<br>•Smoke at night   | •Light irrigation for survival<br>•Smoke at night   | •Harvesting  |
| Tomato                         | •Light irrigation for survival<br>•Smoke at night   | •Light irrigation for survival<br>•Smoke at night   | •Light irrigation for survival<br>•Smoke at night   | •De halming  |
| <b>Pea</b>                     | •Light irrigation for survival<br>•Smoke at night   | •Light irrigation for survival<br>•Smoke at night   | •Light irrigation for survival<br>•Smoke at night   | •Harvesting  |
| Mango                          | • Irrigation &Smoking during night  | •Irrigation &Smoking during night   | •Irrigation &Smoking during night   |  |
| Muskmelon                      | •Irrigation &Smoking during night   | •Irrigation &Smoking during night   | •Irrigation &Smoking during night   |  |
| <b>Horticulture</b>            |   |   |   |  |
| <b>All the Vegetable crops</b> | Re sowing   | Re sowing of Catch crop   | Harvest for fodder  | Pre Harvesting   |
| <b>All the Fruit crops</b>     | <ul style="list-style-type: none"> <li>• Use anti hail net</li> <li>• Spray of fungicide with 2% urea solution</li> </ul> | <ul style="list-style-type: none"> <li>• Use anti hail net</li> <li>• Spray of fungicide with 2% urea solution</li> </ul> | <ul style="list-style-type: none"> <li>• Use anti hail net</li> <li>• Spray of fungicide with 2% urea solution</li> </ul> | <ul style="list-style-type: none"> <li>•Harvest the damaged fruits</li> <li>•Spray of fungicide with 2% urea solution</li> </ul> |
| <b>Fog</b>                     |   |   |   |  |

## 2.5 Contingent strategies for Livestock, Poultry & Fisheries

### 2.5.1 Livestock

|                               | Suggested contingency measures  |   |   |
|-------------------------------|---|---|---|
|                               | Before the event  | During the event  | After the event   |
| <b>Drought</b>                |   |   |   |
| Feed and fodder availability  | <ul style="list-style-type: none"> <li>• Fodder crop Insurance</li> <li>• Making of feed blocks</li> <li>• Encourage farmers to allocate some lands for cultivating perennial fodder (Napier grass, Subabul), specially on bunds and wasteland</li> <li>• Establishing fodder banks, encouraging fodder crops in irrigated area</li> <li>• Making silage or hay of excess fodder.</li> <li>• Statistics regarding feed/fodder availability and requirement should be updated by the concerned deptt.</li> <li>• Seed production and development of drought resistant crops and their varieties of fodder crops.</li> <li>• Encourage farmers to adopt sprinkler irrigation system.</li> <li>• Training to the farmers and extension functionaries for production and long term storage of feed and fodder.</li> </ul> | <ul style="list-style-type: none"> <li>• Utilizing fodder from perennial trees/shrubs/fodder bank reserves for small ruminant.</li> <li>• Utilizing stored fodder as silage, hay, feed blocks &amp; mixture etc.</li> <li>• Migration of herd /flock to other places.</li> <li>• Establishment of communication and linkage with other state agencies.</li> </ul> | <ul style="list-style-type: none"> <li>• Availing crop insurance</li> <li>• Cultivation of fast growing green fodder crops.</li> <li>• Development of drought resistance fodder.</li> <li>• Increase the no. of Fodder Banks for future use.</li> </ul> |
| Drinking water                | <ul style="list-style-type: none"> <li>• Preserving water in the pond/tank for drinking purpose.</li> <li>• Excavation of bore well/creation of tanks or ponds.</li> <li>• De-silting of village ponds on regular basis and adopt water harvesting techniques through water shed approach.</li> <li>• Filling of the ponds with canal/tube well water during lean period.</li> </ul>  | <ul style="list-style-type: none"> <li>• Using preserved water in the tanks for drinking</li> <li>• Available ground water should be used for drinking on priority basis.</li> </ul>  | <ul style="list-style-type: none"> <li>• Recharge of well/ Tanks etc.</li> </ul>  |
| Health and disease management | <ul style="list-style-type: none"> <li>• Farmers should be encouraged to avail Livestock insurance</li> <li>• Training to livestock owners regarding natural</li> </ul>   | <ul style="list-style-type: none"> <li>• Conduction mass animal health camp and treating the effected animals.</li> <li>• Mass campaigning though different media</li> </ul>  | <ul style="list-style-type: none"> <li>• Availing insurance benefits.</li> <li>• Followed standard Livestock</li> </ul>   |

|                               |  |   |  |
|-------------------------------|--|---|--|
|                               | <p>calamities.</p> <ul style="list-style-type: none"> <li>• Veterinary preparedness with medicines and vaccines.</li> <li>• Vaccination</li> </ul>   | <p>regarding possible outbreak of diseases and their management.</p>  | <p>management practices.</p> <ul style="list-style-type: none"> <li>• Proper health care &amp; treatment.</li> </ul>   |
| <b>Floods</b>                 |  |   |  |
| Feed and fodder availability  | <ul style="list-style-type: none"> <li>• Fodder crop Insurance</li> <li>• Making of feed blocks</li> <li>• Encourage farmers to allocate some lands for cultivating perennial fodder (Napier grass, Subabul), specially on bunds and wasteland</li> <li>• Establishing fodder banks, encouraging fodder crops.</li> <li>• Making silage or hay of excess fodder and that should be stored on up land.</li> <li>• Statistics regarding feed/fodder availability and requirement should be updated by the concerned deptt.</li> <li>• Seed production and development of crops and their varieties of fodder crops for water logged conditions.</li> <li>• Training to the farmers and extension functionaries for production and long term storage of feed and fodder.</li> </ul> | <ul style="list-style-type: none"> <li>• Utilizing fodder from perennial tress/shrubs/fodder bank reserves.</li> <li>• Use of feed mixture/block hay etc</li> <li>• Migration of flock /herds</li> <li>• Establishment of communication and linkage with other state agencies</li> </ul>                                      | <ul style="list-style-type: none"> <li>• Availing crop insurance</li> <li>• Cultivation of fast growing green fodder crops</li> </ul>  |
| Drinking water                | <ul style="list-style-type: none"> <li>• Making suitable provision for safe drinking surface water including excavation of bore well/hand pump (India mark—II) at community level.</li> <li>• Make farmers aware not to use contaminated/ flood water for drinking purpose.</li> </ul>   | <ul style="list-style-type: none"> <li>• Contaminated flood water should not be used for drinking.</li> </ul>   | <ul style="list-style-type: none"> <li>• Open sources of drinking water (tank/well ) should be further treated with potassium per magnate.</li> </ul>  |
| Health and disease management | <ul style="list-style-type: none"> <li>• Live stock Insurance</li> <li>• Training to livestock owners regarding natural calamities.</li> <li>• Veterinary preparedness with medicines and vaccines.</li> <li>• Vaccination</li> <li>•</li> </ul>   | <ul style="list-style-type: none"> <li>• Conduction mass animal health camp and treating the effected animals.</li> <li>• Training to livestock owners regarding natural calamities.</li> <li>• Establishment of Co-ordination with other Agencies.</li> <li>• Use of mass media to spread expat advice</li> <li>•</li> </ul> | <ul style="list-style-type: none"> <li>• Culling sick animals</li> <li>• Availing insurance benefits.</li> <li>• Culling unproductive livestock</li> <li>• Proper disposal of corpse of dead bodies to prevent the spread of contagious diseases.</li> </ul> |
| <b>Cyclone</b>                | <b>NA</b>  | <b>NA</b>   | <b>NA</b>  |

|                                |  |  |   |
|--------------------------------|--|--|---|
|                                |  |  |   |
| <b>Heat wave and cold wave</b> |  |  |   |
| Shelter/environment management | <ul style="list-style-type: none"> <li>• Avoid use of GI sheet for roofing in the animal shed</li> <li>• Create adequate sources for additional supply of water to protect the animals from heat waves.</li> <li>• Establishment of modern shelter sheds.</li> <li>• As far as possible grow shade trees such as Neem, Pilkhan, Karanj etc near the animal sheds.</li> <li>• Make provision for adequate no. of fans/coolers /heaters according to the situation, if possible</li> </ul> | <ul style="list-style-type: none"> <li>• Provide the thatches/ tarpaulins/ rags in the animal sheds to protect against direct entry of hot/ cold waves</li> <li>• Provide proper bedding to prevent from cold and proper ventilation to prevent from heat.</li> <li>• Provide drinking water to animal frequently during heat wave</li> <li>• Watch the forecast of weather department.</li> <li>• As for as possible the animal should be allowed to wallow in pounds/ canals/ river or give bath once or twice in a day during heat waves</li> </ul> | <ul style="list-style-type: none"> <li>• Repair and maintenance of additional facilities</li> </ul>   |
| Health and disease management  | <ul style="list-style-type: none"> <li>• Insure the animals</li> <li>• Training to livestock owners/ para-vets regarding preventive measure against extreme weather conditions</li> <li>• Veterinary preparedness with medicines and vaccines etc.</li> <li>• Vaccination against FMD &amp; Cold</li> </ul>  | <ul style="list-style-type: none"> <li>• Organize village level animal health camps</li> <li>• Consult veterinary officer immediately if any adverse symptoms are noticed</li> <li>• Use of ITKs for food supplements</li> </ul>   | <ul style="list-style-type: none"> <li>• Proper after care of animals.</li> <li>• Availing insurance benefits.</li> <li>• Proper disposal of corpse of dead bodies to prevent the spread of contagious diseases.</li> </ul> |

<sup>s</sup> based on forewarning wherever available

## 2.5.2 Poultry

|                               | Suggested contingency measures   |  |   | Convergence/linkages with ongoing programs, if any |
|-------------------------------|--|--|---|--|
|                               | Before the event   | During the event   | After the event   |  |
| <b>Drought</b>                |  |  |   |  |
| Shortage of feed ingredients  | <ul style="list-style-type: none"> <li>• Making and storage of feed concentrates</li> <li>• Awareness regarding traditional feed banks.</li> <li>• Feed requirement data should be generated</li> <li>• Prepare the feed requirement data base of poultry farm.</li> <li>• Store the feed ingredients</li> </ul> | <ul style="list-style-type: none"> <li>• Use of feed concentrates/ mixture/blocks etc</li> <li>• Establishment of communication with other state agencies.</li> <li>• Use of locally available feed recourses.</li> <li>• Import the feed recourse form other states.</li> </ul> | <ul style="list-style-type: none"> <li>• Availing insurance</li> <li>• Increase the no. of feed banks for future use</li> </ul>   |  |
| Drinking water                | <ul style="list-style-type: none"> <li>• Making extra facility for drinking water.</li> <li>• Repair &amp; maintenance of water resources</li> </ul>   | <ul style="list-style-type: none"> <li>• Frequent supply of drinking water</li> </ul>  |   |  |
| Health and disease management | <ul style="list-style-type: none"> <li>• Veterinary preparedness with medicines and vaccines.</li> <li>• Vaccination</li> <li>• Training to poultry Growers regarding natural calamities.</li> </ul>   | <ul style="list-style-type: none"> <li>• Treatment of affected poultry birds</li> </ul>  | <ul style="list-style-type: none"> <li>• Culling of flock</li> <li>• Availing insurance benefits</li> <li>• Proper disposal of corpse of dead bodies to prevent the pared of contagious diseases</li> </ul> |  |
| <b>Floods</b>                 |  |  |   |  |
| Shortage of feed ingredients  | <ul style="list-style-type: none"> <li>• Sufficient quantity of feed ingredients should be stored</li> </ul>   | <ul style="list-style-type: none"> <li>• Use of stored feed in balanced form</li> <li>• Prevent the feed from moisture.</li> </ul>   | <ul style="list-style-type: none"> <li>• Cleaning of feed store &amp; repair if any.</li> <li>• Moist feed should be dried &amp; treated as per requirement</li> </ul>                                      |  |

|                                |   |  |  |   |
|--------------------------------|---|--|--|---|
| Drinking water                 | <ul style="list-style-type: none"> <li>• Make provision of ground water for drinking</li> </ul>   | <ul style="list-style-type: none"> <li>• Use only Ground water obtained from India Mrka II or Tubewell</li> </ul>  | <ul style="list-style-type: none"> <li>• Repair, maintenance and cleaning of water recourse</li> <li>• Sanitation of open Wells</li> </ul>   |   |
| Health and disease management  | <ul style="list-style-type: none"> <li>• Veterinary preparedness with medicines and vaccines</li> <li>• Vaccination</li> </ul>  | <ul style="list-style-type: none"> <li>• Migration of flock if required</li> <li>• Treatment</li> </ul>  | <ul style="list-style-type: none"> <li>• Availing insurance benefits.</li> <li>• Culling of unproductive flock</li> </ul>  |   |
| <b>Cyclone</b>                 | NA  | NA   | NA   |   |
| Shortage of feed ingredients   | <ul style="list-style-type: none"> <li>• Storage and making of feed concentrates</li> <li>• Proper feed requirement data base</li> </ul>  | <ul style="list-style-type: none"> <li>• Establishment of communication with other state agencies</li> <li>• Use of stored feed ingredient</li> <li>• Import of feed from other areas</li> </ul>   | <ul style="list-style-type: none"> <li>• Repair and maintenance of feed store</li> </ul>   |   |
| Drinking water                 | <ul style="list-style-type: none"> <li>• Make provision of ground water for drinking</li> </ul>   | <ul style="list-style-type: none"> <li>• Use only Ground water obtained from India Mrka II or Tubewell</li> </ul>  | <ul style="list-style-type: none"> <li>• Repair and maintenance of water recourse</li> </ul>   |   |
| Health and disease management  | <ul style="list-style-type: none"> <li>• Training to poultry growers regarding natural calamities.</li> <li>• Veterinary preparedness with medicines and vaccines.</li> </ul>   | <ul style="list-style-type: none"> <li>• Treatment of injured poultry birds.</li> </ul>  | <ul style="list-style-type: none"> <li>• Culling of flock</li> <li>• Availing insurance benefits.</li> <li>• Proper disposal of corpse of dead bodies to prevent the pared of contagious diseases.</li> </ul>            |   |
| <b>Heat wave and cold wave</b> |   |  |  |   |
| Shelter/environment management | <ul style="list-style-type: none"> <li>• Making sufficient provision of shelter to protect live stock from heat and cold waves</li> <li>• Establishment of alternate resource for water supply.</li> <li>• Modern shelter sheds.</li> </ul> | <ul style="list-style-type: none"> <li>• Keep the birds in appropriate shelter</li> <li>• Provide proper bedding to prevent from cold and proper ventilated to prevent from heat</li> <li>• Provide drinking water to birds frequently.</li> <li>• Adopted proper management practices.</li> <li>• Watch the fore cast of weather department.</li> </ul> | <ul style="list-style-type: none"> <li>• Making of modern shelter sheds</li> <li>• Increase the plantation of trees</li> </ul>   |   |
| Health and disease management  | <ul style="list-style-type: none"> <li>• Insurance</li> <li>• Veterinary preparedness with medicines and vaccines</li> <li>• Training to poultry growers regarding natural calamities</li> </ul>  | <ul style="list-style-type: none"> <li>• Provide proper treatment as per requirement</li> <li>• Treatment of injured poultry</li> </ul>  | <ul style="list-style-type: none"> <li>• Availing insurance benefits</li> <li>• Culling of unproductive flock</li> <li>• Proper disposal of corpse of dead bodies to prevent the pared of contagious diseases</li> </ul> | <ul style="list-style-type: none"> <li>•</li> </ul> |

<sup>a</sup> based on forewarning wherever available

## 2.5.3 Fisheries/ Aquaculture

|  | Suggested contingency measures  |   |  |
|--|---|---|--|
|  | Before the event  | During the event  | After the event  |
| <b>1) Drought</b>  |   |   |  |
| A. Capture   |   |   |  |
| Marine   | –   | –   | –  |
| Inland   |   |   |  |
| (i) Shallow water depth due to insufficient rains/inflow             | <ul style="list-style-type: none"> <li>• Adopt appropriate measures to reduce water seepage or infiltration</li> </ul>  | <ul style="list-style-type: none"> <li>• Harvest the crop partially</li> </ul>  | <ul style="list-style-type: none"> <li>• Re stock</li> </ul>   |
| (ii) Changes in water quality  | <ul style="list-style-type: none"> <li>• Regular observation to check the water quality and remove the pollutants if any.</li> </ul>  | <ul style="list-style-type: none"> <li>• Add oxy-flow to improve oxygen</li> <li>• Churning of pond water</li> </ul>  | <ul style="list-style-type: none"> <li>• Maintain appropriate level of water if possible</li> <li>• Check the water quality and remove the pollutants if any.</li> </ul>   |
| (iii) Any other  | –   | –   | –  |
| B. Aquaculture   |   |   |  |
| (i) Shallow water in ponds due to insufficient rains/inflow          | <ul style="list-style-type: none"> <li>• Adopt appropriate measures to reduce water seepage or infiltration from ponds</li> <li>• Avoid any kinds of water pollution and maintain water pH</li> </ul> | <ul style="list-style-type: none"> <li>• Ensure the Oxygen availability into ponds for the survival of fish</li> <li>• Avoid any kind of water pollution</li> <li>• Add oxy-flow to improve oxygen into ponds.</li> <li>• Churning of pond water</li> </ul> | <ul style="list-style-type: none"> <li>• Maintain appropriate level of water in ponds</li> <li>• Check the water quality and remove the pollutants if any.</li> </ul>  |
| (ii) Impact of salt load build up in ponds / change in water quality | <ul style="list-style-type: none"> <li>• Add some fresh water from other source like cannel etc</li> </ul>  | <ul style="list-style-type: none"> <li>• Add oxy-flow to improve oxygen into ponds.</li> <li>• Churning of pond water</li> <li>• Add fresh water into pond for life saving and to reduce salt load</li> </ul>   | <ul style="list-style-type: none"> <li>• Add fresh water into pond for life saving and to reduce salt load</li> <li>• Maintain appropriate level of water in ponds</li> <li>• Check the water quality and remove the pollutants if any.</li> </ul> |
| (iii) Any other  | –   | –   | --   |
| <b>2) Floods</b>   |   |   |  |
| A. Capture   |   |   |  |
| Marine   | --  | --  | --   |
| Inland   |   |   |  |
| (i) No. of boats / nets/damaged                                      | <ul style="list-style-type: none"> <li>• Boats, nets etc should be taken out from</li> </ul>  | <ul style="list-style-type: none"> <li>• Close supervision of flood condition</li> </ul>  | <ul style="list-style-type: none"> <li>• Damaged boat or nets should be repaired</li> </ul>  |



|   |  |  |   |
|---|--|--|---|
|   | water bodies   |  |   |
| (ii) No. of houses damaged                            | –  | –  | • Repair the damaged house.   |
| (iii) Loss of stock                                   | –  | –  | • Sanitation and proper disposal of corpse  |
| (iv) Changes in water quality                         | • Increase the height of bunds.  | --   | --  |
| (v) Health and diseases                               | --   | • Treatment if possible  | --  |
| <b>B. Aquaculture</b>                                 |  |  |   |
| (i) Inundation with flood water                       | <ul style="list-style-type: none"> <li>• Repair the bunds to prevent the inflow of water</li> <li>• If inflow water is not polluted then place the net at inlet and outlet</li> <li>• Raise the height of bunds</li> <li>• Plan a proper drainage system at farm</li> <li>• Plantation of soil binding plants at bund</li> </ul> | <ul style="list-style-type: none"> <li>• Avoid inflow of flood water from outside.</li> <li>• If inflow water is not polluted that can be permitted to flow through net placed at inlet and outlet of pond.</li> <li>• Fencing of net required in case of overflow to avoid the migration of fish</li> </ul> | <ul style="list-style-type: none"> <li>• Repair the damaged bunds</li> <li>• Check water quality</li> <li>• Change the water if it is polluted</li> </ul>             |
| (ii) Water contamination and changes in water quality | <ul style="list-style-type: none"> <li>• Limeing @300 kg/ha</li> </ul>   | <ul style="list-style-type: none"> <li>• Stop inflow of contaminated water</li> </ul>  | <ul style="list-style-type: none"> <li>• Maintain appropriate level of water in ponds</li> <li>• Check the water quality and remove the pollutants if any.</li> </ul> |
| (iii) Health and diseases                             | <ul style="list-style-type: none"> <li>• Limeing @300 kg/ha</li> <li>• Vaccination</li> </ul>  | <ul style="list-style-type: none"> <li>• Diagnostic measures and provide appropriate medicines</li> </ul>  | <ul style="list-style-type: none"> <li>• Limeing and medication as per requirement</li> <li>• Use Cifex to control ulcerative syndromes</li> </ul>                    |
| (iv) Loss of stock and inputs (feed, chemicals etc)   | <ul style="list-style-type: none"> <li>• Marketable stock should be sold</li> </ul>  | <ul style="list-style-type: none"> <li>• Immediately remove the dead fishes from ponds and do sanitation</li> </ul>  | <ul style="list-style-type: none"> <li>• After sanitation add new stock</li> </ul>  |
| (v) Infrastructure damage (pumps, aerators, huts etc) | <ul style="list-style-type: none"> <li>• Dommageable infrastructures should be secured</li> </ul>  | <ul style="list-style-type: none"> <li>• Do not supplié Electric in flood éd area</li> </ul>   | <ul style="list-style-type: none"> <li>• Repaire and service the damage infrastructure</li> </ul>   |
| (vi) Any other  |  |  |   |
| <b>3. Cyclone / Tsunami</b>                           | NA   | NA   | NA  |
| <b>4. Heat wave and cold wave</b>                     |  |  |   |
| <b>A. Capture</b>                                     |  |  |   |
| <b>B. Aquaculture</b>                                 |  |  |   |
| (i)Changes in pond environment (water                 | <ul style="list-style-type: none"> <li>• Maintain appropriate level of water in ponds <i>i.e.</i> 1.75m in 2m deep ponds</li> </ul>  | <ul style="list-style-type: none"> <li>• Maintain appropriate level of water in ponds <i>i.e.</i> 1.75m in 2m deep</li> </ul>  | <ul style="list-style-type: none"> <li>• Maintain appropriate level of water in ponds <i>i.e.</i> 1.75m in 2m deep ponds</li> </ul>                                   |

|                                  |  |   |  |
|----------------------------------|--|---|--|
| quality)                         | <ul style="list-style-type: none"> <li>• Check the water quality and remove the pollutants if any</li> </ul> | <p>ponds</p> <ul style="list-style-type: none"> <li>• Check the water quality and remove the pollutants if any</li> </ul> | <ul style="list-style-type: none"> <li>• Check the water quality and remove the pollutants if any</li> </ul>                                     |
| i) Health and Disease management | <ul style="list-style-type: none"> <li>• Limeing@300kg/ha</li> </ul>   | <ul style="list-style-type: none"> <li>• Medication as per requirement</li> </ul>   | <ul style="list-style-type: none"> <li>• Remove the dead fishes from ponds and add new stocks to compensate</li> <li>• the production</li> </ul> |
| (ii) Any other                   |  |   |  |

<sup>a</sup> based on forewarning wherever available