

## STATE: MANIPUR

### Agriculture Contingency Plan for District: UKHRUL

| 1.0 District Agriculture profile |  |   |                    |
|----------------------------------|--|---|--------------------|
| 1.1                              | Agro-Climatic/Ecological Zone                                      |   |                    |
|                                  | Agro Ecological Sub Region (ICAR)                                  | North-Eastern Hills (Purvachal), Warm Perhumid Eco-sub region (17.2)  |                    |
|                                  | Agro-Climatic Zone (Planning Commission)                           | Eastern Himalayan Region (II)   |                    |
|                                  | Agro Climatic Zone (NARP)  | Sub-Tropical Hill Zone (NEH-3)  |                    |
|                                  | List all the districts or part thereof falling under the NARP Zone | Myanmar in the East, Chandel District in the south, Imphal East and Senapati District in the west and Nagaland state in the North |                    |
|                                  | Geographic coordinates of district headquarters                    | <b>Latitude</b>   | <b>Longitude</b>   |
|                                  |  | 94E to 94.47E   | 24N to 25.41N      |
|                                  |  | <b>Altitude</b>   | 913 m-3114 m (MSL) |
|                                  | Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS      | ICAR Research Complex for NEH Region, Manipur Centre, Lamphelpat  |                    |
|                                  | Mention the KVK located in the district                            | Ukhrul District, Hundung Village.   |                    |

| 1.2 | Rainfall               | Normal RF(mm) | Normal Rainy days (number) | Normal Onset ( specify week and month) | Normal Cessation (specify week and month) |
|-----|------------------------|---------------|----------------------------|--|---|
|     | SW monsoon (June-Sep): | 830.2         | 55                         | 1 <sup>st</sup> week of June           | 4 <sup>th</sup> week of September         |
|     | NE Monsoon(Oct-Dec):   | 200.8         | 15                         | 1 <sup>st</sup> week of January        | 4 <sup>th</sup> week of December          |
|     | Winter (Jan- March)    | 122.4         | 9                          |  |   |
|     | Summer (Apr-May)       | 316.3         | 21                         |  |   |
|     | Annual                 | 1592.4        | 100                        |  |   |

| 1.3 | Land use pattern of the district (latest statistics) | Geographical area ('000 ha) | Cultivable area ('000 ha) | Forest area ('000 ha) | Land under non-agricultural use ('000 ha) | Permanent Pastures ('000 ha) | Cultivable wasteland ('000 ha) | Land under Misc. tree crops and groves ('000 ha) | Barren and uncultivable land ('000 ha) | Current Fallows ('000 ha) | Other fallows ('000 ha) |
|-----|--|-----------------------------|---------------------------|-----------------------|---|------------------------------|--------------------------------|--|--|---------------------------|-------------------------|
|     | <b>Area ('000 ha)</b>                                | 454.4                       | 20.26                     | 342.6                 | 91.54                                     | -                            | -                              | -  | -                                      | -                         | -                       |

| 1.4 | Major Soils (common names like red sandy loam deep soils (etc.,))* | Area ('000 ha) | Percent (%) of total |
|-----|--|----------------|----------------------|
|     | Red clayey soils   | -              | -                    |
|     | Lateritic soils  | -              | -                    |
|     | Alluvial colluvial soils (partly saline)                           | -              | -                    |
|     | Alluvial-colluvial soils   | -              | -                    |
|     | Lateritic gravelly soils   | -              | -                    |
|     | Rock land and water bodies   | -              | -                    |
|     | Medium deep black soils  | -              | -                    |
|     | Red gravelly loam soils  | -              | -                    |
|     | Red gravelly clay loam soils                                       | -              | -                    |

| 1.5 | Agricultural land use    | Area ('000 ha) | Cropping intensity % |
|-----|--------------------------|----------------|----------------------|
|     | Net sown area            | 13.24          | 153.02               |
|     | Area sown more than once | -              |                      |

|                    |       |  |
|--------------------|-------|--|
| Gross cropped area | 20.26 |  |
|--------------------|-------|--|

|  |  |                               |                       |  |
|--|--|-------------------------------|-----------------------|--|
| <b>1.6</b>   | <b>Irrigation</b>  | <b>Area ('000 ha)</b>         |                       |  |
|  | Net irrigated area   |                               |                       |  |
|  | Gross irrigated area   |                               |                       |  |
|  | Rainfed area   | Entire Area                   |                       |  |
|  | <b>Sources of Irrigation</b>   | <b>Number</b>                 | <b>Area ('000 ha)</b> | <b>% of total irrigated area</b>   |
|  | Canals   |                               |                       |  |
|  | Tanks  |                               |                       |  |
|  | Open wells   |                               |                       |  |
|  | Bore wells   |                               |                       |  |
|  | Lift irrigation schemes  |                               |                       |  |
|  | Micro-irrigation   |                               |                       |  |
|  | Other sources (please specify)   | Stream water                  |                       |  |
|  | Total Irrigated Area   |                               |                       |  |
|  | Pump sets  |                               |                       |  |
|  | No. of Tractors  |                               |                       |  |
|  | <b>Groundwater availability and use* (Data source: State/Central Ground water Department /Board)</b> | <b>No. of blocks/ Tehsils</b> | <b>(%) area</b>       | <b>Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)</b> |
|  | Over exploited   |                               |                       |  |
|  | Critical   |                               |                       |  |
|  | Semi- critical   |                               |                       |  |
|  | Safe   |                               |                       |  |
|  | Wastewater availability and use  |                               |                       |  |
|  | Ground water quality   |                               |                       |  |
| <b>*over-exploited: groundwater utilization &gt; 100%; critical: 90-100%; semi-critical: 70-90%; safe: &lt;70%</b> |  |                               |                       |  |

### 1.7 Area under major field crops & horticulture

|            |                                     |                       |             |        |       |
|------------|-------------------------------------|-----------------------|-------------|--------|-------|
| <b>1.7</b> | <b>Major field crops cultivated</b> | <b>Area ('000 ha)</b> |             |        |       |
|            |                                     | <i>Kharij</i>         | <i>Rabi</i> | Summer | Grand |

|            |  | <b>Irrigated</b>            | <b>Rainfed</b> | <b>Total</b>                    | <b>Irrigated</b> | <b>Rainfed</b>                | <b>Total</b> |   | <b>total</b> |
|------------|--|-----------------------------|----------------|---------------------------------|------------------|-------------------------------|--------------|---|--------------|
|            | Rice                                   | -                           | 13.4           | 13.4                            | -                | -                             | -            | - | 13.4         |
|            | Pea                                    | -                           | -              | -                               | -                | -                             | -            | - | -            |
|            | Potato                                 | -                           | -              | -                               | -                | -                             | -            | - | -            |
|            | Maize                                  | -                           | 1.31           | 1.31                            | -                | -                             | -            | - | 1.31         |
|            | Rapeseed mustard                       | -                           | -              | -                               | -                | -                             | -            | - | -            |
| <b>1.7</b> | <b>Horticulture crops - Fruits</b>     |                             |                |                                 |                  |                               |              |   |              |
|            |  | <b>Total area ('000 ha)</b> |                | <b>Rainfed ('000 ha)</b>        |                  | <b>Irrigated ('000 ha)</b>    |              |   |              |
|            | Banana                                 | 0.14                        |                | 0.14                            |                  | -                             |              |   |              |
|            | Limon                                  | 0.63                        |                | 0.63                            |                  | -                             |              |   |              |
|            | Pineapple                              | 0.18                        |                | 0.18                            |                  | -                             |              |   |              |
|            | Peach/Pear/Plum                        | 0.09                        |                | 0.09                            |                  | -                             |              |   |              |
|            | Passion Fruit                          | 0.67                        |                | 0.67                            |                  | -                             |              |   |              |
|            | Others(specify)                        | 1.13                        |                | 1.13                            |                  | -                             |              |   |              |
| <b>1.7</b> | <b>Horticulture crops - Vegetables</b> | <b>Total area ('000 ha)</b> |                | <b>Irrigated area ('000 ha)</b> |                  | <b>Rainfed area ('000 ha)</b> |              |   |              |
|            | Cabbage                                | 0.16                        |                | -                               |                  | 1.6                           |              |   |              |
|            | Cauliflower                            | 0.03                        |                | -                               |                  | 0.3                           |              |   |              |
|            | Pea                                    | 0.13                        |                | -                               |                  | 1.3                           |              |   |              |
|            | Tomato                                 | 0.02                        |                | -                               |                  | 0.2                           |              |   |              |
|            | Chilies                                | 0.25                        |                | -                               |                  | 2.55                          |              |   |              |

|     |                              |      |   |     |
|-----|------------------------------|------|---|-----|
|     |                              | 0.16 | - | 1.6 |
| 1.7 | Medicinal and Aromatic crops | -    | - | -   |
|     | Plantation crops             | -    | - | -   |
|     | Fodder crops                 | -    | - | -   |
|     | Grazing land                 | -    | - | -   |
|     | Sericulture etc              | -    | - | -   |

| <b>1.8</b>  | <b>Livestock (in number)</b>                                       | <b>Male ('000)</b>      | <b>Female ('000)</b>             | <b>Total ('000)</b> |                           |
|-------------|--|-------------------------|----------------------------------|---------------------|---------------------------|
|             | Non descriptive Cattle (local low yielding)                        | 7.3                     | 11.4                             | 18.8                |                           |
|             | Crossbred cattle   | 3.1                     | 6.9                              | 10.1                |                           |
|             | Non descriptive Buffaloes (local low yielding)                     | 7.5                     | 10.5                             | 18.0                |                           |
|             | Graded Buffaloes   |                         |                                  |                     |                           |
|             | Goat   | 0.37                    | 0.46                             | 0.8                 |                           |
|             | Sheep  | 0.01                    | 0.005                            | 0.01                |                           |
|             | Others (Camel, Pig, Yak etc.)                                      |                         |                                  | 7.75                |                           |
|             | Commercial dairy farms (Number)                                    |                         |                                  |                     |                           |
| <b>1.9</b>  | <b>Poultry</b>   | <b>No. of farms</b>     | <b>Total No. of birds ('000)</b> |                     |                           |
|             | Commercial   |                         |                                  |                     |                           |
|             | Backyard   |                         | 253.963                          |                     |                           |
| <b>1.10</b> | <b>Fisheries (Data source: Chief Planning Officer of district)</b> |                         |                                  |                     |                           |
|             | <b>A. Capture</b>  |                         |                                  |                     |                           |
|             | <b>i) Marine (Data Source:</b>                                     | <b>No. of fishermen</b> | <b>Boats</b>                     | <b>Nets</b>         | <b>Storage facilities</b> |

|  |                        |                        |                   |                                    |  |                        |
|--|------------------------|------------------------|-------------------|------------------------------------|--|------------------------|
| Fisheries Department)  |                        | Mechanized             | Non-mechanized    | Mechanized (Trawl nets, Gill nets) | Non-mechanized (Shore Seines, Stake & trap nets) | (Ice plants etc.)      |
|  |                        |                        |                   |                                    |  |                        |
| ii) Inland (Data Source: Fisheries Department)               | No. Farmer owned ponds |                        | No. of Reservoirs |                                    | No. of village tanks                             |                        |
|  |                        |                        |                   |                                    |  |                        |
| <b>B. Culture</b>  |                        |                        |                   |                                    |  |                        |
|  |                        | Water Spread Area (ha) |                   | Yield (t/ha)                       |  | Production ('000 tons) |
| i) Brackish water (Data Source: MPEDA/ Fisheries Department) |                        |                        |                   |                                    |  |                        |
| ii) Fresh water (Data Source: Fisheries Department)          |                        | 7210                   |                   | 0.08                               |  | 589                    |
| Others   |                        |                        |                   |                                    |  |                        |

### 1.11 Production and Productivity of major crops

| 1.11   | Name of crop | Kharif              |                      | Rabi                |                      | Summer              |                      | Total               |                      | Crop residue as fodder ('000 tons) |
|--|--------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|------------------------------------|
|  |              | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) |                                    |
| <b>Major Field crops (Crops to be identified based on total acreage)</b>         |              |                     |                      |                     |                      |                     |                      |                     |                      |                                    |
|  | Rice         | 31.0                | 2315.6               | -                   | -                    | -                   | -                    | 31.0                | 2315.6               | -                                  |
|  | Pea          | -                   | -                    | -                   | -                    | -                   | -                    | 0.93                | -                    | -                                  |
|  | Potato       | -                   | -                    | -                   | -                    | -                   | -                    | 0.76                | -                    | -                                  |
|  | Maize        | 3.0                 | 2354.0               | -                   | -                    | -                   | -                    | 3.0                 | 2354.0               | -                                  |
| <b>Major Horticultural crops (Crops to be identified based on total acreage)</b> |              |                     |                      |                     |                      |                     |                      |                     |                      |                                    |

|  |             |   |   |       |        |   |   |       |         |   |
|--|-------------|---|---|-------|--------|---|---|-------|---------|---|
|  | Cabbage     | - | - | 2.076 | 13542  | - | - | 2.076 | 13542   | - |
|  | Cauliflower | - | - | 0.231 | 8261.7 | - | - | 0.231 | 8261.7  | - |
|  | Pea         | - | - | 0.746 | 6580   | - | - | 0.746 | 6580    | - |
|  | Tomato      | - | - | 0.122 | 7176.4 | - | - | 0.122 | 7176.4  | - |
|  | Chilies     | - | - | -     | -      | - | - | -     | -       | - |
|  |             | - | - | -     | -      | - | - | 0.317 | 5,839.3 | - |

| 1.12 | Sowing window for 5 major field crops (start and end of normal sowing period) | Paddy     | Maize                             | Cabbage                              | Soybean          | Mustard/ Pea      |
|------|---|-----------|-----------------------------------|--------------------------------------|------------------|-------------------|
|      | Kharif- Rainfed   | March-May | 4 <sup>th</sup> week of April-May | June-July                            | May- June        | -                 |
|      | Kharif-Irrigated  | -         | -                                 | -                                    | -                | -                 |
|      | Rabi- Rainfed   | -         | -                                 | September-October (also cauliflower) | October-November | September-October |
|      | Rabi-Irrigated  | -         | -                                 | -                                    | -                | -                 |

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

|  |                  |  |  |  |
|--|------------------|--|--|--|
|  | Others (specify) |  |  |  |
|--|------------------|--|--|--|

**6 out of 10 years = Regular**

|             |   |   |               |
|-------------|---|---|---------------|
| <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: No  |

**Annexure I**





## 2.0 Strategies for weather related contingencies

### 2.1 Drought

#### 2.1.1 Rainfed situation

| Condition  |                         |                      | Suggested Contingency measures |  |                           |
|--|-------------------------|----------------------|--------------------------------|--|---------------------------|
| Early season drought (delayed onset)                 | Major Farming situation | Crop/cropping system | Change in crop/cropping system | Agronomic measures   | Remarks on implementation |
| Delay by 2 weeks<br><br>3 <sup>rd</sup> week of June | Rainfed uplands         | Rice                 | Rice-mustard                   | Weed control   | -                         |
|  |                         | Groundnut            | Groundnut-Pea                  | Select suitable variety like ICGS-76, JL-24, TAG-24, Construction of water harvesting pond |                           |
|  |                         |                      |                                | Adopt line sowing for inter-cultural operations  |                           |
|  |                         |                      |                                | Earthing up should be done before 40 days of sowing  |                           |
|  |                         | Soybean              | Soybean-mustard                | Sow short duration variety JS-335 or local   |                           |
|  |                         |                      |                                | Avoid top dressing   |                           |
|  |                         |                      |                                | Intercultural operation should be done,  |                           |

| Condition                                     | Major Farming situation | Crop/cropping system | Suggested Contingency measures          |   |                           |
|---|-------------------------|----------------------|---|---|---------------------------|
|   |                         |                      | Change in crop/cropping system          | Agronomic measures  | Remarks on implementation |
| Delay by 4 weeks<br>July 1 <sup>st</sup> week | Rainfed uplands         | Rice                 | Rice-mustard                            | Transplanting of 4 weeks old seedlings with receipt of rains<br>Direct seeding with medium duration varieties like RCM-5 up to 3 <sup>rd</sup> week of July | -                         |
|   |                         | Groundnut            | Maize (local)<br>Soybean (JS-335/local) | -   |                           |

| Condition   | Major Farming situation | Crop/cropping system | Suggested Contingency measures |  |                           |
|---|-------------------------|----------------------|--------------------------------|--|---------------------------|
|   |                         |                      | Change in crop/cropping system | Agronomic measures   | Remarks on implementation |
| Delay by 6 weeks<br>July 3 <sup>rd</sup> week           | Rainfed uplands         | Rice                 | Rice-mustard                   | Transplant 35-40 days old seedling and 3-4 seedlings/hill to compensate plant population and yield |                           |
| Select RC maniphou-7 which is photo-insensitive variety |                         |                      |                                |  |                           |
| Sow pre sprouted seed 80kg/ha for direct seeding        |                         |                      |                                |  |                           |
|   |                         | Groundnut/<br>Maize  | Soybean (JS-335/local)         | -  |                           |

| Condition  |                         |                      | Suggested Contingency measures |  |                           |
|--|-------------------------|----------------------|--------------------------------|--|---------------------------|
| Early season drought (delayed onset)             | Major Farming situation | Crop/cropping system | Change in crop/cropping system | Agronomic measures   | Remarks on implementation |
| Delay by 8 weeks<br><br>Aug 1 <sup>st</sup> week | Rainfed uplands         | Rice                 | Rice                           | Direct seeding/ broadcast of rice var. RC maniphou-7                           |                           |
|  |                         |                      |                                | Transplant up to 50 days old seedling and 3-5 seedlings/hill at closer spacing |                           |
|  |                         |                      |                                | If no hope of getting rice crop plough the field for early rabi vegetables     |                           |
|  |                         | Groundnut/ Maize     | Vegetables                     | -  |                           |

| Condition   |                         |                      | Suggested Contingency measures  |   |                           |
|---|-------------------------|----------------------|---|---|---------------------------|
|   | Major Farming situation | Crop/cropping system | Crop management   | Soil nutrient & moisture conservation measures, | Remarks on implementation |
| Normal onset followed by 15-20 days dry spell after sowing leading to poor germination / crop stand etc | Rainfed uplands         | Rainfed rice         | a) Sow short duration var. of 15-20 days shorter in duration<br>b) maintaining high density pattern at one corner of land to get seedling for gap filling | Timely weed control                             |                           |
|   |                         | Maize/ Groundnut     | Line sowing   | Sow the seeds against the slope                 |                           |
|   |                         | Soybean              | Line sowing   | Sow the seeds against the slope                 |                           |

| Condition   |                                |                             | Suggested Contingency measures  |   |                                  |
|---|--------------------------------|-----------------------------|---|---|----------------------------------|
| <b>Mid season drought (long dry spell, consecutive 2 weeks rainless period (&gt; 2.5 mm))</b> | <b>Major Farming situation</b> | <b>Crop/cropping system</b> | <b>Crop management</b>  | <b>Soil nutrient &amp; moisture conservation measures,</b>                  | <b>Remarks on implementation</b> |
| Vegetative stage  | Rainfed uplands                | Rice                        | Split application of N and K <sub>2</sub> O                                 | Thinning is must if plant population is high and use as mulch               |                                  |
|   |                                | Maize/<br>Groundnut         | Earthing up should be done at 35 days DAS before peg formation in groundnut | Remove weeds and use as mulch between rows                                  |                                  |
|   |                                | Soybean                     | Plough the land 2-3 times by cultivator followed by rotavator               | Conservation of soil moisture through mulching<br>Open conservation furrows |                                  |

| Condition                                  |                                |                             | Suggested Contingency measures                                |   |                                  |
|--|--------------------------------|-----------------------------|---|---|----------------------------------|
| <b>Mid season drought (long dry spell)</b> | <b>Major Farming situation</b> | <b>Crop/cropping system</b> | <b>Crop management</b>  | <b>Soil nutrient &amp; moisture conservation measures</b>                   | <b>Remarks on implementation</b> |
| At reproductive stage                      | Rainfed uplands                | Rice                        | Life saving irrigation  | Give life saving irrigation at flowering stage                              |                                  |
|  |                                | Maize/<br>Groundnut         | Remove weeds  | Practice Mulching in between the rows                                       |                                  |
|  |                                | Soybean                     | Plough the land 2-3 times by cultivator followed by rotavator | Conservation of soil moisture through mulching<br>Open conservation furrows |                                  |

| Condition        |                         |                      | Suggested Contingency measures     |   |                           |
|------------------|-------------------------|----------------------|------------------------------------|---|---------------------------|
| Terminal drought | Major Farming situation | Crop/cropping system | Crop management                    | Rabi crop plan                                | Remarks on implementation |
|                  | Rice                    | Rice                 | Harvest the crop for grain purpose | Plan to sow mustard, field pea and vegetables | -                         |
|                  | Maize/ Groundnut        | Groundnut            | Harvest at physiological maturity  |   |                           |
|                  | Soybean                 | Soybean              |                                    |   |                           |

### 2.1.2 Drought - Irrigated situation – Not applicable

| Condition  | Suggested Contingency measures |                             |                                |                    |                           |
|--|--------------------------------|-----------------------------|--------------------------------|--------------------|---------------------------|
|  | Major Farming situation        | Normal Crop/cropping system | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
| Delayed release of water in canals due to low rainfall                     |                                |                             |                                |                    |                           |
| Limited release of water in canals due to low rainfall                     |                                |                             |                                |                    |                           |
| Non release of water in canals under delayed onset of monsoon in catchment |                                |                             |                                |                    |                           |
| Lack of inflows into tanks due to insufficient /delayed onset of monsoon   |                                |                             |                                |                    |                           |
| Insufficient groundwater recharge due to low rainfall                      |                                |                             |                                |                    |                           |

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

| Condition | Suggested contingency measure |  |  |   |
|-----------|-------------------------------|--|--|---|
|           | Vegetative stage              | Flowering stage  | Crop maturity                                    | Post harvest                            |
| Rice      | -                             | Apply Tricyclazole @ 10ml/15 litres of water for blast | Apply Dithane M-45 to control false smut of rice | Dry grain sufficiently and safe storage |

|   |                |  |   |   |
|---|----------------|--|---|---|
|   |                |  | Drain out water 10 days before harvesting<br><br>Application of imidaclopid 17.8SL @ 7ml/15lit of water to control Gundhi bug |   |
| Maize   |                |  | Harvest cobs for seeds before rains.  |   |
| Soybean   |                | Application of imidaclopid 17.8SL @ 7ml/15lit of water to control hairy caterpillars   |   |   |
| Ground nut  |                | Spray Dithane M-45 (0.2%) at 2-3 interval if disease incidence is severe<br><br>Ridomil should be applied for control of Tikka disease | -   | Pods should be dried after harvesting so that moisture is reduced to 10%. |
| <b>Heavy rainfall with high speed winds in a short span</b>   | Not applicable |  |   |   |
| <b>Outbreak of pests and diseases due to unseasonal rains</b> | -              |  | -   | -   |

### 2.3 Floods : Not applicable

| Condition                                   | Suggested contingency measure <sup>o</sup> |                  |                    |            |
|---|--|------------------|--------------------|------------|
|   | Seedling / nursery stage                   | Vegetative stage | Reproductive stage | At harvest |
| Transient water logging/ partial inundation |  |                  |                    |            |
| Continuous submergence                      |  |                  |                    |            |

|                                   |  |  |  |  |
|-----------------------------------|--|--|--|--|
| for more than 2 days <sup>2</sup> |  |  |  |  |
| Sea water intrusion <sup>3</sup>  |  |  |  |  |

#### 2.4 Extreme events: Heat wave / Cold wave/Frost/ Hailstorm /Cyclone : Not experienced / encountered

| Extreme event type                              | Suggested contingency measure   |                  |                    |            |
|---|---|------------------|--------------------|------------|
|   | Seedling /nursery stage   | Vegetative stage | Reproductive stage | At harvest |
| Heat wave/ Cold wave/ Frost /Hailstorm /Cyclone |   |                  |                    |            |
| Early kharif Rice                               | Usually nurseries are raised in Feb. - March.<br>During this month, soil temperature is low. 1t/FYM/ 700 m <sup>2</sup> may be applied for proper germination and seedling growth, water should be maintained 2-3cm | -                | -                  | -          |

#### 2.5 Contingent strategies for Livestock, Poultry & Fisheries

##### 2.5.1 Livestock

|                              | Suggested contingency measures  |  |  |
|------------------------------|---|--|--|
|                              | Before the event <sup>s</sup>   | During the event   | After the event                                |
| <b>Drought</b>               |   |  |  |
| Feed and fodder availability | Insurance<br>Encourage perennial fodder on bunds and waste land<br>on community basis<br>Establishing fodder banks, encouraging | Utilizing tree fodder and jungle hay.<br>Feeding of urea treated paddy straw.<br>Utilization of urea molasses liquid feed<br>Utilizing fodder stored in silos<br>Transporting excess fodder from adjoining districts | Availing Insurance<br><br>Culling unproductive |

|                                |   |   |                      |
|--------------------------------|---|---|----------------------|
|                                | fodder crops in irrigated area<br>Silage – using excess fodder for silage     | Use of mineral mixtures as feed supplement  | livestock            |
| Drinking water                 | Preserving water in the tank for drinking purpose<br>Excavation of Bore wells | Using preserved water in the tanks for drinking<br>Wherever ground water resources are available<br>priority for drinking purpose                                     |                      |
| Health and disease management  | Veterinary preparedness with medicines and vaccines                           | Conducting mass animal Health Camps and treating the affected one in Campaign   | Culling sick animals |
| <b>Floods</b>                  | Not applicable  |   |                      |
| Feed and fodder availability   |   |   |                      |
| Drinking water                 |   |   |                      |
| Health and disease management  |   |   |                      |
| <b>Cyclone</b>                 | Not applicable  |   |                      |
| Feed and fodder availability   |   |   |                      |
| Drinking water                 |   |   |                      |
| Health and disease management  |   |   |                      |
| <b>Heat wave and cold wave</b> |   |   |                      |
| Shelter/environment management | Low cost animal housing with proper ventilation                               | Low cost animal housing with some covering with gunny bag during the cool wave.<br>Use of local charcoal in the house.<br>Use of good bedding materials in the house. |                      |
| Health and disease management  | Veterinary preparedness with medicines and vaccines                           | Conducting mass animal Health Camps and treating the affected one in Campaign   |                      |



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<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  | Insurance & Integration<br>Establishing feed reserve Bank                     | Utilizing from feed reserve banks<br>Use of mineral mixture and vitamins supplement.  | Availing insurance<br>Strengthening feed Reserve Banks<br>Use of mineral mixture and vitamins supplement.                         |  |
| Drinking water                | Preserving water in the tank for drinking purpose<br>Excavation of Bore wells | Using preserved water in the tanks for drinking<br>Wherever ground water resources are available<br>priority for drinking purpose | Using preserved water in the tanks for drinking<br>Wherever ground water resources are available<br>priority for drinking purpose |  |
| Health and disease management | Emergency<br>Veterinary preparedness with medicines/vaccination to birds      | Campaign and Mass Vaccination   | Campaign and Mass Vaccination   | Culling affected and unproductive birds            |
| <b>Floods</b>                 | Not applicable  |   |   |  |
| Shortage of feed ingredients  |   |   |   |  |
| Drinking water                |   |   |   |  |
| Health and disease management |   |   |   |  |

|                                |   |   |   |  |
|--------------------------------|---|---|---|--|
| <b>Cyclone</b>                 | Not applicable  |   |   |  |
| Shortage of feed ingredients   | <p>Insurance</p> <p>Encourage perennial fodder on bunds and waste land on community basis</p> <p>Establishing fodder banks, encouraging fodder crops in irrigated area</p> <p>Silage – using excess fodder for silage</p> | <p>Utilizing tree fodder and jungle hay.</p> <p>Feeding of urea treated paddy straw.</p> <p>Utilization of urea molasses liquid feed</p> <p>Utilizing fodder stored in silos</p> <p>Transporting excess fodder from adjoining districts</p> <p>Use of mineral mixtures as feed supplement</p> | <p>Utilizing tree fodder and jungle hay.</p> <p>Feeding of urea treated paddy straw.</p> <p>Utilization of urea molasses liquid feed</p> <p>Utilizing fodder stored in silos</p> <p>Transporting excess fodder from adjoining districts</p> <p>Use of mineral mixtures as feed supplement</p> |  |
| Drinking water                 | <p>Preserving water in the tank for drinking purpose</p> <p>Excavation of Bore wells</p>  | <p>Using preserved water in the tanks for drinking</p> <p>Wherever ground water resources are available priority for drinking purpose</p>   | <p>Using preserved water in the tanks for drinking</p> <p>Wherever ground water resources are available priority for drinking purpose</p>   |  |
| Health and disease management  | <p>Emergency</p> <p>Veterinary preparedness with medicines/vaccination to birds</p>   | <p>Campaign and Mass Vaccination</p>  | <p>Campaign and Mass Vaccination</p>  | <p>Culling affected and unproductive birds</p> |
| <b>Heat wave and cold wave</b> |   |   |   |  |
| Shelter/environment management | <p>Low cost animal housing with proper ventilation</p>  | <p>Low cost animal housing with some covering with gunny bag during the cool wave.</p> <p>Use of local charcoal in the house.</p> <p>Use of good bedding</p>  | <p>Low cost animal housing with some covering with gunny bag during the cool wave.</p> <p>Use of local charcoal in the house.</p> <p>Use of good bedding</p>  |  |

|                               |   |                                  |                                  |  |
|-------------------------------|---|----------------------------------|----------------------------------|--|
|                               |   | materials in the house.          | materials in the house           |  |
| Health and disease management | Emergency<br>Veterinary preparedness<br>with<br>medicines/vaccination to<br>birds | Campaign and Mass<br>Vaccination | Campaign and Mass<br>Vaccination | Culling affected and<br>unproductive birds |
|                               |   |                                  |                                  |  |

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

### 2.5.3 Fisheries/ Aquaculture –Not applicable

|   | 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<br>insufficient rains/inflow             |                                |                  |                 |
| (ii) Changes in water quality   |                                |                  |                 |
| (iii) Any other   |                                |                  |                 |
| <b>B. Aquaculture</b>   |                                |                  |                 |
| (i) Shallow water in ponds due to<br>insufficient rains/inflow          |                                |                  |                 |
| (ii) Impact of salt load build up in<br>ponds / change in water quality |                                |                  |                 |
| (iii) Any other   |                                |                  |                 |
| <b>2) Floods</b>  |                                |                  |                 |

|  |                |  |  |
|--|----------------|--|--|
| <b>A. Capture</b>  |                |  |  |
| Marine   |                |  |  |
| Inland   |                |  |  |
| (i) Average compensation paid due to loss of human life      |                |  |  |
| (ii) No. of boats / nets/damaged                             |                |  |  |
| (iii) No.of houses damaged                                   |                |  |  |
| (iv) Loss of stock   |                |  |  |
| (v) Changes in water quality                                 |                |  |  |
| (vi) Health and diseases                                     |                |  |  |
| <b>B. Aquaculture</b>  |                |  |  |
| (i) Inundation with flood water                              |                |  |  |
| (ii) Water contamination and changes in water quality        |                |  |  |
| (iii) Health and diseases                                    |                |  |  |
| (iv) Loss of stock and inputs (feed, chemicals etc)          |                |  |  |
| (v) Infrastructure damage (pumps, aerators, huts etc)        |                |  |  |
| (vi) Any other   |                |  |  |
| <b>3. Cyclone / Tsunami</b>                                  | Not applicable |  |  |
| A. Capture   |                |  |  |
| Marine   |                |  |  |
| (i) Average compensation paid due to loss of fishermen lives |                |  |  |
| (ii) Avg. no. of boats / nets/damaged                        |                |  |  |

|  |                |  |  |
|--|----------------|--|--|
| (iii) Avg. no. of houses damaged                                   |                |  |  |
| Inland   |                |  |  |
| <b>B. Aquaculture</b>  |                |  |  |
| (i) Overflow / flooding of ponds                                   |                |  |  |
| (ii) Changes in water quality (fresh water / brackish water ratio) |                |  |  |
| (iii) Health and diseases  |                |  |  |
| (iv) Loss of stock and inputs (feed, chemicals etc)                |                |  |  |
| (v) Infrastructure damage (pumps, aerators, shelters/huts etc)     |                |  |  |
| (vi) Any other   |                |  |  |
| <b>4. Heat wave and cold wave</b>                                  | Not applicable |  |  |
| <b>A. Capture</b>  |                |  |  |
| Marine   |                |  |  |
| Inland   |                |  |  |
| <b>B. Aquaculture</b>  |                |  |  |
| (i) Changes in pond environment (water quality)                    |                |  |  |
| (ii) Health and Disease management                                 |                |  |  |
| (iii) Any other  |                |  |  |

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