

**State: Assam**

**Agriculture Contingency Plan for District: Baksa**

<b>1.0 District Agriculture profile</b>				
<b>1.1</b>	<b>Agro-Climatic/Ecological Zone</b>			
	Agro Ecological Sub Region (ICAR)	15.2 (Q8B8) Brahmaputra plain, hot humid ecosystem with alluvium derived soil and growing period 240-270 days.		
	Agro-Climatic Zone (Planning Commission)	Eastern Himalayan Region		
	Agro Climatic Zone (NARP)	Lower Brahmaputra Valley Zone		
	List all the districts falling under the NARP Zone>(*>50% area falling in the zone)	Kamrup, Nalbari, Barpeta, Bongaigaon, Dhubri, Goalpara, Baksa, Chirang, Kokrajhar		
	Geographic coordinates of district headquarters	<b>Latitude</b>	<b>Longitude</b>	<b>Altitude</b>
		26°37 N - 26°83 N	90°80 E - 91°85 E	48.15 Mts. above mean sea level
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	RARS, Gossaigaon		
	Mention the KVK located in the district with address	Allotted site-Dhepargaon, Goreswar, Baksa, pin-781354		
Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	RARS Gossaigaon			

<b>1.2</b>	<b>Rainfall</b>	<b>Normal RF(mm)</b>	<b>Normal Rainy days (number)</b>	<b>Normal Onset ( specify week and month)</b>	<b>Normal Cessation (specify week and month)</b>
	SW monsoon (June-Sep):	1685	75	1st Week of June	2nd week of August
	Post Monsoon/ NE Monsoon (Oct-Dec):	54	08	3rd week of October	2nd Week of November
	Winter (Jan- March)	93.2	12	-	-
	Summer (Apr-May)	261.5	27	-	-
	Annual	2093.7	122	-	-

<b>1.3</b>	<b>Land use pattern of the district</b> (latest statistics)	Geographical area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	<b>Area ('000 ha)</b>	234.62	120.01	18.94	12.34	0.42	5.93	0.96	22.17	5.28	0.37

<b>1.4</b>	<b>Major Soils (common names like red sandy loam deep soils (etc.,))*</b>	<b>Area ('000 ha)</b>	<b>Percent (%) of total</b>
	1. Sandy Loam	43.149	28.69
	2. Alluvial Soil	36.567	26.17
	3. Clay Loam	34.051	24.36
	4. Sandy Soil	21.602	15.45
	Others (specify):		

\* mention colour, depth and texture (heavy, light, sandy, loamy, clayey etc) and give vernacular name, if any, in brackets (data source: Soil Resource Maps of NBSS & LUP)

<b>1.5</b>	<b>Agricultural land use</b>	<b>Area ('000 ha)</b>	<b>Cropping intensity %</b>
	Net sown area	1,15,735	160.70 %
	Area sown more than once	70,200	
	Gross cropped area	1,86,000	

<b>1.6</b>	<b>Irrigation</b>	<b>Area ('000 ha)</b>		
	Net irrigated area	10.962		
	Gross irrigated area	19.78		
	Rainfed area	104.773		
	<b>Sources of Irrigation</b>	<b>Number</b>	<b>Area ('000 ha)</b>	<b>Percentage of total irrigated area</b>
	Canals	5710	3.55	17.94
	Tanks	98	0.2	1.01
	Open wells			
	Bore wells	5990	11.728	76.90

Lift irrigation schemes	50	0.1	0.5
Micro-irrigation	-	-	-
Other sources (please specify)	25 (Dong)	0.82	4.15
Total Irrigated Area	-	16.398	
Pump sets	7065	7.065	35.6
No. of Tractors	309		
<b>Groundwater availability and use*</b> <b>(Data source: State/Central Ground water Department /Board)</b>	No. of blocks/ Tehsils	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
Over exploited	-	-	-
Critical	-	-	-
Semi- critical	-	-	-
Safe	-	-	-
Wastewater availability and use	-	-	-
Ground water quality	-		

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

**1.7 Area under major field crops & horticulture (as per latest figures) (Specify year 2015-16)**

1.7	S.No.	Major field crops cultivated	Area ('000 ha)							
			Kharif			Rabi			Summer	Grand total
			Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
1	Rice	6.5	81.00	87.5	1.5	41.0	42.5	7.50	138.0	
2	Rapeseed & Mustard	-	-	-	-	10.4	10.4	-	10.4	
3	Linsed	-	-	-	-	0.82	0.82	-	0.82	
4	Niger	-	-	-	-	0.86	0.86	-	0.86	
5	Sesamum	-	-	-	-	0.98	0.98	-	0.98	
6	Pea	-	-	-	-	0.85	0.85	-	0.85	
7	Lentil	-	-	-	-	3.50	3.50	-	3.50	
8	Black gram	-	-	-	-	2.20	2.20	-	2.20	
9	Greengram	-	-	-	-	0.43	0.43	-	0.43	
10	Arhar	-	-	-	-	0.38	0.38	-	0.38	
	Others (specify)	-	-	-	-	-	-	-	-	

S.No.	Horticulture crops - Fruits	Area ('000 ha)		
		Total	Irrigated	Rainfed
1	Banana	0.850	0.255	0.850
2	Jackfruit	0.750	-	0.750
3	Assam Lemon	0.520	0.120	0.520
4	Papaya	0.150	0.015	0.150
5	Litchi	0.156	-	0.156
6	Orange	0.390	0.078	0.390
7	Pineapple	0.280	-	0.280
8	Colocasia	0.250	-	0.250
Others (specify)	-	-	-	-
	<b>Horticulture crops - Vegetables</b>	<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>
1	Kharif	4.20	2.23	2.23
2	Rabi	5.463	5.463	-
3	Potato	4.20	-	4.20
Others (specify)	-	-	-	-
	<b>Medicinal and Aromatic crops</b>	<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>
1	Citronella	0.02	-	0.02
2	Lemongrass	0.02	-	0.02
3	Neem	0.03	-	0.03
4	Patchouli	0.01	-	0.01
5	Amla	0.01	-	0.01
Others (specify)	<b>Spices</b>	<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>
1	Coriander	1.869	-	1.869

2	Turmeric	1.40	-	1.40
3	Chilli	0.300	0.105	0.195
4	Ginger	1.25	-	1.25
	<b>Plantation crops</b>	<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>
1	Coconut	1.650	-	1.650
2	Arecanut	4.150	-	4.150
Others (Specify)	Eg., industrial pulpwood crops etc.	-	-	-
	<b>Fodder crops</b>	<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>
Others (Specify)	-	-	-	-
	<b>Total fodder crop area</b>	-	-	-
	<b>Grazing land</b>	-	-	-
	<b>Sericulture etc</b>	-	-	-
	<b>Eri seeds (DFLS)</b>	1750	-	1750

<b>1.8</b>	<b>Livestock</b>	<b>Male ('000)</b>	<b>Female ('000)</b>	<b>Total ('000)</b>
	Non descriptive Cattle (local low yielding)	-	-	33050
	Improved cattle	-	-	-
	Crossbred cattle	-	-	-
	Non descriptive Buffaloes (local low yielding)	-	-	1290
	Descript Buffaloes	-	-	-
	Goat	-	-	101900
	Sheep	-	-	7820
	Others (Camel, Pig, Yak etc.)	-	-	Pig-5246
	Commercial dairy farms (Number)			
<b>1.9</b>	<b>Poultry</b>	<b>No. of farms</b>	<b>Total No. of birds ('000)</b>	
	Commercial	998	142.48	
	Backyard	26,765	135.00	
	Duck	16,000(backyard)	68.22	

<b>1.10</b>	<b>Fisheries</b> (Data source: Chief Planning Officer)						
	<b>A. Capture</b>						
	<b>i) Marine</b> (Data Source: Fisheries Department)	<b>No. of fishermen</b>	<b>Boats</b>		<b>Nets</b>		<b>Storage facilities (Ice plants etc.)</b>
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
		-	-	-	-	-	-
<b>ii) Inland</b> (Data Source: Fisheries Department)	<b>No. Farmer owned ponds</b>		<b>No. of Reservoirs</b>		<b>No. of village tanks</b>		
	-		-		-		
<b>B. Culture</b>							
			<b>Water Spread Area (ha)</b>	<b>Yield (t/ha)</b>	<b>Production ('000 tons)</b>		
<b>i) Brackish water</b> (Data Source: MPEDA/ Fisheries Department)			-	-	-		
<b>ii) Fresh water</b> (Data Source: Fisheries Department)			49750.20	0.187	9752		
<b>Others</b>			43212				

### 1.11 Production and Productivity of major crops (2015-16)

1.11	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder ('000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
<b>Major Field crops (Crops to be identified based on total acreage)</b>										
Crop 1	Rice	336.34	3824	13.294	3285	22.437	4579	372.074	11688	-
Crop 2	Rapeseed & Mustard	-	-	19.643	1876	-	-	19.643	1876	-
Crop 3	Linsed	-	-	0.487	779	-	-	0.487	779	-
Crop 4	Sesamum	-	-	-	-	0.749	723	0.749	723	-
Crop5	Pea	-	-	0.725	855	-	-	0.725	855	-
Crop6	Lentil	-	-	2.890	615	-	-	2.890	615	-
Crop7	Black gram	-	-	2.150	560	-	-	2.150	560	-
Crop8	Greengram	-	-	0.245	560	-	-	0.245	560	-
Crop9	Arhar	-	-	1.094	1146	-	-	1.094	1146	-
<b>Major Horticultural crops (Crops to be identified based on total acreage)</b>										
Crop 1	Potato	-	-	114.131	24206	-	-	114.131	24206	-
Crop 2	Rabi vegetables	-	-	152.131	22346	-	-	152.131	22346	-
Crop 3	Kharif vegetables	84.943	18240	-	-	-	-	84.943	18240	-
Crop 4	Arecanut	-	-	-	-	-	-	95.356	12672	-
Crop 5	Coconut	-	-	-	-	-	-	120 nut/plant	120 nut/plant	-
Others	Banana	-	-	-	-	-	-	45.393	33750	-

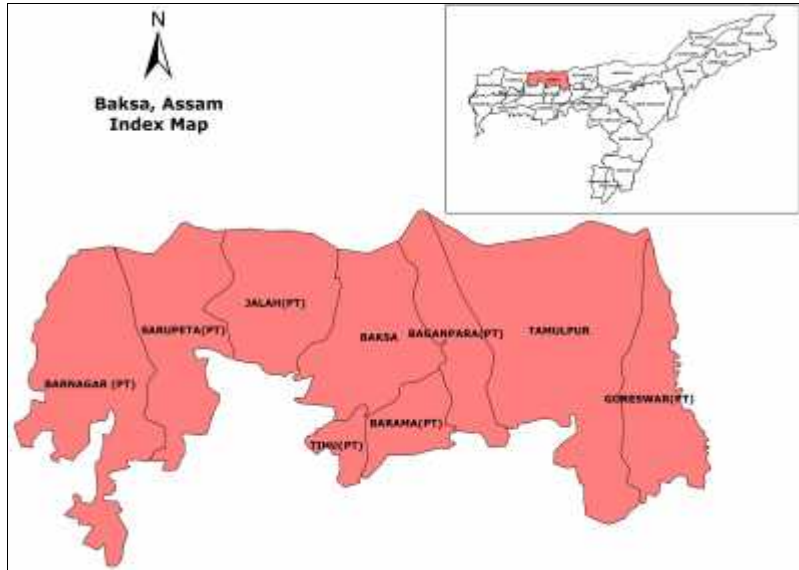
<b>1.12</b>	<b>Sowing window for 5 major field crops</b> (start and end of normal sowing period)	<b>Crop 1 : Rice</b>	<b>Crop 2: Rapeseed</b>	<b>Crop 3: Lentil</b>	<b>Crop 4: Pea</b>	<b>Crop 5: Blackgram</b>
	Kharif- Rainfed	June-November	-	-	-	-
	Kharif-Irrigated	June-November	-	-		-
	Rabi- Rainfed	November-May	November-February	November-February	November-February	Mid October-February March-April
	Rabi-Irrigated	November-May	November-February	-	-	-

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

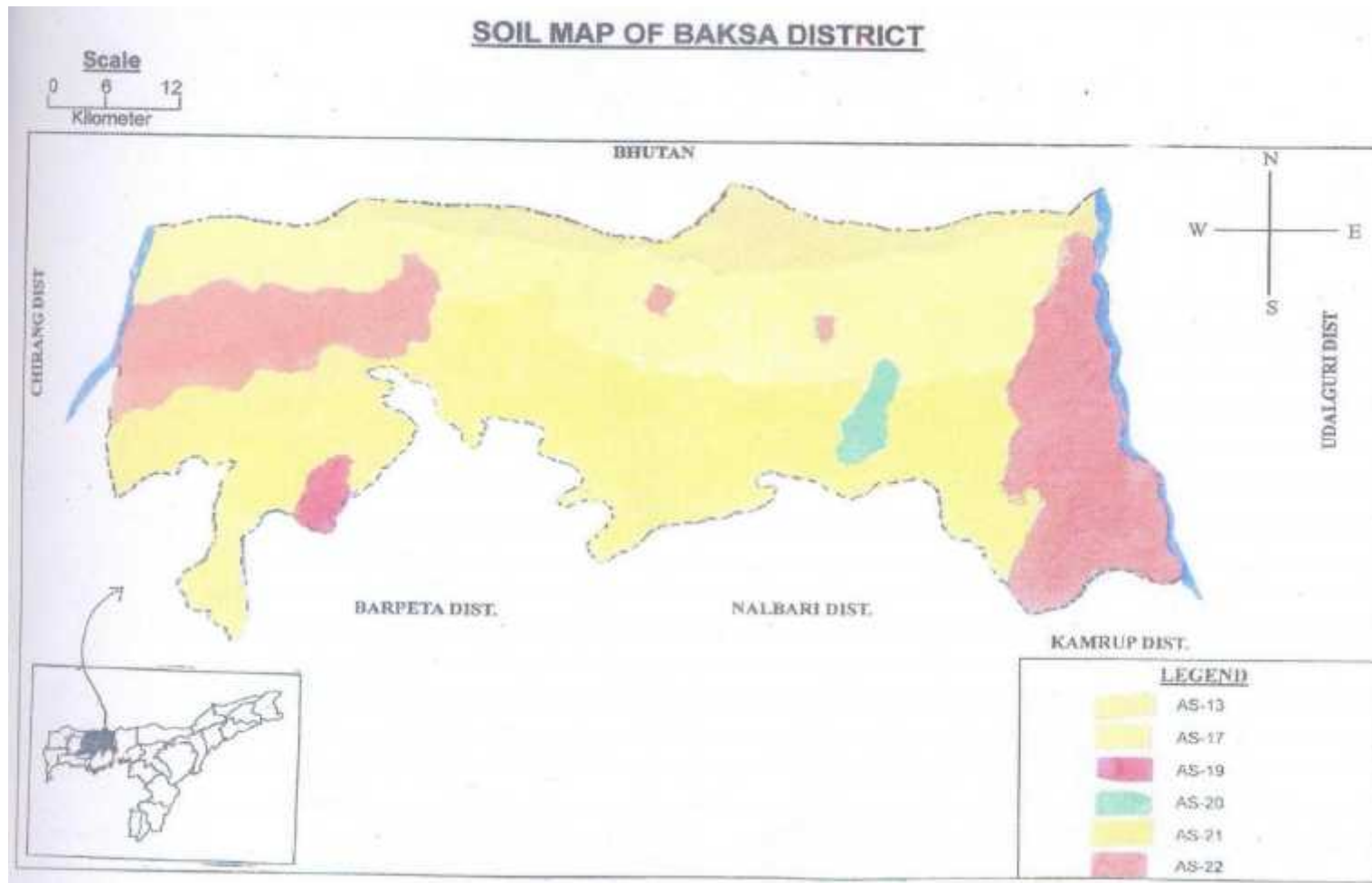
<b>1.14</b>	<b>Include Digital maps of the district for</b>	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: No
		Soil map as Annexure 3	Enclosed: Yes



Annexure – 1: Location map of Baksa within Assam



Annexure 3. Soil Map of Baksa district



## 2.0 Strategies for weather related contingencies

### 2.1 Drought

#### A. Drought-Pre-Monsoon (Last week of March to First week of April) Normal

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Normal Crop / Cropping system	Change in crop /cropping system including variety	Agronomic measures	Remarks on Implementation
Delayed by 2 weeks ( 2 <sup>nd</sup> to 3 <sup>rd</sup> week of April)	Rainfed upland, (Sandy loam to clay loam)	Okra	Short duration crops/varieties	<ul style="list-style-type: none"> <li>▪ Conservation of pre-monsoon soil moisture through soil/straw/grass mulching practices</li> <li>▪ seed soaking in water for 24hr and followed by shade drying before sowing.</li> <li>▪ Application of organic manure before sowing.</li> <li>▪ Practice on conservative agriculture</li> </ul>	Provision for supply of seeds/inputs through RKVY and various Central/State schemes
		cucurbits	Short duration crops/varieties		
		Black gram	Short duration crops/varieties		
	Rainfed medium / medium lowland (Sandy loam to clay loam)	Summer vegetables	Short duration crops/varieties		

#### Normal onset of Pre-monsoon

Condition			Suggested Contingency measures		
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 etc.	Rainfed upland, (Sandy loam to clay loam)	Okra	<ul style="list-style-type: none"> <li>▪ Short duration crops/varieties</li> <li>▪ Seed priming</li> <li>▪ Pre sowing irrigation.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Conservation of pre-monsoon soil moisture through soil/straw/grass mulching practices</li> <li>▪ Application of organic manure before sowing</li> <li>▪ Delay the sowing for few days.</li> </ul>	Provision for supply of seeds/inputs through RKVY and various Central/State schemes
		cucurbits	<ul style="list-style-type: none"> <li>▪ Short duration crops/varieties Maize + groundnut/soya bean/rice bean inter cropping.</li> <li>▪ Seed priming</li> </ul>		

		Ginger/turmeric	<ul style="list-style-type: none"> <li>▪ Planting of pre sprouted rhizome.</li> <li>▪ Maintenance of proper plant population</li> </ul>		
	Rainfed medium / medium lowland (Sandy loam to clay loam)	Sesamum	<ul style="list-style-type: none"> <li>▪ Stress tolerant variety.</li> <li>▪ Maintenance of proper plant population</li> </ul>	<ul style="list-style-type: none"> <li>▪ Conservation of pre-monsoon soil moisture through soil/straw/grass mulching practices</li> <li>▪ Application of organic manure before sowing</li> </ul>	Provision for supply of seeds/inputs through RKVY and various Central/State schemes

Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm)period)	Major Farming situation	Normal Crop /cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Vegetative stage	Rainfed upland, (Sandy loam to clay loam)	Okra	<ul style="list-style-type: none"> <li>▪ Life saving irrigation</li> <li>▪ Foliar application of 1% MOP</li> </ul>	<ul style="list-style-type: none"> <li>▪ Mulching with locally available material</li> </ul>	Provision for water harvesting structures under PMKSY
		cucurbits	<ul style="list-style-type: none"> <li>▪ Life saving irrigation</li> <li>▪ Interculture</li> <li>▪ Foliar application of 1% MOP</li> </ul>		
		Ginger/turmeric	-		
	Rainfed medium / medium lowland (Sandy loam to clay loam)	Sesamum	<ul style="list-style-type: none"> <li>▪ Stress tolerant variety.</li> <li>▪ Maintenance of proper plant population</li> </ul>	<ul style="list-style-type: none"> <li>▪ Use of organic manure.</li> </ul>	

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

Reproductive stage	Rainfed upland, (Sandy loam to clay loam)	Okra	<ul style="list-style-type: none"> <li>▪ Foliar application of 1% MOP</li> </ul>	<ul style="list-style-type: none"> <li>▪ Provide irrigation from the available sources</li> <li>▪ Mulching with locally available material</li> <li>▪</li> </ul>	Provision for water harvesting structures under PMKSY
		cucurbits	<ul style="list-style-type: none"> <li>▪ Foliar application of 1% MOP</li> </ul>		
		Ginger/turmeric	<ul style="list-style-type: none"> <li>• Intercropping with pigeon pes</li> </ul>		
	Rainfed medium / medium lowland (Sandy loam to clay loam)	Sesamum	<ul style="list-style-type: none"> <li>▪ Interculture</li> <li>▪ Foliar application of 1% MOP</li> </ul>	<ul style="list-style-type: none"> <li>▪ Provide irrigation from the available sources</li> <li>▪ Mulching with locally available material</li> </ul>	

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning	Remarks on Implementation
	Rainfed upland, (Sandy loam to clay loam)	Okra	<ul style="list-style-type: none"> <li>▪ Harvest at physiological maturity.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Planning for zero tillage cultivation of pea.</li> <li>▪ Preparation for cole crops</li> </ul>	-
		cucurbits	<ul style="list-style-type: none"> <li>▪ Harvest at physiological maturity.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Planning for zero tillage cultivation of pea.</li> <li>▪ Preparation for cole crops</li> </ul>	-
		Ginger/turmeric	<ul style="list-style-type: none"> <li>▪ Harvest at physiological maturity.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Planning for zero tillage cultivation of pea.</li> <li>▪ Preparation for cole crops</li> </ul>	-
	Rainfed medium / medium lowland (Sandy loam to clay loam)	Sesamum	<ul style="list-style-type: none"> <li>▪ Harvest at physiological maturity.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Planning for zero tillage cultivation of pea.</li> <li>▪ Preparation for cole crops</li> </ul>	-

### 2.1.1 Rainfed situation

Condition	Major Farming situation <sup>a</sup>	Suggested Contingency measures			Remarks on Implementation <sup>c</sup>
		Normal Crop / Cropping system <sup>b</sup>	Change in crop / cropping system <sup>c</sup> including variety	Agronomic measures <sup>d</sup>	
<b>Early season drought (delayed onset)</b>  <b>Delay by 2 weeks (Specify month)*</b> <b>Month: 3rd week of June</b>	Rainfed upland, (Sandy loam to clay loam)	Rice - Toria/ Potato / Rabi vegetables	No Change	<ul style="list-style-type: none"> <li>Moisture stress tolerant rice varieties like <i>Sahabhazi</i> and <i>Elongkhiri</i>.</li> <li>Short duration rice variety like <i>Dishang</i>, <i>Kalang</i>, <i>Luit</i>, <i>Kapili</i> etc.</li> <li>Early planting.</li> <li>SRI practice.</li> </ul>	Supply of seeds may be done through NFSM, BGREI and other such scheme. Supply of weeder and other farm machineries under RKVY
		Summer vegetables - Toria / Lentil / Potato / Rabi vegetables/	No Change	<ul style="list-style-type: none"> <li>Add more FYM/ compost in Soil.</li> <li>Growing of vegetables with mulching.</li> </ul>	
	Rainfed medium / medium lowland (Sandy loam to clay loam)	Rice (Kharif) monocropping	No Change	<ul style="list-style-type: none"> <li>Growing of medium duration <i>Sali</i> Rice variety like <i>Shravani</i>.</li> <li>Moisture deficit stress tolerant rice variety like <i>Sahabhazi</i> and <i>Elongkhiri</i>.</li> </ul>	
		Rice(Kharif)- Toria / Lentil/ Potato / Rabi vegetables	No Change	<ul style="list-style-type: none"> <li>Growing of medium duration <i>Sali</i> Rice variety like <i>Shravani</i>.</li> <li>Moisture deficit stress tolerant rice variety like <i>Sahabhazi</i> and <i>Elongkhiri</i>.</li> </ul>	
		Rice (kharif) – Rice (summer)	No Change	<ul style="list-style-type: none"> <li>Growing of medium duration <i>Sali</i> Rice variety like <i>Shravani</i>.</li> <li>Moisture deficit stress tolerant rice variety like <i>Sahabhazi</i> and <i>Elongkhiri</i>.</li> </ul>	

	Flood prone/low land (sandy loam to clay loam)	Late Sali (Kharif) – Toria/Rabi vegetables	Varieties adopted for flood prone situation/ pre or post flood prone situation should be selected	<ul style="list-style-type: none"> <li>• Growing of submergence tolerant varieties such as Ranjit Sub 1, Chehrang Sub 1, IR 64Sub1, Swarna Sub1 which can tolerate 12-15 days submergence (transplanting within July)</li> <li>• If flood water recedes early and transplanting can be done by mid August, select varieties like Shravani, Basundhara, Jaymati etc.</li> <li>• For chronically flood affected areas, Manohar <i>Sali</i>, Andrew <i>Sali</i>, Salpona etc. and traditional photosensitive coarse grain varieties with up to 60 days old seedlings can be grown up to last part of August. About 60 kg seed/ha is required with closer spacing (15 cm x 10 cm) and 6-8 seedlings/hill. Community nursery may be raised in non- flood prone or high land for raising of rice seedlings.</li> <li>• Select delayed planting varieties like Prafulla and Gitesh with up to 60 days old seedlings (Sowing in the nursery bed within June). Seedlings should be raised in non flood prone or high land area.</li> </ul>	
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Condition	Major Farming situation <sup>a</sup>	Suggested Contingency measures			Remarks on Implementation <sup>e</sup>
		Normal Crop/cropping system <sup>b</sup>	Change in crop/cropping system <sup>c</sup>	Agronomic measures <sup>d</sup>	
Early season drought (delayed onset) <b>Delay by 4 weeks (Specify month)* Month: 1st week of July</b>	Rainfed upland, (Sandy loam to clay loam)	Rice - Toria/ Potato / Rabi vegetables	No Change	<ul style="list-style-type: none"> <li>• Moisture deficit stress tolerant rice variety like <i>Sahabhagi</i> and <i>Elongkhiri</i>.</li> <li>• Short duration rice variety like <i>Dishang</i>, <i>Kalang</i>, <i>Luit</i>, <i>Kapili</i> etc.</li> <li>• SRI practice.</li> </ul>	Supply of seeds may be done through NFSM, BGREI and other such scheme. Supply of weeder and other farm machineries under RKVY
		Summer vegetables - Black gram/Sesamum	No Change	<ul style="list-style-type: none"> <li>• Add more FYM/ compost in Soil.</li> <li>• Growing of vegetables with mulching.</li> </ul>	
		Summer vegetables - Toria / Potato / Rabi vegetables	No Change	<ul style="list-style-type: none"> <li>• Add more FYM/ compost in Soil.</li> <li>• Growing of vegetables with mulching.</li> </ul>	
	Rainfed	Rice(Kharif)	No change	<ul style="list-style-type: none"> <li>• If transplanting is possible within July, HYVs</li> </ul>	

	medium/medium lowland (Sandy loam to clay loam)	monocropping		<p>like Ranjit, Bahadur, Mahsuri etc can be selected.</p> <ul style="list-style-type: none"> <li>• Growing of medium duration rice varieties such as Shravani, Basundhara, Jaymati etc (transplanting up to mid August).</li> <li>• Varieties such as Pankaj, Kushal, Lakhimi can be grown up to August 15 with 45 -50 days old seedlings.</li> <li>• Varieties that can be grown as late Sali up to last part of August are Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse grain varieties with up to 60 days old seedlings. About 60 kg seed/ha is required with closer spacing (15 cm x 10 cm) and 6-8 seedlings/hill.</li> </ul>
		Rice(Kharif)- Toria / Potato / Rabi vegetables	No change	<ul style="list-style-type: none"> <li>• Growing of medium duration rice varieties such as Shravani ,Basundhara, Jaymati, Mulagabhoru etc (transplanting up to mid August).</li> <li>• Very short duration varieties such as Luit, Kolong, Dishang etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/hill.</li> <li>• Varieties that can be grown as late Sali up to last part of August are Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse grain varieties with up to 60 days old seedlings. About 60 kg seed/ha is required with closer spacing (15 cm x 10 cm) and 6-8 seedlings/hill.</li> </ul>
		Rice (kharif) – Rice (summer)	No change	<ul style="list-style-type: none"> <li>• Growing of medium duration rice varieties such as Basundhara, Jaymati etc (transplanting up to mid August).</li> <li>• Varieties such as Pankaj, Kushal, Lakhimi can be grown up to August 15 with 45 -50 days old seedlings.</li> <li>• Varieties that can be grown as late Sali up to last part of August are Manohar Sali, Andrew</li> </ul>



				Sali, Salpona etc. and traditional photosensitive coarse grain varieties with up to 60 days old seedlings. About 60 kg seed/ha is required with closer spacing (15 cm x 10 cm) and 6-8 seedlings/hill.	
	Flood prone/ low land (Sandy loam to clay loam)	Late Sali (Kharif) –Torria/Potato/Rabi vegetables	No Change	<ul style="list-style-type: none"> <li>• Selection of varieties having staggering ability like Prafulla, Gitesh. The seedling of these varieties can be planted upto the age of 60 days or more.</li> <li>• Transplanting with double transplanted seedling.</li> <li>• Cultivation of varietie like Ranjit Sub 1, Swarna Sub 1 etc. which can talerate submergence up to 10- 15 days.</li> <li>• Cultivation of late HYV varieties like Manohar Sali, Andrew Sali and traditional Sali varieties like Bordhan, Tangaguri, Local Joha and Bora etc., if seeds of HYV are not available</li> <li>• If flood damages crop during last part of August and there is no time to raise seedlings, direct seeding (wet seeding) of very short duration high yielding varieties such as Luit, Kolong, Dishang etc .</li> </ul>	Supply of seeds may be done through NFSM, BGREI and other such scheme.

Condition	Major Farming situation <sup>a</sup>	Suggested Contingency measures			Remarks on Implementation <sup>e</sup>
		Normal Crop/cropping system <sup>b</sup>	Change in crop/cropping system <sup>c</sup>	Agronomic measures <sup>d</sup>	
Early season drought (delayed onset)					
Delay by 6 weeks (Specify month)* Month: 3rd week of July	Rainfed upland, (Sandy loam to clay loam)	Rice - Torria/ Potato / Rabi vegetables	No Change	<ul style="list-style-type: none"> <li>• Cultivation of short duration varieties like Chilaray, Lachit and very short duration varieties like Luit, Kolong Kapilee etc. seedling of 20-25 days old should be transplanted at 20x15 cm spacing with 4-5 seedlings/hill.</li> <li>• Growing of rice variety like Bolan with staggered planting.</li> <li>• Sowing of sprouted seed of short duration rice variety with drum seeder.</li> </ul>	

		Rice / summer vegetables - Black gram/Sesamum	No Change	<ul style="list-style-type: none"> <li>• Cultivation of short duration varieties like Chilaray, Lachit and very short duration varieties like Luit, Kolong, Kapilee etc. Seedling of 20-25 days old should be transplanted at 20x15 cm spacing with 4-5 seedlings/hill.</li> </ul>	
		Summer vegetables - Toria / Potato / Rabi vegetables	No Change	<ul style="list-style-type: none"> <li>• Recommended package of practices for normal sowing.</li> </ul>	
	Rainfed medium/medium lowland (Sandy loam to clay loam)	Rice(Kharif) monocropping	No change	<ul style="list-style-type: none"> <li>• Very short duration varieties such as Luit, Kolong, Dishang etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/hill.</li> <li>• Varieties that can be grown as late Sali up to last part of August are Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse grain varieties with up to 60 days old seedlings. About 60 kg seed/ha is required with closer spacing (15 cm x 15 cm) and 6-8 seedlings/hill.</li> </ul>	
		Rice(Kharif)- Toria / Potato / Rabi vegetables	No change	<ul style="list-style-type: none"> <li>• Very short duration varieties such as Luit, Kolong, Dishang etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/hill.</li> <li>• Varieties that can be grown as late Sali up to last part of August are Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse grain varieties with up to 60 days old seedlings. About 60 kg seed/ha is required with closer spacing (15 cm x 15 cm) and 6-8 seedlings/hill.</li> </ul>	

		Rice (kharif) – Rice (summer)	No change	<ul style="list-style-type: none"> <li>• Very short duration varieties such as Luit, Kolong, Dishang etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/hill.</li> <li>• Varieties that can be grown as late Sali up to last part of August are Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse grain varieties with up to 60 days old seedlings. About 60 kg seed/ha is required with closer spacing (15 cm x 15 cm) and 6-8 seedlings/hill.</li> </ul>	
	Flood prone / low land (Sandy loam to clay loam)	Late Sali (Kharif) – Toria/ Rabi vegetables	No Change	<ul style="list-style-type: none"> <li>• If transplanting is possible during last part of August, very short duration varieties such as Luit, Kolong, Dishang etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/hill.</li> <li>• For chronically flood affected areas, Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse grain varieties with up to 60 days old seedlings can be grown up to last part of August. About 60 kg seed/ha is required with closer spacing (15 cm x 15 cm) and 6-8 seedlings/hill. Community nursery may be raised in non- flood prone or high land for raising of rice seedlings.</li> <li>• If flood damages crop during last part of August and there is no time to raise seedlings, direct seeding (wet seeding) of short duration high yielding varieties such as Luit, Kolong, Dishang etc or any traditional photo period sensitive coarse grain varieties can also be done up to 1st week of September. For this purpose sprouted seeds @ 75 kg/ha is to be broadcasted directly in puddled field.</li> </ul>	

Condition	Major Farming situation <sup>a</sup>	Suggested Contingency measures			Remarks on Implementation <sup>e</sup>
		Normal Crop/cropping system <sup>b</sup>	Crop management <sup>c</sup>	Soil nutrient & moisture conservation measures <sup>d</sup>	
Early season drought (Normal onset)					
Normal onset followed by 15-20 days dry spell after sowing / transplanting	Rainfed upland, (Sandy loam to clay loam)	Rice - Toria/ Potato / Rabi vegetables		<ul style="list-style-type: none"> <li>Life saving supplemental irrigation</li> <li>Weeding at critical stages of growth.</li> <li>Application of organic manure in the field</li> <li>Optimum spacing</li> <li>Plant protection measures against thrips in nursery bed</li> </ul>	<ul style="list-style-type: none"> <li>Development of water harvesting structure under MGNREGS/PMKSY</li> <li>Arrangements of pump sets under NFSM and RKVY</li> </ul>
		Kharif vegetables - Toria / Potato / Rabi vegetables	No Change	<ul style="list-style-type: none"> <li>Life saving supplemental irrigation</li> <li>Weeding at critical stages of growth.</li> <li>Application of sufficient quantity of FYM or compost and mulch materials</li> </ul>	
	Rainfed medium /medium lowland (Sandy loam to clay loam)	Rice(Kharif) monocropping	No change	<ul style="list-style-type: none"> <li>Supplemental irrigation in the nursery bed of rice.</li> <li>The gap of 30 cm between two beds may be converted into channel to supply water to keep the raised beds moist in the event of drought occurs.</li> <li>Application of sufficient quantity of FYM or compost in the nursery bed and main field.</li> <li>Where germination is severely affected, re-sowing of rice seed may also be recommended. Varieties suitable for medium and short duration should be selected for sowing.</li> </ul>	
		Rice(Kharif)- Toria / Potato / Rabi vegetables	No change		
		Rice (kharif) – Rice (summer)	No change	<ul style="list-style-type: none"> <li>Relay cropping with Lathyrus or Lentil in the rice field.</li> <li>Growing of suitable Maize varieties.</li> </ul>	

	Flood prone / low land	Late Sali (Kharif) – Toria/Potato/Rabi vegetables	No Change	<ul style="list-style-type: none"> <li>• In chronically flood affected areas, where rice nursery is raised in upland/ non flood prone areas to grow recommended rice varieties as late sali with higher seedling age, re-sowing of rice seed may also be recommended where germination is severely affected.</li> <li>• Seed treatment with 4% MOP (600ml/kg of seed) for 24 hrs, dry it in shade for 24 hrs and sowing should be done</li> <li>• Supplemental irrigation in the nursery bed of rice.</li> <li>• The gap of 30 cm between two beds of rice nursery may be converted into channel to supply water to keep the raised beds moist in the event of drought occurs.</li> <li>• Application of sufficient quantity of FYM or compost in the nursery bed and main field.</li> </ul>	<ul style="list-style-type: none"> <li>• Development of water harvesting structure under MGNREGS/PMKSY</li> </ul>

Condition	Major Farming situation <sup>a</sup>	Suggested Contingency measures				Remarks on Implementation <sup>e</sup>
		Normal Crop/cropping system <sup>b</sup>	Crop management <sup>c</sup>	Soil nutrient & moisture conservation measures <sup>d</sup>		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)						
At vegetative stage	Rainfed upland, (Sandy loam to	Rice - Toria/ Potato / Rabi vegetables	No Change	<ul style="list-style-type: none"> <li>• Life saving supplemental irrigation</li> <li>• Weeding at critical stages of growth.</li> <li>• Application of organic manure in the field.</li> <li>• Top dressing of additional quantities of MOP</li> </ul>	-Development of water harvesting structure under MGNREGS/	

	clay loam)	Rice / summer vegetables - Black gram/Sesamum	No Change	<ul style="list-style-type: none"> <li>@ 37.5 kg/ha.</li> <li>Mulching with water hyacinth or crop residue.</li> <li>Spraying with 2% KCl solution.</li> </ul>	PMKSY
		Summer vegetables - Toria / Potato / Rabi vegetables	No Change		
	Rainfed medium /medium lowland (Sandy loam to clay loam)	Rice(Kharif) monocropping	No change	<ul style="list-style-type: none"> <li>Top dressing of additional quantities of MOP @ 37.5 kg/ha</li> <li>Spraying of 2% KCl solution on leaves of rice when drought appears.</li> <li>Top dressing of urea may be delayed upto heading stage of rice if drought prevails at tillering stage.</li> <li>Life saving supplemental irrigation at critical stages of crop growth</li> <li>Spraying of Mancozeb @ 2.5g/l or Edifenophos 2 lml/l or Carbendazim @ 1g/l against brown spot disease in rice.</li> <li>Weeding at critical stages of growth.</li> </ul>	-Development of water harvesting structure under MGNREGS/PMKSY  - Arrangements of pump sets under NFSM and RKVY
		Rice(Kharif)- Toria /Potato / Rabi vegetables	No change		
Rice (kharif) – Rice (summer)	No change				
	Flood prone / low land	Late Sali (Kharif) – Toria/Potato/Rabi vegetables	No Change	-	-

Condition	Major Farming situation <sup>a</sup>	Suggested Contingency measures			
		Normal Crop/cropping system <sup>b</sup>	Crop management <sup>c</sup>	Soil nutrient & moisture conservation measures <sup>d</sup>	Remarks on Implementation <sup>e</sup>
Mid season drought (long dry spell)					
At flowering/ fruiting stage	Rainfed upland, (Sandy loam to clay loam)	Rice - Toria/ Potato / Rabi vegetables	No Change	<ul style="list-style-type: none"> <li>Life saving supplemental irrigation</li> <li>Weeding at critical stages of growth.</li> <li>Application of organic manure in the field</li> <li>Top dressing of additional quantities of MOP @ 37.5 kg/ha</li> <li>Application of Soil mulching with dry water hyacinth or straw</li> </ul>	-Development of water harvesting structure under MGNREGS/PMKSY
		Rice / summer vegetables - Black gram/Sesamum	No Change		
		Summer vegetables - Toria / Potato / Rabi	No Change		

		vegetables			
	Rainfed medium /medium lowland (Sandy loam to clay loam)	Rice(Kharif) monocropping	No change	<ul style="list-style-type: none"> <li>• Top dressing of additional quantities of MOP @ 37.5 kg/ha</li> <li>• Spraying of 2% KCl solution on leaves of rice when drought appears.</li> <li>• Top dressing of urea may be delayed upto heading stage of rice if drought prevails at tillering stage.</li> <li>• Life saving supplemental irrigation at critical stages of crop growth</li> <li>• Spraying of Mancozeb @ 2.5g/l or Edifenophos 2 1ml/l or Carbendazim @ 1g/l against brown spot disease in rice.</li> <li>• Weeding at critical stages of growth.</li> </ul>	--Development of water harvesting structure under MGNREGS/PMKSY for life saving irrigation - Arrangements of pump sets under NFSM and RKVY
		Rice(Kharif)- Toria /Potato / Rabi vegetables	No change		
		Rice (kharif) – Rice (summer)	No change		
	Flood prone / low land	Late Sali (Kharif) – Toria/Potato/Rabi vegetables	No Change	<ul style="list-style-type: none"> <li>• Supplementary life saving irrigation at critical stages of crop growth</li> <li>• Top dressing of additional quantities of MOP @ 37.5 kg/ha</li> <li>• Spraying of 2% KCl solution on leaves of rice when drought appears.</li> <li>• Top dressing of urea may be delayed upto heading stage of rice if drought prevails at the stages of top dressing</li> </ul>	--Development of water harvesting structure under MGNREGS/PMKSY for life saving irrigation - Arrangements of pump sets under NFSM and RKVY

Condition	Major Farming situation <sup>a</sup>	Suggested Contingency measures				Remarks on Implementation <sup>e</sup>
		Normal Crop/cropping system <sup>b</sup>	Crop management <sup>c</sup>	Rabi Crop planning <sup>d</sup>		
Terminal drought (Early withdrawal						

of monsoon)	Rainfed upland, (Sandy loam to clay loam)	Rice - Toria/ Potato / Rabi vegetables /Small millets	<ul style="list-style-type: none"> <li>• Light life saving supplemental irrigation</li> <li>• Harvesting of kharif crops at physiological maturity stage.</li> <li>• Monitoring of important pest like Earhead caterpillar and take management measures at community basis.</li> </ul>	<ul style="list-style-type: none"> <li>• Rabi cropping with cole crops such as Cauliflower</li> <li>• Growing of Tomato, Brinjal, pea, potato and Leafy vegetables with recommended varieties and package of practices.</li> <li>• Growing of rabi field crops like toria, lentil, etc. in time with pre-sowing irrigation if required with recommended varieties and package of practices.</li> </ul>	--Development of water harvesting structure under MGNREGS/ PMKSY for life saving irrigation - Arrangements of pump sets under NFSM and RKVY
		Rice / summer vegetables - Black gram/Sesamum/ Maize			
		Summer vegetables - Toria / Potato / Rabi vegetables			
of monsoon)	Rainfed medium /medium lowland (Sandy loam to clay loam)	Rice(Kharif) monocropping	<ul style="list-style-type: none"> <li>• Light life saving supplemental – irrigation</li> <li>• Harvesting of kharif crops at physiological maturity stage.</li> </ul>	<ul style="list-style-type: none"> <li>• Rabi cropping with cole crops</li> <li>• Growing of Tomato, Brinjal, pea, potato and Leafy vegetables with recommended varieties and package of practices.</li> <li>• Growing of rabi field crops like toria, lentil, etc. in time with pre-sowing irrigation if required with recommended varieties and package of practices.</li> </ul>	--Development of water harvesting structure under MGNREGS/PMKSY for life saving irrigation
		Rice(Kharif)- Toria / Potato / Maize/Rabi vegetables			
		Rice (kharif) – Rice (summer)			
Flood prone / low land	Late Sali (Kharif) – Toria/Potato/ Rabi vegetables	<ul style="list-style-type: none"> <li>• Life saving supplemental irrigation</li> <li>• Harvesting of kharif crops at physiological maturity stage.</li> </ul>	<ul style="list-style-type: none"> <li>• Growing of rabi field crops like toria with late sown variety like TS-67.</li> </ul>	- Development of water harvesting structure under MGNREGS/PMKSY for life saving irrigation	



## 2.1.2 Drought - Irrigated situation

Condition	Major Farming situation <sup>f</sup>	Normal Crop/cropping system <sup>g</sup>	Suggested Contingency measures		
			Change in crop/cropping system <sup>h</sup>	Agronomic measures <sup>i</sup>	Remarks on Implementation <sup>j</sup>
Delayed release of water in canals due to low rainfall	1) Farming situation: Mention source of irrigation, topography (upland/lowland) and soil colour & depth Eg; canal irrigated shallow red soils; <b>tankfed medium deep black soils</b>	NA  Cropping system 3:			

Condition	Major Farming situation <sup>f</sup>	Normal Crop/cropping system <sup>g</sup>	Suggested Contingency measures		
			Change in crop/cropping system <sup>h</sup>	Agronomic measures <sup>i</sup>	Remarks on Implementation <sup>j</sup>
Limited release of water in canals due to low rainfall	1) Farming situation: Mention source of irrigation, topography (upland/lowland) and soil colour & depth Eg; canal irrigated shallow red soils; <b>tankfed medium deep black soils</b>	NA			

Condition	Major Farming situation <sup>f</sup>	Normal Crop/cropping system <sup>g</sup>	Suggested Contingency measures		
			Change in crop/cropping system <sup>h</sup>	Agronomic measures <sup>i</sup>	Remarks on Implementation <sup>j</sup>
Non release of water in canals under delayed onset of monsoon in catchment	1) Farming situation: Mention source of irrigation, topography (upland/lowland) and soil colour & depth Eg; canal irrigated shallow red soils; <b>tankfed medium deep black soils</b>	NA			

Condition	Major Farming situation <sup>f</sup>	Normal Crop/cropping system <sup>g</sup>	Suggested Contingency measures		
			Change in crop/cropping system <sup>h</sup>	Agronomic measures <sup>i</sup>	Remarks on Implementation <sup>j</sup>
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	1) Farming situation: Mention source of irrigation, topography (upland/lowland) and soil colour & depth Eg; canal irrigated shallow red soils; <b>Tube well irrigated medium red soils</b>	NA			

Condition	Suggested Contingency measures				
	Major Farming situation <sup>f</sup>	Normal Crop/cropping system <sup>g</sup>	Change in crop/cropping system <sup>h</sup>	Agronomic measures <sup>i</sup>	Remarks on Implementation <sup>j</sup>
Insufficient groundwater recharge due to low rainfall	1) Farming situation: Mention source of irrigation, topography (upland/lowland) and soil colour & depth Eg; canal irrigated shallow red soils; <b>tankfed medium deep black soils</b>	NA			

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

Condition	Suggested contingency measure			
	Vegetative stage <sup>k</sup>	Flowering stage <sup>l</sup>	Crop maturity stage <sup>m</sup>	Post harvest <sup>n</sup>
<b>Continuous high rainfall in a short span leading to water logging</b>				
Crop1 Summer rice	-Sow rice seed in raised nursery bed with 30cm gap between two beds which can be utilized to drain out excess water. - Excess rain water to be drained out through surface drainage channel to avoid submergence in the main field. -Light hoeing and weeding	Excess rain water to be drained out through surface drainage channel to avoid submergence	-Excess rain water to be drained out through surface drainage channel to avoid submergence -Crop to be harvested at physiological maturity stage.	-Proper drying of grains to maintain optimum moisture percentage (12-14%) for storage
Crop2 Winter rice	-Sow rice seed in raised nursery bed with 30cm gap between two beds which can be utilized to drain out excess water. - Excess rain water to be drained out through surface drainage channel to avoid submergence in the main	Excess rain water to be drained out through surface drainage channel to avoid submergence	-Excess rain water to be drained out through surface drainage channel to avoid submergence. -Crop to be harvested at physiological	-Proper drying of grains to maintain optimum moisture percentage (12-14%) for storage

	field. -Light hoeing and weeding		maturity stage	
Crop3 Sesame	-Excess rain water to be drained out through surface drainage channel of 25cm wide, 15cm deep spaced at 6 m -Light hoeing and weeding	Excess rain water to be drained out through surface drainage channel of 25cm wide, 15cm deep spaced at 6 m	-Excess rain water to be drained out through surface drainage channel of 25cm wide, 15cm deep spaced at 6 m. -Crop to be harvested at physiological maturity stage.	-Proper drying of grains to maintain optimum moisture percentage for storage
<b>Horticulture</b>				
Crop1 Chilli	-Drainage - Plant protection measures against anthracknose	-Drainage - Application of hormones, nutrient sprays to prevent flower drop.	-Drainage -Plant protection measures against fruit rot --Crop to be harvested at physiological maturity stage.	-Shifting of the produce to drier place. - sell the produce immediately.
Crop2 Potato	-Drainage -Proper plant protection measure against late blight -Earthing up at 25 and 60 days after planting.	-Drainage -Proper plant protection measure against late blight	-Drainage -Harvesting of tuber	-proper drying of the produce. -Keep in drier place before storage
Crop3 Vegetables	-Drainage - Application of hormones, nutrient sprays to prevent flower drop.	-Drainage - Application of hormones, nutrient sprays to prevent flower drop.	Drainage	Shifting of the produce to drier place, cold storage.
Heavy rainfall with high speed winds in a short span2	Vegetative stagek	Flowering stagel	Crop maturity stagem	Post harvest
Crop1 Summer rice	-Sow rice seed in raised nursery bed with 30cm gap between two beds which can be utilized to drain out	- Excess rain water to be drained out through surface drainage channel to avoid	-Crop to be harvested at physiological maturity stage.	-Proper drying of grains to maintain optimum moisture

	excess water. - Excess rain water to be drained out through surface drainage channel to avoid submergence in the main field.	submergence in the main field		percentage (12-14%) for storage
Crop2 Winter rice	-Sow rice seed in raised nursery bed with 30cm gap between two beds which can be utilized to drain out excess water. - Excess rain water to be drained out through surface drainage channel to avoid submergence in the main field.	- Excess rain water to be drained out through surface drainage channel to avoid submergence in the main field	-Crop to be harvested at physiological maturity stage.	-Proper drying of grains to maintain optimum moisture percentage (12-14%) for storage
<b>Horticulture</b>				
Crop1 Banana	Drainage, Make trenches/furrows in between ridges to facilitate drainage of excess water, propping.	Drainage, Make trenches/furrows in between ridges to facilitate drainage of excess water, propping.	Drainage, Make trenches/furrows in between ridges to facilitate drainage of excess water, propping.	Shifting of the produce to drier place
Crop2 Vegetable (climbers)	Drainage, make trenches/furrows in between ridges to facilitate drainage of excess water.	Drainage, application of hormones, nutrient sprays to prevent flower drop.	Drainage	Shifting of the produce to drier place, Cold storage.
Crop3 Okra	Drainage	Drainage, Application of hormones, nutrient sprays to prevent flower drop.	Drainage	Shifting of the produce to drier place ,harvesting should be done before rain as far as possible, drying to remove excess moisture of produce.
<b>Outbreak of pests and diseases due to unseasonal rains</b>	<b>Vegetative stage<sup>k</sup></b>	<b>Flowering stage<sup>l</sup></b>	<b>Crop maturity stage<sup>m</sup></b>	<b>Post harvest<sup>n</sup></b>
Crop1 summer rice	-Application of pesticides like	-Rouging of infected plant ,	-	-Insect pests and

	<p>chloropyriphos or Monocrotophos @ 2 ml/lit against stem borer, leaf folder, case worm.</p> <p>-Adoption IPM module.</p> <p>-Alternate flooding and drying against case worm.</p> <p>-Application of carbendazim @ 1g/l against blast and sheath blight. Water from the sheath blight infested field should not be allowed to enter disease free field.</p>	<p>- Application of pesticides like chloropyriphos or Monocrotophos @ 2 ml/lit against stem borer</p> <p>-Adoption IPM module against stem borer</p> <p>-Spraying of pesticide should not coincide pollination time.</p> <p>-Application of carbendazim @ 1g/l against blast and sheath blight. Water from the sheath blight infested field should not be allowed to enter disease free field.</p>		<p>disease infested seed/grains should be discarded</p>
Crop2 Winter rice	<p>-Application of pesticides like chloropyriphos or Monocrotophos @ 2 ml/lit against stem borer, leaf folder, case worm.</p> <p>-Adoption IPM module.</p> <p>-Alternate flooding and drying against case worm.</p> <p>-Application of carbendazim @ 1g/l against blast and sheath blight. Water from the sheath blight infested field should not be allowed to enter disease free field.</p>	<p>-Rouging of infected plant ,</p> <p>- Application of pesticides like chloropyriphos or Monocrotophos @ 2 ml/lit against stem borer</p> <p>-Adoption IPM module against stem borer</p> <p>-Spraying of pesticide should not coincide pollination time.</p> <p>-Application of carbendazim @ 1g/l against blast and sheath blight. Water from the sheath blight infested field should not be allowed to enter disease free field.</p>	-	<p>Insect pests and disease infested seed/grains should be discarded</p>
Crop3 Black gram	<p>Against YMV, spray Dimethoate @ 2ml/l (2 -3 spraying)</p> <p>Against jassids, aphids, flee beetle,</p>	<p>Against YMV, spray Dimethoate @ 2ml/l (2 -3 spraying)</p>	<p>-Against pod borer &amp; pod bug, spray Malathion 50 EC @ 2</p>	<p>Insect pests and disease infested seed/grains should be</p>

	leaf folder, spray Malathion 50 EC @ 2 ml/l of water. Against damping off, root rot and seedling blight, apply carbendazim @ 1g/l of water.	Against jassids, aphids, flea beetle, leaf folder, spray Malathion 50 EC @ 2 ml/l of water.	ml/l of water.	discarded
<b>Horticulture</b>				
Crop1 Potato	-Depending on the weather condition, Mancozeb @ 2.5 g/l should be sprayed as prophylactic measures against late blight. -Against late blight, 6 spraying with Mancozeb 2.5g/l of water at an interval of 12 days. -Use of sticker is essential in the spray solution for spraying during rainy weather. -Drainage of excess water	-	-	-Discard disease and insect infested tubers.
Crop2 Tomato	-Depending on the weather condition, Mancozeb @ 2.5 g/l should be sprayed as prophylactic measures against late blight. -Against late blight, 6 spraying with Mancozeb 2.5g/l of water at an interval of 12 days. -Use of sticker is essential in the spray solution for spraying during rainy weather. -Drainage of excess water	-	-	-Discard disease and insect infested fruits.

## 2.3 Floods

Condition	Suggested contingency measure <sup>o</sup>			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation <sup>1</sup>				
Crop1: Summer rice	-Raised nursery bed with 30 cm gap in between two beds so that excess water can be removed.	-	-	Harvesting at physiological maturity stage, trying the harvested head and transferred to dry place for drying
Crop2: Winter rice	-Raised nursery bed with 30 cm gap in between two beds so that excess water can be removed.	-Growing of submergence tolerant variety like Swarna Sub-1 and Ranjit Sub 1 - Application of incubated Urea or neem coated Urea. - Application of 2% Urea sprays at afternoon.	-	-
Crop3: Sesame	-Drainage of flood water -Hoeing in between lines for aeration in root zone after flood	- Drainage of flood water -Hoeing in between lines for aeration in root zone after flood.	- Drainage of flood water -Hoeing in between lines for aeration in root zone after flood.	-Harvest the crop as quickly as possible, carry and thrash them immediately.
Crop4: Black gram	-Drainage of flood water -Hoeing in between lines for aeration in root zone after flood	- Drainage of flood water -Hoeing in between lines for aeration in root zone after flood.	- Drainage of flood water -Hoeing in between lines for aeration in root zone after flood.	-Picking up of matured pod and carry them to safer place.
Horticulture /Plantation crops				
Crop1: Banana	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water, propping.	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water, propping.	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water,	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water, propping.



			propping.	
Crop2: Kharif Vegetable	-Drainage of flood water -Hoeing in between lines for aeration in root zone after flood	-Drainage of flood water -Hoeing in between lines for aeration in root zone after flood	-Drainage of flood water -Hoeing in between lines for aeration in root zone after flood	-Harvesting of produce as early as possible
Crop3 Arecanut	Drainage, Make trenches/furrows in between rows to facilitate drainage of excess water	Drainage, Make trenches/furrows in between rows to facilitate drainage of excess water	Drainage, Make trenches/furrows in between rows to facilitate drainage of excess water	-
<b>Continuous submergence for more than 2 days<sup>2</sup></b>				
Crop1 Summer rice	-Raised nursery bed with 30 cm gap in between two beds so that excess water can be removed.	-Drainage of excess water	-Drainage of excess water	Harvesting at physiological maturity stage, tying the harvested head and transferred to dry place for drying
Crop2 Winter rice	-Raised nursery bed with 30 cm gap in between two beds so that excess water can be removed. -If seedlings are damaged by flood water, re-sowing may be done with the following varieties- -If transplanting can be done by mid August, select varieties like Satyaranjan, Basundhara, Jaymati etc. Seedlings should be raised in non flood prone or high land area. - If transplanting is possible	-Drainage of excess water -If crop is damaged by flood, the nursery may be raised with the following varieties- - If transplanting is possible during last part of August, very short duration varieties such as Luit, Kolong, Dishang etc. can also be selected (transplanting up to last part of August). 18-21 days old seedling should be transplanted at 15x15 cm spacing with 4-5 seedlings/hill. -If flood damages crop during last part of August and there is no time to raise seedlings,	-Drainage of excess water	Harvesting at physiological maturity stage, tying the harvested head and transferred to dry place for drying

	during last part of August, short duration varieties like Lachit, Chilaray and very short duration varieties such as Luit, Kolong, Dishang etc. can also be selected (transplanting up to last part of August). 18-21 days old seedling should be transplanted at 15x15 cm spacing with 4-5 seedlings/hill.	direct seeding (wet seeding) of very short duration high yielding varieties such as Luit, Kolong, Dishang etc or any traditional photo period sensitive coarse grain varieties can also be done up to 1st week of September. Sprouted seed of 75 kg/ha is to be broadcast in puddle field.		
Crop3 Sesame	-Drainage of flood water - Re sowing may required if crop is damaged by flood. -Hoeing in between lines for aeration in root zone after flood	- Drainage of flood water -Hoeing in between lines for aeration in root zone after flood.	- Drainage of flood water -Hoeing in between lines for aeration in root zone after flood.	-Harvesting at physiological maturity stage. -Proper drying of produce
Crop4 Black gram	-Drainage of flood water - Re sowing may required if crop is damaged by flood. -Hoeing in between lines for aeration in root zone after flood	- Drainage of flood water -Hoeing in between lines for aeration in root zone after flood.	- Drainage of flood water -Hoeing in between lines for aeration in root zone after flood.	-Harvesting at physiological maturity stage. -Proper drying of produce
<b>Horticulture / Plantation crops</b>				
Crop1 Banana	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water, propping. -Replanting if crop is damaged by flood	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water, propping.	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water, propping.	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water, propping.
Crop2 Kharif Vegetable	-Drainage of flood water - Re sowing may required if crop is damaged by flood.	-Drainage of flood water -Hoeing in between lines for aeration in root zone after	-Drainage of flood water -Hoeing in between	-Harvesting of produce as early as possible

	-Hoeing in between lines for aeration in root zone after flood	flood	lines for aeration in root zone after flood	
Crop3 Areca nut	Drainage, Make trenches/furrows in between rows to facilitate drainage of excess water Replanting	Drainage, Make trenches/furrows in between rows to facilitate drainage of excess water	Drainage, Make trenches/furrows in between rows to facilitate drainage of excess water	-

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

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

#### 2.5.1. Livestock

	Suggested contingency measures		
	Before the event <sup>s</sup>	During the event	After the event
<b>Drought</b>			
Feed and fodder availability	<ul style="list-style-type: none"> <li>Increasing cultivation of perennial fodder and feed reserves in district</li> <li>Establishment of fodder banks with inclusion of drought tolerant fodders</li> <li>Training and preparation of hay and silage</li> <li>Making facility for block feed and UMMB licks</li> <li>Raising drought tolerant perennial grasses, trees, shrubs &amp; bushes in field boundaries</li> <li>Quality up-gradation of inferior quality roughages like paddy straw, wheat straw etc. with urea treatment.</li> <li>Preventing the practice of burning paddy</li> </ul>	<ul style="list-style-type: none"> <li>Feeding fodders from perennial trees.</li> <li>Feeding already prepared silage, hay, UMMB lick</li> <li>Providing feed blocks, unconventional feeds and various byproducts.</li> <li>Providing urea treated straw.</li> <li>Use of harvested tree/top of fodder as feed for livestock animals.</li> <li>Feeding of grains damaged during processing, milling by products &amp; use of all failed field crops during</li> </ul>	<ul style="list-style-type: none"> <li>Culling of affected and unproductive animals.</li> <li>Fodder rejuvenation and cultivation of fodder crops (Oat, Maize etc.)</li> </ul>

	<p>straw, maize stover and sugarcane tress.</p> <ul style="list-style-type: none"> <li>• Encouraging production of Azolla for animal feed.</li> <li>• Mass awareness on feeding the livestock with unconventional feeds and various byproducts.</li> <li>• Mass awareness on utilization of crop byproducts like sugarcane tops and bagasse for animal feeding with method demonstration on urea treatment of straw.</li> </ul>	the drought period as animal feed.	
Drinking water	<ul style="list-style-type: none"> <li>• Storing water in tanks for the hard period</li> <li>• On farm /Roof top water harvesting/</li> <li>• Identification of natural water resources and their use in a planned way.</li> </ul>	<ul style="list-style-type: none"> <li>• Offering stored water to the livestock.</li> <li>• Preventing wastage of water</li> <li>• Animals not to be exposed outside</li> </ul>	<ul style="list-style-type: none"> <li>• Culling of affected and unproductive animals.</li> </ul>
Health and disease management	<ul style="list-style-type: none"> <li>• Popularizing the concept of animal insurance and its implementation.</li> <li>• Creation of repositories to store a sizeable stock of veterinary medicines for emergencies</li> <li>• Prompt recognition of endemic animal diseases and timely vaccination against them.</li> <li>• Mass awareness programme on management of livestock during drought.</li> <li>• Regular de-worming of animals to minimize the parasitic burden and improve the productivity of farm livestock.</li> <li>• Constituting efficient team of workers to act as a Rapid Action Force during emergencies</li> <li>• Collaboration with local and district veterinary officials to handle endemic animal diseases.</li> </ul>	<ul style="list-style-type: none"> <li>• Immediate treatment of the sick animals.</li> <li>• Organizing mass animal health check up camps wherever necessary.</li> <li>• Providing anthelmintics and mineral mixtures to productive animals.</li> <li>• Segregation of suspicious and disease animals from the herd and their early treatment.</li> </ul>	<ul style="list-style-type: none"> <li>• Availing insurance</li> <li>• Culling of unproductive livestock to improve economic status of livestock owners.</li> <li>• Organizing need based animal health check up camps</li> <li>• Minimizing cases of anestrus and repeat breeding in productive animals by organizing mass animal fertility camps.</li> </ul>
<b>Floods</b>			

Feed and fodder availability	<ul style="list-style-type: none"> <li>• Increasing cultivation of perennial fodder and feed reserves in district</li> <li>• Establishment of community fodder banks with inclusion of flood tolerant fodder variety.</li> <li>• Encouraging preparation of hay making and silage preparation</li> <li>• Making facility for block feed and UMMB licks</li> <li>• Preventing the practice of burning paddy straw, maize stover and sugarcane tress and quality up gradation of inferior quality roughages like paddy straw, wheat straw etc. with urea treatment.</li> <li>• Encouraging production of Azolla for animal feed.</li> <li>• Mass awareness on feeding the livestock with unconventional feeds and various byproducts.</li> <li>• Mass awareness on utilization of crop byproducts like sugarcane tops and bagasse for animal feeding with method demonstration of urea treatment of straw.</li> <li>• Erection of raised platform for feed storage and animals</li> </ul>	<ul style="list-style-type: none"> <li>• Making fodders available from community fodder banks</li> <li>• Feeding already prepared silage, hay, UMMB lick feed blocks, unconventional feeds and various byproducts.</li> <li>• Providing urea treated straw.</li> <li>• Use of harvested tree/top of fodder as feed for livestock animals.</li> <li>• Keep animals in safe place like raised plate form/upland</li> </ul>	<ul style="list-style-type: none"> <li>• Availing insurance</li> <li>• Culling of affected and unproductive animals.</li> <li>• Fodder rejuvenation</li> </ul>
Drinking water	<ul style="list-style-type: none"> <li>• Storing water in tanks</li> </ul>	<ul style="list-style-type: none"> <li>• Offering stored water to the livestock.</li> </ul>	<ul style="list-style-type: none"> <li>• Treating of drinking water.</li> </ul>
Health and disease management	<ul style="list-style-type: none"> <li>• Popularizing the concept of animal insurance and its implementation</li> <li>• Prompt recognition of endemic animal diseases and timely vaccination against them.</li> <li>• Creation of repositories to store a sizeable stock of veterinary medicines for</li> </ul>	<ul style="list-style-type: none"> <li>• Immediate treatment of the sick animals.</li> <li>• Conducting animal health camps during the period.</li> </ul>	<ul style="list-style-type: none"> <li>• Availing insurance</li> <li>• Organizing need based animal health check up camps and vaccination</li> <li>• Culling of unproductive livestock to improve economic status of livestock owners.</li> </ul>

	<p>emergencies</p> <ul style="list-style-type: none"> <li>• Mass awareness programme on management of livestock during floods.</li> <li>• Regular de-worming of animals to minimize the parasitic burden and improve the productivity of farm livestock.</li> <li>• Constituting trained team of workers to act as a Rapid Action Force during emergencies</li> <li>• Involvement of the local veterinary officials to handle endemic animal diseases.</li> </ul>		<ul style="list-style-type: none"> <li>• Minimizing cases of anestrous and repeat breeding in productive animals by organizing mass animal fertility camps.</li> </ul>
<b>Cyclone</b>	NA	NA	NA
Feed and fodder availability	NA	NA	NA
Drinking water	NA	NA	NA
Health and disease management	NA	NA	NA
<b>Heat wave and cold wave</b>	NA	NA	NA
Shelter/environment management	NA	NA	NA
Health and disease management	NA	NA	NA
	NA	NA	NA

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

## 2.5.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event <sup>a</sup>	During the event	After the event	
<b>Drought</b>				
Shortage of feed ingredients	<ul style="list-style-type: none"> <li>• Culling of unproductive poultry for efficient utilization of poultry feed.</li> <li>• Storage of household grains like broken rice, maize, pulses, oilseeds etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Offering stored feed and use of non conventional source of feed like broken grains, brewery wastes, etc.</li> <li>• Supplementation of shell grit/ calcium to the laying birds</li> <li>• Immediate marketing of the meat type birds</li> <li>• Arrangement of good quality poultry feed</li> </ul>	<ul style="list-style-type: none"> <li>• Culling unproductive birds.</li> <li>• Providing of good quality poultry feed to obtain optimum growth</li> </ul>	RKVY
Drinking water	<ul style="list-style-type: none"> <li>• Preserving water in tank</li> </ul>	<ul style="list-style-type: none"> <li>• Judicious use of stored water</li> </ul>	<ul style="list-style-type: none"> <li>• Developing drinking water storage facilities.</li> </ul>	
Health and disease management	<ul style="list-style-type: none"> <li>• Culling of weak and diseased birds.</li> <li>• Timely de-worming.</li> <li>• Vaccination against endemic diseases especially Ranikhet disease.</li> <li>• Arrangement of brooding facilities for young chicks</li> <li>• Construction of good quality poultry houses or farms to minimize disease incidences and to avoid predation by carnivores.</li> <li>• Proper waste disposal system in poultry farms possessing large flocks.</li> <li>• Provision for balanced feeding of productive birds</li> </ul>	<ul style="list-style-type: none"> <li>• Immediate segregation of disease affected and suspicious birds from the flock.</li> <li>• Immediate treatment of the sick animals.</li> <li>• Conducting animal health camps during the period.</li> <li>• Maintenance of proper hygiene and sanitation in the commercial poultry farms.</li> <li>• Regular cleaning of poultry houses to minimize disease incidence.</li> <li>• Restricting trade of poultry, poultry meat and eggs during outbreak of a disease having potential to take an epidemic form.e.g. Bird flu.</li> <li>• Restriction against needless movement of individuals in the</li> </ul>	<ul style="list-style-type: none"> <li>• Culling of unproductive birds</li> <li>• Availing insurance wherever required</li> <li>• Maintenance of proper hygiene and sanitation in the poultry sheds.</li> <li>• Disposal of dead birds by burning or by deep burial with lime in pits of optimum sizes.</li> <li>• Timely vaccination of all the birds.</li> <li>• Timely marketing of meat type poultry and poultry eggs to minimize losses due to mortality.</li> </ul>	

	<ul style="list-style-type: none"> <li>• Veterinary preparedness</li> <li>• Mass awareness programme on management of poultry during drought.</li> <li>• Popularizing poultry insurance and its implementation.</li> </ul>	farm premises	<ul style="list-style-type: none"> <li>• Mass awareness programme on management of poultry during drought.</li> </ul>	
<b>Floods</b>				
Shortage of feed ingredients	<ul style="list-style-type: none"> <li>• Procurement and storage of sufficient good quality feed ingredients in flood prone areas</li> </ul>	<ul style="list-style-type: none"> <li>• Supply feed ingredient to the affected poultries</li> </ul>	<ul style="list-style-type: none"> <li>• Culling unproductive birds.</li> <li>• Use of good quality poultry feed to obtain optimum growth</li> </ul>	
Drinking water	<ul style="list-style-type: none"> <li>• Preserving water in tank</li> </ul>	<ul style="list-style-type: none"> <li>• Arrangement of safe drinking/ medicated water from outside</li> </ul>	<ul style="list-style-type: none"> <li>• Treating drinking water</li> </ul>	
Shelter management	<ul style="list-style-type: none"> <li>• Popularizing poultry sheds on raised bamboo/ pucca structures to protect birds/sheds from flood water, occurrence of diseases and storage of feed</li> <li>• Identification of sites/areas not prone to inundation during floods for erecting poultry sheds and feeds storage units</li> </ul>	<ul style="list-style-type: none"> <li>• Shifting of birds and feed to raised sheds and storage units respectively</li> </ul>	<ul style="list-style-type: none"> <li>• Sterilization of vacant poultry sheds before bringing back the batch of birds</li> </ul>	<ul style="list-style-type: none"> <li>• Insure poultry units and avail gov. programs for the same</li> </ul>



Health and disease management	<ul style="list-style-type: none"> <li>• Vaccination against endemic diseases especially Ranikhet disease.</li> <li>• Stocking of emergency medicine for prevalent diseases</li> <li>• Mass awareness programme on management of poultry and zoonotic diseases.</li> </ul>	<ul style="list-style-type: none"> <li>• Conducting animal health camps during the period</li> <li>• Immediate segregation of disease affected and suspicious birds from the flock and treatment of the sick birds</li> <li>• Maintenance of proper hygiene and sanitation in the commercial poultry farms</li> <li>• Restricting trade of poultry meat and eggs during outbreak of a disease having potential to take an epidemic form.e.g. Bird flu.</li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance of proper hygiene and sanitation in the poultry sheds.</li> <li>• Disposal of dead birds by burning or by deep burial with lime in pits at proper depth</li> <li>• Timely marketing of meat type poultry and poultry eggs to minimize losses due to mortality</li> </ul>	
<b>Cyclone</b>	-	-	-	-
Shortage of feed ingredients	-	-	-	-
Drinking water	-	-	-	-
Health and disease management	-	-	-	-
<b>Heat wave and cold wave</b>	-	-	-	-
Shelter/environment management	-	-	-	-
Health and disease management	-	-	-	-

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

### 2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event <sup>a</sup>	During the event	After the event
<b>1) Drought</b>	-	-	-
<b>A. Capture</b>	-	-	-
Marine	-	-	-
<b>Inland</b>	-	-	-
(i) Shallow water depth due to insufficient rains/inflow	<ul style="list-style-type: none"> <li>• Stop over-exploitation</li> <li>• Judicious or planned release of water from reservoir/tanks which are used for fisheries in drought prone areas</li> <li>• Water harvesting structure using polythene lining to supply water during the event</li> <li>• Harvesting and marketing of all large fish except brood stock</li> </ul>	<ul style="list-style-type: none"> <li>• Prioritize the ponds for rescuing from drought</li> <li>• Supplement water in the pond with ground water to maintain optimum depth in identified ponds</li> <li>• Drying of fish or production of value added fish products from the over harvested stock</li> <li>• Shift fish stock to deeper water, especially in case of pens</li> <li>• Restrict release of water from reservoir/tanks which are used for fisheries</li> <li>• Fingerlings and brood fishes, if caught, to be released back to safe waters</li> <li>• Stock water bodies with desirable species for culture</li> </ul>	<ul style="list-style-type: none"> <li>• Restocking, wherever possible.</li> <li>• Digging of pond to increase the depth.</li> <li>• Fertilization, manuring and rewatering of pond</li> <li>• Use feed supplement to increase the growth rate</li> </ul>
(ii) Changes in water quality	<ul style="list-style-type: none"> <li>• Thinning out of stock against reduced dissolved oxygen and space</li> <li>• Removal of aquatic weeds</li> </ul>	<ul style="list-style-type: none"> <li>• Provide aeration</li> </ul>	<ul style="list-style-type: none"> <li>• Remove aquatic vegetation</li> </ul>

(iii) Any other	<ul style="list-style-type: none"> <li>As a long-term measure, deepening and regular de-silting of ponds and tanks in drought prone areas should be taken up</li> </ul>	-	-
<b>B. Aquaculture</b>	-	-	-
(i) Shallow water in ponds due to insufficient rains/inflow	<ul style="list-style-type: none"> <li>Capturing some amount of fishes and keeping few to minimize quantity of fishes in the pond</li> <li>Digging of ponds to increase depth</li> <li>Follow measures like addition of cow dung etc. to stop/minimize downward percolation of water</li> <li>Enquiring alternative water sources to add to the pond</li> <li>For pond construction select soils with sufficient clay for retention of water.</li> <li>Apply sufficient organic manure during preparation to minimize water loss through seepage.</li> <li>Educating for Insurance and apply</li> <li>Excavation of bore wells</li> <li>Reduce biomass and stocking density through partial harvesting.</li> <li>Sell out the fishes attaining marketable size to minimize loss.</li> <li>Stock fishes that can thrive low water depth, like air breathing fishes.</li> <li>Maintenance of proper record for</li> </ul>	<ul style="list-style-type: none"> <li>Digging of ponds/ middle of ponds to increase depth for saving life of the fishes</li> <li>Minimizing quantity of fishes</li> <li>Pump in water from other water source (nearby spring, stream, rivers etc) or ground water, if any.</li> <li>Reduce food for minimum metabolism.</li> <li>Restrict fertilizer for preventing algal bloom and minimum stress.</li> <li>Dig deep trench in convenient part of the pond to save brood fishes.</li> <li>Careful observation on daily basis.</li> <li>Scare away birds and other animals (attracted by shallow water to catch fish) – may be vector for diseases.</li> </ul>	<ul style="list-style-type: none"> <li>Cleaning and digging of ponds to increase depth</li> <li>Use of clay material in pond beds to minimize water loss through percolation</li> <li>Extended seed production</li> <li>Restock the pond.</li> <li>Promoting area specific Integrated fish farming</li> <li>Short duration culture of species that are fast growing in initial stage and can be marketed at small size (minor and medium carps).</li> <li>Air breathing fish culture</li> <li>Claim compensation with support of record and documents.</li> </ul>

	<p>claiming compensation, especially in schemes assisted by Govt. or financial institutes.</p> <ul style="list-style-type: none"> <li>• Planning for rain water harvest.</li> </ul>		
(ii) Impact of salt load build up in ponds / change in water quality	<ul style="list-style-type: none"> <li>• Identify risks associated with the suspected outbreak of pathogens and be ready with suitable remedial measures</li> </ul>	-	<ul style="list-style-type: none"> <li>• Partial water exchange to optimize salinity</li> </ul>
(iii) Any other	<ul style="list-style-type: none"> <li>• Repairing/ arrangement of alternate safe place to keep pumps, aerators, etc</li> <li>• Store the feeds in a proper place</li> </ul>	-	-
<b>2) Floods</b>	-	-	-
<b>A. Capture</b>	-	-	-
Marine	-	-	-
Inland	-	-	-
(i) No. of boats / nets/damaged	<ul style="list-style-type: none"> <li>• Arrangement of boats, nests, etc in surplus</li> </ul>	-	-
(ii) No.of houses damaged	-	-	-
(iii) Loss of stock	<ul style="list-style-type: none"> <li>• Thin out population</li> </ul>	<ul style="list-style-type: none"> <li>• Use FAD, feed attractant</li> </ul>	<ul style="list-style-type: none"> <li>• Use of disinfectant</li> </ul>
(iv) Changes in water quality			
(v) Health and diseases	<ul style="list-style-type: none"> <li>• Use of disinfectant</li> </ul>		
<b>B. Aquaculture</b>			
(i) Inundation with flood water	<ul style="list-style-type: none"> <li>• Dyke should be strongly constructed/ renovated above the expected flood level.</li> <li>• Insurance</li> </ul>	<ul style="list-style-type: none"> <li>• Encircling the fishery with fish net to prevent the escaping of fishes</li> </ul>	<ul style="list-style-type: none"> <li>• Dyke should be renovated strongly above the maximum flood level.</li> </ul>

	<ul style="list-style-type: none"> <li>• Repairing, turving and compaction of peripheral embankments.</li> <li>• Growing horticultural crops on the embankment to prevent erosion.</li> <li>• Sufficient bamboo poles and nylon nets to be kept ready.</li> <li>• Construction of earthen nursery ponds in upland areas</li> <li>• ‘High stocking multiple harvesting’ can be taken up.</li> <li>• Sell out the fishes attaining marketable size to minimize loss.</li> <li>• Maintenance of proper record for claiming compensation, especially in schemes assisted by Govt. or financial institutes.</li> </ul>	<ul style="list-style-type: none"> <li>• Surround the pond with nets supported by bamboo poles to prevent escape of fish.</li> <li>• Supply sufficient food to fishes to reduce tendency of escaping from the pond.</li> <li>• Fixing nets with appropriate size to reduce the loss of stock</li> <li>• Turbidity need to be controlled</li> <li>• Collection of naturally bred seeds (spawn/ fry/ fingerlings) from flooded water</li> </ul>	<ul style="list-style-type: none"> <li>• Sampling of fishes and water for disease analysis</li> <li>• Desilting</li> <li>• Restock the pond if original stock escapes.</li> <li>• Promotion of suitable Integrated fish farming</li> <li>• Short duration culture of species that are fast growing and can be marketed at small size.</li> <li>• Claim compensation with support of record and documents.</li> <li>• Removal of unwanted/ predatory fish from pond before stocking.</li> </ul>
(ii) Water contamination and changes in water quality	<ul style="list-style-type: none"> <li>• Dyke should be strongly constructed above the expected flood level.</li> <li>• Prevent entry of water from outside.</li> <li>• Precaution to prevent entry of pesticide/insecticide laden water from nearby agricultural land.</li> <li>• Apply lime regularly as per recommendation.</li> </ul>	<ul style="list-style-type: none"> <li>• Use disinfectant</li> <li>• Apply lime regularly as per recommendation.</li> </ul>	<ul style="list-style-type: none"> <li>• Use disinfectant, Remove all unwanted exotic fishes</li> <li>• Apply lime regularly as per recommendation.</li> <li>• Remove muck and debris, if entered with flood.</li> <li>• Apply preventive agents (eg. CIFAX) before on set of winter.</li> </ul>
(iii) Health and diseases	<ul style="list-style-type: none"> <li>• Provided vitamin, mineral with feed</li> <li>• Arrangement of medicines and chemical stocks</li> </ul>	<ul style="list-style-type: none"> <li>• Provided vitamin, mineral, protein with feed, use bactericide</li> </ul>	<ul style="list-style-type: none"> <li>• Use bactericide and disinfectant and feed with balance diets.</li> </ul>
(iv) Loss of stock and inputs (feed, chemicals etc)	<ul style="list-style-type: none"> <li>• Dyke should be strongly constructed above the maximum flood level.</li> </ul>	<ul style="list-style-type: none"> <li>• Catch the some amount of fishes to reduce the stock.</li> </ul>	<ul style="list-style-type: none"> <li>• Dyke should be strongly renovated and apply disinfectant and fish out the unwanted exotic fishes</li> </ul>

(v) Infrastructure damage (pumps, aerators, huts, etc)	NA	NA	NA
(vi) Any other	NA	NA	NA
<b>3. Cyclone / Tsunami</b>	NA	NA	NA
<b>A. Capture</b>	NA	NA	NA
Marine	NA	NA	NA
(i) Average compensation paid due to loss of fishermen lives	NA	NA	NA
(ii) Avg. no. of boats / nets/damaged	NA	NA	NA
(iii) Avg. no. of houses damaged	NA	NA	NA
Inland	NA	NA	NA
<b>B. Aquaculture</b>	NA	NA	NA
(i) Overflow / flooding of ponds	NA	NA	NA
(ii) Changes in water quality (fresh water / brackish water ratio)	NA	NA	NA
(iii) Health and diseases	NA	NA	NA
(iv) Loss of stock and inputs (feed, chemicals etc)	NA	NA	NA
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)	NA	NA	NA
(vi) Any other	NA	NA	NA
<b>4. Heat wave and cold wave</b>	NA	NA	NA
<b>A. Capture</b>	NA	NA	NA
Marine	NA	NA	NA
Inland	NA	NA	NA

<b>B. Aquaculture</b>	NA	NA	NA
(i) Changes in pond environment (water quality)	<ul style="list-style-type: none"> <li>• Reduction of biomass by partial harvest in the event of heat as the DO levels will be very low.</li> <li>• Apply lime regularly as per recommendation.</li> <li>• Apply preventive agents (eg. CIFAX) before onset of winter.</li> </ul>	<ul style="list-style-type: none"> <li>• Apply lime regularly as per recommendation.</li> <li>• Restrict application of fertilizer as per requirement.</li> <li>• Deep pool refuge based aquaculture to provide shelter and growth during summer and winter season</li> </ul>	<ul style="list-style-type: none"> <li>• Exchange water upto 2/3rd and take suggestion from expert</li> <li>• Apply lime regularly as per recommendation.</li> <li>•</li> </ul>
(ii) Health and Disease management	-	-	-
(iii) Any other	-	-	---

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