

## State: Madhya Pradesh

### Agriculture Contingency Plan for District: PANNA

| 1.0 District Agriculture profile |                                                                    |                                                                                      |                                      |
|----------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------|
| <b>1.1</b>                       | <b>Agro-Climatic/Ecological Zone</b>                               |                                                                                      |                                      |
|                                  | Agro Ecological Sub Region (ICAR)                                  | Central Highlands (Malwa And Bundelkhand), Hot Sub humid (Dry) Eco-sub region (10.3) |                                      |
|                                  | Agro-Climatic Zone (Planning Commission)                           | Central Plateau And Hills Region (VIII)                                              |                                      |
|                                  | Agro Climatic Zone (NARP)                                          | Bundelkhand Zone (MP-8)-64%, Kymore Plateau and Satpura Hill Zone (MP-4)-32%         |                                      |
|                                  | List all the districts or part thereof falling under the NARP Zone | Satna, Panna, Rewa, Katni, Jabalpur, Sidhi, Seoni and Umaria                         |                                      |
|                                  | Geographic coordinates of district headquarters                    | Latitude                                                                             | Longitude                            |
|                                  |                                                                    | 23° 45' to 25° 10' N                                                                 | 79° 45' to 80° 40' E                 |
|                                  | Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS      | RARS, Rewa                                                                           |                                      |
|                                  | Mention the KVK located in the district                            | Programme Coordinator<br>Krishi Vigyan Kendra, Laxmipur, Distt. Panna – 488 001      |                                      |
| <b>1.2</b>                       | <b>Rainfall</b>                                                    | Normal RF(mm)                                                                        | Normal Onset                         |
|                                  | SW monsoon (June-Sep):                                             | 1069.6                                                                               | 2 <sup>nd</sup> week of week of June |
|                                  | NE Monsoon(Oct-Dec):                                               | 53.5                                                                                 | 1 <sup>st</sup> week of October      |
|                                  | Winter (Jan- Feb.)                                                 | 44.7                                                                                 |                                      |
|                                  | Summer (March-May)                                                 | 15.1                                                                                 |                                      |
|                                  | Annual                                                             | 1182.9                                                                               |                                      |

| 1.3 | Land use pattern of the district (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 |
|-----|------------------------------------------------------|-------------------|------------------|-------------|---------------------------------|--------------------|----------------------|----------------------------------------|------------------------------|-----------------|---------------|
|     | Area ('000 ha)                                       | 702.9             | 270.2            | 299.7       | 42.0                            | 8.3                | 60.0                 | 0.0                                    | 22.7                         | 21.7            | 14.4          |

\* Net sown area+ current fallow + old fallow

| 1.4 | Major Soils (common names like red sandy loam deep soils (etc.,))* | Area ('000 ha) | Percent (%) of total |
|-----|--------------------------------------------------------------------|----------------|----------------------|
|     | Deep soils                                                         | 283.2          | 39.7                 |
|     | Medium deep                                                        | 175.4          | 24.6                 |
|     | Shallow soils                                                      | 253.2          | 35.5                 |

Source:- NBSS & LUP, Nagpur

| 1.5 | Agricultural land use    | Area ('000 ha) | Cropping intensity % |
|-----|--------------------------|----------------|----------------------|
|     | Net sown area            | 234.1          | 115                  |
|     | Area sown more than once | 34.8           |                      |
|     | Gross cropped area       | 268.9          |                      |

(Source : Agriculture Statistics 2009, Directorate of Farmer Welfare and Agriculture Development Madhya Pradesh, Bhopal)

| 1.6 | Irrigation              | Area ('000 ha) |                |                                    |
|-----|-------------------------|----------------|----------------|------------------------------------|
|     | Net irrigated area      | 78.5           |                |                                    |
|     | Gross irrigated area    | 78.6           |                |                                    |
|     | Rainfed area            | 155.6          |                |                                    |
|     | Sources of Irrigation   | Number         | Area ('000 ha) | Percentage of total irrigated area |
|     | Canals                  | 61             | 6.5            | 8.26                               |
|     | Tanks                   | 92             | 3.8            | 4.83                               |
|     | Open wells              | 13329          | 17.3           | 21.97                              |
|     | Bore wells              | 380            | 5.2            | 6.60                               |
|     | Lift irrigation schemes | NA             |                |                                    |

|                                                                                                       |                                                                                                      |                           |          |                                                                                             |
|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|---------------------------|----------|---------------------------------------------------------------------------------------------|
|                                                                                                       | Micro-irrigation                                                                                     | NA                        |          |                                                                                             |
|                                                                                                       | Other sources (reservoir)                                                                            | 23                        | 45.8     | 58.17                                                                                       |
|                                                                                                       | Total Irrigated Area                                                                                 |                           | 78.6     |                                                                                             |
|                                                                                                       | Pump sets                                                                                            | NA                        |          |                                                                                             |
|                                                                                                       | No. of Tractors                                                                                      | NA                        |          |                                                                                             |
|                                                                                                       | <b>Groundwater availability and use* (Data source: State/Central Ground water Department /Board)</b> | No. of blocks/ Tehsils 08 | (%) area | Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc) |
|                                                                                                       | Over exploited                                                                                       |                           |          |                                                                                             |
|                                                                                                       | Critical                                                                                             |                           |          |                                                                                             |
|                                                                                                       | Semi- critical                                                                                       |                           |          |                                                                                             |
|                                                                                                       | Safe                                                                                                 | 08                        |          |                                                                                             |
|                                                                                                       | Wastewater availability and use                                                                      |                           | 70%      |                                                                                             |
|                                                                                                       | 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 etc. (2008-09)

| 1.7 | Major Field Crops cultivated | Area ('000 ha) |         |       |           |         |       |        |       |
|-----|------------------------------|----------------|---------|-------|-----------|---------|-------|--------|-------|
|     |                              | Kharif         |         |       | Rabi      |         |       | Summer | Total |
|     |                              | Irrigated      | Rainfed | Total | Irrigated | Rainfed | Total |        |       |
|     | Rice                         |                |         | 55.5  |           |         |       | NA     | 55.5  |
|     | Blackgram                    |                |         | 5.5   |           |         |       |        | 5.5   |
|     | Pigeonpea                    |                |         | 5.4   |           |         |       |        | 5.4   |
|     | Sesame                       |                |         | 5.2   |           |         |       |        | 5.2   |
|     | Sorghum                      |                |         | 4.8   |           |         |       |        | 4.8   |
|     | Soybean                      |                |         | 4.6   |           |         |       |        | 4.6   |
|     | Chickpea                     |                |         |       |           |         | 94.1  |        | 94.1  |
|     | Wheat                        |                |         |       |           |         | 62.8  |        | 62.8  |
|     | Lentil                       |                |         |       |           |         | 19.9  |        | 19.9  |
|     | Pea                          |                |         |       |           |         | 5.2   |        | 5.2   |
|     | Rape Mustard                 |                |         |       |           |         | 3.0   |        | 3.0   |

|  | <b>Horticulture crops - Fruits</b>      | <b>Total area(ha)</b>  | <b>Irrigated</b> | <b>Rainfed</b> |
|--|-----------------------------------------|------------------------|------------------|----------------|
|  | Mango                                   | 344                    |                  |                |
|  | Guava                                   | 26                     |                  |                |
|  | Water Chestnet                          | 58                     |                  |                |
|  | Citrus                                  | 2                      |                  |                |
|  | Others (specify)                        |                        |                  |                |
|  | <b>Horticultural crops - Vegetables</b> | <b>Total area (ha)</b> | <b>Irrigated</b> | <b>Rainfed</b> |
|  | Potato                                  | 457                    |                  |                |
|  | Onion                                   | 283                    |                  |                |
|  | Tomato                                  | 127                    |                  |                |
|  | Brinjal                                 | 132                    |                  |                |
|  | Okara                                   | 129                    |                  |                |
|  | Others (specify)                        | <b>397</b>             |                  |                |

|  | <b>Medicinal and Aromatic crops -</b> | <b>Total area</b> | <b>Irrigated</b> | <b>Rainfed</b> |
|--|---------------------------------------|-------------------|------------------|----------------|
|  |                                       | NA                |                  |                |

|  | <b>Plantation crops-</b>                               | <b>Total area (ha.)</b> | <b>Irrigated</b> | <b>Rainfed</b> |
|--|--------------------------------------------------------|-------------------------|------------------|----------------|
|  |                                                        | NA                      |                  |                |
|  | Others such as industrial pulpwood crops etc (specify) |                         |                  |                |
|  | <b>Fodder crops-</b>                                   | <b>Total area</b>       | <b>Irrigated</b> | <b>Rainfed</b> |
|  |                                                        | NA                      |                  |                |
|  | Others (specify)                                       |                         |                  |                |
|  | <b>Total fodder crop area</b>                          |                         |                  |                |
|  | <b>Grazing land</b>                                    | 8300                    |                  |                |
|  | <b>Sericulture etc</b>                                 |                         |                  |                |
|  | <b>Others (Specify)</b>                                |                         |                  |                |

(Source : Agriculture Statistics 2009, Directorate of Farmer Welfare and Agriculture Development Madhya Pradesh, Bhopal)

| 1.8  | Livestock                                                    | Male ('000)            | Female ('000)             | Total ('000)           |                                    |                                                  |                                      |
|------|--------------------------------------------------------------|------------------------|---------------------------|------------------------|------------------------------------|--------------------------------------------------|--------------------------------------|
|      | Non descriptive Cattle (local low yielding)                  |                        |                           | 524.9                  |                                    |                                                  |                                      |
|      | Crossbred cattle                                             |                        |                           | NA                     |                                    |                                                  |                                      |
|      | Non descriptive Buffaloes (local low yielding)               |                        |                           | NA                     |                                    |                                                  |                                      |
|      | Graded Buffaloes                                             |                        |                           | 248.6                  |                                    |                                                  |                                      |
|      | Goat                                                         |                        |                           | 143.5                  |                                    |                                                  |                                      |
|      | Sheep                                                        |                        |                           | 9.2                    |                                    |                                                  |                                      |
|      | Others (Pig, Horses)                                         |                        |                           | 87.6                   |                                    |                                                  |                                      |
|      | Commercial dairy farms (Number)                              |                        |                           | NA                     |                                    |                                                  |                                      |
| 1.9  | Poultry                                                      | No. of farms -         | Total No. of birds ('000) |                        |                                    |                                                  |                                      |
|      | Commercial                                                   | NA                     |                           |                        |                                    |                                                  |                                      |
|      | Backyard                                                     | 42                     | 3.21                      |                        |                                    |                                                  |                                      |
| 1.10 | Fisheries (Data source: Chief Planning Officer)              |                        |                           |                        |                                    |                                                  |                                      |
|      | A. Capture                                                   |                        |                           |                        |                                    |                                                  |                                      |
|      | i) Marine (Data Source: Fisheries Department)                | No. of fishermen       | Boats                     |                        | Nets                               |                                                  | Storage facilities (Ice plants etc.) |
|      |                                                              |                        | Mechanized                | Non-mechanized         | Mechanized (Trawl nets, Gill nets) | Non-mechanized (Shore Seines, Stake & trap nets) |                                      |
|      |                                                              |                        |                           |                        |                                    |                                                  |                                      |
|      | ii) Inland (Data Source: Fisheries Department)               | No. Farmer owned ponds |                           | No. of Reservoirs      |                                    | No. of village tanks                             |                                      |
|      |                                                              |                        |                           |                        | 29                                 |                                                  | 12                                   |
|      | B. Culture                                                   |                        |                           |                        |                                    |                                                  |                                      |
|      |                                                              | Water Spread Area (ha) | Yield (t/ha)              | Production ('000 tons) |                                    |                                                  |                                      |
|      | i) Brackish water (Data Source: MPEDA/ Fisheries Department) |                        |                           |                        |                                    |                                                  |                                      |
|      | ii) Fresh water (Data Source: Fisheries Department)          | 924.54                 | 1.30                      | 1.12                   |                                    |                                                  |                                      |
|      | 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) |                                    |
|      | Rice         | 31.02               | 574                  |                     |                      |                     |                      | 31.0                | 574                  |                                    |
|      | Sorghum      | 3.9                 | 864                  |                     |                      |                     |                      | 3.9                 | 864                  |                                    |
|      | Blackgram    | 1.5                 | 299                  |                     |                      |                     |                      | 1.5                 | 299                  |                                    |
|      | Pigeonpea    | 2.0                 | 401                  |                     |                      |                     |                      | 2.0                 | 401                  |                                    |
|      | Sesame       | 2.7                 | 442                  |                     |                      |                     |                      | 2.7                 | 442                  |                                    |
|      | Soybean      | 1.4                 | 555                  |                     |                      |                     |                      | 1.4                 | 555                  |                                    |
|      | Chickpea     |                     |                      | 76.3                | 815                  |                     |                      | 76.3                | 815                  |                                    |
|      | Wheat        |                     |                      | 68.2                | 1135                 |                     |                      | 68.2                | 1135                 |                                    |
|      | Lentil       |                     |                      | 11.7                | 513                  |                     |                      | 11.7                | 513                  |                                    |
|      | Pea          |                     |                      | 1.4                 | 407                  |                     |                      | 1.4                 | 407                  |                                    |
|      | Rape Mustard |                     |                      | 1.3                 | 438                  |                     |                      | 1.3                 | 438                  |                                    |

(Source : Agriculture Statistics 2009, Directorate of Farmer Welfare and Agriculture Development Madhya Pradesh, Bhopal)

| 1.12 | Sowing window for 5 major field crops (start and end of normal sowing period) | Rice                                                      | Blackgram                                                   | Sesame                                                      | Soybean                                                     | Pigeonpea                                                   |
|------|-------------------------------------------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|
|      | <b>Kharif- Rainfed</b>                                                        | 3 <sup>rd</sup> week of June-3 <sup>rd</sup> week of July | 1 <sup>st</sup> week of July – 2 <sup>nd</sup> week of July | 3 <sup>rd</sup> week of June – 1 <sup>st</sup> week of July | 3 <sup>rd</sup> week of June – 1 <sup>st</sup> week of July | 3 <sup>rd</sup> week of June – 1 <sup>st</sup> week of July |
|      | <b>Kharif-Irrigated</b>                                                       |                                                           |                                                             |                                                             |                                                             |                                                             |
|      |                                                                               | <b>Wheat</b>                                              | <b>Chickpea</b>                                             | <b>Pea</b>                                                  | <b>Mustard</b>                                              | <b>Linseed</b>                                              |

|  |                       |                                                                        |                                                                        |                                                                              |                                                                      |                                                                       |
|--|-----------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------------------------|-----------------------------------------------------------------------|
|  | <b>Rabi- Rainfed</b>  | 3 <sup>rd</sup> week of October-<br>1 <sup>st</sup> week of November   | 3 <sup>rd</sup> week of October to<br>2 <sup>nd</sup> week of November | 3 <sup>rd</sup> week of October<br>- 1 <sup>st</sup> week of<br>November     | 2 <sup>nd</sup> week of October –<br>4 <sup>th</sup> week of October | 2 <sup>nd</sup> week of October –<br>4 <sup>th</sup> week of October  |
|  | <b>Rabi-Irrigated</b> | 2 <sup>nd</sup> week of November –<br>4 <sup>th</sup> week of November | 2 <sup>nd</sup> week of November –<br>4 <sup>th</sup> week of November | 1 <sup>st</sup> week of<br>November -<br>3 <sup>rd</sup> week of<br>November | 3 <sup>rd</sup> week of October-<br>1 <sup>st</sup> week of November | 3 <sup>rd</sup> week of October -<br>1 <sup>st</sup> week of November |

| 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)<br>Rice - Insect Pest : Gall midge, leaf folder, Army worm, Gundhi bug<br>Diseases : BLB, Bacterial leaf streak, Brown Spot, Blast.<br>Soybean - Insect pest : Stemfly, G.B., Semi-looper, Heilcoverpa, Tobacco caterpillar<br>- Diseases - YMV (In JS 335)<br>Pigeonpea- Insect Pest : Leaf folder, pod borer, blister beetle.<br>Blackgram Greengram - Diseases : YM<br>Chickpea - Insect Pest : Helicoverpa Diseases : Root rot, Fusarium wilt.<br>Mustard - Insect Pest : Ahpids. | √       | -          |      |
|      | Others (specify)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |         |            |      |

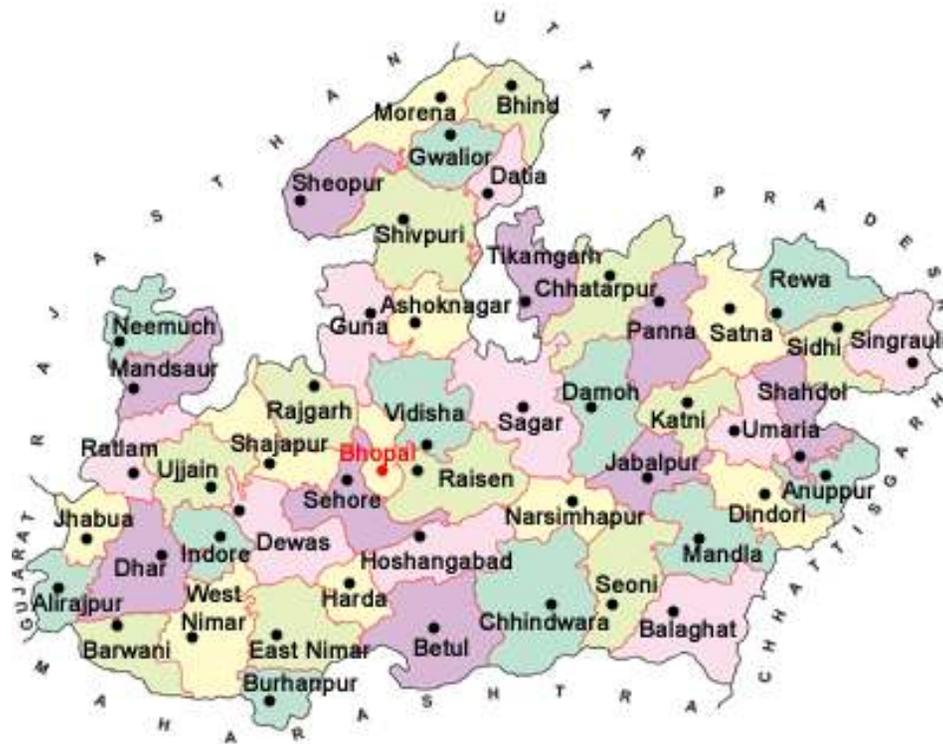
|      |                                          |                                                     |               |
|------|------------------------------------------|-----------------------------------------------------|---------------|
| 1.14 | Include Digital maps of the district for | Location 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

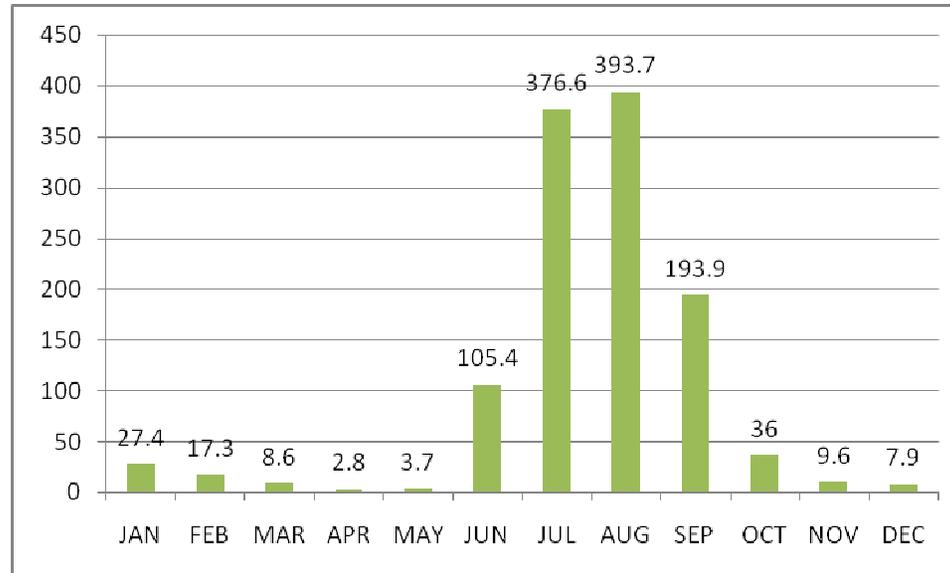
**MADHYA PRADESH**

State Capital ..... ●

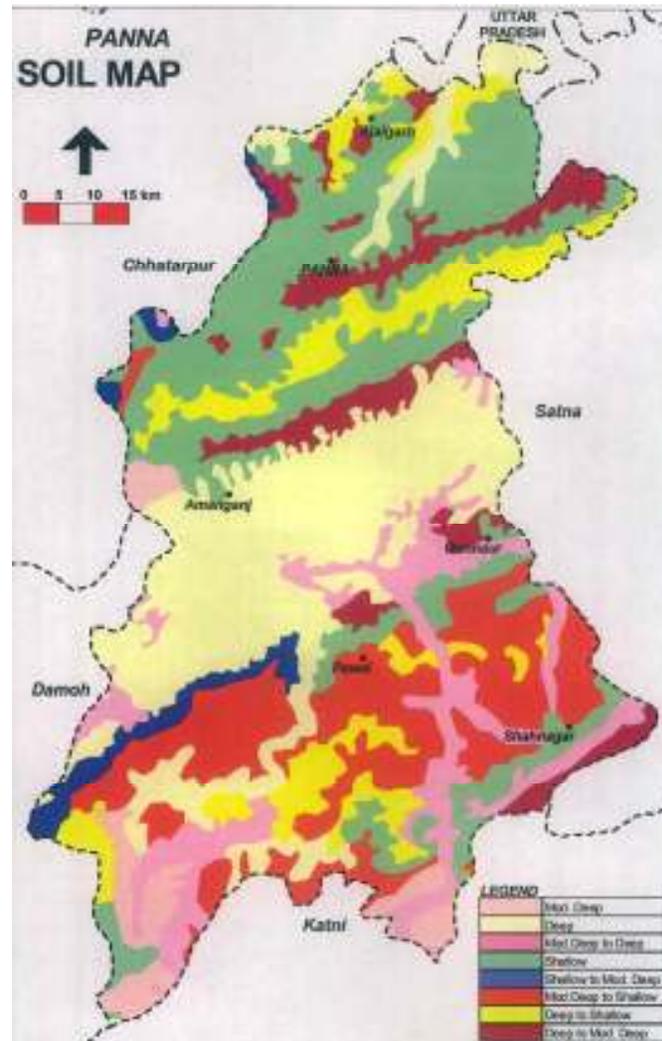
District ..... ●



### Annexure II



Annexure III



Source: NBSS & LUP, Nagpur

## 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                                                                  | Normal Crop / Cropping system | Change in crop / cropping system including variety                                                                                                                                                                                                                     | Agronomic measures                                                                                                                                                                                                                  | Remarks on Implementation (source of Seed)                                     |
| Delay by 2 weeks<br><br>4 <sup>th</sup> week of June | Deep black soils (800-1000 mm rainfall)                                                  | Rice-Wheat                    | <b>Rice</b> -Upland field: IR-36, JR-201, JR-503, vandna, porrnima, Ananda, Narendra 97, Govinda and hybrid rice JRH 4, 5 and 8                                                                                                                                        | 1. Seed treatment with mixture of Thiram (1.5g) + Carbendazim (1.5g) /kg seed followed by treated with biofertilizers<br>2. For early maturing varieties, adopt 15x15 cm geometry but seedlings are not more than 18 to 21 days old | Linkage with SAU, NSC, Beej Nigam and farmers societies for seed availability. |
|                                                      |                                                                                          | Blackgram                     |                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                     |                                                                                |
|                                                      |                                                                                          | Pigeonpea                     |                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                     |                                                                                |
|                                                      |                                                                                          | Sesame                        |                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                     |                                                                                |
|                                                      | Shallow soils (Sandy loam ( <i>matasi</i> ) with 750-900 mm rainfall)                    | Rice-Wheat                    | Lowland field WGL-32100, MR-219, Mhamaya, IR-36,IR-64, HMT, Swarna, Madhuri, Pusa basmati, Karnal basmati, Pusa sugandha3,4,and5 and Hybrid rice (PRH-10,PA6201,PHB71, Pro Agro 6444)                                                                                  |                                                                                                                                                                                                                                     |                                                                                |
|                                                      |                                                                                          | Blackgram                     |                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                     |                                                                                |
|                                                      |                                                                                          | Pigeonpea                     |                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                     |                                                                                |
|                                                      |                                                                                          | Sesame                        |                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                     |                                                                                |
|                                                      | Shallow soils (Red ( <i>padwa</i> ) & yellow( <i>dhankar</i> ) with 600-800 mm rainfall) | Rice-Wheat                    |                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                     |                                                                                |
|                                                      |                                                                                          | Blackgram                     |                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                     |                                                                                |
|                                                      |                                                                                          | Pigeonpea                     |                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                     |                                                                                |
|                                                      |                                                                                          | Sesame                        |                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                     |                                                                                |
|                                                      | Medium deep soils (( <i>Kachari</i> ) with 900-1100 mm rainfall)                         | Rice-Wheat                    | <b>Pigeonpea</b> - Asha ,No-148,JKM-7,JA-4,ICPL-85063(Laxmi) ,JKM-189<br><br><b>Blackgram</b> – JU-2,JU-3,JU-86,T-9,JBG-623,LBG684,TAU-1,Berkha,PU-30,35,19<br><br><b>Soybean</b> - JS-335,JS 80-21,JS 97-42,JS 94-60,JS 9305<br><br><b>Sesame</b> - TKG -306, TKG-35, |                                                                                                                                                                                                                                     |                                                                                |
|                                                      |                                                                                          | Blackgram                     |                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                     |                                                                                |
|                                                      |                                                                                          | Pigeonpea                     |                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                     |                                                                                |
|                                                      |                                                                                          | Sesame                        |                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                     |                                                                                |

|  |  |  |                                                    |  |
|--|--|--|----------------------------------------------------|--|
|  |  |  | JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1 |  |
|--|--|--|----------------------------------------------------|--|

| 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 (source of Seed)                                     |
| Delay by 4 weeks<br><br>2 <sup>nd</sup> week of July | Deep black soils (800-1000 mm rainfall)                                                  | Rice-Wheat                    | <b>Dont sow soybean</b><br><br><b>Rice(Early cv.)</b> – IR-36 JR-201, Poornima ,JR-503,Vandna<br><br><b>Blackgram</b> – JU-2,JU-3,JU-86,T-9, JBG-623, LBG684,TAU-1, Berkha, PU-30, 35, 19 | 1. Blade harrowing (Bakhar) for moisture conservation<br>2. Remove the weeds<br>3. In direct seeding use 25% higher seed rate.<br>4. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers<br>5.For early maturing varieties, adopt 15x15 cm geometry but seedlings are not more than 18 to 21 days old | Linkage with SAU, NSC, Beej Nigam and farmers societies for seed availability. |
|                                                      |                                                                                          | Blackgram                     |                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                     |                                                                                |
|                                                      |                                                                                          | Pigeonpea                     |                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                     |                                                                                |
|                                                      |                                                                                          | Sesame                        |                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                     |                                                                                |
|                                                      | Shallow soils (Sandy loam ( <i>matasi</i> ) with 750-900 mm rainfall)                    | Rice-Wheat                    |                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                     |                                                                                |
|                                                      |                                                                                          | Blackgram                     |                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                     |                                                                                |
|                                                      |                                                                                          | Pigeonpea                     |                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                     |                                                                                |
|                                                      |                                                                                          | Sesame                        |                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                     |                                                                                |
|                                                      | Shallow soils (Red ( <i>padwa</i> ) & yellow( <i>dhankar</i> ) with 600-800 mm rainfall) | Rice-Wheat                    |                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                     |                                                                                |
|                                                      |                                                                                          | Blackgram                     |                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                     |                                                                                |
|                                                      |                                                                                          | Pigeonpea                     |                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                     |                                                                                |
|                                                      |                                                                                          | Sesame                        |                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                     |                                                                                |
|                                                      | Medium deep soils (( <i>Kachari</i> ) with 900-1100 mm rainfall)                         | Rice-Wheat                    |                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                     |                                                                                |
|                                                      |                                                                                          | Blackgram                     |                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                     |                                                                                |
|                                                      |                                                                                          | Pigeonpea                     |                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                     |                                                                                |
|                                                      |                                                                                          | Sesame                        |                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                     |                                                                                |

| 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 (source of Seed) |
| Delay by 6                           | Deep black soils        | Rice-Wheat                    | Prefer alternate crops like                        | 1.Blade harrowing (Bakhar) for moisture | Linkage with                               |

|                                    |                                                                                          |            |                                                                                                    |                                                                                                                                                                             |                                                                   |
|------------------------------------|------------------------------------------------------------------------------------------|------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| <b>4<sup>th</sup> week of July</b> | (800-1000 mm rainfall)                                                                   | Blackgram  | Niger, Castor ,Kodo ,Kutki<br><b>Kodo-JK-41, JK-48</b><br><b>Niger</b> —JNC-6, JNC-1, JNC-9, JVN-1 | conservation<br>2. Intercultivation.<br>3. 100 kg seed /ha required for lehi system in rice.<br>4. Don't sown soybean and maize<br>5. Intercropping of niger with pigeonpea | SAU, NSC, Beej Nigam and farmers societies for seed availability. |
|                                    |                                                                                          | Pigeonpea  |                                                                                                    |                                                                                                                                                                             |                                                                   |
|                                    |                                                                                          | Sesame     |                                                                                                    |                                                                                                                                                                             |                                                                   |
|                                    | Shallow soils (Sandy loam ( <i>matasi</i> ) with 750-900 mm rainfall)                    | Rice-Wheat |                                                                                                    |                                                                                                                                                                             |                                                                   |
|                                    |                                                                                          | Blackgram  |                                                                                                    |                                                                                                                                                                             |                                                                   |
|                                    |                                                                                          | Pigeonpea  |                                                                                                    |                                                                                                                                                                             |                                                                   |
|                                    | Shallow soils (Red ( <i>padwa</i> ) & yellow( <i>dhankar</i> ) with 600-800 mm rainfall) | Sesame     |                                                                                                    |                                                                                                                                                                             |                                                                   |
|                                    |                                                                                          | Rice-Wheat |                                                                                                    |                                                                                                                                                                             |                                                                   |
|                                    |                                                                                          | Blackgram  |                                                                                                    |                                                                                                                                                                             |                                                                   |
|                                    | Medium deep soils (( <i>Kachari</i> ) with 900-1100 mm rainfall)                         | Pigeonpea  |                                                                                                    |                                                                                                                                                                             |                                                                   |
|                                    |                                                                                          | Sesame     |                                                                                                    |                                                                                                                                                                             |                                                                   |
|                                    |                                                                                          | Rice-Wheat |                                                                                                    |                                                                                                                                                                             |                                                                   |
|                                    |                                                                                          | Blackgram  |                                                                                                    |                                                                                                                                                                             |                                                                   |
|                                    |                                                                                          | Pigeonpea  |                                                                                                    |                                                                                                                                                                             |                                                                   |
|                                    |                                                                                          | Sesame     |                                                                                                    |                                                                                                                                                                             |                                                                   |

| 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 (source of Seed)                                     |
| <b>Delay by 8 weeks</b><br><b>2<sup>nd</sup> week of August</b> | Deep black soils (800-1000 mm rainfall)                                                  | Rice-Wheat                    | Prefer alternate crops like Niger, Castor<br><br>Lowland field : Sowing of JR-201, JR-503, Poornima, Vandna, Narendra-97, Govinda by Lehi system<br><br><b>Kodo-JK-41, JK-48</b><br><b>Niger</b> —JNC-6, JNC-1, JNC-9, JVN-1 | 1. Don't sow soybean and maize<br>2. Prefer intercropping of niger with Pigeonpea<br>3. Plan for early rabi crops. | Linkage with SAU, NSC, Beej Nigam and farmers societies for seed availability. |
|                                                                 |                                                                                          | Blackgram                     |                                                                                                                                                                                                                              |                                                                                                                    |                                                                                |
|                                                                 |                                                                                          | Pigeonpea                     |                                                                                                                                                                                                                              |                                                                                                                    |                                                                                |
|                                                                 | Shallow soils (Sandy loam ( <i>matasi</i> ) with 750-900 mm rainfall)                    | Sesame                        |                                                                                                                                                                                                                              |                                                                                                                    |                                                                                |
|                                                                 |                                                                                          | Rice-Wheat                    |                                                                                                                                                                                                                              |                                                                                                                    |                                                                                |
|                                                                 |                                                                                          | Blackgram                     |                                                                                                                                                                                                                              |                                                                                                                    |                                                                                |
|                                                                 | Shallow soils (Red ( <i>padwa</i> ) & yellow( <i>dhankar</i> ) with 600-800 mm rainfall) | Pigeonpea                     |                                                                                                                                                                                                                              |                                                                                                                    |                                                                                |
|                                                                 |                                                                                          | Sesame                        |                                                                                                                                                                                                                              |                                                                                                                    |                                                                                |
|                                                                 |                                                                                          | Rice-Wheat                    |                                                                                                                                                                                                                              |                                                                                                                    |                                                                                |
|                                                                 |                                                                                          | Blackgram                     |                                                                                                                                                                                                                              |                                                                                                                    |                                                                                |
|                                                                 |                                                                                          | Pigeonpea                     |                                                                                                                                                                                                                              |                                                                                                                    |                                                                                |
|                                                                 |                                                                                          | Sesame                        |                                                                                                                                                                                                                              |                                                                                                                    |                                                                                |

|  |                                                                    |                                                |  |  |  |
|--|--------------------------------------------------------------------|------------------------------------------------|--|--|--|
|  | Medium deep soils<br>( <i>Kachari</i> ) with 900-1100 mm rainfall) | Rice-Wheat<br>Blackgram<br>Pigeonpea<br>Sesame |  |  |  |
|--|--------------------------------------------------------------------|------------------------------------------------|--|--|--|

| Condition                                                                                              | Major Farming situation                                                                  | Normal Crop / Cropping system | Suggested Contingency measures                                                   |                                                                                                                                    |                                                                                |
|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Early season drought<br>(Normal onset)                                                                 |                                                                                          |                               | Crop management                                                                  | Soil nutrient & moisture conservation measures                                                                                     | Remarks on Implementation (source of Seed)                                     |
| Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc. | Deep black soils (800-1000 mm rainfall)                                                  | Rice-Wheat                    | Resowing of existing crop with short/medium duration varieties                   | 1.Blade harrowing (Bakhar) for moisture conservation<br>2.Remove the weeds.<br>3.Mulching between crop row with weed/crop residue. | Linkage with SAU, NSC, Beej Nigam and farmers societies for seed availability. |
|                                                                                                        |                                                                                          | Blackgram                     |                                                                                  |                                                                                                                                    |                                                                                |
|                                                                                                        |                                                                                          | Pigeonpea                     |                                                                                  |                                                                                                                                    |                                                                                |
|                                                                                                        |                                                                                          | Sesame                        |                                                                                  |                                                                                                                                    |                                                                                |
|                                                                                                        | Shallow soils (Sandy loam ( <i>matasi</i> ) with 750-900 mm rainfall)                    | Rice-Wheat                    | Prefer alternate crops like Soybean, Pigeonpea, Greengram and Blackgram on bunds |                                                                                                                                    |                                                                                |
|                                                                                                        |                                                                                          | Blackgram                     |                                                                                  |                                                                                                                                    |                                                                                |
|                                                                                                        |                                                                                          | Pigeonpea                     |                                                                                  |                                                                                                                                    |                                                                                |
|                                                                                                        |                                                                                          | Sesame                        |                                                                                  |                                                                                                                                    |                                                                                |
|                                                                                                        | Shallow soils (Red ( <i>padwa</i> ) & yellow( <i>dhankar</i> ) with 600-800 mm rainfall) | Rice-Wheat                    | Intercultivation                                                                 |                                                                                                                                    |                                                                                |
|                                                                                                        |                                                                                          | Blackgram                     |                                                                                  |                                                                                                                                    |                                                                                |
|                                                                                                        |                                                                                          | Pigeonpea                     |                                                                                  |                                                                                                                                    |                                                                                |
|                                                                                                        |                                                                                          | Sesame                        |                                                                                  |                                                                                                                                    |                                                                                |
| Medium deep soils ( <i>Kachari</i> ) with 900-1100 mm rainfall)                                        | Rice-Wheat                                                                               |                               |                                                                                  |                                                                                                                                    |                                                                                |
|                                                                                                        | Blackgram                                                                                |                               |                                                                                  |                                                                                                                                    |                                                                                |
|                                                                                                        | Pigeonpea                                                                                |                               |                                                                                  |                                                                                                                                    |                                                                                |
|                                                                                                        | Sesame                                                                                   |                               |                                                                                  |                                                                                                                                    |                                                                                |

| Condition                                                                          | Major Farming situation | Normal Crop / Cropping system | Suggested Contingency measures |                                                |                                            |
|------------------------------------------------------------------------------------|-------------------------|-------------------------------|--------------------------------|------------------------------------------------|--------------------------------------------|
| Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period) |                         |                               | Crop management                | Soil nutrient & moisture conservation measures | Remarks on Implementation (source of Seed) |

|                                                                  |                                                                                          |            |                                                                                     |                                                                                                                                                                                                                                              |   |
|------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| <b>At vegetative stage</b>                                       | Deep black soils (800-1000 mm rainfall)                                                  | Rice-Wheat | -Maintain optimum plant stand.<br>-Weed management through intercultural operation. | 1. Interculture with Dora/Kulpha/Hand hoe in between rows<br>2. Use uprooted weeds as mulch for moisture conservation.<br>2. Ridges are made after 15-20 lines of crops for the moisture conservation.<br>3. Adopt plant protection measures | - |
|                                                                  |                                                                                          | Blackgram  |                                                                                     |                                                                                                                                                                                                                                              |   |
|                                                                  |                                                                                          | Pigeonpea  |                                                                                     |                                                                                                                                                                                                                                              |   |
|                                                                  |                                                                                          | Sesame     |                                                                                     |                                                                                                                                                                                                                                              |   |
|                                                                  | Shallow soils (Sandy loam ( <i>matasi</i> ) with 750-900 mm rainfall)                    | Rice-Wheat |                                                                                     |                                                                                                                                                                                                                                              |   |
|                                                                  |                                                                                          | Blackgram  |                                                                                     |                                                                                                                                                                                                                                              |   |
|                                                                  |                                                                                          | Pigeonpea  |                                                                                     |                                                                                                                                                                                                                                              |   |
|                                                                  |                                                                                          | Sesame     |                                                                                     |                                                                                                                                                                                                                                              |   |
|                                                                  | Shallow soils (Red ( <i>padwa</i> ) & yellow( <i>dhankar</i> ) with 600-800 mm rainfall) | Rice-Wheat |                                                                                     |                                                                                                                                                                                                                                              |   |
|                                                                  |                                                                                          | Blackgram  |                                                                                     |                                                                                                                                                                                                                                              |   |
|                                                                  |                                                                                          | Pigeonpea  |                                                                                     |                                                                                                                                                                                                                                              |   |
|                                                                  |                                                                                          | Sesame     |                                                                                     |                                                                                                                                                                                                                                              |   |
| Medium deep soils (( <i>Kachari</i> ) with 900-1100 mm rainfall) | Rice-Wheat                                                                               |            |                                                                                     |                                                                                                                                                                                                                                              |   |
|                                                                  | Blackgram                                                                                |            |                                                                                     |                                                                                                                                                                                                                                              |   |
|                                                                  | Pigeonpea                                                                                |            |                                                                                     |                                                                                                                                                                                                                                              |   |
|                                                                  | Sesame                                                                                   |            |                                                                                     |                                                                                                                                                                                                                                              |   |

| Condition                           |                                                                                          |                               | Suggested Contingency measures                                                            |                                                                                                                                                                                                                                 |                                            |
|-------------------------------------|------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Mid season drought (long dry spell) | Major Farming situation                                                                  | Normal Crop / Cropping system | Crop management                                                                           | Soil nutrient & moisture conservation measures                                                                                                                                                                                  | Remarks on Implementation (source of Seed) |
| <b>At flowering/ fruiting stage</b> | Deep black soils (800-1000 mm rainfall)                                                  | Rice-Wheat                    | Give supplemental irrigation if available.<br><br>Harvest crop at physiological maturity. | 1. Blade harrowing (Bakhar) for moisture conservation and<br>2. Remove the weeds.<br>3. Use of leaf /dust mulch. Ridges are made after 15-20 lines of crops for the moisture conservation<br>4. Adopt plant protection measures | -                                          |
|                                     |                                                                                          | Blackgram                     |                                                                                           |                                                                                                                                                                                                                                 |                                            |
|                                     |                                                                                          | Pigeonpea                     |                                                                                           |                                                                                                                                                                                                                                 |                                            |
|                                     |                                                                                          | Sesame                        |                                                                                           |                                                                                                                                                                                                                                 |                                            |
|                                     | Shallow soils (Sandy loam ( <i>matasi</i> ) with 750-900 mm rainfall)                    | Rice-Wheat                    |                                                                                           |                                                                                                                                                                                                                                 |                                            |
|                                     |                                                                                          | Blackgram                     |                                                                                           |                                                                                                                                                                                                                                 |                                            |
|                                     |                                                                                          | Pigeonpea                     |                                                                                           |                                                                                                                                                                                                                                 |                                            |
|                                     |                                                                                          | Sesame                        |                                                                                           |                                                                                                                                                                                                                                 |                                            |
|                                     | Shallow soils (Red ( <i>padwa</i> ) & yellow( <i>dhankar</i> ) with 600-800 mm rainfall) | Rice-Wheat                    |                                                                                           |                                                                                                                                                                                                                                 |                                            |
|                                     |                                                                                          | Blackgram                     |                                                                                           |                                                                                                                                                                                                                                 |                                            |
|                                     |                                                                                          | Pigeonpea                     |                                                                                           |                                                                                                                                                                                                                                 |                                            |
|                                     |                                                                                          | Sesame                        |                                                                                           |                                                                                                                                                                                                                                 |                                            |

|  |                                                                    |            |  |  |  |
|--|--------------------------------------------------------------------|------------|--|--|--|
|  | 600-800 mm rainfall)                                               |            |  |  |  |
|  | Medium deep soils<br>( <i>Kachari</i> ) with 900-1100 mm rainfall) | Rice-Wheat |  |  |  |
|  |                                                                    | Blackgram  |  |  |  |
|  |                                                                    | Pigeonpea  |  |  |  |
|  |                                                                    | Sesame     |  |  |  |

| Condition                                         |                                                                                          |                               | Suggested Contingency measures                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                |
|---------------------------------------------------|------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Terminal drought<br>(Early withdrawal of monsoon) | Major Farming situation                                                                  | Normal Crop / Cropping system | Crop management                                                                           | Rabi crop planning                                                                                                                                                                                                                                                                                                                                                                                                               | Remarks on Implementation (source of Seed)                                     |
|                                                   | Deep black soils (800-1000 mm rainfall)                                                  | Rice-Wheat                    | Give supplemental irrigation if available.<br><br>Harvest crop at physiological maturity. | <ol style="list-style-type: none"> <li>1. Preference will be given on sowing of Lentil, Linseed, Chickpea, irrigated and unirrigated wheat</li> <li>2. Line sowing of Lentil, Linseed, Chickpea in moist zone .</li> <li>3. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers</li> <li>4. Sowing of small seeded grains mix with FYM and vermicompost</li> </ol> | Linkage with SAU, NSC, Beej Nigam and farmers societies for seed availability. |
|                                                   |                                                                                          | Blackgram                     |                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                |
|                                                   |                                                                                          | Pigeonpea                     |                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                |
|                                                   |                                                                                          | Sesame                        |                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                |
|                                                   | Shallow soils (Sandy loam ( <i>matasi</i> ) with 750-900 mm rainfall)                    | Rice-Wheat                    |                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                |
|                                                   |                                                                                          | Blackgram                     |                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                |
|                                                   |                                                                                          | Pigeonpea                     |                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                |
|                                                   |                                                                                          | Sesame                        |                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                |
|                                                   | Shallow soils (Red ( <i>padwa</i> ) & yellow( <i>dhankar</i> ) with 600-800 mm rainfall) | Rice-Wheat                    |                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                |
|                                                   |                                                                                          | Blackgram                     |                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                |
|                                                   |                                                                                          | Pigeonpea                     |                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                |
|                                                   |                                                                                          | Sesame                        |                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                |
|                                                   | Medium deep soils ( <i>Kachari</i> ) with 900-1100 mm rainfall)                          | Rice-Wheat                    |                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                |
|                                                   |                                                                                          | Blackgram                     |                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                |
|                                                   |                                                                                          | Pigeonpea                     |                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                |
|                                                   |                                                                                          | Sesame                        |                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                |

### 2.1.2 Irrigated situation

| Condition | Major Farming situation | Normal Crop/cropping system | Suggested Contingency measures |                    |                           |
|-----------|-------------------------|-----------------------------|--------------------------------|--------------------|---------------------------|
|           |                         |                             | Change in crop/cropping system | Agronomic measures | Remarks on Implementation |
|           |                         |                             |                                |                    |                           |

| Condition                                              | Major Farming situation | Normal Crop/cropping system | Suggested Contingency measures                                                                   |                                                                                   |                           |
|--------------------------------------------------------|-------------------------|-----------------------------|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------|
|                                                        |                         |                             | Change in crop/cropping system                                                                   | Agronomic measures                                                                | Remarks on Implementation |
| Delayed release of water in canals due to low rainfall | Upland                  | Rice                        | Replace upland rice with Soybean, Blackgram, Sesame                                              | -                                                                                 | -                         |
|                                                        |                         | Wheat                       | Prefer short duration low water requirement varieties of wheat.                                  |                                                                                   |                           |
|                                                        | Midland                 | Rice                        | Replace rice with maize, sorghum etc. if conditions prevails go SRI method of rice transplanting | Dry sowing with short duration crop varieties.                                    |                           |
|                                                        |                         | Wheat                       | Prefer short duration low water requirement varieties of wheat.                                  |                                                                                   |                           |
|                                                        | Low land                | Rice                        | Prefer short duration varieties- JR-75, JR-201, 353, Vandana, Poornima etc.                      | Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice |                           |
|                                                        |                         | Wheat                       | Prefer short duration low water requirement varieties of wheat.                                  |                                                                                   |                           |
|                                                        |                         |                             | Prefer early maturing Cultivars.                                                                 |                                                                                   |                           |
|                                                        |                         |                             | Irrigate at critical stages                                                                      |                                                                                   |                           |

| Condition                                              | Major Farming situation | Normal Crop/cropping system | Suggested Contingency measures                                                                         |                                                                                                                                                                                                                                        |                           |
|--------------------------------------------------------|-------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                                                        |                         |                             | Change in crop/cropping system                                                                         | Agronomic measures                                                                                                                                                                                                                     | Remarks on Implementation |
| Limited release of water in canals due to low rainfall | Upland                  | Rice                        | Replace upland rice with lesser water required crops viz., Soybean, Blackgram, Sesame                  | -Dry sowing with short duration crop varieties.<br>-Use of vermicompost.<br>-Use balanced quantity of fertilizers.<br>-Water harvesting and use of collected water for life saving irrigation.<br>Application of need based irrigation | -                         |
|                                                        | Midland                 | Rice                        | Replace rice with maize, sorghum etc. if conditions prevails<br>Adopt SRI method of rice transplanting |                                                                                                                                                                                                                                        |                           |

| Condition | Suggested Contingency measures |                             |                                                                             |                                |                           |
|-----------|--------------------------------|-----------------------------|-----------------------------------------------------------------------------|--------------------------------|---------------------------|
|           | Major Farming situation        | Normal Crop/cropping system | Change in crop/cropping system                                              | Agronomic measures             | Remarks on Implementation |
|           | Low land                       | Rice                        | Select short duration varieties- JR-75, JR-201, 353, Vandana, Poornima etc. | by pressure irrigation method. |                           |

| 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 | Upland                         | Rice                        | Replace upland rice with low water required crops viz., Soybean, Blackgram, Sesamel | <b>Rice-</b> Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice<br>Adopt furrow irrigation and use of micro-irrigation system<br><br>Adaptation of soil and water conservation practices.<br><br>Weed management in rice | -                         |
|                                                                            |                                | Wheat                       | Prefer short duration low water requirement varieties of wheat.                     |                                                                                                                                                                                                                                                         |                           |
|                                                                            | Midland                        | Rice                        | Replace rice with maize, sorghum etc.<br>Adopt SRI method of rice transplanting     |                                                                                                                                                                                                                                                         |                           |
|                                                                            | Low land                       | Rice                        | Select short duration varieties- JR-75, JR-201, 353, Vandana, Poornima etc.         |                                                                                                                                                                                                                                                         |                           |

| Condition | Suggested Contingency measures |                             |                                |                    |
|-----------|--------------------------------|-----------------------------|--------------------------------|--------------------|
|           | Major Farming situation        | Normal Crop/cropping system | Change in crop/cropping system | Agronomic measures |

| Condition                                                                | Suggested Contingency measures |                             |                                                                                                        |                                                                                                                                                                                                                            |                                     |
|--------------------------------------------------------------------------|--------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
|                                                                          | Major Farming situation        | Normal Crop/cropping system | Change in crop/cropping system                                                                         | Agonomic measures                                                                                                                                                                                                          | Remarks on Implementation           |
| Lack of inflows into tanks due to insufficient /delayed onset of monsoon | Upland                         | Rice                        | Replace upland Rice with lesser water required crops viz., Soybean, Blackgram, Sesame                  | <b>Rice-</b> Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice<br><br>Adopt furrow irrigation and use of micro-irrigation system<br><br>Adopt soil and water conservation by use of mulch. | Awareness programme in Atma and FTC |
|                                                                          |                                | Wheat                       | Prefer short duration low water requirement varieties of wheat.                                        |                                                                                                                                                                                                                            |                                     |
|                                                                          | Midland                        | Rice                        | Replace Rice with maize, sorghum etc. if conditions prevails<br>Adopt SRI method of rice transplanting |                                                                                                                                                                                                                            |                                     |
|                                                                          | Low land                       | Rice                        | Prefer short duration varieties- JR-75, JR-201, 353, Vandana, Poornima etc.                            |                                                                                                                                                                                                                            |                                     |

| Condition                                             | Suggested Contingency measures       |                                          |                                                                                                                                                                                                                |                                                                                                                                                                  |                                        |
|-------------------------------------------------------|--------------------------------------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
|                                                       | Major Farming situation <sup>f</sup> | Normal Crop/cropping system <sup>g</sup> | Change in crop/cropping system <sup>h</sup>                                                                                                                                                                    | Agonomic measures <sup>i</sup>                                                                                                                                   | Remarks on Implementation <sup>j</sup> |
| Insufficient groundwater recharge due to low rainfall | Upland                               | Rice                                     | Replace upland rice with lesser water required crops viz., Soybean, Blackgram, Sesame<br><br>Sowing of pulses & oilseeds in place of cereals<br>Plan for relay or utera cropping with any short duration pulse | <b>Rice-</b> Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice<br><br>Adopt furrow irrigation and use of micro-irrigation system |                                        |
|                                                       |                                      | Chickpea                                 | Chickpea should be sown under residual moisture immediately after harvest of soybean or give pre sowing irrigation to chickpea                                                                                 | -                                                                                                                                                                |                                        |
|                                                       |                                      | Wheat                                    | Prefer short duration low water requirement varieties of wheat.<br><br>Protective irrigation at CRI stage in wheat.                                                                                            | -                                                                                                                                                                |                                        |

| Condition | Suggested Contingency measures       |                                          |                                                                                                                                                                          |                                                                                                                                                                  |                                        |
|-----------|--------------------------------------|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
|           | Major Farming situation <sup>f</sup> | Normal Crop/cropping system <sup>g</sup> | Change in crop/cropping system <sup>h</sup>                                                                                                                              | Agonomic measures <sup>i</sup>                                                                                                                                   | Remarks on Implementation <sup>j</sup> |
|           | Midland                              | Rice                                     | Replace Rice with maize, sorghum etc. if conditions prevails<br>Adopt SRI method of rice transplanting<br>Plan for relay or utera cropping with any short duration pulse | <b>Rice-</b> Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice<br><br>Adaptation of soil and water conservation by use of mulch. |                                        |
|           |                                      | Chickpea                                 | Chickpea should be sown with residual moisture after harvest of soybean or give pre sowing irrigation to chickpea                                                        |                                                                                                                                                                  |                                        |
|           |                                      | Wheat                                    | Prefer short duration low water requirement varieties of wheat.<br><br>Protective irrigation at CRI stage in wheat.                                                      |                                                                                                                                                                  |                                        |
|           | Low land                             | Rice                                     | Select short duration varieties- JR-75, JR-201, 353, Vandana, Poornima etc.<br>Plan for relay or utera cropping with any short duration pulse                            | -                                                                                                                                                                |                                        |
|           |                                      | Chickpea                                 | Chickpea should be sown with residual moisture after harvest of soybean or give pre sowing irrigation to chickpea                                                        |                                                                                                                                                                  |                                        |
|           |                                      | Wheat                                    | Prefer short duration low water requirement varieties of wheat.<br><br>Protective irrigation at CRI stage in wheat.                                                      |                                                                                                                                                                  |                                        |

**2.2 Unusual rains (untimely, unseasonal etc)] (for both rain fed and irrigated situations)**

| Condition                                                 | Suggested contingency measure |                 |                     |              |
|-----------------------------------------------------------|-------------------------------|-----------------|---------------------|--------------|
|                                                           | Vegetative stage              | Flowering stage | Crop maturity stage | Post harvest |
| Continuous high rainfall in a short span leading to water |                               |                 |                     |              |

| logging              |                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                   |                                                                                                                                        |                                                                                                                                                                                                                                                                                                  |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rice                 | Drain the excess water as early as possible<br>Apply 20 kg N + 10 kg K /ha after draining excess water<br>Take up gap filling either with available nursery or by splitting the tillers from the surviving hills<br>Take up suitable plant protection Measures in anticipation of pest & disease out breaks | Drain the excess water as early as possible<br>Apply 20 kg N + 10 kg K /ha after draining excess water<br>Take up suitable plant protection Measures in anticipation of pest & disease out breaks | Drain the excess water as early as possible<br>Take up suitable plant protection measures in anticipation of pest & disease out breaks | Drain out water and spread sheaves loosely in field or field bunds where there is no water stagnation<br>Spray common salt at 5% on panicles to prevent germination and spoilage of straw from moulds<br>Thresh after drying the sheaves properly<br>Ensure proper grain moisture before storing |
| Sesame/<br>Blackgram | Provide drainage care should be taken that rain water does not stagnate in the field<br>-Planting on ridge and furrow.                                                                                                                                                                                      | Care should be taken that rain water does not stagnate in the field.<br>Interculture operation to improve soil aeration.                                                                          | -Drain excess rain water.<br>-Harvesting of crop in clear weather.<br>-Keep the harvested produce in safe place.                       | Produce should be placed under shade. or protect the produce by tarpaulin kept in T floor.<br>Sun Dry of the produce.                                                                                                                                                                            |
| Wheat                | Care should be taken that rain water does not stagnate in the field.<br>-top dressing of nitrogenous fertilizers.                                                                                                                                                                                           | Care should be taken that rain water does not stagnate in the field.<br>Interculture operation to improve soil aeration.                                                                          | Drain excess rain water.<br>-Harvesting of crop in clear weather.<br>-Keep the harvested produce in safe place.                        | - Produce should be placed under shade. Protect the produce by tarpaulin kept in T floor.<br>Sun dry of the produce.                                                                                                                                                                             |

|                                                                 |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                           |                                                                                                                                            |                                                                                                                         |
|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Chickpea                                                        | Care should be taken that rain water does not stagnate in the field.<br>-Planting in ridge and furrow.<br>-Interculture operation for aeration.                                                                                                                      | Care should be taken that rain water does not stagnate in the field.<br>-Planting in ridge and furrow.<br>-Interculture operation for aeration.<br>- Spray of 2% DAP.                                                                     | Drain excess rain water from field.<br>-Harvesting of crop in clear weather.<br>-Keep the harvested produce in safe place.                 | - Produce should be placed under shade.<br>Protect the produce by tarpaulin kept in T floor.<br>Sun dry of the produce. |
| <b>Horticulture</b>                                             | -                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                           |                                                                                                                                            |                                                                                                                         |
| <b>Heavy rainfall with high speed wind in a short span</b>      | NA                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                           |                                                                                                                                            |                                                                                                                         |
| <b>Outbreak of pests and diseases due to unseasonable rains</b> |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                           |                                                                                                                                            |                                                                                                                         |
| Rice                                                            | Control Rice hispa by clipping of seedlings<br>Tips- to remove eggs masses of stem borers and rice hispa-or apply chlorpyrifos 20 EC @500 ml/ha.<br><br><b>Disease-</b> control bacterial leaf blight, leaf streak, brown spot, by applying streptocycline (250ppm). | For same pest apply trichogramma or crysopa @ 40000-50000 eggs/ha.<br>Use NPV 250 LE/ha<br>Use Bt formulations 1 lt./ha.<br><b>Disease</b> control of bacterial leaf blight, leaf streak, brown spot by applying streptocycline (250ppm). | Control of important Disease viz. rice blast<br>Brown spot, false smut etc by applying Propiconzol (0.6ml/lit)/<br>Henzconazole(0.2%) etc. | Well drying prior to storage place should be of moisture proof rodent proof etc.                                        |
| Blackgram                                                       | Greater incidence of semi looper and cattter piller for control apply Choloropyriphos 20 EC @ 500 ml/ ha.<br>Apply Dithane M-45 @ 2.5 gm/lt. of water to control cercospora disease                                                                                  | -                                                                                                                                                                                                                                         | -                                                                                                                                          | -                                                                                                                       |
| Soybean                                                         | Control of semi looper, girdle betle, stem Fly by applying Trizopphas 40 EC or Profenofos 50 EC @ 800 ml/ha                                                                                                                                                          | Incidence of tobacco caterpillar, bihar hairy caterpillar.<br>Trichogramma                                                                                                                                                                | Control of pod borer and Cercospora, bacterial blight                                                                                      | Well drying prior to storage place should                                                                               |

|                     |                                                                                                                                                                                          |                                                                                                                                                                  |                                                                                                                                                                                                                                                                    |                                        |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
|                     |                                                                                                                                                                                          | @ 40000-50000 eggs/ha.<br>Use NPV 250 LE/ha<br>Use Bt formulations<br>1. lit./ha                                                                                 |                                                                                                                                                                                                                                                                    | be of moisture proof rodent proof etc. |
| Pigeonpea           | Incidence of leaf Webber, blister beetle and girdle beetle etc. and incidence of phytopthera Disease<br>Quinalphos 1.5% or cholorpyriphos 1.5%<br>Endosulphon 2% or methyle parathion 2% | Incidence of pod fly, pod borer, pod bug and plume moth.<br><i>Bacillus thuringeinsis</i> @ 1.5 kg /ha<br>HaNPV@ 500 LE/ ha + 0.1%<br>UV retardant + 0.% jaggery | Incidente of pod fly, pod borer, Pod bugs and plume moth<br>Against pod fly<br>Dimethoate 30 EC @ 0.03%<br>Against gram pod borer<br>Dusting @ 20-25 kg/ha<br>Fenvalerate 0.4% or quinalphos 1.5%<br>Or Cholorpyriphos 1.5% Endosulphan 2% or methyle Parathion 2% |                                        |
| Sesame              | Sesame leaf rollor, Sesame hawk moth, bihar hairy caterpillar, apply choloropyriphos 20EC @ 500 ml/ ha, Quinolphos 50 EC @ 800 ml/ha                                                     | Capsule borer<br>Gall fly                                                                                                                                        | Capsule borer, gall fly, apply Triazophos 40 EC or Profenofos 50 EC @ 800mli/ha                                                                                                                                                                                    |                                        |
| <b>Horticulture</b> |                                                                                                                                                                                          |                                                                                                                                                                  |                                                                                                                                                                                                                                                                    |                                        |
| Tomato              | Avoid water stagnation                                                                                                                                                                   | Stacking of plants                                                                                                                                               |                                                                                                                                                                                                                                                                    |                                        |

## 2.2 Floods - Not Applicable

| Condition                                                | Suggested contingency measure |                  |                    |            |
|----------------------------------------------------------|-------------------------------|------------------|--------------------|------------|
|                                                          | Seedling / nursery stage      | Vegetative stage | Reproductive stage | At harvest |
| Transient water logging/ partial inundation <sup>1</sup> |                               |                  |                    |            |
| Continuous submergence for more than 2 days <sup>2</sup> | Not Applicable                |                  |                    |            |
| Sea water intrusion <sup>3</sup>                         |                               |                  |                    |            |

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

| Extreme event type           | Suggested contingency measure                                                                                                                                                |                                                                                                                                                                                 |                                                                                                                                                                              |                                        |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
|                              | Seedling / nursery stage                                                                                                                                                     | Vegetative stage                                                                                                                                                                | Reproductive stage                                                                                                                                                           | At harvest                             |
| <b>Heat Wave</b>             |                                                                                                                                                                              |                                                                                                                                                                                 |                                                                                                                                                                              |                                        |
| Rice                         | Light and repeated irrigation at the appearance of hair line cracks in soil surface,<br><br>Correct iron deficiency with 0.5% iron sulphate spray.                           | Repeated irrigation at the appearance of hair line cracks in soil surface, pounding of water for 15 days after transplanting to check Fe deficiency and for crop establishment. | Repeated irrigation at the appearance of hairline cracks in soil surface                                                                                                     | Harvest crop at physiological maturity |
| Blackgram, Pigeonpea, Sesame | Protect the crop with the help of light irrigation; wind breaks are necessary where cold and heat wave in regular                                                            | Protect the crop with the help of light irrigation; wind breaks are necessary where cold and heat wave in regular                                                               | Protect the crop with the help of light irrigation; wind breaks are necessary where cold and heat wave in regular                                                            | Harvest at physiological maturity      |
| <b>Horticulture</b>          |                                                                                                                                                                              |                                                                                                                                                                                 |                                                                                                                                                                              |                                        |
| Mango , Guava                | Protect the crop with the help of light irrigation, wind breaks are necessary where cold and heat wave in regular                                                            | Protect the crop with the help of light irrigation; wind breaks are necessary where cold and heat wave in regular                                                               | Protect the crop with the help of light irrigation; wind breaks are necessary where cold and heat wave in regular                                                            | Harvest at physiological maturity      |
| <b>Cold wave</b>             |                                                                                                                                                                              |                                                                                                                                                                                 |                                                                                                                                                                              |                                        |
| Chick pea<br>Wheat           | Light irrigation<br>Smoke generation at night time to rise temperature                                                                                                       | Light irrigation<br>Smoke generation at night time to rise temperature                                                                                                          | Light irrigation<br>Smoke generation at night time to rise temperature                                                                                                       | Harvest at physiological maturity      |
| <b>Frost</b>                 |                                                                                                                                                                              |                                                                                                                                                                                 |                                                                                                                                                                              |                                        |
| Chickpea, Lentil, Pigeonpea  | Protect the crop with the help of light irrigation;<br>Smoke generation at night time to rise temperature ;<br>Wind breaks are necessary where cold and heat wave in regular | Protect the crop with the help of light irrigation,<br>Smoke generation at night time to rise temperature ;<br>Wind breaks are necessary where cold and heat wave in regular    | Protect the crop with the help of light irrigation,<br>Smoke generation at night time to rise temperature ;<br>Wind breaks are necessary where cold and heat wave in regular | Harvest at physiological maturity      |
| <b>Hailstorm</b>             | Not applicable                                                                                                                                                               |                                                                                                                                                                                 |                                                                                                                                                                              |                                        |
| <b>Cyclone</b>               | Not applicable                                                                                                                                                               |                                                                                                                                                                                 |                                                                                                                                                                              |                                        |

## 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 | <p>As the district is occasionally prone to drought the following practices may be implemented to prevent fodder shortage problem</p> <p>Sowing of cereals (fodder varieties of Sorghum/ Bajra) and leguminous crops (Lucerne, Berseem, Horse gram, Cowpea) during North-East monsoon under dry land system for fodder production.</p> <p>Collection of soybean and chick pea stover for use as feed supplement during drought</p> <p>Preserving the green maize fodder as silage</p> <p>Encourage fodder production with Bajra – stylo-Bajra on rotation basis and also to cultivate short-term fodder crops like sunhemp</p> | <p>Harvest and use biomass of dried up crops (Rice, wheat, Maize, Soybean, Black gram, Green gram, chick pea etc., ) material as fodder</p> <p>Harvest all the top fodder available (Subabul, Glyricidia, Pipol, Prosopis etc) and feed the LS during drought</p> <p>Concentrate ingredients such as Grains, brans, chunnies &amp; oilseed cakes, low grade grains etc. unfit for human consumption should be procured from Govt. Godowns for feeding as supplement for high productive animals during drought</p> <p>Promotion of Horse gram as contingent crop and harvesting it at vegetative stage as fodder</p> <p>Continuous supplementation of minerals and vitamin to prevent infertility.</p> <p>Encourage mixing available kitchen waste with dry fodder while feeding to the milch animals</p> | <p>Encourage progressive farmers to grow multi cut fodder crops of sorghum/bajra/maize with input subsidy</p> <p>Supply of quality stem cuttings of Hybrid napier (CO1), paragrass, guinea grass etc., well before monsoon</p> <p>Encourage growing fodder crops like Berseem in winter and Juar in summer season</p> <p>Flushing the stock to recoup</p> <p>Replenish the feed and fodder banks</p> |

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                    |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Drinking water                 | <p>Adopt various water conservation methods at village level to improve the ground water level for adequate water supply.</p> <p>Identification of water resources</p> <p>De-silting of ponds</p> <p>Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals)</p> <p>Construction of drinking water tanks in herding places/village junctions/relief camp locations</p> <p>Community drinking water trough can be arranged in sandies /community grazing areas</p> | <p>Adequate supply of drinking water.</p> <p>Restrict wallowing of animals in water bodies/resources; Add alum in stagnated water bodies</p>                                                                                                                                                                                                                                                                                                                                                                                                       | <p>Watershed management practices shall be promoted to conserve the rainwater. Bleach (0.1%) drinking water / water sources</p> <p>Provide clean drinking water</p>                                                                                                                                                |
| Health and diseases management | <p>Procure and stock emergency medicines and vaccines for important endemic diseases of the area</p> <p>All the stock must be immunized for endemic diseases of the area</p> <p>Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district</p> <p>Adequate refreshment training on draught management to be given to VAS, Jr.VAS, LI with regard to health &amp; management measures</p> <p>Procure and stock multivitamins &amp; area specific mineral mixture</p>    | <p>Carryout deworming to all animals entering into relief camps</p> <p>Identification and quarantine of sick animals</p> <p>Constitution of Rapid Action Veterinary Force</p> <p>Performing ring vaccination (8 km radius) in case of any outbreak</p> <p>Restricting movement of livestock in case of any epidemic</p> <p>Tick control measures be undertaken to prevent tick borne diseases in animals</p> <p>Rescue of sick and injured animals and their treatment</p> <p>Organize with community, daily lifting of dung from relief camps</p> | <p>Keep close surveillance on disease outbreak.</p> <p>Undertake the vaccination depending on need</p> <p>Keep the animal houses clean and spray disinfectants Farmers should be advised to breed their milch animals during July-September so that the peak milk production does not coincide with mid summer</p> |
| <b>Floods</b>                  | <b>NA</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                    |
| <b>Cyclone</b>                 | <b>NA</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                    |
| <b>Heat wave and cold wave</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                    |

|                  |                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| <b>Heat wave</b> | <ul style="list-style-type: none"> <li>i) Plantation around the shed</li> <li>ii) H<sub>2</sub>O sprinklers / foggers in the shed</li> <li>iii) Application of white reflector paint on the roof</li> <li>iv) Thatched sheds should be provided as a shelter to animal to minimize heat stress</li> </ul> | <p>Allow the animals early in the morning or late in the evening for grazing during heat waves</p> <p>Feed green fodder/silage / concentrates during day time and roughages / hay during night time in case of heat waves</p> <p>Put on the foggers / sprinklers /fans during heat waves in case of high yielders (Jersey/HF crosses)</p> <p>In severe cases, vitamin 'C' and electrolytes should be added in H<sub>2</sub>O during heat waves.</p> | <p>Feed the animals as per routine schedule</p> <p>Allow the animals for grazing (normal timings)</p>          |
| <b>Cold wave</b> | Covering all the wire meshed walls / open area with gunny bags/ polyethylene sheets (with a mechanism for lifting during the day time and putting down during night time)                                                                                                                                 | <p>Allow for grazing between 10AM to 3PM during cold waves</p> <p>Add 25-50 ml of edible oil in concentrates and fed to the animal during cold waves</p> <p>Apply / sprinkle lime powder in the animal shed during cold waves to neutralize ammonia accumulation</p>                                                                                                                                                                                | <p>Feed the animals as per routine schedule</p> <p>Allow the animals for grazing (normal timings)</p>          |
| <b>Insurance</b> | Encouraging insurance of livestock                                                                                                                                                                                                                                                                        | Listing out the details of the dead animals                                                                                                                                                                                                                                                                                                                                                                                                         | <p>Submission for insurance claim and availing insurance benefit</p> <p>Purchase of new productive animals</p> |

### 2.5.2 Poultry

|                              | <b>Suggested contingency measures</b>                                                                |                                                                                                                                        |                                       |
|------------------------------|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
|                              | <b>Before the event</b>                                                                              | <b>During the event</b>                                                                                                                | <b>After the event</b>                |
| <b>Drought</b>               |                                                                                                      |                                                                                                                                        |                                       |
| Shortage of feed ingredients | Storing of house hold grain like maize, broken rice etc, in to use as feed in case of severe drought | <p>Supplementation only for productive birds with house hold grain</p> <p>Supplementation of shell grit (calcium) for laying birds</p> | Supplementation to all survived birds |

|                                       |                                                                                                                      |                                                                                                                                                                                  |                                                                                                                 |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
|                                       |                                                                                                                      | Culling of weak birds                                                                                                                                                            |                                                                                                                 |
| Drinking water                        |                                                                                                                      | Use water sanitizers or offer cool hygienic drinking water                                                                                                                       |                                                                                                                 |
| Health and disease management         | Culling of sick birds.<br>De-worming and vaccination against RD and IBD                                              | Mixing of Vit. A,D,E, K and B-complex including vit C in drinking water (5ml in one litre water)                                                                                 | Hygienic and sanitation of poultry house<br>Disposal of dead birds by burning / burying with lime powder in pit |
| <b>Floods</b>                         | <b>NA</b>                                                                                                            |                                                                                                                                                                                  |                                                                                                                 |
| <b>Cyclone</b>                        | <b>NA</b>                                                                                                            |                                                                                                                                                                                  |                                                                                                                 |
| <b>Heat wave and cold wave</b>        |                                                                                                                      |                                                                                                                                                                                  |                                                                                                                 |
| <b>Shelter/environment management</b> | <b>Heat wave:</b> Provision of proper shelter with good ventilation                                                  | In severe cases, foggers/water sprinklers/wetting of hanged gunny bags should be arranged<br>Don't allow for scavenging during mid day                                           | Routine practices are followed                                                                                  |
|                                       | <b>Cold wave:</b> Provision of proper shelter<br>Arrangement for brooding<br>Assure supply of continuous electricity | Close all openings with polythene sheets<br>In severe cases, arrange heaters<br>Don't allow for scavenging during early morning and late evening                                 | Routine practices are followed                                                                                  |
| <b>Health and disease management</b>  | De-worming and vaccination against RD and fowl pox                                                                   | Supplementation of house hold grain<br>Provide cool and clean drinking water with electrolytes and vit. C<br>In hot summer, add anti-stress probiotics in drinking water or feed | Routine practices are followed                                                                                  |

### 2.5.3

### Fisheries/ Aquaculture

|                                                                        | <b>Suggested contingency measures</b>                                                                                                                                                                                                                                     |                                                                                                                                                                                                              |                                                                                                                                                                         |
|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                        | <b>Before the event</b>                                                                                                                                                                                                                                                   | <b>During the event</b>                                                                                                                                                                                      | <b>After the event</b>                                                                                                                                                  |
| <b>Drought</b>                                                         |                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                              |                                                                                                                                                                         |
| Shallow water in ponds due to insufficient rains/inflow                | <ol style="list-style-type: none"> <li>1. Restricted release of water from reservoir.</li> <li>2. Supplementary water harvest structures like pond and tanks have to be developed.</li> <li>3. Renovation and maintenance of existing water harvest structures</li> </ol> | <ol style="list-style-type: none"> <li>1. Restrict lifting of water for irrigation purpose of crops</li> <li>2. Catch the stock, market the produce to reduce the density of population in ponds.</li> </ol> | <ol style="list-style-type: none"> <li>1. Excavate the ponds to increase the depth.</li> <li>2. Try to release water into the pond if it rains in off-season</li> </ol> |
| Impact of heat & salt load build up in ponds / change in water quality | <ol style="list-style-type: none"> <li>1. Prepare to release water into the habitat</li> </ol>                                                                                                                                                                            | <ol style="list-style-type: none"> <li>1. Mixing of water from the water harvest structure like ponds and tanks into the fish habitat.</li> </ol>                                                            | <ol style="list-style-type: none"> <li>1. Monitoring the water quality and health of aquatic organisms</li> </ol>                                                       |
| <b>Floods</b>                                                          | <b>NA</b>                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                              |                                                                                                                                                                         |
| <b>Cyclone</b>                                                         | <b>NA</b>                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                              |                                                                                                                                                                         |
| <b>Heat wave and cold wave</b>                                         |                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                              |                                                                                                                                                                         |
| Management of pond environment                                         | Good water quality to be maintained, Water depth to be maintained                                                                                                                                                                                                         | Recirculation of water and pruning                                                                                                                                                                           | Water treatment with lime                                                                                                                                               |
| Health and diseases management                                         | Prophylactic measures to be taken                                                                                                                                                                                                                                         | Maintain good quality water in ponds                                                                                                                                                                         | Treatment of pond water with lime and medicines                                                                                                                         |