

## State: Mizoram

### Agriculture Contingency Plan for District: Mamit

1.0 District Agriculture profile				
<b>1.1</b>	<b>Agro-Climatic/Ecological Zone</b>			
	Agro Ecological Sub Region (ICAR)	Eastern Himalayas Warm Perhumid Eco-region		
	Agro-Climatic Zone (Planning Commission)	Eastern Himalayan Region		
	Agro Climatic Zone (NARP)	Humid subtropical hill Zone		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	All District of Mizoram		
	Geographic coordinates of district headquarters			
	Geographic coordinates of district headquarters	<b>Latitude</b>	<b>Longitude</b>	<b>Altitude</b>
		23 <sup>0</sup> 15' - 24 <sup>0</sup> 15' N	92 <sup>0</sup> 15' - 92 <sup>0</sup> 40' E	40-1485 m msl
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	ICAR Research Complex for NEH Region, Mizoram Centre, Kolasib-796081, Mizoram		
	Mention the KVK located in the district with address	Krishi Vigyan Kendra, Mamit District, Lengpui- 796421, Mizoram		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Automatic Weather Station installed at KVK Complex, Lengpui by ISRO		

1.2	Rainfall	Normal RF(mm)	Normal Rainy days (number)	Normal Onset ( specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	1633.7	72	1 <sup>st</sup> week of June	Last week of September
	NE Monsoon(Oct-Dec):	114.2	11	1 <sup>st</sup> week of October	2 <sup>nd</sup> week of November
	Winter (Jan- March)	9.5	1	-	-
	Summer (Apr-May)	751.9	29	First week of April	-
	Annual	2421.71	113	-	-

Source: Daily and monthly rainfall record (January to December 2013), Directorate of Agriculture (Crop Husbandry), Government of Mizoram

<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>	302.575	15.380	249.742	8.344	0.200	0.675	4.050	1.030	6.415	16.739

<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>
	Alluvial soil	32.15	10.62
	Sandy soil	47.71	15.77
	Laterite soil	179.61	59.36
	Acid soils	38.14	12.60
	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	15.380	101%
	Area sown more than once	0.130	
	Gross cropped area	15.510	

<b>1.6</b>	<b>Irrigation</b>	<b>Area ('000 ha)</b>		
	Net irrigated area	0.798		
	Gross irrigated area	0.766		
	Rainfed area			
	<b>Sources of Irrigation</b>	<b>Number</b>	<b>Area ('000 ha)</b>	<b>Percentage of total irrigated area</b>
	Canals	-	-	
	Tanks	72	-	
	Open wells	-	-	
	Bore wells	32	-	
	Lift irrigation schemes	-	-	
	Micro-irrigation	-	-	
	Other sources (please specify)			
	River	4		

	Perennial stream	132		
	Springs (Tuikhur)	162		
	Farm pond	209		
	Total Irrigated Area			
	Pump sets			
	No. of Tractors			
	<b>Groundwater availability and use* (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 (2012-13) & horticulture (2013-14)

1.7	S.No.	Major field crops cultivated	Area ('000 ha)							
			Kharif			Rabi			Summer	Grand total
			Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
1	Rice	-	3.748	3.748	-	-	-	-	3.748	
2	Maize	-	0.633	0.633	0.031	-	0.031	-	0.664	
3	Cowpea	-	0.179	0.179	-	-	-	-	0.179	
4	Sesamum	-	0.074	0.074	-	-	-	-	0.074	
5	French bean	-	-	-	0.070	-	0.070	-	0.070	
6	Rice bean	-	0.044	0.044	-	-	-	-	0.044	
7	Sugarcane	-	0.042	0.042	-	-	-	-	0.042	
8	Tapioca	-	0.029	0.029	-	-	-	-	0.029	
9	Soybean	-	0.016	0.016	-	-	-	-	0.016	
10	Field Pea	-	-	-	0.033	-	0.033	-	0.033	

	S.No.	Horticulture crops – Fruits	Area ('000 ha)		
			Total	Irrigated	Rainfed
	1	Khasi mandarin	2.015		
	2	Lime/lemon	1.090		
	3	Banana	0.646		
	4	Papaya	0.498		

	5	Hatkora	0.463		
	6	Pineapple	0.335		
		<b>Horticulture crops – Vegetables</b>	<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>
	1	Bitter gourd	0.530		
	2	Okra	0.383		
	3	Chayote	0.378		
	4	Cowpea	0.355		
	5	Cabbage	0.295		
	6	Brinjal	0.169		
		<b>Medicinal and Aromatic crops</b>	<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>
	1	Aloe Vera	0.100		
	2	Stevia	0.015		
	3	Citronella	0.005		
	4	Sweet Flag	0.001		
		<b>Plantation crops</b>	<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>
	1	Arecanut	3.35000		
		Oilpalm*	0.78847		
	2	Cashewnut	0.00025		
	3	Coconut	0.00500		
	4	Tung	0.04500		
	5	Jatropha	0.02500		
	6				
		<b>Spices</b>	<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>
		Turmeric	0.1790		
		Chillies (Dried)	0.1300		
		Ginger	0.1038		
		Coriander	0.0005		
		<b>Fodder crops</b>	<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>
	1	-	-	-	-
	2	-	-	-	-
	3	-	-	-	-
	4	-	-	-	-
	5	-	-	-	-
	Others	-	-	-	-
		<b>Total fodder crop area</b>	-	-	-
		<b>Grazing land</b>	-	-	-

	<b>Sericulture etc</b>	-	-	-
	<b>Others (specify)</b>	-	-	-

\*2012-13

<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)	-	-	2.063	
	Improved cattle	-	-	-	
	Crossbred cattle	-	-	0.648	
	Non descriptive Buffaloes (local low yielding)	-	-	0.075	
	Descript Buffaloes	-	-	-	
	Goat	-	-	3.670	
	Sheep	-	-	0.168	
	Pig (Crossbred)	-	-	22.251	
	Pig (Indigenous)	-	-	4.022	
	Commercial dairy farms (Number)			-	
<b>1.9</b>	<b>Poultry</b>	<b>No. of farms</b>	<b>Total No. of birds ('000)</b>		
	Commercial				
	Backyard		30.435		
<b>1.10</b>	<b>Fisheries (Data source: Chief Planning Officer)</b>				
	<b>A. Capture</b>				
	<b>i) Marine</b> (Data Source: Fisheries Department)	<b>No. of fishermen</b>	<b>Boats</b>		<b>Storage facilities (Ice plants etc.)</b>
			Mechanized	Non-mechanized	
	<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>
		NA		NA	NA
	<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, Mizoram 2016)		1042	1.650	1719
	<b>Others</b>				

### 1.11 Production and Productivity of major crops (2012-13)

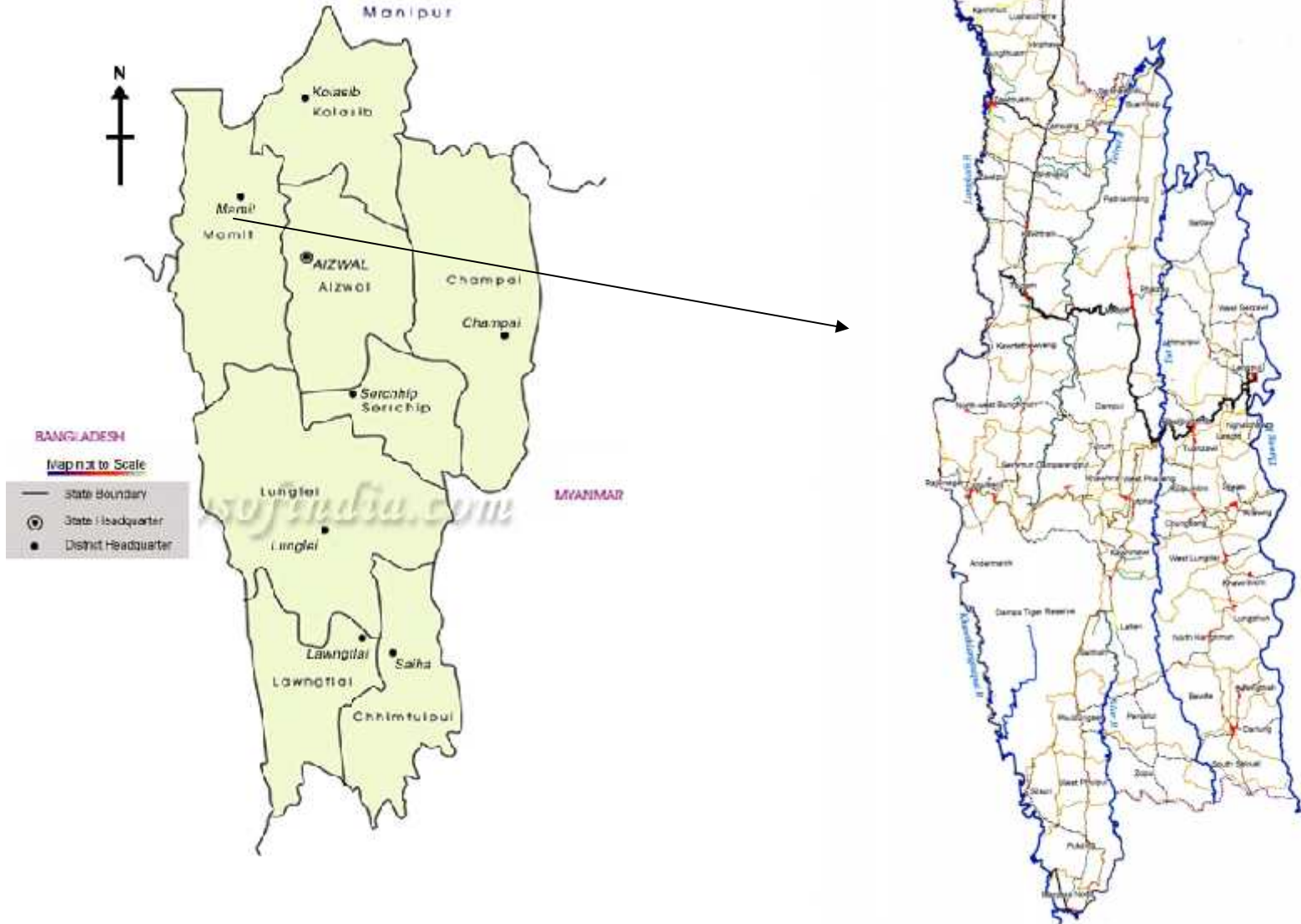
1.11	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder ('000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
<b>Major Field crops (Crops to be identified based on total acreage)</b>										
Crop 1	Rice	4.241	1131.54	-	-	-	-	4.241	1131.54	-
Crop 2	Maize	1.202	1898.89	0.043	1387.10	-	-	1.245	1875.00	-
Crop 3	Cowpea	0.161	899.44	0.050	877.19	-	-	0.211	894.07	-
Crop 4	Sesamum	0.037	500.00	-	-	-	-	0.037	500.00	-
Crop 5	French bean	-	-	0.062	885.71	-	-	0.062	885.71	-
Others	Rice bean	0.061	1386.36	-	-	-	-	0.061	1386.36	-
<b>Major Horticultural crops (Crops to be identified based on total acreage)</b>										
Crop 1	Arecanut	-	-	-	-	-	-	2.345	699.85	-
Crop 2	Khasi Mandarin	-	-	-	-	-	-	4.211	2089.83	-
Crop 3	Lime/ lemon	-	-	-	-	-	-	3.390	3110.09	-
Crop 4	Banana	-	-	-	-	-	-	7.501	11611.78	-
Crop 5	Bitter gourd	-	-	-	-	-	-	2.772	5230.19	-
Others	-	-	-	-	-	-	-	-	-	-

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Rice	Maize	Cowpea	Sesamum	French bean
	Kharif- Rainfed	April-July	April-June	April-June	May-June	-
	Kharif-Irrigated	-	-	-	-	-
	Rabi- Rainfed	-	-	-	-	-
	Rabi-Irrigated	-	November	-	-	November

<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)			

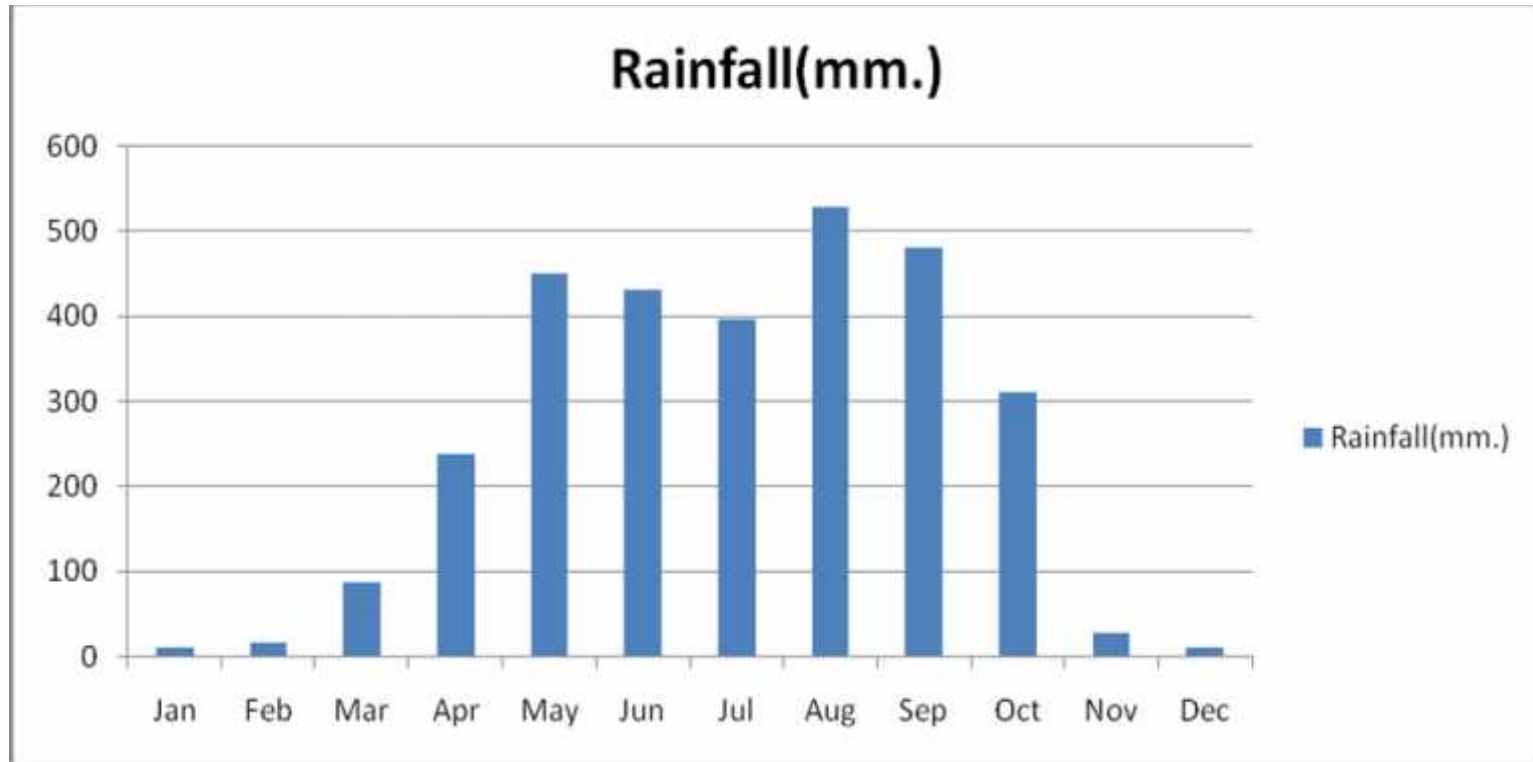
<b>1.14</b>	<b>Include Digital maps of the district</b>	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

# Annexure I: Location Map of District





Annexure 2: Average monthly rainfall of Mamit District(1986-2013)



### Annexure 3: Soil Map of Mamit District



### LEGEND

- Hill top/hill crest
  - Hill side 0-25% slope with current jhum and scrubland
  - Hill side 0-25% slope with abandoned jhum and horticulture
  - Hill side 0-25% slope with bamboo forest
  - Hill side 0-25% slope with forest and forest plantation
  - Hill side 25-50% slope with current jhum and scrubland
  - Hill side 25-50% slope with abandoned jhum and horticulture
  - Hill side 25-50% slope with bamboo forest
  - Hill side 25-50% slope with forest and forest plantation
  - Hill side >50% slope with current jhum and scrubland
  - Hill side >50% slope with abandoned jhum and horticulture
  - Hill side >50% slope with bamboo forest
  - Hill side >50% slope with forest and forest plantation
  - Valley/WRC
  - Built up land
- National Highway
  - State Highway
  - District Road
  - Railway line
  - River

## 2.0 Strategies for weather related contingencies

### 2.1 Drought:

#### 2.1.1 Rainfed situation

Condition	Major Farming situation <sup>a</sup>	Normal Crop / Cropping system <sup>b</sup>	Suggested Contingency measures		
			Change in crop / cropping system <sup>c</sup> including variety	Agronomic measures <sup>d</sup>	Remarks on Implementation
<b>Early season drought (delayed onset)</b>  <b>Delay by 2 weeks (April 2<sup>nd</sup> to 3<sup>rd</sup> week )</b> <b>Pre-monsoon</b>	<b>1. Upland-rain fed (Red soil with moderate rainfall, no irrigation facility)</b>	<b>Cropping System:1 Paddy based cropping System</b> a. Paddy b. Paddy + Maize + Rice bean c. Paddy + Sesamum + Colocasia d. Paddy+ bird's eye chillies e. Paddy + soybean	No Change	a. Sowing with the onset at rainfall. b. Closer row and plant spacing c. Apply full P, K and 50% N of recommended dose along with well decomposed organic matter for early seedling vigour d. Ridge and furrow methods of sowing at closer plant-to-plant distance with wider inter-row spacing.	Supply of quality seeds through State Department, KVK & ICAR  Implementation of line departments schemes
		<b>Cropping System:2 Maize based cropping system</b> a. Maize b. Maize + Soybean c. Maize+ Ricebean d. Maize + Ginger /Turmeric e. Maize + Bird's eye chillies f. Maize+ Okra g. Maize+Cow pea h. Maize+ Sesamum + Colocasia	No Change	a. Selection of short duration varieties b. Sowing with the onset of rainfall. c. Frequent intercropping operation for conservation of moisture d. Closer row and plant spacing e. Apply full P, K and 50% N of recommended dose along with well decomposed organic	Supply of quality seeds through State Department, KVK & ICAR Implementation of line departments schemes

				<p>matter for early seedling vigour</p> <p>f. Ridge and furrow methods of sowing at closer plant-to-plant distance with wider inter-row spacing.</p>	
		<p><b>Cropping System/crops:3</b></p> <p><b>Horticulture crops</b></p> <p><b>Vegetable &amp; Spices crops</b></p> <p>a. Ginger</p> <p>b. Turmeric</p> <p>c. Okra</p> <p>d. Pumpkin</p> <p>e. Ash gourd</p> <p>f. Bird's eye chillies</p> <p>g. Cowpea</p> <p>h. Brinjal</p> <p>i. Cucumber</p> <p>j. Bitter gourd etc.</p> <p><i>Most of crops Shown as Mixed crops</i></p> <p><b>Fruits &amp; plantation crops</b></p> <p>a. Banana</p> <p>b. Khasi mandarin</p> <p>c. Pine apple</p> <p>d. Hatkora (<i>Citurs macroptera</i> Montor)</p> <p>e. Arecanut</p> <p>f. Passion fruits</p> <p>g. Oilpalm</p> <p>h. Assam lemon &amp; other fruit crops</p>	<b>No Change</b>	<p>a. Sowing with the onset of rainfall.</p> <p>b. Frequent intercultural operation for conservation of moisture</p> <p>c. Closer row and plant spacing</p> <p>d. Apply full P, K and 50% N of recommended dose along with well decomposed organic matter for early seedling vigour</p> <p>e. Ridge and furrow methods of sowing at closer plant-to-plant distance with wider inter-row spacing.</p>	Supply of quality seeds through State Department, KVK & ICAR Implementation of line departments schemes
	<b>2) Farming situation : Lowland farming situation , Red soil with moderate to high rainfall</b>	<p><b>Cropping System:1</b></p> <p><b>Paddy based cropping System</b></p> <p>a. Paddy</p> <p>b. Paddy – Vegetables</p>	<b>No Change</b>	<p>a. Transplantation of 3-4 nos. of seedlings per hill.</p> <p>b. Closer spacing</p> <p>c. Apply full P, K and 50% N of</p>	Supply of quality seeds through State Department, KVK & ICAR Implementation of line departments

		<ul style="list-style-type: none"> <li>c. Paddy - Maize</li> <li>d. Paddy - Pulses</li> <li>e. Paddy - Oilseeds</li> </ul>		recommended dose along with well decomposed organic matter for early seedling vigour	schemes
<p><b>Delay by 4 weeks</b> (4<sup>th</sup> week of April to 1<sup>st</sup> week of May)</p> <p><b>Pre-monsoon</b></p>	<p><b>1. Upland-rain fed (Red soil with moderate rainfall, no irrigation facility)</b></p>	<p><b>Cropping System:1 Paddy based cropping System</b></p> <ul style="list-style-type: none"> <li>a. Paddy</li> <li>b. Paddy + Maize + Rice bean</li> <li>c. Paddy + Sesamum + Colocasia</li> <li>d. Paddy+ bird's eye chillies</li> <li>e. Paddy + soybean</li> </ul>	<b>No Change</b>	<ul style="list-style-type: none"> <li>a. Sowing with the onset at rainfall.</li> <li>b. Closer row and plant spacing</li> <li>c. Apply full P, K and 50% N of recommended dose along with well decomposed organic matter for early seedling vigour</li> <li>d. Ridge and furrow methods of sowing at closer plant-to-plant distance with wider inter-row spacing.</li> </ul>	Supply of quality seeds through State Department, KVK & ICAR Implementation of line departments schemes

		<p><b>Cropping System:2</b>  <b>Maize based cropping system</b></p> <ol style="list-style-type: none"> <li>a. Maize</li> <li>b. Maize + Soybean</li> <li>c. Maize+ Ricebean</li> <li>d. Maize + Ginger / Turmeric</li> <li>e. Maize + Bird's eye chillies</li> <li>f. Maize+ Okra</li> <li>g. Maize+Cow pea</li> <li>h. Maize+ Sesamum + Colocasia</li> </ol>	<p><b>No Change</b></p>	<ol style="list-style-type: none"> <li>a. Selection of short duration varieties</li> <li>b. Sowing with the onset of rainfall.</li> <li>c. Frequent intercultural operation for conservation of moisture</li> <li>d. Closer row and plant spacing</li> <li>e. Apply full P, K and 50% N of recommended dose along with well decomposed organic matter for early seedling vigour</li> <li>f. Ridge and furrow methods of sowing at closer plant-to-plant distance with wider inter-row spacing.</li> </ol>	<p>Supply of quality seeds through State Department, KVK &amp; ICAR  Implementation of line departments schemes</p>
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		<p><b>Cropping System/crops:3</b></p> <p><b>Horticulture crops</b></p> <p><b>Vegetable &amp; Spices crops</b></p> <ol style="list-style-type: none"> <li>Ginger</li> <li>Turmeric</li> <li>Okra</li> <li>Pumpkin</li> <li>Ash gourd</li> <li>Bird's eye chillies</li> <li>Cowpea</li> <li>Brinjal</li> <li>Cucumber</li> <li>Bitter gourd etc.</li> </ol> <p><i>Most of crops Shown as Mixed crops</i></p> <p><b>Fruits &amp; plantation crops</b></p> <ol style="list-style-type: none"> <li>Banana</li> <li>Khasi mandarin</li> <li>Pine apple</li> <li>Hatkora(<i>Citrus macroptera</i> Montor)</li> <li>Areca nut</li> <li>Passion fruits</li> <li>Oilpalm</li> <li>Assam lemon &amp; other fruit crops</li> </ol>	<b>No Change</b>	<ol style="list-style-type: none"> <li>Sowing with the onset of rainfall.</li> <li>Frequent intercultural operation for conservation of moisture</li> <li>Closer row and plant spacing</li> <li>Apply full P, K and 50% N of recommended dose along with well decomposed organic matter for early seedling vigour</li> <li>Ridge and furrow methods of sowing at closer plant-to-plant distance with wider inter-row spacing.</li> </ol>	Supply of quality seeds through State Department, KVK & ICAR Implementation of line departments schemes
	<p><b>3) Farming situation : Lowland farming situation , Red soil with moderate to high rainfall</b></p>	<p><b>Cropping System:1</b></p> <p><b>Paddy based cropping System</b></p> <ol style="list-style-type: none"> <li>Paddy</li> <li>Paddy – Vegetables</li> <li>Paddy - Maize</li> <li>Paddy - Pulses</li> <li>Paddy - Oilseeds</li> </ol>	<b>No Change</b>	<ol style="list-style-type: none"> <li>Transplantation of 3-4 nos. of seedlings per hill.</li> <li>Closer spacing</li> <li>Apply full P, K and 50% N of recommended dose along with well decomposed organic matter for early seedling vigour</li> </ol>	Supply of quality seeds through State Department, KVK & ICAR Implementation of line departments schemes

**2.1.2 Rainfed situation** – South west monsoon - normal (1<sup>st</sup> week of June)

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation <sup>a</sup>	Normal Crop / Cropping system <sup>b</sup>	Change in crop / cropping system <sup>c</sup> including variety	Early season drought (delayed onset)	Remarks on Implementation
Delay by 2 weeks (3 <sup>rd</sup> week of June)	<b>1) Farming situation: Upland rain fed (<i>Jhum</i> cultivation) on hill slop</b> Red soil with moderate to high rainfall, no irrigation facility. Crops are taken only during rainy season	<b>Cropping System:1 Paddy based cropping System</b> a. Paddy b. Paddy + Maize + Rice bean c. Paddy + Sesamum + Colocasia d. Paddy+ bird's eye chillies e. Paddy + soybean	<b>Paddy:</b> Bhalum-1, Bhalum-2, Bhalum-3, Bhalum-4, Local ( Buhsakhi, Leilettai) <b>Sesamum :</b> ST-1683, B-67, Local (Chhibung, Chhitunglun, Chhiriat)  <b>Soybean:</b> Bragg, Indira soy 9,MAUS 61-2,Pusa-22,Pusa-37, RAUS-5, Local(Fangsin,Fanghraw)	a. Selection of short duration varieties b. Sowing with the onset of rainfall. c. Frequent intercultural operation for conservation of moisture d. Closer row and plant spacing e. Apply full P, K and 50% N of recommended dose along with well decomposed organic matter for early seedling vigour f. Ridge and furrow methods of sowing at closer plant-to-plant distance with wider inter-row spacing.	Supply of quality seeds through State Department, KVK & ICAR  Implementation of line departments schemes
		<b>Cropping System:2 Maize based cropping system</b> a. Maize b. Maize + Soybean c. Maize+ Ricebean d. Maize + Ginger /Turmeric e. Maize + Bird's eye chillies f. Maize+ Okra g. Maize +Cow pea h. Maize+ Sesamum + Colocasia	<b>Maize :</b> C-1415, C-1837, HQPM-1, Vivek- 15, Vivek -9, Vivek-23 ( Hybrid), Suwan Composite, Local <b>Soybean:</b> Bragg, Indira soy 9,MAUS 61-2,Pusa-22,Pusa-37, RAUS-5, Local (Fangsin,Fanghraw) <b>Okra:</b> Arka Anamika, Parbhani Kranti, VRO-6 <b>Cow Pea:</b> Arka Komal, Arka	a. Selection of short duration varieties b. Sowing with the onset of rainfall. c. Frequent interculture operation for conservation of moisture d. Closer row and plant spacing e. Apply full P, K and	Supply of quality seeds through State Department, KVK & ICAR  Implementation of line departments schemes



			Anoop, Kashi Kanchan, Local <b>Ginger:</b> Nadia, Thingpui, Thingaria, Thinglaidum <b>Turmeric :</b> RCT-1, Lakadong, Sugandham, Alleppey, Wynad	50% N of recommended dose along with well decomposed organic matter for early seedling vigour f. Ridge and furrow methods of sowing at closer plant-to-plant distance with wider inter-row spacing.	
		<b>Cropping System/crops:3</b> <b>Horticulture crops</b> <b>Vegetable &amp; Spices crops</b> a. Ginger b. Turmeric c. Okra d. Pumpkin e. Ash gourd f. Bird's eye chillies g. Cowpea h. Brinjal i. Cucumber j. Bitter gourd etc.  <i>Most of crops Shown as Mixed crops</i> <b>Fruits &amp; plantation crops</b> a. Banana b. Khasi mandarin c. Pine apple d. Hatkora( <i>Citrus macroptera</i> Montor) e. Arecanut f. Passion fruits g. Oilpalm h. Assam lemon & other fruit crops	<b>Okra:</b> Arka Anamika, Parbhani Kranti, VRO-6 <b>Cow Pea:</b> Arka Komal, Arka Anoop, Kashi Kanchan, Local <b>Ginger:</b> Nadia, Thingpui, Thingaria, Thinglaidum <b>Turmeric :</b> RCT-1, Lakadong, Sugandham, Alleppey, Wynad <b>Brinjal:</b> Pusa purple Cluster, Kashi Sandesh, Kashi Komal, Hisar Shyamal, , RCMBL-1, Local <b>Cucumber:</b> Pusa Uday, Pusa Sanyog, Poinsette, Local <b>Pumpkin:</b> Arka Suryamukhi, , Arka, Chandan, Pusa Vishwas, Local <b>Ash gourd :</b> Local, Pusa Ujjwal, Khasi Ujjwal	f. Sowing with the onset of rainfall. g. Frequent interculture operation for conservation of moisture h. Closer row and plant spacing i. Apply full P, K and 50% N of recommended dose along with well decomposed organic matter for early seedling vigour j. Ridge and furrow methods of sowing at closer plant-to-plant distance with wider inter-row spacing.	Supply of quality seeds through State Department, KVK & ICAR  Implementation of line departments schemes
	<b>2) Farming</b>	<b>Cropping System:1</b>	<b>Paddy:</b> Shahsarang, Lumpnah,	g. Transplantation of 3-	Supply of quality

	<b>situation : Lowland farming situation , Red soil with moderate to high rainfall</b>	<b>Paddy based cropping System</b>  f. Paddy – Vegetables g. Paddy - Maize h. Paddy - Pulses i. Paddy - Oilseeds	Mega SA-1, Mega SA-2, RC Maniphou 4, RC Maniphou 5, RCM10, Tampaphou, Aizawang, IR- 64, , CAUR-1, Gomati	4 nos. of seedlings per hill. h. Closer spacing i. Apply full P, K and 50% N of recommended dose along with well decomposed organic matter for early seedling vigour	seeds through State Department, KVK & ICAR  Implementation of line departments schemes
<b>Condition</b>			<b>Suggested Contingency measures</b>		
<b>Early season drought (delayed onset)</b>	<b>Major Farming situation<sup>a</sup></b>	<b>Normal Crop/cropping system<sup>b</sup></b>	<b>Change in crop / cropping system<sup>c</sup> including variety</b>	<b>Early season drought (delayed onset)</b>	<b>Remarks on Implementation</b>
<b>Delay by 4 weeks (1<sup>st</sup> week of July)</b>	<b>1) Farming situation:</b> Upland rain fed ( <i>Jhum</i> cultivation) on hill slop Red soil with moderate to high rainfall, no irrigation facility.Crops are taken only during rainy season	<b>Cropping system 1: Paddy based cropping System</b> a. Paddy b. Paddy + Maize + Rice bean c. Paddy + Sesamum + Colocasia d. Paddy+ bird’s eye chillies e. Paddy + soybean	<b>Paddy:</b> Bhalum-1, Bhalum-2, Bhalum-3, Bhalum-4, Local ( Buhsakhi, Leilettai) <b>Sesamum :</b> ST-1683, B-67, Local (Chhibung, Chhitunglun, Chhiriat)  <b>Soybean:</b> Bragg, Indira soy 9,MAUS 61-2,Pusa-22,Pusa-37, RAUS-5,Local(Fangsin,Fanghraw)	a. Selection of short duration varieties b. Sowing with the onset of rainfall. c. Frequent interculture operation for conservation of moisture d. Closer row and plant spacing e. <input type="checkbox"/> Apply full P, K and 50% N of recommended dose along with well decomposed organic matter for early seedling vigour. f. <input type="checkbox"/> Ridge and furrow methods of sowing at closer plant-to-plant distance with wider inter-row spacing.	Supply of quality seeds through State Department, KVK & ICAR  Implementation of line departments schemes
		<b>Cropping system 2: Maize based cropping system</b>	<b>Maize :</b> C-1415, C-1837, HQPM-1, Vivek- 15, Vivek -9,	a. Selection of short duration varieties	Supply of quality seeds through State

		<ul style="list-style-type: none"> <li>a. Maize</li> <li>b. Maize + Soybean</li> <li>c. Maize+ Ricebean</li> <li>d. Maize + Ginger /Turmeric</li> <li>e. Maize + Bird's eye chillies</li> <li>f. Maize+ Okra</li> <li>g. Maize +Cow pea</li> <li>h. Maize+ Sesamum + Colocasia</li> </ul>	<p>Vivek-23 ( Hybrid), Suwan Composite, Local  <b>Soybean:</b> Bragg, Indira soy 9,MAUS 61-2,Pusa-22,Pusa-37, RAUS-5, Local (Fangsin,Fanghraw)  <b>Okra:</b> Arka Anamika, Parbhani Kranti, VRO-6  <b>Cow Pea:</b> Arka Komal, Arka Anoop, Kashi Kanchan, Local  <b>Ginger:</b> Nadia, Thingpui, Thingaria, Thinglaidum  <b>Turmeric :</b> RCT-1, Lakadong, Sugandham, Alleppey, Wynad</p>	<ul style="list-style-type: none"> <li>b. Sowing with the onset of rainfall.</li> <li>c. Frequent interculture operation for conservation of moisture</li> <li>d. Closer row and plant spacing</li> <li>e. <input type="checkbox"/> Apply full P, K and 50% N of recommended dose along with well decomposed organic matter for early seedling vigour.</li> <li>f. <input type="checkbox"/>Ridge and furrow methods of sowing at closer plant-to-plant distance with wider inter-row spacing.</li> </ul>	<p>Department, KVK &amp; ICAR</p> <p>Implementation of line departments schemes</p>
		<p><b>Cropping System/crops:3</b>  <b>Horticulture crops</b>  <b>Vegetable &amp; Spices crops</b></p> <ul style="list-style-type: none"> <li>a. Ginger</li> <li>b. Turmeric</li> <li>c. Okra</li> <li>d. Pumpkin</li> <li>e. Ash gourd</li> <li>f. Bird's eye chillies</li> <li>g. Cowpea</li> <li>h. Brinjal</li> <li>i. Cucumber</li> <li>j. Bitter gourd etc.</li> </ul> <p><i>Most of crops Shown as Mixed crops</i></p> <p><b>Fruits &amp; plantation crops</b></p> <ul style="list-style-type: none"> <li>i. Banana</li> </ul>	<p><b>Okra:</b> Arka Anamika, Parbhani Kranti, VRO-6  <b>Cow Pea:</b> Arka Komal, Arka Anoop, Kashi Kanchan, Local  <b>Ginger:</b> Nadia, Thingpui, Thingaria, Thinglaidum  <b>Turmeric :</b> RCT-1, Lakadong, Sugandham, Alleppey, Wynad  <b>Brinjal:</b> Pusa purple Cluster, Kashi Sandesh, Kashi Komal, Hisar Shyamal, , RCMBL-1, Local  <b>Cucumber:</b> Pusa Uday, Pusa Sanyog, Poinsette, Local  <b>Pumpkin:</b> Arka Suryamukhi, , Arka, Chandan, Pusa Vishwas, Local  <b>Ash gourd :</b> Local, Pusa</p>	<ul style="list-style-type: none"> <li>a. Selection of short duration varieties</li> <li>b. Sowing with the onset of rainfall.</li> <li>c. Frequent interculture operation for conservation of moisture</li> <li>d. Closer row and plant spacing</li> <li>e. <input type="checkbox"/> Apply full P, K and 50% N of recommended dose along with well decomposed organic matter for early seedling vigour.</li> </ul>	<p>Supply of quality seeds through State Department, KVK &amp; ICAR</p> <p>Implementation of line departments schemes</p>

		<ul style="list-style-type: none"> <li>j. Khasi mandarin</li> <li>k. Pine apple</li> <li>l. Hatkora(<i>Citrus macroptera</i> Montor)</li> <li>m. Arecanut</li> <li>n. Passion fruits</li> <li>o. Oilpalm</li> <li>p. Assam lemon &amp; other fruit crops</li> </ul>	Ujjwal, Khasi Ujjwal	f. <input type="checkbox"/> Ridge and furrow methods of sowing at closer plant-to-plant distance with wider inter-row spacing.	
	<b>2) Farming situation :</b> Lowland farming situation , Red soil with moderate to high rainfall	<b>Cropping System:1 Paddy based cropping System</b>  <ul style="list-style-type: none"> <li>3) Paddy – Vegetables</li> <li>4) Paddy - Maize</li> <li>5) Paddy - Pulses</li> <li>6) Paddy - Oilseeds</li> </ul>	<b>Paddy:</b> Shahsarang, Lumpnah, Mega SA-1, Mega SA-2, RC Maniphou 4, RC Maniphou 5, RCM10, Tampaphou, Aizawang, IR- 64, CAUR-1, Gomati	<ul style="list-style-type: none"> <li>j. Transplantation of 3-4 nos. of seedlings per hill.</li> <li>k. Closer spacing</li> <li>l. Apply full P, K and 50% N of recommended dose along with well decomposed organic matter for early seedling vigour</li> </ul>	Supply of quality seeds through State Department, KVK & ICAR Implementation of line departments schemes

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation <sup>a</sup>	Normal Crop/cropping system <sup>b</sup>	Change in crop/cropping system <sup>c</sup>	Agronomic measures <sup>d</sup>	Remarks on Implementation <sup>e</sup>
<b>Delay by 6 weeks (3<sup>rd</sup> week of July)</b>	<b>1) Farming situation:</b> Upland rain fed ( <i>Jhum</i> cultivation) on hill slop. Red soil with moderate to high rainfall, no irrigation facility. Crops are taken only during rainy season	<b>Cropping system 1: Paddy based cropping System</b> <ul style="list-style-type: none"> <li>a. Paddy</li> <li>b. Paddy + Maize + Rice bean</li> <li>c. Paddy + Sesamum + Colocasia</li> <li>d. Paddy+ bird's eye chillies</li> <li>e. Paddy + soybean</li> </ul>	<b>Paddy:</b> Bhalum-1, Bhalum-2, Bhalum-3, Bhalum-4, Local ( Buhsakhi, Leilettai) <b>Sesamum :</b> ST-1683, B-67, Local (Chhibung, Chhitunglun, Chhiriati)  <b>Soybean:</b> Bragg, Indira soy 9, MAUS 61-2, Pusa-22, Pusa-37, RAUS-5, Local (Fangsin, Fanghraw)	<ul style="list-style-type: none"> <li>a. Selection of short duration varieties</li> <li>b. Sowing with the onset of rainfall.</li> <li>c. Frequent interculture operation for conservation of moisture</li> <li>d. Closer row and plant spacing</li> <li>e. Apply full P, K and 50% N of recommended dose along with well</li> </ul>	Supply of quality seeds through State Department, KVK & ICAR  Implementation of line departments schemes

				decomposed organic matter for early seedling vigour. f. Ridge and furrow methods of sowing at closer plant-to-plant distance with wider inter-row spacing.	
		<b>Cropping system 2: Maize based cropping system</b> a. Maize b. Maize + Soybean c. Maize+ Ricebean d. Maize + Ginger /Turmeric e. Maize + Bird's eye chillies f. Maize+ Okra g. Maize +Cow pea h. Maize+ Sesamum + Colocasia	<b>Maize :</b> C-1415, C-1837, HQPM-1, Vivek- 15, Vivek -9, Vivek-23 ( Hybrid), Suwan Composite, Local <b>Soybean:</b> Bragg, Indira soy 9,MAUS 61-2,Pusa-22,Pusa-37, RAUS-5, Local (Fangsin,Fanghraw) <b>Okra:</b> Arka Anamika, Parbhani Kranti, VRO-6 <b>Cow Pea:</b> Arka Komal, Arka Anoop, Kashi Kanchan, Local <b>Ginger:</b> Nadia, Thingpui, Thingaria, Thinglaidum <b>Turmeric :</b> RCT-1, Lakadong, Sugandham, Alleppey, Wynad	a. Selection of short duration varieties b. Sowing with the onset of rainfall. c. Frequent intercultural operation for conservation of moisture d. Closer row and plant spacing e. Apply full P, K and 50% N of recommended dose along with well decomposed organic matter for early seedling vigour. f. Ridge and furrow methods of sowing at closer plant-to-plant distance with wider inter-row spacing.	Supply of quality seeds through State Department, KVK & ICAR  Implementation of line departments schemes
		<b>Cropping System/crops:3 Horticulture crops Vegetable &amp; Spices crops</b> a. Ginger b. Turmeric c. Okra d. Pumpkin	<b>Okra:</b> Arka Anamika, Parbhani Kranti, VRO-6 <b>Cow Pea:</b> Arka Komal, Arka Anoop, Kashi Kanchan, Local <b>Ginger:</b> Nadia, Thingpui, Thingaria, Thinglaidum <b>Turmeric :</b> RCT-1, Lakadong,	a. Selection of short duration varieties b. Sowing with the onset of rainfall. c. Frequent intercultural operation for	Supply of quality seeds through State Department, KVK & ICAR  Implementation of line departments

		e. Ash gourd f. Bird's eye chillies g. Cowpea h. Brinjal i. Cucumber j. Bitter gourd etc.  <i>Most of crops Shown as Mixed crops</i> <b>Fruits &amp; plantation crops</b> a. Banana b. Khasi mandarin c. Pine apple d. Hatkora( <i>Citrus macroptera</i> Montor) e. Arecanut f. Passion fruits g. Oilpalm h. Assam lemon & other fruit crops	Sugandham, Alleppey, Wynad <b>Brinjal:</b> Pusa purple Cluster, Kashi Sandesh, Kashi Komal, Hisar Shyamal, , RCMBL-1, Local <b>Cucumber:</b> Pusa Uday, Pusa Sanyog, Poinsette, Local <b>Pumpkin:</b> Arka Suryamukhi, , Arka, Chandan, Pusa Vishwas, Local <b>Ash gourd :</b> Local, Pusa Ujjwal, Khasi Ujjwal	conservation of moisture d. Closer row and plant spacing e. Apply full P, K and 50% N of recommended dose along with well decomposed organic matter for early seedling vigour. f. Ridge and furrow methods of sowing at closer plant-to-plant distance with wider inter-row spacing.	schemes
	<b>2) Farming situation :</b> Lowland farming situation , Red soil with moderate to high rainfall	<b>Cropping System:1 Paddy based cropping System</b>  a. Paddy – Vegetables b. Paddy - Maize c. Paddy - Pulses d. Paddy - Oilseeds	<b>Paddy:</b> Shalsarang, Lumpnah, Mega SA-1, Mega SA-2, RC Maniphou 4, RC Maniphou 5, RCM10, Tampaphou, Aizawang, IR- 64, CAUR-1, Gomati	a. Transplantation of 3-4 nos. of seedlings per hill. b. Closer spacing c. Apply full P, K and 50% N of recommended dose along with well decomposed organic matter for early seedling vigour	Supply of quality seeds through State Department, KVK & ICAR  Implementation of line departments schemes

Condition	Major Farming situation <sup>a</sup>	Normal Crop/cropping system <sup>b</sup>	Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation <sup>a</sup>	Normal Crop/cropping system <sup>b</sup>	Change in crop/cropping system <sup>c</sup>	Agronomic measures <sup>d</sup>	Remarks on Implementation <sup>e</sup>
Delay by 8 weeks (1 <sup>st</sup> Week of August)	<b>1) Farming situation:</b> Upland rainfed ( <i>Jhum</i> )	<b>Cropping system 1: Paddy based cropping System</b> a. Paddy	<b>Paddy:</b> Bhalum-1, Bhalum-2, Bhalum-3, Bhalum-4, Local ( Buhsakhi, Leilettai) <b>Sesamum :</b> ST-1683, B-67,	a. Selection of short duration varieties b. Sowing with the onset of rainfall.	Supply of quality seeds through State Department, KVK & ICAR

	<p>cultivation) on hill slop. Red soil with moderate to high rainfall, no irrigation facility. Crops are taken only during rainy season</p>	<p>b. Paddy + Maize + Rice bean  c. Paddy + Sesamum + Colocasia  d. Paddy+ bird's eye chillies  e. Paddy + soybean</p>	<p>Local (Chhibung, Chhitunglun, Chhiriati)   <b>Soybean:</b> Bragg, Indira soy 9,MAUS 61-2,Pusa-22,Pusa-37, RAUS-5, Local(Fangsin, Fanghraw)</p>	<p>c. Frequent intercultural operation for conservation of moisture  d. Closer row and plant spacing  e. Apply full P, K and 50% N of recommended dose along with well decomposed organic matter for early seedling vigour.  f. Ridge and furrow methods of sowing at closer plant-to-plant distance with wider inter-row spacing.</p>	
		<p><b>Cropping system 2: Maize based cropping system</b>  a. Maize  b. Maize + Soybean  c. Maize+ Ricebean  d. Maize + Ginger /Turmeric  e. Maize + Bird's eye chillies  f. Maize+ Okra  g. Maize +Cow pea  h. Maize+ Sesamum + Colocasia</p>	<p><b>Maize :</b> C-1415, C-1837, HQPM-1, Vivek- 15, Vivek -9, Vivek-23 ( Hybrid), Suwan Composite, Local  <b>Soybean:</b> Bragg, Indira soy 9,MAUS 61-2,Pusa-22,Pusa-37, RAUS-5, Local (Fangsin,Fanghraw)  <b>Okra:</b> Arka Anamika, Parbhani Kranti, VRO-6  <b>Cow Pea:</b> Arka Komal, Arka Anoop, Kashi Kanchan, Local  <b>Ginger:</b> Nadia, Thingpui, Thingaria, Thinglaidum  <b>Turmeric :</b> RCT-1, Lakadong, Sugandham, Alleppey, Wynad</p>	<p>a. Selection of short duration varieties  b. Sowing with the onset of rainfall.  c. Frequent intercultural operation for conservation of moisture  d. Closer row and plant spacing  e. Apply full P, K and 50% N of recommended dose along with well decomposed organic matter for early seedling vigour.  f. Ridge and furrow methods of sowing</p>	<p>Supply of quality seeds through State Department, KVK &amp; ICAR  Implementation of line departments schemes</p>

				at closer plant-to-plant distance with wider inter-row spacing.	
		<p><b>Cropping System/crops:3 Horticulture crops</b>  <b>Vegetable &amp; Spices crops</b></p> <ol style="list-style-type: none"> <li>Ginger</li> <li>Turmeric</li> <li>Okra</li> <li>Pumpkin</li> <li>Ash gourd</li> <li>Bird's eye chillies</li> <li>Cowpea</li> <li>Brinjal</li> <li>Cucumber</li> <li>Bitter gourd etc.</li> </ol> <p><i>Most of crops Shown as Mixed crops</i></p> <p><b>Fruits &amp; plantation crops</b></p> <ol style="list-style-type: none"> <li>Banana</li> <li>Khasi Mandarin</li> <li>Pine apple</li> <li>Hatkora(<i>Citrus macroptera</i> Montor)</li> <li>Arecanut</li> <li>Passion fruits</li> <li>Oilpalm</li> <li>Assam lemon &amp; other fruit crops</li> </ol>	<p><b>Okra:</b> Arka Anamika, Parbhani Kranti, VRO-6  <b>Cow Pea:</b> Arka Komal, Arka Anoop, Kashi Kanchan, Local  <b>Ginger:</b> Nadia, Thingpui, Thingaria, Thinglaidum  <b>Turmeric :</b> RCT-1, Lakadong, Sugandham, Alleppey, Wynad  <b>Brinjal:</b> Pusa purple Cluster, Kashi Sandesh, Kashi Komal, Hisar Shyamal, , RCMBL-1, Local  <b>Cucumber:</b> Pusa Uday, Pusa Sanyog, Poinsette, Local  <b>Pumpkin:</b> Arka Suryamukhi, Arka, Chandan, Pusa Vishwas, Local  <b>Ash gourd :</b> Local, Pusa Ujjwal, Khasi Ujjwal</p>	<ol style="list-style-type: none"> <li>Selection of short duration varieties</li> <li>Sowing with the onset of rainfall.</li> <li>Frequent intercultural operation for conservation of moisture</li> <li>Closer row and plant spacing</li> <li>Apply full P, K and 50% N of recommended dose along with well decomposed organic matter for early seedling vigour.</li> <li>Ridge and furrow methods of sowing at closer plant-to-plant distance with wider inter-row spacing.</li> </ol>	<p>Supply of quality seeds through State Department, KVK &amp; ICAR</p> <p>Implementation of line departments schemes</p>
	<p><b>2) Farming situation :</b>  Lowland farming situation , Red soil with moderate to high rainfall</p>	<p><b>Cropping System:1 Paddy based cropping System</b></p> <ol style="list-style-type: none"> <li>Paddy – Vegetables</li> <li>Paddy - Maize</li> <li>Paddy - Pulses</li> <li>Paddy - Oilseeds</li> </ol>	<p><b>Paddy:</b> Shahsarang, Lumpnah, Mega SA-1, Mega SA-2, RC Maniphou 4, RC Maniphou 5, RCM10, Tampaphou, Aizawang, IR- 64, CAUR-1, Gomati</p>	<ol style="list-style-type: none"> <li>Transplantation of 3-4 nos. of seedlings per hill.</li> <li>Closer spacing</li> <li>Apply full P, K and 50% N of recommended dose along with well decomposed organic</li> </ol>	<p>Supply of quality seeds through State Department, KVK &amp; ICAR</p> <p>Implementation of line departments schemes</p>



				matter for early seedling vigour	
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## 2.0 Strategies for weather related contingencies

**\*Matrix for specifying condition of early season drought due to delayed onset of monsoon (2, 4, 6 & 8 weeks) compared to normal onset (2.1.1)**

Normal onset (Month and week)	Month and week for specifying condition of early season drought due to delayed onset of monsoon			
	Delay in onset of monsoon by			
	2 wks	4 wks	6 wks	8 wks
June 1 <sup>st</sup> wk	June 3 <sup>rd</sup> wk	July 1 <sup>st</sup> wk	July 3 <sup>rd</sup> wk	Aug 1 <sup>st</sup> wk
June 2 <sup>nd</sup> wk	June 4 <sup>th</sup> wk	July 2 <sup>nd</sup> wk	July 4 <sup>th</sup> wk	Aug 2 <sup>nd</sup> wk
June 3 <sup>rd</sup> wk	July 1 <sup>st</sup> wk	July 3 <sup>rd</sup> wk	Aug 1 <sup>st</sup> wk	Aug 3 <sup>rd</sup> wk
June 4 <sup>th</sup> wk	July 2 <sup>nd</sup> wk	July 4 <sup>th</sup> wk	Aug 2 <sup>nd</sup> wk	Aug 4 <sup>th</sup> wk
July 1 <sup>st</sup> wk	July 3 <sup>rd</sup> wk	Aug 1 <sup>st</sup> wk	Aug 3 <sup>rd</sup> wk	Sep 1 <sup>st</sup> wk
July 2 <sup>nd</sup> wk	July 4 <sup>th</sup> wk	Aug 2 <sup>nd</sup> wk	Aug 4 <sup>th</sup> wk	Sep 2 <sup>nd</sup> wk

Condition	Major Farming situation <sup>a</sup>	Normal Crop/cropping system <sup>b</sup>	Suggested Contingency measures		
			Crop management <sup>c</sup>	Soil nutrient & moisture conservation measures <sup>d</sup>	Remarks on Implementation <sup>e</sup>
Early season drought (Normal onset)					
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	1) <b>Farming situation:</b> Upland rain fed ( <i>Jhum</i> cultivation) on hill slop Red soil with moderate to high rainfall, no irrigation facility. Crops are taken only during rainy season	<b>Cropping system 1: Paddy based cropping System</b> f. Paddy g. Paddy + Maize + Rice bean h. Paddy + Sesamum + Colocasia i. Paddy+ bird's eye chillies j. Paddy + soybean	1. Re-sowing of crop 2. In case of poor population, needs gap filling.	a. Mulching with green/ dry leaves  b. Frequent intercultural operation for conservation of moisture  c. Cover cropping with main crop d. Furrow application of FYM e. Soil moisture conservation measures to be followed f. Water harvesting in Jalkund for life saving irrigation	a. Construction of rainwater harvesting ponds (Jal kund). b. Training by KVK and ATMA
		<b>Cropping system 2: Maize based cropping system</b> i. Maize j. Maize + Soybean k. Maize+ Ricebean l. Maize + Ginger /Turmeric m. Maize + Bird's eye chillies n. Maize+ Okra o. Maize +Cow pea p. Maize+ Sesamum + Colocasia	1. Re-sowing of crop 2. In case of poor population, needs gap filling.	a. Mulching with green/ dry leaves b. Frequent intercultural operation for conservation of moisture c. Cover cropping with main crop d. Furrow application of FYM e. Soil moisture conservation	a. Construction of rainwater harvesting ponds (Jal kund). b. Training by KVK and ATMA

				measures to be followed f. Water harvesting in Jalkund for life saving irrigation	
		<p><b>Cropping System/crops:3</b>  <b>Horticulture crops</b>  <b>Vegetable &amp; Spices crops</b>  k. Ginger  l. Turmeric  m. Okra  n. Pumpkin  o. Ash gourd  p. Bird's eye chillies  q. Cowpea  r. Brinjal  s. Cucumber  t. Bitter gourd etc.  <i>Most of crops Shown as Mixed crops</i></p> <p><b>Fruits &amp; plantation crops</b>  i. Banana  j. Khasi mandarin  k. Pine apple  l. Hatkora(<i>Citrus macroptera</i> Montor)  m. Arecanut  n. Passion fruits  o. Oilpalm  Assam lemon &amp; other fruit crops</p>	<p>1. Re-sowing of crop  2. In case of poor population, needs gap filling.</p>	<p>a. Mulching with green/ dry leaves  b. Frequent intercultural operation for conservation of moisture  c. Cover cropping with main crop  d. Furrow application of FYM  e. Soil moisture conservation measures to be followed  f. Water harvesting in Jalkund for life saving irrigation</p>	<p>a. Construction of rainwater harvesting ponds (Jal kund).  b. Training by KVK and ATMA</p>
	<p><b>2) Farming situation :</b>  Lowland farming situation ,  Red soil with moderate to high rainfall</p>	<p><b>Cropping System:1</b>  <b>Paddy based cropping System</b>  a. Paddy – Vegetables  b. Paddy - Maize  c. Paddy - Pulses  d. Paddy - Oilseeds</p>	<p>10 to 12 days nursery can be replanted</p>	<p>a. Urea application at active tillering stage can be delayed in rainfed shallow lowland  b. Intercultural operations can be delayed</p>	<p>a. Construction of rainwater harvesting ponds (Jal kund).  b. Training by KVK and ATMA</p>
<b>Condition</b>				<b>Suggested Contingency measures</b>	

Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation <sup>a</sup>	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>
At vegetative stage	1) <b>Farming situation:</b> Upland rain fed ( <i>Jhum</i> cultivation) on hill slop Red soil with moderate to high rainfall, no irrigation facility. Crops are taken only during rainy season	<b>Cropping system 1: Paddy based cropping System</b> a. Paddy b. Paddy + Maize + Rice bean c. Paddy + Sesamum + Colocasia d. Paddy+ bird's eye chillies e. Paddy + soybean	Weeding, Inter -cultivation to create soil mulch to conserve moisture. Protective irrigation if possible.	a. Avoid applying fertilizer till there is sufficient moisture in the soil. Opening of alternate furrows. b. Mulching with green/ dry leaves c. Frequent interculture operation for conservation of moisture d. Cover cropping with main crop e. Furrow application of FYM f. Soil moisture conservation measures to be followed g. Water harvesting in Jalkund for life saving irrigation	With limited water availability prefer micro irrigation system Intercultivation implements/ machineries to be popularized through Govt. schemes.
		<b>Cropping system 2: Maize based cropping system</b> a. Maize b. Maize + Soybean c. Maize+ Ricebean d. Maize + Ginger /Turmeric e. Maize + Bird's eye chillies f. Maize+ Okra g. Maize +Cow pea h. Maize+ Sesamum +	Weeding, Inter-cultivation to create soil mulch to conserve moisture. Protective irrigation if possible.	a. Avoid applying fertilizer till there is sufficient moisture in the soil. Opening of alternate furrows. b. Mulching with green/ dry leaves c. Frequent interculture operation for	With limited water availability prefer micro irrigation system Inter-cultivation implements/ machineries to be popularized through Govt. schemes.

		Colocasia		<p>conservation of moisture</p> <p>d. Cover cropping with main crop</p> <p>e. Furrow application of FYM</p> <p>f. Soil moisture conservation measures to be followed</p> <p>g. Water harvesting in Jalkund for life saving irrigation</p>	
		<p><b>Cropping System/crops:3</b></p> <p><b>Horticulture crops</b></p> <p><b>Vegetable &amp; Spices crops</b></p> <p>a. Ginger</p> <p>b. Turmeric</p> <p>c. Okra</p> <p>d. Pumpkin</p> <p>e. Ash gourd</p> <p>f. Bird's eye chillies</p> <p>g. Cowpea</p> <p>h. Brinjal</p> <p>i. Cucumber</p> <p>j. Bitter gourd etc.</p> <p><i>Most of crops Shown as Mixed crops</i></p> <p><b>Fruits &amp; plantation crops</b></p> <p>a. Banana</p> <p>b. Khasi mandarin</p> <p>c. Pine apple</p> <p>d. Hatkora(<i>Citrus macroptera</i> Montor)</p> <p>e. Arecanut</p> <p>f. Passion fruits</p> <p>g. Oilplam</p> <p>h. Assam lemon</p>	Weeding, Intercultivation to create soil mulch to conserve moisture. Protective irrigation if possible.	<p>a. Avoid applying fertilizer till there is sufficient moisture in the soil. Opening of alternate furrows.</p> <p>b. Mulching with green/ dry leaves</p> <p>c. Frequent intercultural operation for conservation of moisture</p> <p>d. Cover cropping with main crop</p> <p>e. Furrow application of FYM</p> <p>f. Soil moisture conservation measures to be followed</p> <p>g. Water harvesting in Jalkund for life saving irrigation</p>	With limited water availability prefers micro irrigation system Intercultivation implements/ machineries to be popularized through Govt. schemes.
	<b>2) Farming situation :</b>	<b>Cropping System:1</b> <b>Paddy based cropping</b>	Intercultivation to create soil mulch to conserve moisture.	Foliar N management (1% urea spray) instead	Construction of rain water

	Lowland farming situation , Red soil with moderate to high rainfall	<b>System</b> a. Paddy – Vegetables b. Paddy - Maize c. Paddy - Pulses d. Paddy - Oilseeds	Life saving irrigation from rain water harvest ponds,	of Top N dress only if the crop stand is still better, Spray of potassium nitrate and potassium chloride, Use local available plant material for mulch.	harvesting ponds through IWMP and MNREGS
<b>Mid season drought (long dry spell, consecutive 2 weeks rainless (&gt;2.5 mm) period)</b>	<b>Major Farming situation<sup>a</sup></b>	<b>Normal Crop/cropping system<sup>b</sup></b>	<b>Crop management<sup>c</sup></b>	<b>Soil nutrient &amp; moisture conservation measues<sup>d</sup></b>	<b>Remarks on Implementation<sup>e</sup></b>
<b>At flowering/ fruiting stage</b>	<b>1) Farming situation:</b> Upland rain fed ( <i>Jhum</i> cultivation) on hill slop Red soil with moderate to high rainfall, no irrigation facility. Crops are taken only during rainy season	<b>Cropping system 1: Paddy based cropping System</b> f. Paddy g. Paddy + Maize + Rice bean h. Paddy + Sesamum + Colocasia i. Paddy+ bird’s eye chillies j. Paddy + soybean	Weeding, Intercultivation to create soil mulch to conserve moisture. Protective irrigation if possible.	a. Mulching with green/ dry leaves b. Frequent interculture operation for conservation of moisture c. Cover cropping with main crop d. Furrow application of FYM e. Soil moisture conservation measures to be followed f. Water harvesting in Jalkund for life saving irrigation	Water harvesting structures under different schemes of state line departments and MNREGA for life saving irrigation. With limited water availability prefers micro irrigation system Intercultivation implements/ machineries to be popularized through Govt. schemes.
		<b>Cropping system 2: Maize based cropping system</b> i. Maize j. Maize + Soybean k. Maize+ Ricebean l. Maize + Ginger /Turmeric m. Maize + Bird’s eye chillies	Weeding, Inter-cultivation to create soil mulch to conserve moisture. Protective irrigation if possible.	a. Mulching with green/ dry leaves b. Frequent interculture operation for conservation of moisture c. Cover cropping	Water harvesting structures under different schemes of state line departments and MNREGA for life saving irrigation. With limited water

		<p>n. Maize+ Okra o. Maize +Cow pea p. Maize+ Sesamum + Colocasia</p>		<p>d. Furrow application of FYM e. Soil moisture conservation measures to be followed f. Water harvesting in Jalkund for life saving irrigation</p>	<p>availability prefers micro irrigation system Intercultivation implements/ machineries to be popularized through Govt. schemes..</p>
		<p><b>Cropping System/crops:3</b> <b>Horticulture crops</b> <b>Vegetable &amp; Spices crops</b> k. Ginger l. Turmeric m. Okra n. Pumpkin o. Ash gourd p. Bird's eye chillies q. Cowpea r. Brinjal s. Cucumber t. Bitter gourd etc. <i>Most of crops Shown as Mixed crops</i> <b>Fruits &amp; plantation crops</b> i. Banana j. Khasi mandarin k. Pine apple l. Hatkora(<i>Citurs macroptera</i> Montor) m. Arecanut n. Passion fruits o. Oilplam p. Assam lemon</p>	<p>Weeding, Intercultivation to create soil mulch to conserve moisture. Protective irrigation if possible.</p>	<p>a. Mulching with green/ dry leaves b. Frequent intercultural operation for conservation of moisture c. Cover cropping with main crop d. Furrow application of FYM e. Soil moisture conservation measures to be followed f. Water harvesting in Jalkund for life saving irrigation</p>	<p>Water harvesting structures under different schemes of state line departments and MNREGA for life saving irrigation. With limited water availability prefers micro irrigation system Intercultivation implements/ machineries to be popularized through Govt. schemes.</p>
	<p><b>3) Farming situation :</b> Lowland farming situation , Red</p>	<p><b>Cropping System:1</b> <b>Paddy based cropping System</b> e. Paddy – Vegetables f. Paddy - Maize</p>	<p>Intercultivation to create soil mulch to conserve moisture. Life saving irrigation from rain water harvest ponds,</p>	<p>a. Strengthening of field bunds, blocking drainage and seepage holes, Compartmental</p>	<p>Construction of rain water harvesting ponds through IWMP and MNREGS and</p>

	soil with moderate to high rainfall	g. Paddy - Pulses h. Paddy - Oilseeds		bunding b. In-situ water harvesting→ and recycling c. Provide dust mulching by→ hoeing with mechanical weeder	other govt, schemes.
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Condition	Major Farming situation <sup>a</sup>	Normal Crop/cropping system <sup>b</sup>	Suggested Contingency measures		
			Crop management <sup>c</sup>	Rabi Crop planning <sup>d</sup>	Remarks on Implementation <sup>e</sup>
Terminal drought (Early withdrawal of monsoon)	1) <b>Farming situation:</b> Upland rain fed ( <i>Jhum</i> cultivation) on hill slop Red soil with moderate to high rainfall, no irrigation facility. Crops are taken only during rainy season	<b>Cropping system 1: Paddy based cropping System</b> a. Paddy b. Paddy + Maize + Rice bean c. Paddy + Sesamum + Colocasia d. Paddy+ bird's eye chillies e. Paddy + soybean	1. Site specific crop management technologies 2. Life saving irrigation from rainwater harvest ponds. 3. If possible harvesting at physiological maturity	Sowing of French bean, leaf mustered Use local available plant material for mulch.	Construction of rain water harvesting ponds through IWMP and MNREGS
		<b>Cropping system 2: Maize based cropping system</b> a. Maize b. Maize + Soybean c. Maize+ Ricebean d. Maize + Ginger /Turmeric e. Maize + Bird's eye chillies f. Maize+ Okra g. Maize +Cow pea Maize+ Sesamum + Colocasia	1. Site specific crop management technologies 2. Life saving irrigation from rain water harvest ponds. 3. If possible harvesting at physiological maturity.	Sowing of French bean, leaf mustered Use local available plant material for mulch.	Construction of rain water harvesting ponds through IWMP and MNREGS
		<b>Cropping System/crops:3 Horticulture crops Vegetable &amp; Spices crops</b>	1. Site specific crop management technologies	Sowing of French bean, leaf mustered Use local available	Construction of rain water harvesting ponds



		<ul style="list-style-type: none"> <li>a. Ginger</li> <li>b. Turmeric</li> <li>c. Okra</li> <li>d. Pumpkin</li> <li>e. Ash gourd</li> <li>f. Bird's eye chillies</li> <li>g. Cowpea</li> <li>h. Brinjal</li> <li>i. Cucumber</li> <li>j. Bitter gourd etc.</li> </ul> <p><i>Most of crops Shown as Mixed crops</i></p> <p><b>Fruits &amp; plantation crops</b></p> <ul style="list-style-type: none"> <li>a. Banana</li> <li>b. Khasi mandarin</li> <li>c. Pine apple</li> <li>d. Hatkora(<i>Citrus macroptera</i> Montor)</li> <li>e. Arecanut</li> <li>f. Passion fruits</li> <li>g. Oilpalm</li> <li>h. Assam lemon</li> </ul>	<ul style="list-style-type: none"> <li>2. Life saving irrigation from rain water harvest ponds,</li> </ul>	plant material for mulch.	through IWMP and MNREGS
	<p><b>4) Farming situation :</b> Lowland farming situation , Red soil with moderate to high rainfall</p>	<p><b>Cropping System:1 Paddy based cropping System</b></p> <ul style="list-style-type: none"> <li>1. Paddy – Vegetables</li> <li>2. Paddy – Maize</li> <li>3. Paddy – Pulses</li> <li>4. Paddy - Oilseeds</li> </ul>	<ul style="list-style-type: none"> <li>1. Site specific crop management technologies</li> <li>2. Life saving irrigation from rain water harvest ponds,</li> <li>3. If rain comes Mustard /Torina sowing in mid September</li> </ul>	<p>Mustard/Toria seeds can be sown as broadcasting or zero-till methods in the lowland field.</p> <p>Sowing of French bean, leaf mustered</p>	<p>Construction of rain water harvesting ponds through IWMP and MNREGS,</p>

**Notes:**

- a. Describe the major farming situation to provide information on growing environment (rainfall and soil information - colour, depth & texture) such as low rainfall shallow red sandy loam soils, high rainfall deep black soils, uplands, medium lands, eroded hill slopes etc. tank fed black soils, shallow acid soils, sodic vertisols etc
- b. Describe the normal crop or cropping system grown in that farming situation including catch crop, sequence, rotation & variety if known

- c. Describe the alternative crop, variety and/or cropping pattern in view of the delay in monsoon and shortening of the growing period including delay in sowing of nurseries in case of paddy.
- In case of normal onset followed by early season droughts re-sowing may be recommended including variety seed rate etc.
  - In case of early or mid season dry spells indicate crop management techniques to save standing crop.
  - In case of terminal drought indicate giving life saving supplemental irrigation, if available or taking up harvest at physiological maturity with some realizable grain/fodder yield etc.
- d. Describe all agronomic practices which help in coping with late planting like increased or decreased spacing, changes in planting geometry, intercropping in case of sole crops, thinning, mulching, spray of anti-transpirants or other chemicals, supplemental irrigation, soil and moisture conservation practices like ridging, conservation furrows, dust mulch etc.
- In case of early and mid season dry spells indicate moisture conservation techniques to save standing crop.
  - In case of terminal drought indicate early rabi cropping with suitable crops/varieties with a possibility of giving pre-sowing/come up irrigation etc.
- e. Give details on the source of the breeder seed, in case an alternate crop or variety is suggested as part of the contingency. For agronomic measures, indicate any convergence possible with ongoing central or state schemes like National Rural Employment Guarantee Scheme (NREGS), Integrated Watershed Management Programme (IWMP), Rashtriya Krishi Vikas Yojana (RKVY), National Food Security Mission (NFSM), Integrated Scheme on Oilseeds, Pulses, Oilpalm and Maize (ISOPOM), National Horticulture Mission (NHM), Community Land Development Programme (CLDP) etc., to meet the cost of materials, labour or implements etc. to carry out any field based activity quickly.

**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>	Cropping system 1:	NA	NA	NA
		Cropping system 2:	NA	NA	NA
		Cropping system 3:	NA	NA	NA
	2) Farming situation:	Cropping system 1:	NA	NA	NA
		Cropping system 2:	NA	NA	NA
		Cropping system 3:	NA	NA	NA
			NA	NA	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>
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>	Cropping system 1:	NA	NA	NA
		Cropping system 2:	NA	NA	NA
		Cropping system 3:	NA	NA	NA
	2) Farming situation:	Cropping system 1:	NA	NA	NA
		Cropping system 2:	NA	NA	NA
		Cropping system 3:	NA	NA	NA
			NA	NA	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>	Cropping system 1:	NA	NA	NA
		Cropping system 2:	NA	NA	NA
		Cropping system 3:	NA	NA	NA
	2) Farming situation:	Cropping system 1:	NA	NA	NA
		Cropping system 2:	NA	NA	NA
		Cropping system 3:	NA	NA	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>
			NA	NA	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>	Cropping system 1:	NA	NA	NA
		Cropping system 2:	NA	NA	NA
		Cropping system 3:	NA	NA	NA
	2) Farming situation:	Cropping system 1:	NA	NA	NA
		Cropping system 2:	NA	NA	NA
		Cropping system 3:	NA	NA	NA
			NA	NA	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>
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</b>	Cropping system 1:	NA	NA	NA
		Cropping system 2:	NA	NA	NA
		Cropping system 3:	NA	NA	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>	Agonomic measures <sup>i</sup>	Remarks on Implementation <sup>j</sup>
	<b>black soils</b>				
	2) Farming situation:	Cropping system 1:	NA	NA	NA
		Cropping system 2:	NA	NA	NA
		Cropping system 3:	NA	NA	NA
Any other condition (specify)			NA	NA	NA
			NA	NA	NA
			NA	NA	NA

**Notes:**

<sup>f</sup> Describe such as uplands, medium and low lands and source of irrigation such as tank fed medium or deep black/loamy/red soils, tube well irrigated red soils, canal irrigated red soils, well irrigated black soils etc.,

<sup>g</sup> The normal crop or cropping systems grown in a given irrigated situation

<sup>h</sup> Suggested change in the crop, variety or cropping system in view of delay in release of irrigation water, less water availability etc.,

<sup>i</sup> All agronomic measures like improved methods of irrigation (skip row etc.), micro irrigation (drip/sprinkler/sub-surface), deficit irrigation, limited area irrigation, mulching etc, that improve water use efficiency and make best use of limited water including methods of ground water recharge and sharing.

<sup>j</sup> Comments on source of availability of seed of the alternate crop or variety, any constraints in marketing of alternative crop implications for livestock and dairy sectors and details of state or central schemes like National Rural Employment Guarantee Scheme (NREGS), Rashtriya Krishi Vikas Yojana (RKVY), National Food Security Mission (NFSM), Integrated Scheme on Oilseeds, Pulses, Oilpalm and Maize (ISOPOM), National Horticulture Mission (NHM) etc., which facilitate implementation of the agronomic measures suggested.

**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>				
Paddy	Provide drainage If possible	Drain out excess water,	Shifting to a safer place Dry in shade in a well ventilated space	Proper sun drying, keep away from storage pest.
Maize	Provide drainage	Provide drainage	Drain out excess water, harvest at physiological maturity	Storing the produce at dry place
Sesamum	Provide drainage	Provide drainage	Drain out excess water, harvest at physiological maturity	Storing the produce at dry place
Crop4				
Crop5				
<b>Horticulture</b>				

Okra	Provide drainage	Drainage , Application of hormones, nutrient, sprays to prevent flower drop	Drainage Harvesting of the produce before the rain occurs	Shifting of the produce to drier place, Cold storage
Birds eye chillies	Provide drainage	Drainage , Application of hormones, nutrient, sprays to prevent flower drop	Drainage Harvesting of the produce before the rain occurs	Shifting of the produce to drier place, Cold storage
Cucurbit vegetables	Provide drainage	Drainage , Application of hormones, nutrient, sprays to prevent flower drop	Drainage Harvesting of the produce before the rain occurs	Shifting of the produce to drier place, Cold storage
Solanaceous vegetables	Provide drainage	Drainage , Application of hormones, nutrient, sprays to prevent flower drop	Drainage Harvesting of the produce before the rain occurs	Shifting of the produce to drier place, Cold storage
Khasi Mandarin, Banana, pineapple, Arecanut, Hatkora, Papaya	Avoid waterlogging at the Collar portion	Avoid water logging at the Collar portion Application of hormones, nutrient, sprays to prevent flower drop.	Avoid water logging at the Collar portion	Store the produce at dry place
<b>Heavy rainfall with high speed winds in a short span<sup>2</sup></b>				
Paddy	Drainage if water logging persists Small seedlings withstand the problem	Drainage if waterlogging persists	Lodged panicles may be harvested at physiological maturity stage	Ensure drainage Harvesting at tender stages
Maize	Drainage if water logging persists Small seedlings withstand the problem	Drainage if waterlogging persists	Lodged crop may be harvested at physiological maturity stage	Ensure drainage Harvesting at tender stages
Sesamum	Drainage if water logging persists Small seedlings withstand the	Drainage if waterlogging persists	Lodged crop may be harvested at physiological maturity stage	Ensure drainage Harvesting at tender stages

	problem			
Crop4				
Crop5				
<b>Horticulture</b>				
Okra	Making of trenches/furrows in between ridges to facilitate drainage of excess water	Drainage if waterlogging persists Installation of wind breaks	Harvested crop at physiological maturity stage Installation of wind breaks	Provide drainage Stored at safer places
Birds eye chillies	Drainage if water logging persists Small seedlings withstand the problem	Drainage if waterlogging persists	harvested crop at physiological maturity stage Installation of wind breaks	Provide drainage Stored at safer places
Cucurbit vegetables	Drainage if water logging persists Small seedlings withstand the problem	Drainage if waterlogging persists	harvested crop at physiological maturity stage Installation of wind breaks	Provide drainage Stored at safer places
Solanaceous vegetables	Drainage if water logging persists Small seedlings withstand the problem	Drainage if waterlogging persists	harvested crop at physiological maturity stage Installation of wind breaks	Provide drainage Stored at safer places
Khasi Mandarin, Banana, pineapple, Arecanut, Hatkora, Papaya	Avoid waterlogging at the Collar portion	Installation of wind breaks, Propping	Installation of wind breaks, propping	Shifting of the produce to drier place, Cold storage
<b>Outbreak of pests and diseases due to unseasonal rains</b>				
Paddy	Spray tricyclazole against blast, Chloropyriphos, Regent against stem borer, Monocrotophos against Swarming caterpillar	Spray tricyclazole against blast, Chloropyriphos against stem borer, Monocrotophos against Swarming caterpillar & leaf folder	Malathion spray against Gundhi bug	Sun drying / disinfection of gunny bags with malathion or heat treatment to manage stored grain pests

Maize	Apply Phorate granules in the whorls & spray of Endosulfan against maize stem borer	Spray Dimethoate against aphid	Wrapping of cobs against bird damage	Store in clean godown, disinfection of gunny bags / storage structure with malathion
Sesamum	Removal of infested tips to manage leaf webber	Spraying of systemic insecticide against borers	Spray of Ekalux against capsule borer	Store in clean godown, disinfection of gunny bags / storage structure with malathion
Crop4				
Crop5				
<b>Horticulture</b>				
Solanaceous vegetables	Spraying malathion against beetle, hand collection of egg mass Soil drenching of COC & streptocycline against wilting	Application of Neem oil & Triazophos alternatively against brinjal fruit & shoot borer/ leaf curl virus,	Spraying of Profenophos against fruit borer Metalaxyl against Anthracnose	Segregation of infested fruits & destruction
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
Crop3				
Crop4				
Crop5				

<sup>k</sup>Such as drainage in black soils, indicate taking up need based inter-culture operations, outbreak of pests/diseases along with their management etc.



<sup>l</sup> Such as drainage in black soils, application of hormones/nutrient sprays to prevent flower drop or promote quick flowering/fruitletting and indicate possibility of pest/disease outbreak with need based prophylactic / curative management etc.

<sup>m</sup> Such as drainage in black soils, measures for preventing seed germination etc and Indicate possibility of harvesting at physiological maturity immediately and shifting produce to safer place and protection against pest/disease damage in storage etc.

<sup>n</sup> Such as shifting of produce to safer place for drying and maintaining the quality of grain/fodder and protection against pest/disease damage in storage etc

### 2.3 Floods

Condition	Suggested contingency measure <sup>o</sup>			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
<b>Transient water logging/ partial inundation<sup>1</sup></b>				
Rice,	Provide drainage Spray clean water to clear up the leaves If seedlings damaged reseedling Community nursery raising	a. Provide drainage b. If damage is more than 50% retrans plant or put pregerminated sprouted seeds on puddle soil with higher seed rate and closer spacing c. Transplant 40 – 60 days old seedling after flood water residues d. Apply moderate dose of fertiliser	a. Early drainage b. Rinsing the top leaves and floral parts c. If revival is not possible go for paira cropping pea and mustard	a. Provide drainage b. Harvesting and drying of produce c. Plan for rabi crop
Maize, Sesamum	Drain out excess water, Gap filling and drenching with fungicide to prevent seedling rot	Drain out excess water, Weeding and top dressing	Drain out excess water	Drain out excess water, Harvesting and drying of earheads
<b>Horticulture</b>				
Okra, Birds eye chillies, Cucurbit vegetables, Solanaceous vegetables	Cleaning of channels in between the raised nursery bed.	Drain out excess water	Drain out excess water	Drain out excess water
Khasi Mandarin, Banana, pineapple, Arecanut, Hatkora, Papaya	Provision for proper drainage	Drain out excess water	Drain out excess water	Drain out excess water
Crop <sup>3</sup>				
<b>Continuous submergence for more than 2 days<sup>2</sup></b>				
Rice	Drain out excess water	Drain out excess water,	Drain out excess water;	Drain out excess water,

		Weeding and top dressing	Tying up of lodged plants	Tying up of lodged plants drying of earheads and Harvesting
Maize, Sesamum	Drain out excess water, Gap filling	Drain out excess water, Weeding and top dressing	Drain out excess water, Earthing up of maize plant; Tying up of lodged plants	Drain out excess water, Harvesting and drying of Cobs/plants
<b>Horticulture</b>				
Okra, Birds eye chillies, Cucurbit vegetables, Solanaceous vegetables	Crop cannot survive	-	-	-
<b>Sea water intrusion<sup>3</sup></b>	NA	NA	NA	NA
Crop1	NA	NA	NA	NA
Crop2	NA	NA	NA	NA
Crop3	NA	NA	NA	NA
Crop4	NA	NA	NA	NA
Crop5	NA	NA	NA	NA

**Notes:**

<sup>1</sup> Water logging due to heavy rainfall, poor drainage in vertisols, flash floods in streams and rivers due to high rainfall, breach of embankments

<sup>2</sup> If the water remains in the field due to continuous rains, poor infiltration and push back effect

<sup>3</sup> Entry of sea water into cultivated fields in coastal districts due to tidal wave during cyclones or tsunamis; intrusion of seawater into groundwater in coastal districts

<sup>0</sup> Crop/field management depends on nature of material (sand or silt) deposited during floods. In sand deposited crop fields/ fallows indicate ameliorative measures such as early removal of sand for facilitating *rabi* crop or next kharif. In silt deposited indo-gangetic plains, indicate early *rabi* crop plan in current cropped areas and current fallow lands. Indicate drainage of stagnating water and strengthening of field bunds etc. In diara land areas indicate crop plans for receding situations. Usually rice cropped areas are flood prone causing loss of nurseries, delayed transplanting or damage to the already transplanted fields etc. Indicate community nursery raising, scheduling bushenings, re-transplanting in damaged fields and transplanting new areas or direct seeding including seed availability so that the season is not lost. Indicate steps for preventing pre-mature germination of submerged crop at maturity or harvested produce.

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

Extreme event type	Suggested contingency measure <sup>f</sup>			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave <sup>p</sup>	NA	NA	NA	NA
Crop1	NA	NA	NA	NA
Crop2	NA	NA	NA	NA
Crop3	NA	NA	NA	NA
Crop4	NA	NA	NA	NA

Crop 5	NA	NA	NA	NA
<b>Horticulture</b>	NA	NA	NA	NA
Crop1 (specify)	NA	NA	NA	NA
Crop2	NA	NA	NA	NA
Crop3	NA	NA	NA	NA
<b>Cold wave<sup>9</sup></b>	NA	NA	NA	NA
Crop1	NA	NA	NA	NA
Crop2	NA	NA	NA	NA
Crop3	NA	NA	NA	NA
Crop4	NA	NA	NA	NA
Crop 5	NA	NA	NA	NA
<b>Horticulture</b>	NA	NA	NA	NA
Crop1 (specify)	NA	NA	NA	NA
Crop2	NA	NA	NA	NA
Crop3	NA	NA	NA	NA
<b>Frost</b>	NA	NA	NA	NA
Crop1	NA	NA	NA	NA
Crop2	NA	NA	NA	NA
Crop3	NA	NA	NA	NA
Crop4	NA	NA	NA	NA
Crop 5	NA	NA	NA	NA
<b>Horticulture</b>	NA	NA	NA	NA
Crop1 (specify)	NA	NA	NA	NA
Crop2	NA	NA	NA	NA
Crop3	NA	NA	NA	NA
<b>Hailstorm</b>				
Crop1	NA	NA	NA	NA
Crop2	NA	NA	NA	NA
Crop3	NA	NA	NA	NA
Crop4	NA	NA	NA	NA
Crop 5	NA	NA	NA	NA
<b>Horticulture</b>				
Cucurbits	NA	Remove the affected	NA	NA

		plants and top dress with urea		
Banana, papaya	NA	NA	Harvested at green stage or table purpose, No problem for marketing as it has buyers' preference	Store for ripening in closed godowns for marketing
<b>Cyclone</b>				
Paddy	Re-sowing of crop. Cultivation of Short duration varieties	NA	NA	Timely broadcast and telecast and other types of announcement warning regarding cyclone. Harvest crop as much as possible. Store harvest crop at safe place Emphasis should be given on forthcoming rabi crops Supply of seeds and other agro-inputs of <i>rabi</i> crops at subsidized rate, provision of bank loan etc
Crop2	NA	NA	NA	NA
Crop3	NA	NA	NA	NA
Crop4	NA	NA	NA	NA
Crop 5	NA	NA	NA	NA
<b>Horticulture</b>	NA	NA	NA	NA
Banana	Replanting of suckers Growing more wind tolerant varieties i.e. dwarf Cavendish to minimize loss. Provision of wind break to reduce wind speed	NA Provision of wind break to reduce wind speed	Propping of plants to avoid fall down. Harvested at green stage or table purpose.	Propping of plants to avoid fall down. Harvested mature bunches and store for ripening in closed godowns for marketing

Citrus	Replanting of seedling/ sapling Provision of wind break to reduce wind speed	Provision of wind break to reduce wind speed	Provision of wind break to reduce wind speed	Harvested mature and ripe fruits Provision of wind break to reduce wind speed
Papaya	Resowing of seeds in nursery. Growing dwarf varieties i.e. Pusa Nanha etc. Replanting of seedling Provision of wind break to reduce wind speed	NA Provision of wind break to reduce wind speed	Propping of plants to avoid fall down. Harvested at green stage or table purpose. Provision of wind break to reduce wind speed	Propping of plants to avoid fall down. Harvested mature bunches and store for ripening in closed godowns for marketing

<sup>p</sup> In regions where the normal maximum temperature is more than 40°C, if the day temperature exceeds 3°C above normal for 5 days it is defined as heat wave. Similarly, in regions where the normal temperature is less than 40°C, if the day temperature remains 5°C above normal for 5 days, it is defined as heat wave.

<sup>q</sup> In regions where normal minimum temperature remains 10°C or above, if the minimum temperature remains 5°C lower than normal continuously for 3 days or more it is considered as cold wave. Similarly in regions with normal minimum temperature is less than 10°C, if the minimum temperature remains 3°C lower than normal it is considered as cold wave

<sup>r</sup> Indicate appropriate crop/soil management measures depending upon the crop and its stage for alleviating the specified stress.

## 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	1. Storage of feed ingredients maize, rice polish etc. 2. Storage of rice straw silage making 3. Cultivation of perennial grass, fodder grass etc.	1. Restricted Stall feeding 2. Utilization of agriculture, house hold waste etc especially for pigs	1. Rain fed cultivation of both perennial and seasonal fodder 2. Utilization of fodder tree leaves.
Drinking water	1. Provision of either shallow tube well or ring well 2. Community water tank if possible	1. Economizing of water use 2. Utilization of shallow tube or ring well	1. Community water tank if possible

		3. Community water tank if possible	
Health and disease management	1. Vaccination programs 2. Anti-stress management	1. Heat stress management with restricted movement 2. Showering facility	1. Health tonics and Vitamins 2. Disease management
<b>Floods</b>			
Feed and fodder availability	a. Storage of feed ingredient (wheat bran, Rice polish) b. Straw, processed fodder above the water level of last major flood.	a. Community shelter b. Restricted stall feeding c. Fodder tree leaves.	a. Cultivation of seasonal and perennial fodder crop b. Utilization of fodder tree leaves
Drinking water	a. Overhead storage water tank	Utilization of chemical treated (Chlorinated) water Boiled water	Community tank
Health and disease management	a. Vaccination against FMD, HS, BQ b. De-worming	a. Community rescue centre b. Quarantine/ Isolation facility c. Vaccination/ Treatment	a. Post flood disease management (Vaccination/Treatment/ Isolation) b. Quarantine/ Isolation of any suspected animal
<b>Cyclone</b>			
Feed and fodder availability	1. Storage of feed ingredients maize, rice polish etc. 2. Storage of rice straw silage making		
Drinking water	1. Provision of ground water harvesting		
Health and disease management	1. Vaccination program 2. Deworming	1. Community rescue program if possible 2. Vaccination 3. Community quarantine facility provision	1. Post cyclone disease management 2. Post vaccination wherever possible 3. Deworming
<b>Heat wave and cold wave</b>			
Shelter/environment management	Provision of community shelter if possible	1. Utilization of community shelter if possible 2. Provision of shelter against extreme weather	
Health and disease management	Provision of community shelter if possible	1. Utilization of community shelter if possible 2. Provision of shelter against extreme weather	

<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	Early storage of feed ingredients	1. Economize feeding 2. Reduction of stock if possible	1. Restricted feeding 2. Reduction of stock if possible	<b>NEDP</b>
Drinking water	Provision of water storage	Economize use of water	Economize use of water	<b>NEDP</b>
Health and disease management	Vaccination program	Health management strictly adhered to	Health management strictly adhered to	<b>NEDP</b>
<b>Floods</b>				
Shortage of feed ingredients	Storage of feed ingredients	Reducing the stock	Reducing the stock and restricted feeding	<b>NEDP</b>
Drinking water	Over head water reservoir, Jal kund construction	Use boiled water	Use boiled water.	<b>NEDP</b>
Health and disease management	Strategic vaccination of the bird for all possible diseases	Preventive doses of antimicrobial drug, biosecurity, electrolyte powder in day to day management	Preventive doses of antimicrobial drug, biosecurity, electrolyte powder in day to day management	<b>NEDP</b>
<b>Cyclone</b>				
Shortage of feed ingredients	Storage of feed ingredients	Restricted feeding and reducing stock if possible	Restricted feeding	<b>NEDP</b>
Drinking water	Provision of ground water	Clean water	Clean water	<b>NEDP</b>
Health and disease management	Vaccination program	Health management strictly adhered to	Health management strictly adhered to	<b>NEDP</b>
<b>Heat wave and cold wave</b>				
Shelter/environment management	Provision of shelter against extreme weather	Provision of shelter against extreme weather	Provision of shelter against extreme weather	<b>NEDP, NLUP</b>

Health and disease management	Vaccination programs	Health management strictly adhered to	Health management strictly adhered to	<b>NEDP</b>

<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			
Inland			
(i) Shallow water depth due to insufficient rains/inflow			
(ii) Changes in water quality			
(iii) Any other			
<b>B. Aquaculture</b>			
(i) Shallow water in ponds due to insufficient rains/inflow	Shallow water in ponds due to insufficient rains/inflow	1. Supplementary water harvest structures like pond and tanks has to be developed. 2. Renovation and maintenance of existing water harvest structures	1. Restrict lifting of water for irrigation purpose of crops 2. Catch the stock, market the produce to reduce the density of population in ponds.
(ii) Impact of salt load build up in ponds / change in water quality	Impact of heat in ponds / change in water quality	1. Prepare to release water into the habitat	1. Mixing of water from the water harvest structure like ponds and tanks into the fish habitat.
(iii) Any other			
<b>2) Floods</b>			
<b>A. Capture</b>			
Marine			
Inland			
(i) No. of boats / nets/damaged			
(ii) No. of houses damaged			
(iii) Loss of stock			
(iv) Changes in water quality			
(v) Health and diseases			
<b>B. Aquaculture</b>			
(i) Inundation with flood water	1. Storage of sand filled bags for	1. Timely broadcast and telecast	1. Relief operation will continue.



	emergency use. 2. Repair and maintenance of bunds. 3. Insurance coverage provision for life and property	and other types of announcement warning about the danger level with respect to water level. 2. Relief operation.	2. Care of health of affected people 3. Settlement of insurance. 4. Financial support to other people.
(ii) Water contamination and changes in water quality	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 2. Application of Alum. 3. Application of KmnO4
(iii) Health and diseases	Stock preventive medicines, vaccines	Prevent influx of diseased fish from outside source, Check through nets Administer medicines through random catch Disinfect water by lime , KMnO4	1. Application of lime and KmnO4. 2. Assessment of the health status of fish and accordingly control measure should be taken. 3. Control on transport of brooders and seeds.
(iv) Loss of stock and inputs (feed, chemicals etc)	1. Strengthening and increase in dyke height. 2. Before flood the stock should be harvested and sold in flood prone areas. 3. Transport of feed and chemicals to safer place. 4. Purchase of feeds and chemicals on weekly or fortnightly basis. 5. Insurance coverage for stock.	1. Net enclosure should be provided over the dyke to prevent the escape of fish from pond. 2. Water should be diverted from the main stream. 3. Sand bags can be used for protection of dykes. 4. Storing of feed and chemicals to safer place.	1. Stock assessment and restocking with advanced fingerlings or yearling if required. 2. Repairing of dykes. 3. Assessment of quality of feed and fertilizer. 4. Assessment and settlement of insurance.
(v) Infrastructure damage (pumps, aerators, huts etc)	Construction of flood shelter for pumps, aerators etc.	-	1. Repairing of pumps, aerators if required. 2. Repairing of damaged hut.
(vi) Any other			
<b>3. Cyclone / Tsunami</b>	NA	NA	NA
A. Capture	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. Aquaculture	NA	NA	NA
(i) Overflow / flooding of ponds	NA	NA	NA
(ii) Changes in water quality (fresh	NA	NA	NA

water / brackish water ratio)			
(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)	NA	NA	NA
(ii) Health and Disease management	NA	NA	NA
(iii) Any other	NA	NA	NA

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