



भा कृ अनुप - पु प सं
ICAR - RCNEH

Agriculture Contingency Plan

District: Sepahijala



भा कृ अनुप
ICAR

Krishi Vigyan Kendra
(ICAR Research Complex for NEH Region)
West Tripura

State: TRIPURA

Agriculture Contingency Plan for District: Sepahijala

| 1.0 District Agriculture profile | | | |
|----------------------------------|---|--|--|
| 1.1 | Agro-Climatic/Ecological Zone | | |
| | Agro Ecological Sub Region (ICAR) | Humid Eastern Himalayan Region (17.2) | |
| | Agro-Climatic Region (Planning Commission) | Eastern Himalaya Region (II) | |
| | Agro Climatic Zone (NARP) | Humid subtropical climate | |
| | List all the districts or part thereof falling under the NARP Zone | Sepahijala District | |
| | Geographic coordinates of district | Latitude | Longitude |
| | | 22 ^o 56' and 24 ^o 32' N | 91 ^o 0' and 92 ^o 20'E |
| | Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS | ICAR Research Complex for N.E.H. Region, Tripura Centre Lembucherra, West Tripura, Tripura. | |
| | Mention the KVK located in the district | KVK, Sepahijala (CAU, Lembucherra) | |
| | Name & address of the nearest Agromet field unit (AMFU, IMD) for agro-advisories in the zone | ICAR Research Complex for N.E.H. Region, Tripura Centre Lembucherra, West Tripura, Tripura. | |
| 1.2 | Rainfall | Average (mm) | Normal Onset (specify week and month) |
| | | | Normal Cessation (specify week and month) |

| | | | |
|--------------------------------|--------|---------------------------------|------------------------------|
| SW monsoon (June-September): | 1377.9 | 2 nd week of June | 4 th week of Sept |
| NE Monsoon (October-December): | 210.4 | 2 nd week of October | First week of November |
| Winter (Jan-February) | 28.8 | - | - |
| Summer (March-May) | 557.5 | 15 th April | 30 th May |
| Annual | 2174.6 | - | - |

Source: Draft C-DAP of Dept. of Agriculture and Allied Departments, Govt. of Tripura

| 1.3 | Land use pattern of the district (latest statistics) | Geographical area | Forest area | Land under non-agricultural use | Permanent pastures | Cultivable wasteland | Land under Misc. tree crops and groves | Barren and uncultivable land | Current fallows | Other fallows |
|-----|--|-------------------|-------------|---------------------------------|--------------------|----------------------|--|------------------------------|-----------------|---------------|
| | Area (ha) | 103080 | 30996 | 24292 | 14 | 300 | 950 | Data not available | 137 | 132 |

Source: Office of the Deputy Director, Dept. of Agriculture, Sepahijala District (2013-14)

| 1.4 | Major Soils (common names like shallow red soils etc.) | Area ('000 ha) | Percent (%) of total |
|-----|--|----------------|----------------------|
| | 1. Red Soil | NA | - |
| | 2. Alluvial Soil | NA | - |
| | 3. Sandy Soil | NA | - |
| | 4. Sandy Loam | NA | - |
| | 5. Clay Loam | NA | - |
| | Others (specify): | -- | - |
| 1.5 | Agricultural land use | Area ('000 ha) | Cropping intensity % |
| | Net sown area | 46259 | 218% |
| | Area sown more than once | 55020 | |
| | Gross cropped area | 101279 | |

Source: Agriculture Department, Govt. of Tripura

| | | | |
|---|--|--|-----------------------|
| 1.6 | Irrigation | Area ('000 ha) | |
| | Net cultivated Area | 44855 | |
| | Net irrigated area | 12889 | |
| | Gross cultivated area | 93399 | |
| | Gross irrigated area | 11239 | |
| | Rainfed area | | |
| | | | |
| | Sources of Irrigation | Number | Area ('000 ha) |
| | Canals (medium and minor) | 30 | 474 |
| | Tanks | 121 | 51 |
| | Open wells | 2 | 1 |
| | Bore wells | 1261 | 1924 |
| | Lift irrigation schemes | 165 | 9567 |
| | Micro-irrigation (Drip and sprinkler) | Nil | Nil |
| | Other sources (please specify) WHS | 222 | 187 |
| | Total Irrigated Area | | 12889 |
| | Pump sets | - | - |
| | Canals (medium and minor) | Not Available | - |
| | Groundwater availability and use* (Data source: State/Central Ground water Department /Board) | No. of blocks/ Tehsils | (%) area |
| | Over exploited | Data not available | Data not available |
| | Critical | Data not available | Data not available |
| | Semi- critical | Data not available | Data not available |
| | Safe | All | 100 |
| | Wastewater availability and use | Data not available | Data not available |
| | Ground water quality | Contaminant –Iron, greater than 1.00 mg/lit. | |
| *over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70% | | | |

| 1.6. a. | Fertilizer and Pesticides use | Type | Total quantity (tonnes) |
|---------|-------------------------------|---|--|
| 1 | Fertilizers* | Urea DAP Potash SSP RP Other complex fertilizers (specify) Total | 3851 374 1375 3512 1722 10834 |
| 2 | Chemical Pesticides* | Insecticides+ Fungicides Weedicides Others (specify) Total | 44.4 -- . |

Source: Office of the Deputy Director, Dept. of Agriculture, Sepahijala District (2016-17)

* If break up is not available, indicate total quantity used in the district for any recent year, mention here the year and source of statistics.

1.7 Area under major field crops & horticulture etc. (Average for last five years)

| 1.7 | | Major Field Crops cultivated | Area ('000 ha) | | | | | |
|-----|--|---|--------------------|---------|------------------|---------|----------------|-------|
| | | | Kharif | | Rabi | | Summer | Total |
| | | | Irrigated | Rainfed | Irrigated | Rainfed | | |
| 1 | | Aush Paddy (Summer) | | - | - | - | 1817 | 1817 |
| 2 | | Aman Paddy (Kharif) | 25690 | - | - | - | - | 25690 |
| 3 | | Boro Paddy (Rabi) | - | - | 22880 | - | - | 22880 |
| 4 | | Maize | - | 1090 | 320 | - | - | 1410 |
| 5 | | Sesamum | - | 517 | - | - | - | 517 |
| 6 | | Mustard | - | - | 600 | - | - | 600 |
| 7 | | Pulses | 1267 | - | 1510 | - | - | 1510 |
| | | | | | | | | |
| | | Horticulture crops - Fruits | Total area | | Irrigated | | Rainfed | |
| 1 | | Mango | 1140 | | - | | - | |
| 2 | | Pineapple | 975 | | - | | - | |
| 3 | | Jackfruit | 580 | | - | | - | |
| 4 | | Banana | 1830 | | - | | - | |
| 5 | | Litchi | 276 | | - | | - | |
| | | Horticultural crops - Vegetables | Total area | | Irrigated | | Rainfed | |
| 1 | | Okra | 275 | | - | | - | |
| 2 | | Brinjal | 292 | | - | | - | |
| 3 | | Cole Crops | 1044 | | 940 | | 104 | |
| 4 | | Tomato | 163 | | 157 | | 12 | |
| 5 | | Chilli | 795 | | 720 | | 75 | |
| | | Medicinal and Aromatic crops | Total area | | Irrigated | | Rainfed | |
| 1 | | Nil. | Data Not Available | | | | | |

| | Plantation crops | Total area | Irrigated | Rainfed |
|---|-------------------------------|-------------------|------------------|----------------|
| 1 | Coconut | 800 | - | - |
| 2 | Arecanut | 495 | - | - |
| 3 | Cashewnut | 266 | - | - |
| 4 | Rubber | - | - | - |
| 5 | | | | |
| | Fodder crops | Total area | Irrigated | Rainfed |
| 1 | Not Available | - | - | - |
| 2 | - | - | - | - |
| 3 | - | - | - | - |
| 4 | - | - | - | - |
| 5 | - | - | - | - |
| | Total fodder crop area | - | - | - |
| | Grazing land | 113 | - | - |
| | Sericulture etc | - | - | - |
| | Others (Specify) | - | - | - |

Source: Office of the Deputy Director, Dept. of Agriculture, Sepahijala District (2016-17)

| 1.8 | Livestock | Male ('000) | Female ('000) | Total (nos) |
|------------|--|--------------------|----------------------|--------------------|
| | Non descriptive Cattle (local low yielding) | - | - | 114.506 |
| | Crossbred cattle | - | - | 24.396 |
| | Non descriptive Buffaloes (local low yielding) | - | - | - |
| | Graded Buffaloes | - | - | - |
| | Goat | - | - | 150.087 |
| | Sheep | 1 | 3 | 4 |

| | | | | |
|------------|---------------------------------|---------------------|----------------------------------|--------|
| | Others (Camel, Pig, Yak etc.) | 21562 | 19195 | 40,757 |
| | Commercial dairy farms (Number) | - | - | - |
| 1.9 | Poultry | No. of farms | Total No. of birds ('000) | |
| | Commercial | Data not available | Data not available | |
| | Backyard | Data not available | Data not available | |

| | | | | | | | |
|-------------------|---|-------------------------------|---------------------|-------------------------------|------------------------------------|--|---|
| 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 | |
| | | 26795 | | - | | 497 | |
| 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) | 3553.33 | 2.334 | 8.295 | | | |
| | Others | - | - | - | | | |

1.11 Production and Productivity of major crops

| 1.11 | Name of crop | Kharif | | Rabi | | Summer | | Total | | Crop residue as fodder ('000 tons) | | | |
|--|---|---------------------|----------------------|---|----------------------|---------------------|----------------------|---------------------|----------------------|------------------------------------|--|----------------------------|--|
| | | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) | | | | |
| Major Field crops (Crops to be identified based on total acreage) | | | | | | | | | | | | | |
| Crop 1 | Rice | 97528 | 3327 | 66665 | 3258 | 2080 | 2546 | | | - | | | |
| Crop 2 | Maize | - | - | - | - | - | - | 891 | 1510 | - | | | |
| Crop 3 | Groundnut | 20 | 1111 | 56 | 1018 | - | - | 76 | 2129 | - | | | |
| Crop 4 | Sesamum | 198 | 595 | - | - | - | - | 198 | 595 | - | | | |
| Crop 5 | Mustard | - | - | 630 | 849 | - | - | 630 | 849 | - | | | |
| Others | | | | | | | | | | - | | | |
| Major Horticultural crops (Crops to be identified based on total acreage) | | | | | | | | | | | | | |
| Crop 1 | Okra | | | | | 2761 | 9860.7 | | | | | | |
| Crop 2 | Brinjal | 5602 | 18989 | | | | | | | | | | |
| Crop 3 | Cabbage | | | 12176 | 27990 | | | | | | | | |
| Crop 4 | Tomato | | | 7526 | 20231 | | | | | | | | |
| Crop 5 | Chilli | 1695 | 6780 | | | | | | | | | | |
| Crop 6 | Cauliflower | | | 10713 | 26649 | | | | | | | | |
| 1.12 | Sowing window for 5 major field crops (start and end of normal sowing period) | | | Crop 1: <u>Rice</u> | | 2: <u>Maize</u> | | 3: <u>Groundnut</u> | | 4: <u>Sesamum</u> | | 5: <u>Rape and Mustard</u> | |
| | Summer rice-Rainfed | | | Sumer rice-April 2 nd week to May 4 th week | | | | | | | | | |

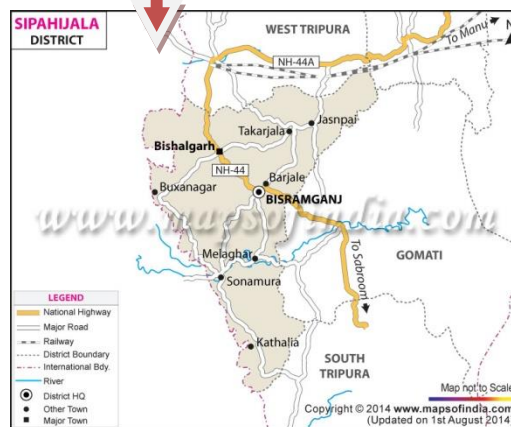
| | | | | | | | | | |
|-------------|--|---|---|--|--|--|------|------|--|
| | | | | | | | | | |
| | Kharif- Rainfed | June 1 st to June 3 rd week | 2 nd week of May to 1 st week of June | 2 nd week of June to 1 st week of July | 1 st week of April to 2 nd week of April | 1 st week of November | | | |
| | Kharif-Irrigated | - | - | - | - | - | | | |
| | Rabi- Rainfed | - | - | - | - | - | | | |
| | Rabi-Irrigated | - | - | Mid October to mid December | - | 15 th September to 15 th October | | | |
| 1.13 | What is the major contingency the district is prone to? (Tick mark and mention years if known during the last 10 year period) | Regular | | | Sporadic | | | None | |
| | | Severe | Moderate | Mild | Severe | Moderate | Mild | | |
| | Drought | - | - | - | - | √ | √ | - | |
| | Flood | - | - | - | - | √ | √ | - | |
| | Cyclone | - | - | - | - | √ | √ | - | |
| | Hail storm | - | - | - | - | - | √ | - | |
| | Heat wave | - | - | - | - | - | Mild | - | |
| | Cold wave | - | - | - | - | - | Mild | - | |
| | Frost | - | - | - | - | - | - | - | |
| | Sea water intrusion | - | - | - | - | - | - | - | |
| | Pests and diseases (specify) | | | - | | | | | |
| | i) Potato | | | | | | | | |
| | Potato late blight | | | | √ | | | | |
| | ii) Rice | | | | | | | | |
| | Rice blast, BLB, Gall midge, Stem borer | | √ | | | | | | |
| | iii) Other Crops | | | | | | | | |
| | Stem borer, pod borer, leaf folder, LB, Termite, Mango hopper, Fruit flies, Mango weevil, fruit & Shoot borer, wilt, leaf curl, | | √ | | | | | | |
| | Others | - | - | - | - | - | - | - | |

| | | | |
|-------------|---|---|---------------|
| 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: Yes |
| | | Soil map as Annexure 3 | Enclosed: Yes |

Annexure1. Location Map of Sepahijala District



i



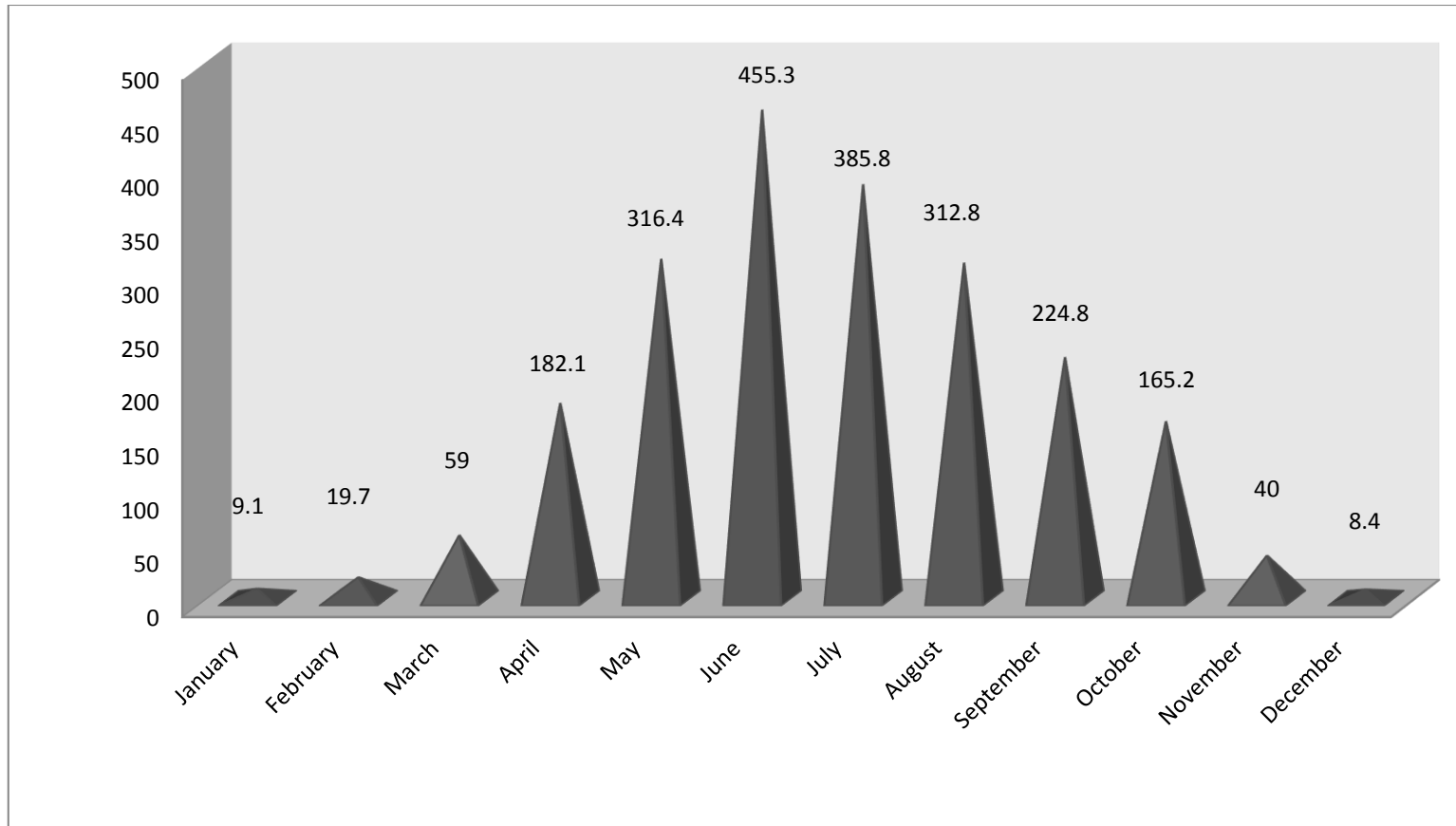


Fig: Mean annual rainfall (mm) of Sepahijala District

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1. Rainfed situation (Pre-Kharif)

| Condition | | | Suggested Contingency measures | | |
|---|--------------------------------|------------------------------------|---------------------------------------|---------------------------|----------------------------------|
| | | | Change in crop/cropping System | Agronomic Measures | Remarks on Implementation |
| Early season drought (delayed onset) | Major Farming Situation | Normal Crop/Cropping System | | | |
| Delay by 2 Weeks (Specify Month)* May 3rd Week to | Tilla and slopy land | Jhum Agriculture | No change | No change | - |
| | | Rice – fallow system | No change | No change | - |
| | | Maize -Vegetable system | No change | No change | - |
| | | Sesamum - vegetable | No change | No change | - |

| | | | | | |
|----------------------------------|----------------------|---|---|---|---|
| June 1st Week) | | | | | |
| | | | | | |
| | Lunga land(low land) | - | - | - | - |

2.1.2. Rainfed situation (Kharif)

| Condition | | | Suggested Contingency measures | | |
|---|--------------------------------|------------------------------------|---------------------------------------|---------------------------|----------------------------------|
| | | | Change in crop/cropping System | Agronomic Measures | Remarks on Implementation |
| Early season drought (delayed onset) | Major Farming Situation | Normal Crop/Cropping System | | | |
| Delay by 2 Weeks (Specify Month)* | Tilla and slopy land | | | | |
| | | Direct seeded Rice – fallow system | No change | No change | - |
| | | Maize -Fallow | No change | No change | - |

| | | | | | |
|---------------------------------|----------------------|--------------------------------|-----------|-----------|---|
| June 3rd Week | | Sesamum - fallow | No change | No change | - |
| | | Vegetable-Fallow | | | |
| | Lunga land(low land) | Transplanted Rice – potato | No change | No change | - |
| | | Transplanted Rice - fallow | No change | No change | - |
| | | Transplanted Rice - vegetables | No change | No change | - |
| | | | | | |

| Condition | | | Suggested Contingency measures | | |
|---|--------------------------------|------------------------------------|---------------------------------------|---------------------------|----------------------------------|
| Early season drought (delayed onset) | Major Farming Situation | Normal Crop/Cropping System | Change in crop/cropping System | Agronomic Measures | Remarks on Implementation |
| Delay by 4 Weeks (Specify Month) July 1st week | Tilla and slopy land | | | | |
| | | Direct seeded Rice – fallow system | No change | No change | - |
| | | Maize -Fallow | No change | No change | - |
| | | Sesamum - fallow | No change | No change | - |
| | | Vegetable-Fallow | No change | No change | - |
| | Lunga land(low land) | Transplanted Rice – potato | No change | No change | - |
| | | Transplanted Rice - fallow | No change | No change | - |
| | | Transplanted Rice - vegetables | No change | No change | - |
| | | | | | |
| Condition | | | Suggested Contingency measures | | |
| Early season drought (delayed onset) | Major Farming Situation | Normal Crop/Cropping System | Change in crop/cropping System | Agronomic Measures | Remarks on Implementation |

| | | | | | |
|--|--|--|--|--|----------------|
| Delay by 6 Weeks (Specify Month) July 3rd week | | | | | Not Applicable |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

| Condition | | | Suggested Contingency measure | | |
|--|-------------------------|------------------------------------|-------------------------------|--|---------------------------|
| Early season Drought (Normal Onset) | Major Farming Situation | Normal Crop/Cropping System | Crop Management | Soil Nutrient & Moisture conservation measures | Remarks on Implementation |
| Normal onset followed by 15-20 days dry spell after sowing leading to poor germination /crop stand | Tilla and slopy land | Direct seeded Rice – fallow system | Resowing /gap filling | Straw Mulching | - |
| | | Maize -Fallow | Resowing /gap filling | Straw Mulching | - |
| | | Sesamum - fallow | Resowing /gap filling | Straw Mulching | - |
| | | Vegetable-Fallow | Gap filling | Straw Mulching | - |
| | Lunga land(low land) | Transplanted Rice – potato | Life saving irrigation | - | - |
| | | Transplanted Rice - fallow | Life saving irrigation | - | - |
| Transplanted Rice - vegetables | | Life saving irrigation | - | - | |
| | | | | | |

| Condition | | | Suggested Contingency measure | | |
|---|-------------------------|-----------------------------|-------------------------------|--|---------------------------|
| Mid season Drought (long dry spell, Consecutive 2 | Major Farming Situation | Normal Crop/Cropping System | Crop Management | Soil Nutrient & Moisture conservation measures | Remarks on Implementation |
| | | | | | |

| weeks rainless (>2.5 mm) Period) | | | | | |
|--|----------------------|---------------------------------------|--|---|---|
| At vegetative stage | Tilla and slopy land | Direct seeded Rice – fallow system | Resowing /gap filling | - | - |
| | | Maize –Fallow system | Resowing /gap filling | Straw Mulching | - |
| | | Sesamum – fallow system | Resowing /gap filling | Straw Mulching | - |
| | | Vegetable-Fallow system | Gap filling | Straw Mulching | - |
| | Lunga land(low land) | Transplanted Rice – potato system | Retransplanting | Life saving irrigation, Postpone top dressing of nitrogen | - |
| | | Transplanted Rice – fallow system | Retransplanting | Life saving irrigation, Postpone top dressing of nitrogen | - |
| | | Transplanted Rice – vegetables system | Retransplanting | Life saving irrigation, Postpone top dressing of nitrogen | - |
| | | | | | |
| Flowering stage | Tilla and slopy land | Direct seeded Rice – fallow system | Life saving irrigation, thinning population | | - |
| | | Maize –Fallow system | Can be harvested for fodder followed by sowing of sesamum/ blackgram | | - |
| | | | | Life saving irrigation | - |
| | | Sesamum – fallow system | Thinning | Life saving irrigation | - |
| | | Vegetable-Fallow system | - | Life saving irrigation | - |

| | | | | | |
|-------------------------|----------------------|---------------------------------------|--|------------------------|---|
| | Lunga land(low land) | Transplanted Rice – potato system | | Life saving irrigation | - |
| | | | Plough down the existing crop and timely sowing of rabi crop | | |
| | | Transplanted Rice – fallow system | | Life saving irrigation | - |
| | | Transplanted Rice – vegetables system | | Life saving irrigation | |
| | | | Plough down the existing crop and timely sowing of rabi vegetables | | |
| | | | | | |
| Terminal draught | Not applicable | | | | |
| | | | | | |
| | | | | | |

2.1.3 Irrigated situation (Pre-Kharif)

| Condition | | | Suggested Contingency measure | | |
|--|-------------------------|-----------------------------|--------------------------------|-------------------|---------------------------|
| | Major Farming Situation | Normal Crop/Cropping System | Change in crop/cropping system | Agronomic measure | Remarks on Implementation |
| Delayed release Of water in Canals due to Low rainfall | Not applicable | | | | |
| Limited release of water in canals due to low rainfall | Not applicable | | | | |

| | | | | | |
|--|----------------|--|--|--|--|
| Non release of water in canals under delayed onset of monsoon in catchment | Not applicable | | | | |
| Lack of inflows into streams due to Insufficient/ delayed onset of monsoon | Not applicable | | | | |

2.1.4 Irrigated situation (Kharif)

| Condition | Suggested Contingency measure | | | | |
|--|-------------------------------|-----------------------------|---------------------------------|-------------------|---------------------------|
| | Major Farming Situation | Normal Crop/Cropping System | Change in crop/ cropping system | Agronomic measure | Remarks on Implementation |
| Insufficient ground Water recharge due to low rainfall | Not applicable | | | | |
| Delayed release Of water in Canals due to Low rainfall | Not applicable | | | | |
| Limited release of water in canals due to low rainfall | Not applicable | | | | |
| Non release of water in canals under delayed onset of monsoon in catchment | Not applicable | | | | |
| Lack of inflows into streams due to Insufficient/ | Not applicable | | | | |

| | | | | | |
|---|-----------------------|--|--|--|--|
| delayed onset of monsoon | | | | | |
| Insufficient ground Water recharge due to low rainfall | Not applicable | | | | |

2.2 Unusual rains (untimely, unseasonal etc.) (For both rainfed and irrigated situations)

| Condition | | | | Suggested Contingency measures | | |
|--|-------|-----------------|------------------|--|---|--|
| Continuous high rainfall in a short span | | Vegetable stage | | Flowering stage | Crop maturity stage | Post harvest |
| leading to water logging | | | | | | |
| Crop 1. | Rice. | 1. | Proper drainage. | Application of hormones/nutrient sprays to prevent flower drop or promote quick flowering/fruiting | Shifting of produce to safer place and protection against pest/disease damage in storage etc. | Shifting of produce to safer place for drying and maintaining the quality of grain/fodder and protection against pest/disease damage in storage etc. |
| Crop 2. | Maize | 2. | Proper drainage | | | |
| Crop 3. Cow Pea | | 3. | Proper drainage | | | |
| Crop 4. Green gram | | 4. | Proper drainage | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| Horticulture | | | | | | |
|--|------------|------------------------|--|-----------------------------|---------------------|----------------------------|
| Crop 1. | Pine apple | Proper drainage of the | | Application of | | Shifting of produce to |
| Crop 2. | Orange | basin | | hormones/nutrient sprays to | Shifting of produce | safer place for drying and |
| | | | | | | |
| Crop 3. | Mango | | | prevent flower drop or | to safer place and | maintaining the quality of |
| Crop 4. | | | | promote quick | protection against | grain/fodder and |
| Crop 5. | | | | flowering/fruiting | pest/disease | protection against |
| | | | | | damage in storage | pest/disease damage in |
| | | | | | etc. | storage etc. |
| | | | | | | |
| Heavy rainfall with high speed winds in a | | | | | | |
| short span² | | | | | | |
| Crop 1. | Rice. | Proper drainage of the | | Application of | Measures for | Shifting of produce to |
| Crop 2. | Maize | soil. | | hormones/nutrient sprays to | preventing seed | safer place for drying and |
| Crop 3. | Cow Pea | | | prevent flower drop or | germination, | maintaining the quality of |
| Crop 4. | Green gram | | | promote quick | shifting | grain/fodder and |

| | | | | |
|--------------------|------------------------|---------------------------------|---------------------|----------------------------|
| | | | produce to | |
| | | flowering/fruiting, staking the | safer place and | protection against |
| | | maize plants. | protection against | pest/disease damage in |
| | | | pest/disease | storage etc. |
| | | | damage in storage | |
| | | | etc. | |
| | | | | |
| Horticulture | | | | |
| Crop 1. Pine apple | Proper drainage of the | Application of | Measures for | Shifting of produce to |
| Crop 2. Orange | soil, | hormones/nutrient sprays to | preventing seed | safer place for drying and |
| Crop 3. Mango | | prevent flower drop or | germination, | maintaining the quality of |
| | | promote quick | shifting produce to | grain/fodder and |
| | | flowering/fruiting | safer place and | protection against |
| | | | protection against | pest/disease damage in |
| | | | pest/disease | storage etc. |
| | | | damage in | |

| | | | | |
|---|--|------------------------------|--|---|
| | | | storage | |
| | | | etc. | |
| | | | | |
| Outbreak of pests and diseases due to unseasonal rains | | | | |
| Crop 1. Rice. | Foliar spray with systemic | Foliar spray of chlorpyrifos | Harvest at proper | 1. Clean & white wash the |
| Crop 2. Maize | fungicide like | @ 2 ml/ lit, neem based | stage of maturity, | store before storing. |
| Crop 3. Cow Pea | carbendazim @0.3%, Soil | insecticides, use of bird | spraying of | 2. Cleared dry garon with |
| Crop 4. Green gram | application of bioagent | perches, | imidacloprid @ 4 | <12 % moisture should |
| | like <i>Trichoderma</i> spp | | ml/10 lit, | stored. 3. Gunny bag |
| | @5g/lit along with CMC | | chlorpyrifos @ 2 | treatment with malathion |
| | | | | |
| | @0.2% (W/V), <i>Pseudomonas</i> @5 g/lit, neem based insecticides. | | ml/lit, NSKE 5% at 10 days intervals. | 1ml/li of water or dichlorvos @2ml/lit of water. 4. Spraying godown wall |

| | | | | |
|---------------------|--|--|--|--|
| | | | | with malathion @ 2ml/lit of water. 5. Disinfect the storage with formaldehyde @4%. 6. Use improved storage bin. 7. Rodent management by using rodent trap or poison bait. |
| Horticulture | | | | |
| Crop 1. Pine apple | Spray mancozeb 75 WP @ 2g/lit, blitox @ 4g/lit | Use of NAA @200 ppm, ANAA @ 1ml/4.5 lit of water. @ 1ml/ lit, | Spray malathion @ 1 ml/lit of water. Use Ethephon @ 100 ppm for uniform ripening. | Shift the freshly harvested produce to dry and cool place. Damaged, diseased harvest should not kept storage. Value addition to the |
| Crop 2. Orange | | | | |
| Crop 3. Mango | | | | |
| | | | | |
| | | | | |

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|--|--|--|--|-------------------------------|
| | | | | harvest. Vacuum packaging. |
|--|--|--|--|-------------------------------|

2.3 Floods.

| Condition | Suggested Contingency measure | | | |
|--|-------------------------------|--|--------------------|----------------|
| | Seedling/nursery stage | Vegetative stage | Reproductive stage | At harvest |
| Transient water logging/ partial Inundation | | | | |
| Rice | Drainage | 2. Foliar spray of 2% NPK solution (19:19:19) 3. Prophylactic spray of fungicide to prevent the crop from pest attack | Not applicable | Not applicable |
| Maize | | | | |
| Vegetable | | | | |

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

| Extreme event type | Suggested contingency measure ^r | | | |
|--------------------|--|------------------|--------------------|------------|
| | Seedling/nursery stage | Vegetative stage | Reproductive stage | At harvest |
| Heat Wave | NA | NA | NA | NA |
| Crop 1 | - | - | - | - |
| Crop 2 | - | - | - | - |

| | | | | |
|---------------------|-----------|-----------|-----------|-----------|
| Crop 3 | - | - | - | - |
| Crop 4 | - | - | - | - |
| Crop 5 | - | - | - | - |
| Horticulture | - | - | - | - |
| Crop 1 (specify) | - | - | - | - |
| Crop 2 | - | - | - | - |
| Crop 3 | - | - | - | - |
| Cold Wave | NA | NA | NA | NA |
| Crop 1 | - | - | - | - |
| Crop 2 | - | - | - | - |
| Crop 3 | - | - | - | - |
| Crop 4 | - | - | - | - |
| Crop 5 | - | - | - | - |
| Horticulture | - | - | - | - |
| Crop 1 (specify) | - | - | - | - |
| Crop 2 | - | - | - | - |
| Crop 3 | - | - | - | - |
| Frost | NA | NA | NA | NA |
| Crop 1 | - | - | - | - |
| Crop 2 | - | - | - | - |

| | | | | |
|---------------------|---|---|---|---|
| Crop 3 | - | - | - | - |
| Crop 4 | - | - | - | - |
| Crop 5 | - | - | - | - |
| Horticulture | - | - | - | - |
| Crop 1 (specify) | - | - | - | - |
| Crop 2 | - | - | - | - |
| Crop 3 | - | - | - | - |

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1. Livestock

| | Suggested contingency measures | | |
|------------------------------|--|--|--|
| | Before the event ^s | During the event | After the event |
| Drought | | | |
| Feed and fodder availability | Quantification of requirement and availability, preservation of fodder | Efficient utilization of preserved and unconventional fodder and feeds | Evaluate the suitability of measures taken during draught and application during next event. |
| Drinking water | Awareness programme to conserve water resource like rain water | Application of techniques to reduce water loss, reduce sweating. | Programme to aware people to realize the last havoc and feel the importance |

| | | | |
|--------------------------------|--|--|--|
| | harvesting and reduced wastage of water | | of water conservation. |
| Health and disease management | Awareness programme on draught preparedness. | Application of measures suggested by health professionals and veterinarians. | Programme to aware people to realize the last havoc and feel the importance of water conservation. |
| Floods NA | | | |
| Cyclone | | | |
| Feed and fodder availability | Weather forecast to the general people along with advice | - | Rehabilitation programme based on damage assessed. |
| Drinking water | Weather forecast to the general people along with advice | Drinking of sterilized and filtered water. | Dispose the dead animals properly away from water source. |
| Health and disease management | Keep first Aid medicines | Keep vigil on animals | Health camps |
| Heat wave and cold wave | | | |
| Shelter/environment management | Awareness programmes to cop up with the events | Vigilance on casualty and rectification of the faults. | Aware the people to cop up with next event. |
| Health and disease management | Awareness programmes to cop up with the events | Vigilance on casualty and rectification of the faults. | Aware the people to cop up with next event. |
| | | | |

2.5.2. Poultry

| | Suggested contingency measures | | | Convergence/linkages with ongoing programs, if any |
|-------------------------------|--|--|---|--|
| | Before the event | During the event | After the event | |
| Drought | | | | |
| Shortage of feed ingredients | Stocking of feed after quantifying the requirement. | Efficient utilization of stocked feed. | Cultivation of draught resistant feed ingredients. | Preparation of low cost feed with locally available ingredients. |
| Drinking water | Awareness programme to conserve water resource like rain water harvesting etc. | Utilization of conserved water. | Let the people feel about the importance of water preservation. | Awareness programme on draught. |
| Health and disease management | Awareness programme on health and hygiene. | Vigilance by veterinarian. | Dispose the dead bodies properly. | Awareness programme on health and hygiene. |
| Floods | | | | |
| Shortage of feed ingredients | To grow flood resistant | Efficient | Evaluate the suitability of | Preparation of low cost feed with locally |

| | | | | |
|--------------------------------|---|---|--|-----------------------------|
| | variety of feed ingredients | utilization of stocked feed. | measures taken during flood and application during next event | available ingredients. |
| Drinking water | Awareness programme on filtration techniques of water | Proper utilization of sterilization and filtration of water | Health camp | Vaccination and health camp |
| Health and disease management | Flood preparedness, awareness camp | Health camp and proper disposal of dead bird | Health camps and awareness programme to cop up with the last event | Vaccination and health camp |
| Cyclone | | | | |
| Shortage of feed ingredient | Weather forecast along with advice | - | Proper disposal of dead bird | Health camp |
| Drinking water | Awareness programme on filtration techniques of water | Provide sterilized and filtrated water | Dispose the dead bird away from water sources | |
| Health and disease management | Keep first aid medicines ready | | | |
| Heat wave and cold wave | | | | |

| | | | | |
|--------------------------------|--|--|---|--|
| Shelter/Environment management | Awareness programme to cop up these events | Vigil on casualty and correction of faults | Aware the people about preparedness to meet event | |
| Health and disease management | Awareness programme to cop up these events | Vigil on casualty and correction of faults | Aware the people about preparedness to meet event | Awareness programme on health and hygiene. |

2.5.3. Fisheries/Aquaculture

| | Suggested contingency measures | | |
|---|--------------------------------|--|--|
| | Before the event | During the event | After the event |
| 1.Drought | | | |
| A. Capture | | | |
| Marine | NA | NA | NA |
| Inland | | | |
| (i) Shallow water depth due to insufficient rains/inflow | Reduce stocking density | De-silting, renovation etc. | Application of full package of practices |
| ii. Changes in water quality | Liming | Ploughing, proper dose of lime application | Application of full package of practices |
| . Any other | - | - | - |
| B. Aquaculture | | | |
| i. Shallow water in ponds due to insufficient rains/inflow | Reduce stocking density | De-silting, renovation etc. | Application of full package of practices |
| ii. Impact of salt load build up in ponds/change in water quality | Liming | Ploughing, proper dose of lime application | Application of full package of practices |
| iii. Any other | - | - | - |
| 2. Floods | | | |

| | | | |
|---|---|--|--|
| A. Capture | | | |
| Marine | NA | NA | NA |
| Inland | | | |
| i. Average compensation paid due to loss of human life | Awareness programme | Rescue and relief | Health camp |
| ii. No.of boats/nets/damaged | Repairing | Proper handling of boats and nets etc. | Repairing and knitting |
| iii. No.of houses damaged | Awareness programme | Rescue | Rehabitation |
| iv. Loss of stock | Reduce stocking density | Harvesting fish and proper guarding by mess nets | Cleaning of aquatic weeds, application of lime, KMnO ₄ and catching weed and predatory fishes |
| v. Changes in water quality | Proper maintenance of pond embankments | Proper guard by mess nets | Application of bleaching powder |
| vi. Health and diseases | Reduce stocking density | Proper guard by mess nets | Netting and sorting programme |
| B. Aquaculture | | | |
| (i) Inundation with flood water | Proper maintenance of pond embankments | Checking and repairing | Application of lime and KMnO ₄ |
| ii. Water continuation and changes in water quality | Proper maintenance of pond embankments | Checking and repairing | Application of lime and KMnO ₄ |
| iii. Health and diseases | Reduce stocking density | Proper guard by mess nets | Netting and sorting programme |
| iv. Loss of stock and inputs (feed, chemicals etc.) | Reduce stock and less application of inputs | Withdraw feed and chemicals | Assessment and fixing of stocking density and proper dose of inputs |
| v.. Infrastructure damage(pumps, aerators, huts etc.) | Keep these in secured place | Keep these in secured place | Checking and reinstallation |
| vi. Any other | - | - | - |
| 3. Cyclone/ Tsunami | | | |
| A. Capture | | | |
| Marine | NA | NA | NA |
| i. Average compensation paid due to loss of fishermen lives | | | |

| | | | |
|--|---|---|---|
| ii. Avg. no. of boats/nets/damaged | | | |
| Inland | | | |
| B. Aquaculture | | | |
| i. Overflow/flooding of ponds | Reduce stocking density | Arrange outflow | Assessment of stocking density |
| ii. Changes in water quality(fresh water/brackish water ratio) | Maintain pond embankments | Checking and repairing | Application of lime and KMnO ₄ |
| iii. Health and diseases | Reduce stocking density | Proper guard by mess nets | Application of bleaching powder |
| iv. Loss of stock and inputs(feed, chemicals etc.) | Reduce stock and less application of inputs | Withdraw feed and chemicals | Assessment and fixing of stocking density and proper dose of inputs |
| v. Infrastructure damage(pumps,aerators, shelters/huts etc.) | Keep these in secured place | Keep these in secured place | Checking and reinstallation |
| vi. Any other | - | - | - |
| 4. Heat wave and cold wave | | | |
| A. Capture | | | |
| Marine | NA | NA | NA |
| Inland | | | |
| B. Aquaculture | | | |
| i. Changes in pond environment(water quality) | Influx of water from nearby channels during heat wave and reduce stocking density in cold | Harvesting of fish during both heat and cold wave | Harvesting of fish during both heat and cold wave and water quality maintenance |
| ii. Health and Diseases management | - | - | - |
| iii. Any other | - | - | - |

| | | | | |
|------------------|----------------------------|--------------------------|------------------------------|---------------------------|
| Hailstorm | | | | |
| Crop 1. Rice | Cover the nursery with net | Prevention of hails by | Prevention of hails by hails | Following forecasts of |
| Crop 2. Maize | | hails suppression | suppression techniques, | weather and protecting |
| Crop 3. Mustard | | techniques, following | following forecasts of | crops, spraying salt on |
| Crop 4. Lentil | | forecasts of weather and | weather and protecting | harvested paddy or other |
| | | protecting crops, Use | crops, Use heaters, wind | crop to prevent the |
| | | heaters, wind machines, | machines, sprinkling water | germination and sprouting |
| | | sprinkling water etc. | etc. | of the harvested produce |

| | | | | |
|---------------------|--------------------------------------|----------------------------|--------------------------------|--------------------------------|
| Horticulture | | | | |
| Crop 1. Pine apple | Planting crop after the damage, | Prevention of hails by | Prevention of hails by hails | Following forecasts of |
| Crop 2. Orange | select varieties which will mature | hails suppression | suppression techniques, | weather and protecting |
| Crop 3. Mango | before the beginning of the hazard | techniques, following | following forecasts of | crops, spraying salt on |
| | | forecasts of weather and | weather and protecting | harvested paddy or other |
| | | protecting crops, Use | crops, Use heaters, wind | crop to prevent the |
| | | heaters, wind machines, | machines, sprinkling water | germination and sprouting |
| | | sprinkling water etc. | etc. | of the harvested produce, |
| | | | | Covering plants with hot |
| | | | | caps |
| Cyclone | | | | |
| Crop 1. Rice | Use proper method of irrigation, use | use of shelter belts (like | use of shelter belts (like row | use of shelter belts (like row |
| Crop 2. Maize | of shelter belts (like row of trees | row of trees planted for | of trees planted for wind | of trees planted for wind |
| Crop 3. Mustard | planted for wind protection), grow | wind protection) | protection) | protection) |
| | lodge resistance varieties, | | | |
| Crop 4. Lentil | | | | |
| | Use proper method of irrigation, use | use of shelter belts (like | use of shelter belts (like row | use of shelter belts (like row |
| Crop 2. Orange | of shelter belts (like row of trees | row of trees planted for | of trees planted for wind | of trees planted for wind |
| Crop 3. Mango | planted for wind protection), grow | wind protection) | protection) | protection) |
| | lodge resistance varieties, | | | |