# State: ORISSA
# Agriculture Contingency Plan District: BOLANGIR

| | | | | | |
|---|---|---|---|---|---|
| **1.0 District Agriculture profile** | | | | | |
| **1.1** | **Agro-Climatic/ Ecological Zone** | | | | |
| | Agro Ecological Sub Region (ICAR) | Gujarat Hills, Dandakaranya & eastern ghats hot moist sub humid eco sub-region (12.1) | | | |
| | Agro-Climatic Region (Planning Commission) | Eastern Plateau and hills region (VII) | | | |
| | Agro Climatic Zone (NARP)* | West central Table land zone (OR-9) | | | |
| | List all the districts failing under the NARP Zone | Debagarh, Bolangir, Sonepur , Bargarh, parts of sambalpur and Jharsuguda | | | |
| | Geographical coordinates of district | Latitude | Longitude | Altitude | |
| | | $20^0$42'08.15 N | $83^0$28'49.43" E | 207 m | |
| | Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS | RRTTS, Chiplima, sambalpur- 768 026 | | | |
| | Mention the KVK located in the district | KRISHI VIGYAN KENDRA , Larkipalli farm, Bolangir-767 002 | | | |
| | Name & address of the nearest Agromet field unit ( AMFU, IMD) for agro-advisories in the zone | RRTTS, Chiplima,sambalpur | | | |
| **1.2** | **Rainfall** | **Average (mm)** | **Normal Rainy days (number)** | **Normal Onset (specify week and month)** | **Normal Cessation (specify week and month)** |
| | SW monsoon (June-Sep): | 1134.3 | 49 | 2nd week of June | 2nd week of September |
| | NE Monsoon (Oct-Dec): | 77.9 | 5 | 1st week of October | 1st week of December |
| | Winter (Jan-February) | 36.4 | 3 | | |
| | Summer (March-May) | 41.2 | 3 | | |
| | Annual | 1289.8 | 60 | | |

* If a district falls in two NARP zones, mention the zone in which more than 50% area falls

| 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) | 679 | 346 | 154 | 53 | 46 | 18 | 4 | 23 | 22 | 13 |

Source: Orissa Agriculture statistics 2008-2009

| 1.4 | Major Soils ( Common names) | Area ('000 ha) | Percent (%) of total |
|---|---|---|---|
| | Mixed red and yellow | 196.38 | 30 |
| | Red and black | 189.33 | 29 |
| | Black | 101.56 | 15 |
| | Laterite and lateritic | 54.59 | 9 |

Source: Soil Conservation Office, Bolangir

| 1.5 | Agricultural land use | Area ('000 ha) | Cropping intensity % |
|---|---|---|---|
| | Net sown area | 324 | 146 |
| | Area sown more than once | 148 | |
| | Gross cropped area | 472 | |

Source: Orissa Agriculture statistics 2008-2009

| 1.6 | **Irrigation** | **Area (‘000 ha)** | **Percent (%)** | |
|---|---|---|---|---|
| | Net cultivated area | 346 | 52.66(of geographical area) | |
| | Net irrigated area | 53.92 | 15.58(of net cultivated area) | |
| | Gross irrigated area | 84.04 | 12.79( of geographical area) | |
| | Rainfed area | 270 | 84.39(of net cultivated area) | |
| | **Source of irrigation** | **Number** | **Area (‘000 ha)** | **% area** |
| | Canals | NA | 23.31 | 27.7 |
| | Tanks | NA | NA | NA |
| | Open wells | NA | 16.79 | 20 |
| | Bore wells | 49 | NA | NA |
| | Lift irrigation | NA | 24.47 | 32.2 |
| | Other sources | NA | 42.98 | 52 |
| | Total irrigated area | NA | 84.04 | NA |
| | Pumpsets | 457 | NA | NA |
| | No. of tractors | 68 | NA | NA |
| | **Groundwater availability and use** | **No. of blocks** | **% area** | **Quality of water** |
| | Over exploited | NIL | NA | NA |
| | Critical | NIL | NA | NA |
| | Semi-critical | NA | NA | NA |
| | Safe | NA | NA | NA |
| | Wastewater availability and use | NA | NA | NA |

| | | | | |
|---|---|---|---|---|
| | Ground water quality | NA | NA | NA |

*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%
Data source SREP, 2008-09 Bolangir

### 1.7 Area under major field crops & horticulture etc. as per latest figure (2008)

| 1.7 | S.No. | Major field crops cultivated | Area ('000 ha) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Kharif* | | | *Rabi* | | | Summer | |
| | | | Irrigated | Rainfed | Total | Irrigated | Rainfed | Total | | Grand total |
| | 1 | Rice | 41.82 | 168.91 | 210.73 | 4.12 | - | - | 4.12 | 218.97 |
| | 2 | Mung | 0.67 | 35.51 | 36.18 | 0.67 | 16.87 | 17.54 | - | 53.72 |
| | 3 | Biri | 0.46 | 19.35 | 19.81 | 0.15 | 3.94 | 4.09 | - | 23.90 |
| | 4 | Cotton | - | 21.84 | 21.84 | - | - | - | - | 21.84 |
| | 5 | Sesamum | - | - | 15.54 | 1.82 | - | 1.82 | - | 17.36 |
| | 6 | Groundnut | - | 8.48 | 8.48 | 0.50 | 1.88 | 2.38 | - | 10.86 |
| | 7 | Sunflower | - | 0.02 | 0.02 | 2.47 | - | 2.47 | - | 2.49 |
| | S.No. | **Horticulture crops - Fruits** | **Area ('000 ha)** | | | | | | | |
| | | | **Total** | | | | | | | |
| | 1 | Mango | 7.36 | | | | | | | |
| | 2 | Banana | 1.47 | | | | | | | |
| | 3 | Guava | 0.26 | | | | | | | |
| | 4 | Citrus | 0.67 | | | | | | | |

| | | | |
|---|---|---|---|
| | 5 | Pineapple | 0.01 |
| | | **Horticulture crops - Vegetables** | **Total** |
| | 1 | Onion | 4.79 |
| | 2 | Potato | 0.07 |
| | 3 | Chilli | 3.40 |
| | 4 | Sweet Potato | 3.72 |
| | | **Floriculture** | **Total** |
| | 1 | Mariegold | 35.00 |
| | 2 | Rose | 15.00 |
| | 3 | Gladioli | 25.00 |
| | 4 | Tuberose | 13.00 |
| | | **Medicinal and Aromatic crops** | **Total** |
| | 1 | Garlic | 0.20 |
| | 2 | Turmeric | 0.02 |
| | 3 | Ginger | 0.05 |
| | 4 | Coriander | 0.31 |
| | | **Plantation crops** | **Total** |
| | 1 | Cashewnut | 0.03 |

| | | | |
|---|---|---|---|
| | 2 | Coconut | 0.90 |
| | | **Fodder crops** | **Total** |
| | 1 | Crop 1 | - |
| | | **Total fodder crop area** | |
| | | **Grazing land** | |
| | | **Sericulture etc** | |
| | | **Others (specify)** | |

**Data source -** Data source (Orissa Agriculture stastics 2008-09

*If break-up data (irrigated, rainfed) is not available, give total area

| **1.8** | **Livestock** | **Male ('000)** | **Female ('000)** | **Total ('000)** |
|---|---|---|---|---|
| | Non descriptive Cattle (local low yielding) | 296.2 | 190.3 | 486.5 |
| | Improved cattle | | | |
| | Crossbred cattle | 18.0 | 23.0 | 41.0 |
| | Non descriptive Buffaloes (local low yielding) | 60.8 | 57.4 | 118.3 |
| | Descript Buffaloes | 0.9 | 0.6 | 1.5 |
| | Goat | 104.4 | 194.7 | 299.1 |
| | Sheep | | | |
| | Pig | 1.1 | 1.5 | 2.6 |
| | Commercial dairy farms (Number) | | | |
| **1.9** | **Poultry** | **No. of farms** | **Total No. of birds ('000)** | |
| | Commercial | | 251.3 | |
| | Backyard | | 233.8 | |
| **1.10** | **Fisheries** () | | | |
| | **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** | |
| | | 840 | | 104 | | 4874 | |
| | **B. Culture** | | | | | | |
| | | | | **Water Spread Area (ha)** | **Yield (t/ha)** | **Production ('000 tons)** | |
| | i) **Brackish water** (Data Source: Fisheries Department) | | | | | | |
| | ii) **Fresh water** (Data Source: Fisheries Department) | | | 3936.8 (ha) | 5 | 6.1 | |

### 1.11 Production and Productivity of major crops

| **1.11** | **Production and Productivity of major crops** | **Kharif** | | **Rabi** | | **Summer** | | **Total** | |
|---|---|---|---|---|---|---|---|---|---|
| | **Major field crop** | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) | Production ('000 t) | Productivity (kg/ha) |
| 1 | Paddy | 459.7 | 2149 | - | - | 12.4 | 2985 | 472.2 | 5134 |
| 2 | Mung | 12.3 | 340 | 7.9 | 452 | - | - | 20.2 | 792 |
| 3 | Biri | 5.0 | 255 | 1.8 | 445 | - | - | 6.8 | 700 |
| 4 | Groundnut | 14.3 | 1695 | 4.0 | 1675 | - | - | 18.3 | 3370 |
| 5 | Sesamum | 7.5 | 485 | 0.6 | 348 | - | - | 8.1 | 833 |
| 6 | Sunflower | 0.01 | 710 | 2.8 | 1136 | - | - | 2.8 | 1846 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 7 | Cotton | 43.5 | 339 | - | - | - | - | 43.5 | 339 |
| **Major Horticultural crops** | | | | | | | | | |
| 1 | Potato | - | - | 0.5 | 7520 | - | - | 0.5 | 7520 |
| 2 | Onion | - | - | 43.1 | 9000 | - | - | 43.1 | 9000 |
| 3 | Vegetables | 102.1 | 11028 | 244.2 | 14257 | - | - | 346.3 | 25285 |
| 4 | Sweet potato | 22.2 | 8158 | 11.2 | 11333 | - | - | 33.5 | 19491 |

Source: Orissa Agriculture statistic, Govt of Orissa, 2008-2009

| **1.12** | **Sowing window for 5 major crops (start and end of sowing period)** | **Paddy** | **Blackgram** | **Green gram** | **Sesamum** |
|---|---|---|---|---|---|
| | Kharif-Rainfed | June 1st week – July 2nd week | June 1st week- July 1st week | June 1st week- July 1st week | June 1st week- July 2nd week |
| | Kharif-Irrigated | June 1st week –August 1st week | - | - | - |
| | Rabi-Rainfed | - | October 2nd week-Dec 3rd week | October 2nd week-December 3rd week | September 3rd week |
| | Rabi-Irrigated | December 2nd wk – January 1st wk | - | - | - |

| **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) Rice swarming cater pillar | - | ✓ | - |

| | | | |
|---|---|---|---|
| **1.14** | **Include Digital maps of the district for** | Location map of district with in States as Annexure 1 | Enclosed: Yes |
| | | Mean annual rainfall as Annexure 2 | Enclosed: Yes |
| | | Soil map as Annexure 3 | Enclosed: Yes |

## 2.0 Strategies for weather related contingencies

## 2.1 Drought

### 2.1.1 Rainfed situation

| **Condition** | | | **Suggested Contingency measures** | | |
|---|---|---|---|---|---|
| **Early season droughtt (delayed onset)** | **Major Farming situation** | **Normal Crop / Cropping system** | **Change in crop / cropping system including variety** | **Agronomic measures** | **Remarks on Implementation** |
| **Delay by 2 weeks**<br><br>**July 1ST WEEK** | Low rainfall shallow lateritic soils (Upland) | Rice | Khandagiri, Hira | • Closer row and plantspacing Summer ploughing, interculture tillage practices,<br>• Insitu rain water conservation<br>• Conservation furrow,<br>• Intercultivation and thining to maintain plant population per unit area of the crop<br>• Weed control | Supply of seeds through OSSC & NFSM |
| | | Black gram | Sarala & Ujjala | | |
| | | greengram | Sujata | | |
| | | Sesamum, | Prachi, Nirmala | | |
| | | Cowpea | Utkala Manika | | |
| | Low rainfall shallow lateritic soils (Medium land) | Rice | variety (Naveen, MTU 1010, Surendra, Lalata, Konark | 1-In-situ rain water conservation<br>2-25% N and apply full P, K of recommended doses as basal.<br>3- Raising the bund height in paddy field to conserve rain water<br>4- Checking the seepage and drainage water loss.<br>5-Planting 3 -4 seedlings per hill with closer spacing in paddy field. | Supply of seeds through OSSC & NFSM |
| | Low rainfall shallow lateritic | Rice | Var : Swarna, Pratikshya | 1-In-situ rain water conservation<br>2-25% N and apply full P, K of | Supply of seeds through OSSC & |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Early season droughtt (delayed onset)** | **Major Farming situation** | **Normal Crop / Cropping system** | **Change in crop / cropping system including variety** | **Agronomic measures** | **Remarks on Implementation** |
| | soils (Low land) | | | recommended doses<br>3- raising the bund height in paddy field to conserve rain water<br>4- Checking the seepage and drainage water loss<br>5-planting 3 -4 seedlings per hill with closer spacing in paddy field | NFSM |
| | Low rainfall, red lateritic and black soil | Sole crops<br><br>Rice | Short duration drought tolerent varieties.<br><br>Heera, JHU,Pathara | 1) FYM application<br>2) Maintain more plant population for direct seeded rice/high seed rate.<br>3) In-situ rain water conservation, summer ploughing, interculture, tillage practices, weed control<br><br>4) Ridge and furrow methods of sowing at closer plant-to-plant distance and inter-row spacing.<br>5-Use of mulch with locally available mulch materials. | Seeds from RKVY, OSSC,<br>NFSM, NSC |
| | | Sesamum | Prachi,nirmala,uma | | |
| | | Cotton | Sri Tulasi, Bunny | | |
| | | (Vegetable)<br>Brinjal | Utkal anushree,utkal tarini | | |
| | | Chilli | Pusajwala,utkal ava<br>Utkal manika | | |
| | | Cow pea | inter crop rice + arhar(2:5), rice + blackgram(1:4), | | |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Early season droughtt (delayed onset)** | **Major Farming situation** | **Normal Crop/cropping system** | **Change in crop/cropping system** | **Agronomic measures** | **Remarks on Implementation** |
| Delay by 4 weeks **July 2nd week** | Low rainfall shallow lateritic soils ( Upland) | Rice | Khandagiri, Hira | 1- Closer row and plant spacing<br>2-Summer ploughing, interculture tillage practices,<br>3-Insitu rain water conservation ,<br>4-Conservation furrow,<br>5-intercultivation and thining to maintain plant population per unit area of the crop<br>6-,weed control<br>7-FYM application increase water holding capacity,<br>8-Line sowing<br>9-Seed priming | Supply of seeds through OSSC , through NFSM |
| | | Black gram | Sarala & Ujjala | | |
| | | Greengram | Sujata | | |
| | | Sesamum, | Prachi, Nirmala | | |
| | | Cowpea | Utkala Manika | | |
| | Low rainfall shallow lateritic soils (Medium land) | Rice | variety (Naveen, MTU 1010, Surendra, Lalata, Konark) | • In-situ rain water conservation<br>• 25% N and apply full P, K of recommended doses<br>• raising the bund height in paddy field to conserve rain water<br>• Checking the seapage<br>• Planting 3-4 seedlings per hill with closer spacing in paddy field.<br>• Select medium duration varieties<br>• Apply life saving irrigation to nursery | Supply of seeds through OSSC & NFSM |
| | Low rainfall shallow lateritic soils (Low land) | Rice | Var : Swarna, Pratikshya | •In-situ rain water conservation<br>•25% N and apply full P, K of recommended doses<br>• raising the bund height in paddy field to conserve rain water<br>•Checking the seepage and drainage water loss.<br>•Transplanting 3 -4 seedlings per hill with closer spacing. | Supply of seeds through OSSC & NFSM |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Early season droughtt (delayed onset)** | **Major Farming situation** | **Normal Crop/cropping system** | **Change in crop/cropping system** | **Agronomic measures** | **Remarks on Implementation** |
| | low rainfall, red lateritic and black soil | Sole crops<br><br>Rice | Short duration drought tolerent varieties.<br><br>Heera, JHU,Pathara | 1) FYM application<br>2) Maintain more plant population for direct seeded rice/high seed rate.<br>3) In-situ rain water conservation, summer ploughing, interculture, tillage practices, weed control<br><br>4) Ridge and furrow methods of sowing at closer plant-to-plant distance and inter-row spacing.<br>5-Use of mulch with locally available mulch materials in vegetables. | Seeds from NHM Supply of seeds from OSSC<br><br>Seeds may be procured from NFSM |
| | | Sesamum | Prachi,nirmala,uma | | |
| | | Cotton | Sri Tulasi, Bunny | | |
| | | (Vegetable)<br>Brinjal | Utkal anushree,utkal tarini | | |
| | | Chilli | Pusajwala,utkal ava<br>Utkal manika | | |
| | | Cow pea | inter crop rice + arhar(2:6), rice + blackgram(1:4), | | |

| 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**<br><br>**(August 1st week)** | Low rainfall shallow lateritic soils (Upland) | Rice | Khandagiri, Hira,pathara,JHU | • Top dressing of 25 % urea and potash after receipt of the rain for upland rice.<br>• Spray urea in vegetable crops<br>• Spraying 2% KCl to black gram<br>• Application of recommended dose of FYM during land preparation. | Supply of seeds through OSSC & NFSM |
| | | Black gram | Sarala & Ujjala | | |
| | | Greengram | Sujata | | |
| | | Sesamum, | Prachi, Nirmala | | |

| 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** |
| | | Cowpea | Utkala Manika | | |
| | Low rainfall shallow lateritic soils (Medium land) | Rice | Variety (Naveen, MTU 1010, Surendra, Lalata, Konark) | 1-In-situ rain water conservation<br>2-25% N and apply full P, K of recommended doses<br>3- raising the bund height in paddy field to conserve rain water<br>4- Checking the seepage and drainage water loss.<br>5-planting 3 -4 seedlings per hill with closer spacing in paddy field.<br>6-Apply life saving irrigation | Supply of seeds through OSSC & NFSM |
| | Low rainfall shallow lateritic soils (Low land) | Rice | Var : Swarna, Pratikshya | 1-In-situ rain water conservation<br>2-25% N and apply full P, K of recommended doses<br>3- raising the bund height in paddy field to conserve rain water<br>4- Checking the seepage and drainage water loss.<br>5-planting 3 -4 seedlings per hill with closer spacing in paddy field<br>6-Apply life saving irrigation<br>7-Transplanting of seedling at closer spacing<br>8-Community nursery | Supply of seeds through OSSC & NFSM |
| | low rainfall, red lateritic and black | Rice | Heera,Pathara,JHU | 1) Complete hoeing and weeding of non-paddy crops to provide dust mulch. | Seeds fron RKVY, |

| 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** |
| | soil | Sesamum | Prachi,nirmala,uma | 2) Post emergence spray of Quizalofop 5%EC @ 0.05 kg ai / ha in 500lt of water to control weeds in groundnut.<br>3) Spraying of 2% KCl + 0.1% Boron to black gram.<br>4) Foliar application of 2% urea at pre-flowering and flowering stage of green gram.<br>5) Spray 1% urea in vegetable crops.<br>6) FYM application to increase water holding capacity.<br>7) Remove the pest and disease infected plants from the main field | OSSC,<br>NFSM, NSC |
| | | Cotton | Sri Tulasi, Bunny | | |
| | | (Vegetable)<br>Brinjal | Utkal anushree,utkal tarini | | |
| | | Chilli | Pusajwala,utkal ava Utkal manika | | |
| | | Cow pea | inter crop rice + arhar(2:5), rice + blackgram(1:4) | | |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Early season droughtt (delayed onset)** | **Major Farming situation** | **Normal Crop/cropping system** | **Change in crop/cropping system** | **Agronomic measures** | **Remarks on Implementation** |
| **Delay by 8 weeks August 3rd week** | Low rainfall shallow lateritic soils (Upland) | Rice | Heera JHU, Pathara | 1) Withhold N fertilizer application till receipt of rainfall.<br>2) Follow plant protection measures against stem borer and blast in nursery.<br>3)Provide life saving irrigation | Supply of seeds through OSSC & NFSM |
| | | Black gram | Sarala & Ujjala | | |
| | | Greengram | Sujata | | |
| | | Sesamum, | Prachi, Nirmala | | |
| | | Cowpea | Utkala Monika | | |
| | Low rainfall | Rice | Variety (Naveen, MTU | 1-In-situ rain water conservation | Supply of seeds |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Early season droughtt (delayed onset)** | **Major Farming situation** | **Normal Crop/cropping system** | **Change in crop/cropping system** | **Agronomic measures** | **Remarks on Implementation** |
| | shallow lateritic soils (Medium land) | | 1010, Surendra, Lalata) | 2-25% N and apply full P, K of recommended doses<br>3- raising the bund height in paddy field to conserve rain water<br>4- Checking the seepage and drainage water loss.<br>5-planting 3 -4 seedlings per hill with closer spacing in paddy field.<br>6-Apply life saving irrigation | through OSSC & NFSM |
| | Low rainfall shallow lateritic soils (Low land) | Rice | Var : Bandana swarna | 1-In-situ rain water conservation<br>2-25% N and apply full P, K of recommended doses<br>3- raising the bund height in paddy field to conserve rain water<br>4- Checking the seapage<br>5-planting 3 -4 seedlings per hill with closer spacing in paddy field.<br>6-Apply life saving irrigation | Supply of seeds through OSSC & NFSM |
| | Low rainfall, red lateritic and black soil | Rice | Heera,JHU,Pathara,parijata | 1) Provide life saving irrigation<br><br>2) Remove the pest and disease infected plants from the field.<br><br>3) Mulching of vegetables | Seeds from NHM Supply of seeds from OSSC,<br><br>Seeds may be procured from NFSM |
| | | Sesamum | Prachi,nirmala,uma Sri Tulasi, Bunny | | |
| | | Cotton | Utkal anushree,utkal tarini | | |
| | | (Vegetable) Brinjal | Pusajwala,utkal ava | | |
| | | Chilli | Utkal manika | | |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Early season droughtt (delayed onset)** | **Major Farming situation** | **Normal Crop/cropping system** | **Change in crop/cropping system** | **Agronomic measures** | **Remarks on Implementation** |
| | | Cow pea | inter crop rice + arha(2:5)r, rice + blackgram(1:4), | | |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| Early season droughtt **(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 etc.** | Low rainfall shallow lateritic soils (Upland) | Rice | Khandagiri, Hira | • Thinning and gap filling should be done<br>• Resow the crop if the mortality is more than 50%, and if less than 50% then gap filling should be done<br>• Vegetables like cowpea should be cultivated.<br>• Weeding through herbicide application<br>• Interculture tillage practices<br>• Soil mulching | • Farm pond under NREGS, IWMP, and diesel pump sets in tankfed areas under RKVY and NFSM.<br>• Small nursery development under NHM. |
| | | Black gram | Sarala & Ujjala | | |
| | | Greengram | Sujata | | |
| | | Sesamum, | Prachi, Nirmala | | |
| | | Cowpea | Utkala Manika | | |
| | Low rainfall shallow lateritic soils (Medium land) | Rice | variety (Naveen, MTU 1010, Surendra, Lalata, Konark) | • Select medium duration varieties.<br>• transplanting 3-4 seedlings per hill through closer spacing<br>• Gap filling through clonal propagation should be done<br>• Life saving irrigation | • Supply of seed drills and intercultural implements through RKVY.<br>• Good quality seeds through NFSM and OSSC. |
| | Low rainfall shallow lateritic soils (Low | Rice | Rice Var : Swarna, Pratikshya | •Select medium duration varieties.<br>•Fresh seedlings should be | |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| Early season droughtt **(Normal onset)** | **Major Farming situation** | **Normal Crop/cropping system** | **Crop management** | **Soil nutrient & moisture conservation measures** | **Remarks on Implementation** |
| | land) | | | transplanted.<br>• Life saving irrigation | |
| | low rainfall, red lateritic and black soil | Rice | Heera, Pathara,JHU | 1) Organic matter, FYM application as basal.<br>2) If rice population is less than 50% resow the crop.<br>3) Select early maturing varieties (60d).<br>4) Sprouted seeds may be direct seeded in lines<br>5) Weeding and mulching in vegetables. | |
| | | Sesamum | Prachi,nirmala,uma | | |
| | | cotton | Sri Tulasi, Bunny | | |
| | | (Vegetable)<br>Brinjal | Utkal anushree,utkal tarini | | |
| | | Chilli | Pusajwala,utkal ava<br>Utkal manika | | |
| | | Cow pea | inter crop rice + arhar(2:5), rice + blackgram(1:4), | | |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Mid season droughtt (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)** | **Major Farming situation** | **Normal Crop/cropping system** | **Crop management** | **Soil nutrient & moisture conservation measues** | **Remarks on Implementation** |
| **At vegetative stage** | Low rainfall shallow lateritic soils (Upland) | Rice | Khandagiri, Hira | • Mulching by organic matter<br>• Conservation furrow<br>• Weeding by herbicide application<br>• Strengthening filed bonds<br>• Providing life saving irrigation. | |
| | | Black gram | Sarala & Ujjala | | |
| | | Greengram | Sujata | | |
| | | Sesamum, | Prachi, Nirmala | | |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Mid season droughtt (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)** | **Major Farming situation** | **Normal Crop/cropping system** | **Crop management** | **Soil nutrient & moisture conservation measues** | **Remarks on Implementation** |
| | | Cowpea | Utkala Manika | | |
| | Low rainfall shallow lateritic soils (Medium land) | Rice | Rice variety (Naveen, MTU 1010, Surendra, Lalata, Konark) | • Select medium duration varieties.<br>• Fresh seedlings should be transplanted.<br>• Gap filling through clonal propagation<br>• Life saving irrigation<br>• Checking seepage loss and drainage water loss.<br>• Transplanting 3-4 seedlings per hill | • Supply of seed drills and intercultural implements through RKVY.<br>• Good quality seeds through NFSM and OSSC. |
| | Low rainfall shallow lateritic soils (Low land) | Rice | Var : Swarna, Pratikshya | • Fresh seedlings should be transplanted.<br>• Gap filling through clonal propagation<br>• Life saving irrigation<br>• Checking seepage loss<br>• Transplanting 3-4 seedlings per hill with closer spacing.<br>• Life saving irrigation | • |
| | low rainfall, red lateritic and black soil | Sole crops<br><br>Rice | Short duration drought tolerent varieties.<br><br>Heera,JHU.Pathara | 1)Weed out the field<br>2)Follow plant protection measures<br>3)Provide protective irrigation through harvested rain water<br>4)Withhold N application till rainfall<br>5) Strengthen field bunds<br>6) Follow ridge and furrow method of planting for vegetable crops. | |
| | | Sesamum | Prachi,nirmala,uma | | |
| | | cotton | Sri Tulasi, Bunny | | |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Mid season droughtt (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)** | **Major Farming situation** | **Normal Crop/cropping system** | **Crop management** | **Soil nutrient & moisture conservation measues** | **Remarks on Implementation** |
| | | (Vegetable) | | 7)Follow strip cropping in rolling topography for moisture conservation | |
| | | Brinjal | Utkal anushree,utkal tarini | | |
| | | Chilli | Pusajwala,utkal ava<br>Utkal manika | | |
| | | Cow pea | inter crop rice + arha(2:5)r, rice + blackgram(1:4) | | |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Mid season droughtt (long dry spell)** | **Major Farming situation** | **Normal Crop/cropping system** | **Crop management** | **Soil nutrient & moisture conservation measues** | **Remarks on Implementation** |
| **At flowering/ fruiting stage** | Low rainfall shallow lateritic soils (Upland) | Rice | Heera,Pathara,JHU | • Provide irrigation at critical stages at flowering and grain filling stage.<br>• Destroy of pest and diseases affected plants<br>• Weed control<br>• Rain water conservation<br>• Recycling of rain water<br>• Harvesting at physiological maturity stage<br>• Provide life saving irrigation. | |
| | | Black gram | Sarala & Ujjala | | |
| | | Greengram | Sujata | | |
| | | Sesamum, | Prachi, Nirmala | | |
| | | Cowpea | Utkala Manika | | |
| | Low rainfall shallow | Rice | Variety (Naveen, MTU 1010, | • Provide life saving irrigation. | |

| Condition | | | Suggested Contingency measures | | |
|---|---|---|---|---|---|
| **Mid season droughtt (long dry spell)** | **Major Farming situation** | **Normal Crop/cropping system** | **Crop management** | **Soil nutrient & moisture conservation measues** | **Remarks on Implementation** |
| | lateritic soils (Medium land) | | Surendra, Lalata) | • Control stem borer and Gandhi bug. | |
| | Low rainfall shallow lateritic soils (Low land ) | Rice | Var : Swarna, Pratikshya | • Provide life saving irrigation.<br>• Checking field drainage | |
| | low rainfall, red lateritic and black soil | Rice | Heera, Pathara,JHU | 1).Spray 2% KCl + 0.1% boron to non paddy crops to overcome drought.<br>2) Foliar application of 2% urea at pre-flowering and flowering stage to pulses and oilseeds is helpful.<br>3) Remove and destroy pest and disease affected plants<br>4) Provide irrigation at critical stages at flowering and grain filling stage.<br>5)Spraying of anti-transpirants to check evapo-transpiration<br>Mulching with crop trashes<br>6)Need based plant protection measures to be taken<br><br>7) Harvest the crops at physiological maturity stage. | |
| | | Sesamum | Prachi,nirmala,uma | | |
| | | Cotton | Sri Tulasi, Bunny | | |
| | | (Vegetable) Brinjal | Utkal anushree,utkal tarini | | |
| | | Chilli | Pusajwala,utkal ava Utkal manika | | |
| | | Cow pea | inter crop rice + arhar(2:5), rice + blackgram(1:4), | | |

| **Condition** | | | **Suggested Contingency measures** | | |
|---|---|---|---|---|---|
| **Terminal droughtt** (Early withdrawal of monsoon) | **Major Farming situation** | **Normal Crop/cropping system** | **Crop management** | **Rabi Crop planning** | **Remarks on Implementation** |
| | Low rainfall shallow lateritic soils (Upland) | Rice | Khandagiri, Hira | Cow pea, horse gram, green gram, black gram (tomato Raja, Utkal Kumari, Utkal Urbasi. Cabbage (P of India, Golden Acre, Konark, Sujata, Vijay, Cauliflower (Snow ball, Improved Japanese, Himani), Okra (Utkal Gourab, Arka Anamika), and leafy vegetables to be sown to conserve soil moisture. And provide life saving irrigation as and when necessary,Recycling of rain water, harvesting at physiological maturity stage of the crop. | Farm ponds from NREGS, RKVY<br>Seeds from NHM, OSSC |
| | | Black gram | Sarala & Ujjala | | |
| | | Greengram | Sujata | | |
| | | Sesamum, | Prachi, Nirmala | | |
| | | Cowpea | Utkala Manika | | |
| | Low rainfall shallow lateritic soils (Medium land) | Rice | Variety (Naveen, MTU 1010, Surendra, Lalata) | Provide life saving irrigation, conserve soil moisture. | |
| | Low rainfall shallow lateritic soils (Low land) | Rice | Var : Swarna, Pratikshya | Provide life saving irrigation. | |
| | low rainfall, red lateritic and black soil | Sole crops<br>Rice | Short duration drought tolerant varities<br>Heera, Pathara,JHU | Weed control<br>Irrigation at critical stage<br>Provide lifesaving irrigation | Farm ponds through IWSM programme<br>Seeds from NHM<br>Supply of intercultural implements through RKVY |
| | | Sesamum | Prachi,nirmala,uma | | |
| | | Cotton | Sri Tulasi, Bunny | | |
| | | vegetable | | | |

| | | | | | |
|---|---|---|---|---|---|
| | | Brinjal | Utkal anushree,utkal tarini | | |
| | | Chilli | Pusajwala,utkal ava | | |
| | | Cow pea | Utkal manika | | |

### 2.1.2 Drought- Irrigated situation

| **Condition** | **Suggested Contingency Measures** | | | | |
|---|---|---|---|---|---|
| **Delayed/ limited release of water in canals due to low rainfall** | **Major Farming situation** | **Crop/cropping system** | **Change in crop/cropping system** | **Agronomic measures** | **Remarks on Implementation** |
| | **Upland Lift Irrigated Laterite soil** | Vegetable-vegetable Tomato | Tomato – (Abinash) | • Alternate furrow irrigation<br>• Drip irrigation<br>• Interculture, tillage practices<br>• Soil moisture conservation<br>• Irrigation at critical stage | Seeds through OSSC, NFSM, NHM<br>Intercultural implements through NHM, ATMA, |
| | | Pumkin | Pumkin (Arka chandan, Bidyabati) | | |
| | | Ivy gourd local | Ivy gourd local | | |
| | **Medium land Canal irrigated red laterite soil** | Rice-rice | Rice:MTU 1010, Konark, JogeshLalat, Manaswini, Naveen,Surendra,lalat,<br>Sesamum :Amrit,Uma<br>Sunflower – Modern | Limited & life saving irrigation<br>Alternate furrow irrigation<br>Drip irrigation | Seeds through OSSC, NFSM, NHM<br>Intercultural implements through NHM, ATMA, |

| Condition | Suggested Contingency Measures | | | | |
|---|---|---|---|---|---|
| **Lack of inflows due to insufficient/ delayed onset of monsoon** | **Major Farming situation** | **Crop/cropping system** | **Change in crop/cropping system** | **Agronomic measures** | **Remarks on Implementation** |
| | **Upland Lift Irrigated Laterite soil** | Vegetable-vegetable<br>Tomato | Short duration vegetables<br>Tomato – (Abinash) | Alternate furrow irrigation<br>Drip irrigation<br>Planting in deep furrow.<br>Interculture, tillage practices<br>Soil moisture conservation<br>Irrigation at critical stage | Seeds through OSSC, NFSM, NHM<br>Intercultural implements through NHM, ATMA, |
| | | Pumkin | Pumkin (Arka chandan, Bidyabati) | | |
| | | Ivy gourd local | Ivy gourd local | | |
| | **Medium land Canal irrigated red laterite soil** | Rice-rice | Rice:MTU 1010, Konark, JogeshLalat, Manaswini, Naveen, Surendra,lalat,<br>Rabi rice may be substituted with sunflower and sesamum.<br>Sesamum :Amrit,Uma,<br>Sunflower – Modern | Limited & life saving irrigation<br>Alternate furrow irrigation<br>Drip irrigation<br>Weed control to conserve moisture. | Seeds through OSSC, NFSM, NHM<br>Intercultural implements through NHM, ATMA, |

| Condition | Suggested Contingency Measures | | | | |
|---|---|---|---|---|---|
| **Insufficient ground water recharge due to law rainfall** | **Major Farming situation** | **Crop/cropping system** | **Change in crop/cropping system** | **Agronomic measures** | **Remarks on Implementation** |
| | **Upland Lift Irrigated Laterite soil** | Vegetable-vegetable Tomato | Short duration vegetables Tomato – (Abinash) | • Alternate furrow irrigation<br>• Interculture, tillage practices | Seeds through OSSC, NFSM, NHM |

| | | | | | |
|---|---|---|---|---|---|
| | | Pumkin | Pumkin (Arka chandan, Bidyabati) | • Soil moisture conservation<br>• Irrigation at critical stage | Intercultural implements through NHM, ATMA, |
| | | Ivy gourd local | Ivy gourd local | | |
| | **Medium land Canal irrigated red soil** | Rice-rice | Rice:MTU 1010, Konark, JogeshLalat, Manaswini, Naveen, Surendra,lalat, Rabi rice may be substituted with sunflower and sesamum.<br>Sesamum :Amrit,Uma,<br>Sunflower – Modern | • Limited & life saving irrigation<br>• Alternate furrow irrigation<br>• Irrigation in critical stages.<br>• Weed control to conserve moisture | Seeds through OSSC, NFSM, NHM<br>Intercultural implements through NHM, ATMA, |

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

| **Condition** | **Suggested contingency measures** | | | |
|---|---|---|---|---|
| **Continuous high rainfall in a short span leading to water logging** | **Vegetative stage** | **Flowering stage** | **Crop maturity stage** | **Post harvests** |
| Paddy | Drainage | Drainage | Drainage | Transport to a ventilated space & dry in shade |
| Arhar | Drainage | Drainage | Drainage | Storage against pest & diseases |
| Cowpea | Drainage | Drainage | Drain age | Transport to a ventilated space & storage against pest & diseases |
| **Horticulture** | | | | |
| Fruits( Mango, Citrus etc) | Provide drainage | Provide drainage | Provide drainage | Early harvesting |
| Banana, Papaya | Drainage | Drainage | Drainage | |
| Cucurbit vegetables | Drainage, | Drainage | Drainage | Ensure drainage<br>Harvesting at tender stages |
| **Heavy rainfall with high speed winds in a short span[2]** | | | | |

| | | | | |
|---|---|---|---|---|
| Paddy | Drainage | Drainage | Early harvesting | |
| Sugarcane | Drainage | Drainage | Drainage | Lodged canes may be harvested for extraction of juice & jiggery |
| **Horticulture** | | | | |
| Banana | Drainage | Drainage | Drainage | |
| Papaya | Drainage | Drainage | Drainage | |
| **Outbreak of pests and diseases due to unseasonal rains** | | | | |
| Paddy | Spray tricyclazole against blast, , | Spray tricyclazole against blast, Monocrotophos against stemborer | Malathion spray against Gundhy bug | Sun drying / disinfection of gunny bags with malathion |
| Arhar | Removal of infested tips to manage leaf webber | Hand picking & destruction of blister beetles | Spray of Ekalux against pod borer | Store in clean godown, disinfection of gunny bags / storage structure with malathion |
| Blackgram/Greengram | Application of Triazophos against YMV | Application of malathion against Flea beetle | Spray of Nuvan against pod borer | Disinfection of storage structure to manage stored grain pests |
| **Horticulture** | | | | |
| Cucurbit vegetables | Spraying of Ekalux against Red pumpkin beetle, Collection & destruction of eggs/grubs, Soil drenching of COC & streptocycline against wilting | Spraying Endosulfan against leaf eating caterpillars Metalaxyl against Powdery mildew, Carbendazim against leaf spot & blight | Poison baiting with Malathion & Jaggery against fruit fly | Destruction of overripe & infested fruits |

## 2.3 Floods

| Condition | Suggested contingency measureso | | | |
|---|---|---|---|---|
| **Transient water logging/ partial inundation[1]** | **Seedling/ nursery stage** | **Vegetative stage** | **Reproductive stage** | **At harvest** |
| Paddy | Drainage | Drainage | Drainage | |
| Maize | Drainage | Drainage | Drainage | Harvest the cobs as soon as possible |
| **Horticulture** | | | | |
| Crop1 | | | | |
| **Continuous submergence for more than 2 days** | **NOT A FEATURE OF THE DISTRICT** | | | |
| Crop1 | | | | |
| **Horticulture** | | | | |
| Crop1 | | | | |
| **Sea water intrusion** | **NOT A FEATURE OF THE DISTRICT** | | | |
| Crop1 | | | | |

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

| Extreme event type | Suggested contingency measures | | | |
|---|---|---|---|---|
| | **Seedling/ nursery stage** | **Vegetative stage** | **Reproductive stage** | **At harvest** |
| **Heat Wave** | | | | |
| Rice, maize semamum | Irrigation as per needed. | Irrigation as per needed. | Irrigation as per needed. | |
| **Horticulture** | | | | |
| Vegetables | Irrigation as per needed. | Irrigation as per needed. | Irrigation as per needed. | |
| **Cold wave** | **Not prevalent** | | | |
| **Frost** | **Not prevalent** | | | |
| **Hailstorm** | **Not prevalent** | | | |
| **Cyclone** | **Not prevalent** | | | |

## 2.5 Contingent strategies for Livestock, Poultry & Fisheries

### 2.5.1 Livestock

| | Suggested contingency measures | | |
|---|---|---|---|
| | **Before the event** | During the event | After the event |
| **Drought** | | | |
| Feed and fodder availability | As the district is frequently prone to drought the following practices may be implemented to prevent fodder shortage problem<br>Sowing of cereals (fodder varieties of Sorghum/Bajra) and leguminous crops (Lucerne, Berseem, Horse gram, Cowpea) during rabi under dry land system for fodder production.<br>Motivating the sugarcane farmers to convert green sugarcane tops in to silage by the end of February<br>Preserving the green maize fodder as silage<br>Encourage fodder production with Bajra /sorghum– stylo- Bajra/sorghum on rotation basis and also to cultivate short-term fodder crops like sunhemp<br>Formation of village Disaster Management Committee<br>Capacity building and preparedness of the stakeholders and official staff for the drought/floods | Harvest and use biomass of dried up crops (Paddy, Green gram, Black gram, Maize, cow pea etc., ) material as fodder<br>Use of locally available cheap feed resources like sun flower heads as supplement for feeding of livestock during drought<br>Harvest all the top fodder available (Subabul, Glyricidia, Pipol, Prosopis etc) and feed the LS during drought<br>Concentrate ingredients such as Grains, brans, chunnies & 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<br>Promotion of Horse gram as contingent crop and harvesting it at vegetative stage as fodder<br>Continuous supplementation of minerals to prevent infertility.<br>Encourage mixing available kitchen waste with dry fodder while feeding to the milch animals | Encourage progressive farmers to grow multi cut fodder crops of sorghum/bajra/maize(UP chari, MP chari, HC-136, HD-2, GAINT BAJRA, L-74, K-677, Anand/African Tall, Kisan composite, Moti, Manjari, B1-7 on their own lands with input subsidy<br>Supply of quality stem cuttings of Hybrid napier (CO1), paragrass, guinea grass, combo grass well before monsoon<br>Flushing the stock to recoup<br>Replenish the feed and fodder banks |

| | | | |
|---|---|---|---|
| Drinking water | Adopt various water conservation methods at village level to improve the ground water level for adequate water supply.<br>Identification of water resources<br>Desilting of ponds<br>Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals)<br>Construction of drinking water tanks in herding places/village junctions/relief camp locations<br>Community drinking water trough can be arranged in shandies /community grazing areas | Adequate supply of drinking water.<br>Restrict wallowing of animals in water bodies/resources<br>Add alum in stagnated water bodies | Watershed management practices shall be promoted to conserve the rainwater. Bleach (0.1%) drinking water / water sources<br>Provide clean drinking water |
| Health and diseases management | Procure and stock emergency medicines and vaccines for important endemic diseases of the area<br>All the stock must be immunized for endemic diseases of the area<br>Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district<br>Adequate refreshment training on draught management to be given to VAS, Jr.VAS, LI with regard to health & management measures<br>Procure and stock multivitamins & area specific mineral mixture | Carryout deworming to all animals entering into relief camps<br>Identification and quarantine of sick animals<br>Constitution of Rapid Action Veterinary Force<br>Performing ring vaccination (8 km radius) in case of any outbreak<br>Restricting movement of livestock in case of any epidemic<br>Tick control measures be undertaken to prevent tick borne diseases in animals<br>Rescue of sick and injured animals and their treatment | Keep close surveillance on disease outbreak.<br>Undertake the vaccination depending on need<br>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 |

| | | | |
|---|---|---|---|
| | | Organize with community, daily lifting of dung from relief camps | |
| **Floods** | | | |
| | In case of early forewarning (EFW), harvest all the crops (Paddy, Green gram, Black gram, Maize, cow pea etc.) that can be useful as feed/fodder in future (store properly)<br>Protect the dried Dongri grass, sorghum stover etc., from inundation of flood water<br>Keeping sufficient of dry fodder to transport to the flood affected villages<br>Don't allow the animals for grazing if severe floods are forewarned<br>Keep stock of bleaching powder and lime<br>Carry out Butax spray for control of external parasites<br>Procure and stock emergency medicines and vaccines for important endemic diseases of the area<br>All the stock must be immunized for endemic diseases of the area<br>Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district<br>Adequate refreshment training on draught management to be given to VAS, Jr.VAS, LI with regard to health & management measures<br>Identify the Clinical staff and trained paravets and indent for their services as per | Transportation of animals to elevated areas<br>Proper hygiene and sanitation of the animal shed<br>In severe storms, un-tether or let loose the animals<br>Use of unconventional and locally available cheap feed ingredients for feeding of livestock.<br>Avoid soaked and mould infected feeds / fodders to livestock<br>Carryout deworming to all animals entering into relief camps<br>Identification and quarantine of sick animals<br>Constitution of Rapid Action Veterinary Force<br>Performing ring vaccination (8 km radius) in case of any outbreak<br>Restricting movement of livestock in case of any epidemic<br>Emergency outlet establishment for required medicines or feed in each village<br>Spraying of fly repellants in animal sheds | Repair of animal shed<br>Bring back the animals to the shed<br>Cleaning and disinfection of the shed<br>Bleach (0.1%) drinking water / water sources<br>Encouraging farmers to cultivate short-term fodder crops like sunhemp.<br>Deworming with broad spectrum dewormers<br>Proper disposable of the dead animals / carcasses by burning / deep burying (4-8 feet) with lime powder (1kg for small ruminants and 5kg for large ruminants) in pit<br>Drying the harvested crop material and proper storage for use as fodder.<br>Keep close surveillance on disease outbreak. |

| | | | |
|---|---|---|---|
| | schedules<br>Identify the volunteers who can serve in need of emergency<br>Arrangement for transportation of animals from low lying area to safer places and also for rescue animal health workers to get involve in rescue operations | | |
| **Cyclone** | **NA** | | |
| **Heat wave** | i) Plantation around the shed<br>ii) $H_2O$ sprinklers / foggers in the shed<br>**iii)** Application of white reflector paint on the roof<br>**iv)** Thatched sheds should be provided as a shelter to animal to minimize heat stress | Allow the animals early in the morning or late in the evening for grazing during heat waves<br>Feed green fodder/silage / concentrates during day time and roughages / hay during night time in case of heat waves<br>Put on the foggers / sprinklers /fans during heat weaves in case of high yielders (Jersey/HF crosses)<br>In severe cases, vitamin 'C' and electrolytes should be added in $H_2O$ during heat waves. | Feed the animals as per routine schedule<br>Allow the animals for grazing (normal timings) |
| **Cold wave** | 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) | Allow for grazing between 10AM to 3PM during cold waves<br>Add 25-50 ml of edible oil in concentrates and fed to the animal during cold waves<br>Apply / sprinkle lime powder in the animal shed during cold waves to neutralize ammonia accumulation | Feed the animals as per routine schedule<br>Allow the animals for grazing (normal timings) |
| **Insurance** | Encouraging insurance of livestock | Listing out the details of the dead animals | Submission for insurance claim and availing insurance benefit<br>Purchase of new productive animals |

### 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 | Storing of house hold grain like maize, broken rice etc, in to use as feed in case of severe drought | Supplementation only for productive birds with house hold grain<br>Supplementation of shell grit (calcium) for laying birds<br>Culling of weak birds | Supplementation to all survived birds | |
| Drinking water | | Use water sanitizers or offer cool hygienic drinking water | | |
| Health and disease management | Culling of sick birds.<br>Deworming 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 | |
| **Floods** | | | | |
| Shortage of feed ingredients | In case of early forewarning of floods, shift the birds to safer place<br>Storing of house hold grain like maize, broken rice, bajra etc, | Use stored feed as supplement<br>Don't allow for scavenging<br>Culling of weak birds | Routine practices are followed<br>Deworming and vaccination against RD | |

| | | | | |
|---|---|---|---|---|
| Drinking water | | Use water sanitizers or offer cool hygienic drinking water | | |
| Health and disease management | In case of EFW, add antibiotic powder (Terramycin/Ampicilline/ Ampiclox etc., 10g in one litre) in drinking water to prevent any disease outbreak | Prevent water logging surrounding the sheds through proper drainage facility<br>Assure supply of electricity by generator or solar energy or biogas<br>Sprinkle lime powder to prevent ammonia accumulation due to dampness | Sanitation of poultry house<br>Treatment of affected birds Disposal of dead birds by burning / burying with line powder in pit<br>Disposal of poultry manure to prevent protozoal problem<br>Supplementation of coccidiostats in feed<br>Vaccination against RD | |
| **Cyclone** | NA | | | |
| **Heat wave and cold wave** | | | | |
| ***Shelter/environment management*** | ***Heat wave:*** 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 | |
| | ***Cold wave:*** Provision of proper shelter<br>Arrangement for brooding<br>Assure supply of continuous electricity | Close all openings with polythene sheets<br>In severe cases, arrange heaters<br>Don't allow for scavenging during early morning and late evening | Routine practices are followed | |

| | | | | |
|---|---|---|---|---|
| **Health and disease management** | Deworming and vaccination against RD and fowl pox | Supplementation of house hold grain<br>Provide cool and clean drinking water with electrolytes and vit. C<br>In hot summer, add anti-stress probiotics in drinking water or feed | Routine practices are followed | |

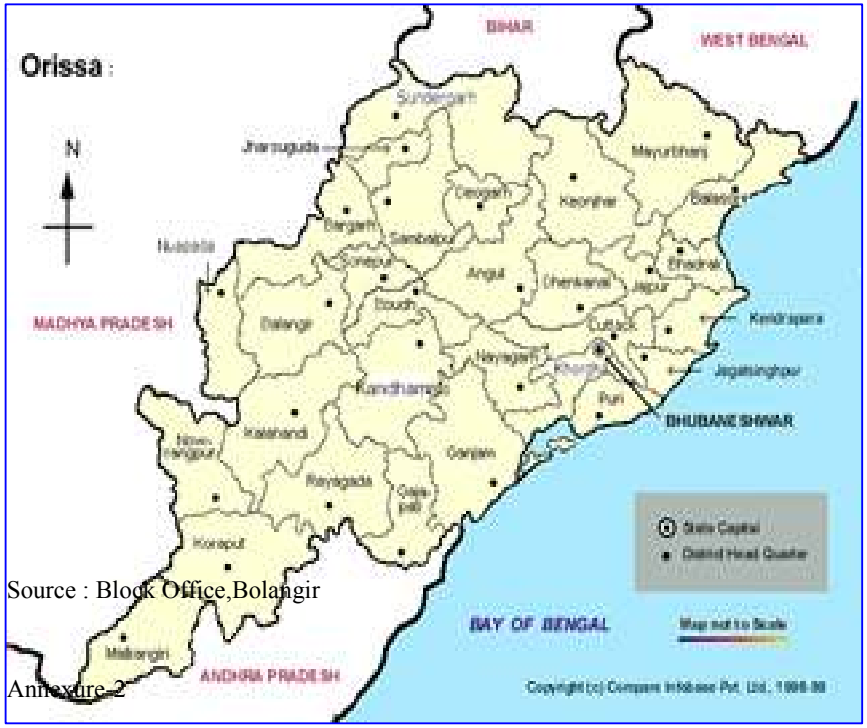
### 2.5.3 Fisheries

| | **Suggested contingency measures** | | |
|---|---|---|---|
| | **Before the event** | **During the event** | **After the event** |
| **Drought** | | | |
| Shallow water in ponds due to insufficient rains/inflow | 1. Restricted release of water from reservoir.<br>2. Supplementary water harvest structures like pond and tanks has to be developed.<br>3. Renovation and maintenance of existing water harvest structures | 1. Restrict lifting of water for irrigation purpose of crops<br>2. Catch the stock, market the produce to reduce the density of population in ponds. | 1. Excavate the ponds to increase the depth.<br>2. Try to release water into the pond if it rains in off-season |
| Impact of heat & salt load build up in ponds / change in water quality | 1. Application of organic manure in culture system | 1. Recharge the ponds with bore well water or water from other sources | 1. Application of organic manure in culture system |
| **Floods** | | | |
| Innundation with flood waters | 1 Storage of sand filled bags for emergency use.<br>2 Repair and maintenance of bundhs. | 1. netting at gate<br>2. Evacuation of people to flood shelter areas.<br>3. Relief operation. | 1. Relief operation will continue.<br>2. Care of health of affected people<br>3. Settlement of insurance. |

| | | | |
|---|---|---|---|
| | | | 4. Financial support to other people. |
| Water contamination & change in BOD | Take appropriate measures to check seepage into pond e.g. Raising bunds to prevent entry of water | Check the water quality & take appropriate action | 1. Application of lime<br>2. Application of Alum.<br>3. Application of KmnO4 |
| Health and diseases management | Stock preventive medicines, vaccines | Administer medicines through random catch<br><br>Disinfect water by lime , KMnO4 | 1. Application of lime and KmnO4.<br><br>2. Assessment of the health status of fish and accordingly control measure should be taken. |
| **Cyclone** | **N O T P R E V A L E N T** | | |
| **Heat wave and cold wave** | **N O T P R E V A L E N T** | | |

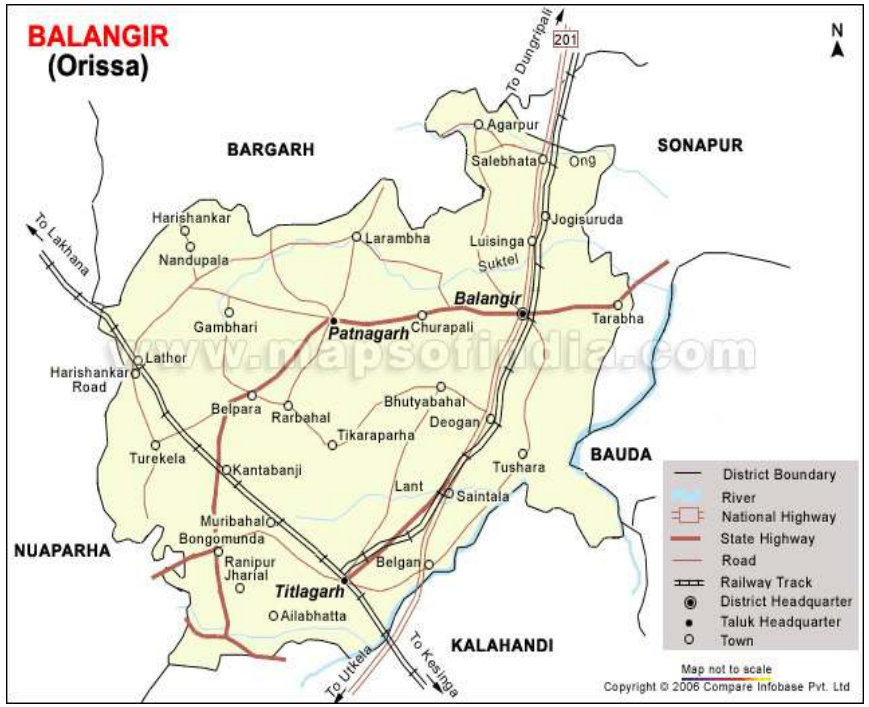
Annexure-1

**STATE MAP OF ORISSA**

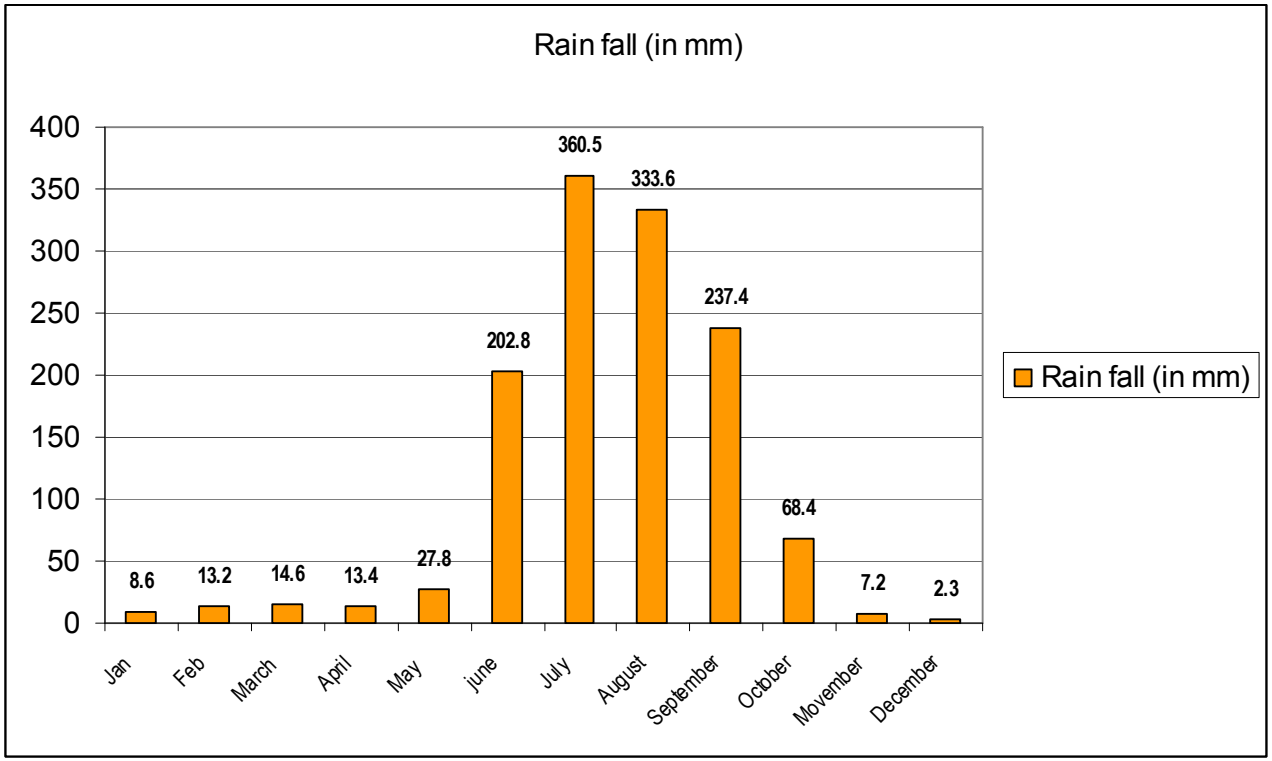



Source : Block Office,Bolangir

**DISTRICT MAP OF BOLANGIR**

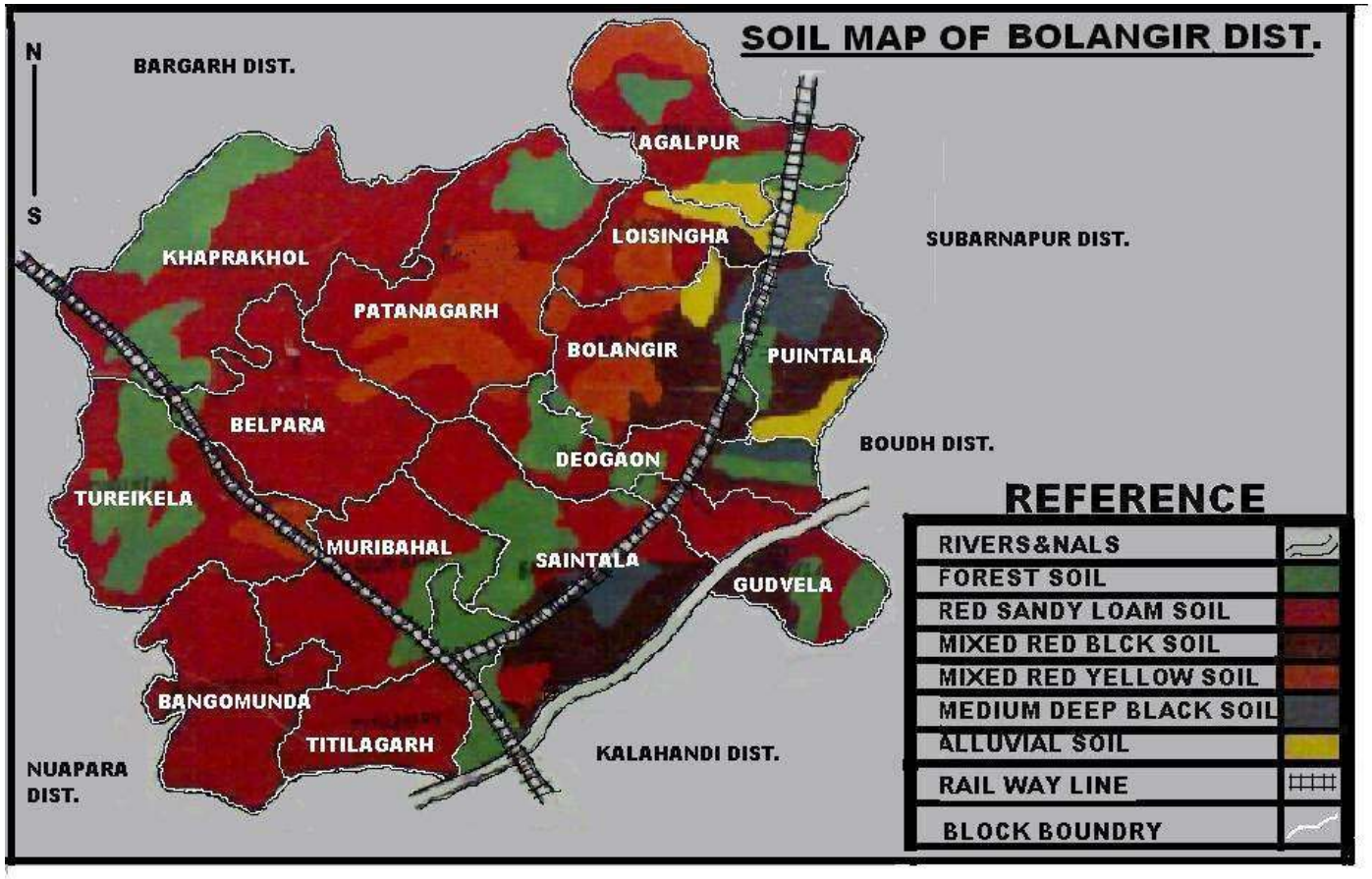



Annexure-2




Source: Department of Agriculture, Bolangir

Annexure-3


SOIL MAP OF BOLANGIR DIST.
N
S
BARGARH DIST.
AGALPUR
LOISINGHA
SUBARNAPUR DIST.
KHAPRAKHOL
PATANAGARH
BOLANGIR
PUINTALA
BELPARA
BOUDH DIST.
DEOGAON
TUREIKELA
MURIBAHAL
SAINTALA
GUDVELA
BANGOMUNDA
TITILAGARH
KALAHANDI DIST.
NUAPARA DIST.
REFERENCE
RIVERS&NALS
FOREST SOIL
RED SANDY LOAM SOIL
MIXED RED BLCK SOIL
MIXED RED YELLOW SOIL
MEDIUM DEEP BLACK SOIL
ALLUVIAL SOIL
RAIL WAY LINE
BLOCK BOUNDRY