State: Tripura

Agriculture Contingency Plan for District: Khowai

1.0 District Agriculture profile					
1.1.	**Agro-Climatic/Ecological Zone**	The Humid Eastern Himalayan Region and the islands			
	Agro Ecological Sub Region (ICAR)	15biii Dc2 3h $B_2$10 (Humid Hyperthermic with LGP .300 days and moisture index 40-60%. Soils red and lateritic)			
	Agro –Climatic Region (Planning Commission)				
	Agro-Climatic Zone (NARP)	Humid Dissected Mounts and Valleys, Sub-Humid Dennunded Hills			
	List all the districts or part thereof falling under the NARP Zone	Parts of West,Dhalai and North districts			
	Geographic coordinates of district	Latitude	Longitude	Altitude	
		24.1 ^{0}N	91.63^{0}E	23 m (75 ft)	
	Name and address of the concerned ZRS/ ZARS/RARS/RRS/RRTTS/HRC	ICAR RCNEHR, Lembucherra and Horticulture Research Complex (HRC), Nagicherra.			
	Mention the KVK located in the district	Krishi Vigyan Kendra, Khowai, Chebri, Khowai			
1.2	**Rainfall(Data Source: Director of Agriculture,Govt of Tripura)**	Normal RF(mm)	Normal Rainy Days Number)	Normal (specify week and month	Normal cessation (specify week and month)
	SW monsoon (June-Sep)	1366.05	79	1st week June	3rd week September
	NE Monsoon (Oct-Dec)	195.25	6	1st week October	2nd week December
	Winter (Jan – March)	99.6	7	2nd week March	3rd week January
	Summer (Apr-May)	530.6	27	2nd week May	2nd week April
	Annual	2191.5	119	June	December

1.3	Land use Pattern of the District (latest Statistics) (Data Source: Director of Agri,GOT)	Geographical Area	Forest area	Land under Non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc.tree Crops and groves	Barren and Uncultivable Land	Current Follows	Other follows
	Area (Lakh ha.)	0.92	0.54	0.050	Nil	0.0011	0.0012	0.00453	0.0005	0.001

1.4	**Major Soils (common names like Shallow red soils etc.,)**	**Area ('000 ha.)**	**Percent (%) of total**
	1. Tilla land(lateritic red soil)	Data Not Available	Data Not Available
	2. Plain and lunga land(Sandy loam)		
	3. Marshy land(Alluvial soil)		
	Others (specify)		
1.5	**Agricultural land use** (Data Source: Director of Agri,GOT)	**Area ('000 ha.)**	**Cropping intensity %**
	Net sown area	32.86	168
	Area sown more than once	23.10	
	Gross cropped area	55.96	

1.6	**Irrigation**	**Area ('000 ha.)**		
	Net irrigated area	6.287		
	Gross irrigated area	9.71		
	Rainfed area	26.573		
	Sources of Irrigation	**Number**	**Area ('000 ha.)**	**Percentage of total irrigated area**
	Lift irrigation	135	4.13	42.5
	Deep tube well	17	0.209	2.15
	Diversion	6	0.82	8.44
	Shallow tube well	453	0.309	3.18
	Over flow	3342	1.854	19.09
	Pump sets	808	0.808	8.32
	Water harvesting structure	235	0.075	0.77
	Common tanks	73	0.074	0.76

	Groundwater availability and use* (Data source: State/Central Ground water Department/Board)	**No.of blocks/Tehisils**	**(%) area**	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited	Data not available	Data not available	NA
	Critical			
	Semi Critical			
	Safe			
	Waste water availability and use			
* Over-exploited groundwater utilization>100%; critical: 90-100%, semi critical : 70-90%; safe : < 70%				

1.7 Area under major field crops & horticulture etc. (Data Source: Director of Agri and Director of Horti and Soil Conservation,GOT)

1.7		**Major Field Crops cultivated**	**Area ('000 ha.)**						
			Kharif		**Rabi**		**Pre-Kharif**		**Total**
			Irrigated	**Rainfed**	**Irrigated**	**Rainfed**	**Irrigated**	**Rainfed**	
	1	Rice		14.063	5.581			2.643	23.889
	2	Maize							0.354
	3	Rape Seed and Mustard							0.339
	4	Sesamum							0.135
	5	Arhar							0.163
	6.	Pea							0.133
		Horticulture crops-Fruits	**Total area**		**Irrigated**		**Rainfed**		
	1	Mango	0.878		NA				
	2	Pine apple	0.813						
	3	Orange	0.222						
	4	Jack fruit	0.490						
	5	Banana	1.490						
		Horticulture crops-Vegetables	**Total area**		**Irrigated**		**Rainfed**		
	1	Potato	0.618		0.618		-		
	2	Brinjal	0.470		0.245		0.225		
	3	Cabbage	0.390		0.345		0.045		
	4	Cauliflower	0.325		0.320		0. 005		
	5	Raddish	0.275		0.275		-		

		Medicinal and Aromatic crops	**Total area**	**Irrigated**	**Rainfed**
	1	Ginger	0.151		
	2	Turmeric	0.108		
	3	Black Pepper	0.0 26		
		Plantation crops	**Total area**	**Irrigated**	**Rainfed**
	1	Coconut	0.654		
	2	Arecanut	0.399		
	3	Cashew nut	0.217		
		Fodder crops	**Total area**	**Irrigated**	**Rainfed**
	1	Napier	7.12 Ha	NA	7.12 Ha
	2	Congo Signal			
	3	Stylo			
	4	Mulberry			
		Total fodder crop area			
		Grazing land	Data Not Available	Data Not Available	
		Sericulture etc.			
		Others (Specify)			

1.8	**Livestock(Data Source: Director of Animal Resource Deptt,GOT)**	**Male('000)**	**Female('000)**	**Total('000)**
	Non descriptive Cattle (Local low yielding)	51.469	130.788	182.257
	Crossbred cattle	2.66	10.731	13.391
	Non descriptive Buffaloes(local low yielding)	0.277	0.411	0.688
	Graded Buffaloes	0.277	0.134	0.411
	Goat	28.837	51.184	80.021
	Sheep	0.039	0.077	0.116
	Pig	28.048	23.519	51.567
	Rabbit	0.045	0.067	0.112
	Dog	2.046	1.231	3.277
1.9	**Poultry**	**No.of farms**	**Total No. of birds ('000)**	
	Commercial		172.728	
	Backyard		367.967	

	Fisheries (Data source: Director of Fisheries,GOT)						
	A. **Capture**						
	i) **Marine** (Data Source: Fisheries Department)	No. of Fishermen	**Boat**		**Nets**		**Storage facilities (ice plants etc.)**
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake and trap nets)	
	ii) **Inland** (Data Source: Fisheries Department)	**No. of farmers owned ponds**		**No. of Reservoirs**		**No. of village tanks**	
				NIL		Data not available	
	B. **Culture**						
		Water Spread Area (ha)		**Yield (t/ha)**		**Production ('MT)**	
	i) **Brackish Water** (Data source: MPEDA/Fisheries Department)	–		–		–	
	ii) **Fresh water** (Data source: Fisheries Department)	2805.76		2.45		7822.67	
	Others						

1.11 Production and productivity of major crops (Average of last 5 years))(Data Source: Director of Agri and Director of Horti and Soil Conservation, GOT)

1.11	**Name of crop**	**Kharif**		**Rabi**		**Pre-Kharif**		**Total**		**Crop Residue as fodder ('000 tons)**
		Production ('000 t)	**Productivity (kg/ha)**	**Production ('000 t)**	**Productivity (kg/ha)**	**Production ('000 t)**	**Productivity (kg/ha)**	**Production ('000 t)**	**Productivity (kg/ha)**	
Major Field crops (Crops to be identified based on total acreage)*										
Crop 1	Paddy	44.408	3158	16.266	2915	7.485	2294	68.159	2853	
Crop 2	Maize	-	-	-	-	-	-	0.469	1354	
Crop 3	Rape Seed and Mustard	-	-	-	-	-	-	0.269	742	
Crop 4	Sesamum	-	-	-	-	-	-	0.054	497	

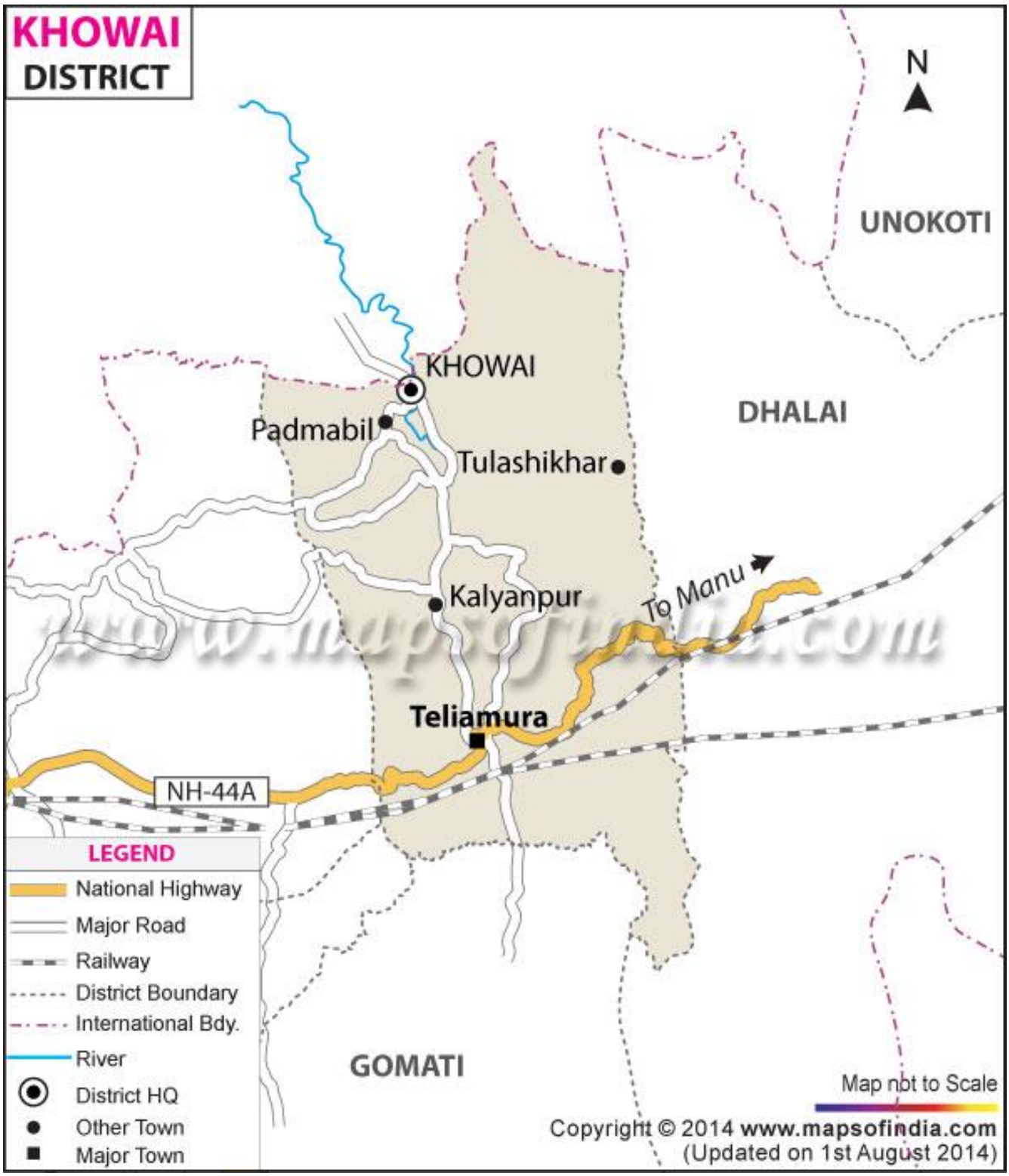
Crop 5	Arahar	-	-	-	-	-	-	0.116	721	
Crop 6	Pea	-	-	-	-	-	-	0.089	689	
Crop 7										
Others										
Major Horticultural crops (Crops to be identified based on total acreage)*										
Crop 1	Banana	-	-	-	-	-	-	15.123	10100	
Crop 2	Mango	-	-	-	-	-	-	4.874	5600	
Crop 3	Pineapple	-	-	-	-	-	-	11.66	14300	
Crop 4	Coconut	-	-	-	-	-	-	1.845	2820	
Crop 5	Potato			10.902	17640			10.902	17640	
Crop 6	Jackfruit							14.121	28820	
Crop 7	Lemon							2.477	5020	
Crop 8	Brinjal	4.225	18800	3.006	12270			7.231	15535	
Crop 9	Aracanut							1.243	3120	
Crop 10	Cabbage	0.463	10290	9.657	27990			10.12	19140	

*Source: Director of Horti and Soil Conservation, GOT

1.12	**Sowing window for 5 major field crops** (Pre Kharif-Rainfed-Irrigated)	Crop 1: Rice	2. Mustard	3. Maize	4. Groundnut	5. Lentil
	Pre-Kharif- Rainfed	3rd week of May to 1st Week of June				
	Kharif – Rainfed	1st week of July- 4th week of July	-	1st week of July	June-July	-
	Kharif – Irrigated	1st of July -15th of August	-	-	-	-
	Rabi – Rainfed	Nov-Dec	15th Oct-15th Nov	-	-	Mid Oct- Mid Nov
	Rabi - Irrigated	Nov-Dec	-	1st week of November	Mid Sept- Mid Oct	-

1.13	**What is the major contingency the district is prone to?** (Tick mark and mention years if known during the last 10 year period)	Regular			Occasional			None
	Drought					√		
	Flood					√		
	Cyclone							✓
	Hail storm							✓
	Heat wave							√
	Cold wave							√
	Frost							√
	Sea water intrusion							√
	Pests and diseases (specify)							√
	Late blight of potato		√					
	Root rot of vegetables					√		
	Brinjal fruit and shoot borer		√					
	Fruit fly of cucurbits		√					
	Red mite					√		
	Downey mildew of cucurbits		√					
	Others							
1.14	**Include Digital maps of the district for**	Location map of district within State as Annexure 1			Enclosed : Yes			

Location map of district Khowai within State as Annexure 1



2.0 Strategies for weather related contingencies
2.1 Drought

2.1.1. Rainfed situation(Pre-Kharif)

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming Situation[a]**	**Normal Crop/Cropping System[b]**	**Change in crop/cropping System[c]**	**Agronomic Measures[d]**	**Remarks on Implementation[e]**
Delay by 2 Weeks (Specify Month)* **May 3rd Week to June 1st Week)** **(REFER TO THE MATRIX TABLE)**	Moderately steeply sloping hill top and hill slopes with deep to very deep fine loamy soils	Crops: Jhum cultivation of rice, maize Cropping system: Mono cropping of Paddy/Maize	Short or medium duration HYV paddy should be introduced (Jhum var. Adama Kinting, Gora Malati, Madhu Malati) (Monocrpping var. Gomati, Tripura Chikon) Single crossed hybrid maize can be introduced.	Conservation practices should be encouraged; instead of burning decomposition of plant parts should be encouraged. Mulching, Rain water Harvesting,Contour planting of Arhar should be encouraged instead of Jhum cultivation to check soil and water loss.	IWMP, MGNREGA, RKVY, NFSM

	Gently to moderately sloping undulating plains with deep fine loamy soils	Crops: Paddy/Maize - Mustard/Lentil/Pea/Ground nut/Maize Cropping system: Paddy/Maize – Lentil/Pea/Maize/Mustard/Rape Seed/Ground Nut	Green manuring of Dhaincha can be included prefer medium duration HYV paddy varieties, Single cross hybrid variety of maize can be included. Summer green gram can also be included where paddy cultivation is problematic due to scarcity of water.	Adopt SRI paddy cultivation, Adopt zero or minimum tillage, Use paddy transplanted machine for timely quick sowing, Promote community nursery bed, Raised bed furrow irrigation method of maize.	RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS,NFSM
	Very gently sloping flood plains with very deep fine loamy soils Very gently sloping flood plains with deep clayey soils	Crops: Paddy/Summer Vegetables – Mustard/Pea/Lentil/Winter Vegetables/Ground nut/Paddy Cropping System: Paddy-Pea/Lentil/Mustard/Rape Seed /Maize/Vegetables	Green manuring of Dhaincha can be included prefer medium duration HYV paddy varieties. (Sohobhagi Dhan, Gomoti) Medium duration drought tolerant maize var. (RCM 76), Black gram (Tripura Maskoloi) can be adopted.	Timely land preparation, sowing & Transplanting. Rain water harvesting by 30 cm high bunding. Utilization of waters for irrigation from nearby beels, ponds, rivers, natural depressions etc. Promote community nursery bed, Zero tillage or minimum tillage should be encouraged in case of mustard, lentil.	AAU, IIPR, CRRI, ICAR-Tripura centre, HRS, (MGNREGA RKVY, IWMP, NHM,NFSM)

2.1.2. Rainfed situation (Kharif)

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming Situation[a]**	**Normal Crop/Cropping System[b]**	**Change in crop/cropping System[c]**	**Agronomic Measures[d]**	**Remarks on Implementation[e]**
Delay by 2 Weeks (Specify Month)* June 3rd Week (REFER TO THE MATRIX TABLE)	Moderately steeply sloping hill top and hill slopes with deep to very deep fine loamy soils	Crops: Jhum cultivation of rice, maize. Cropping system: Mono cropping of Paddy/Maize	Short or medium duration HYV paddy should be introduced (var. CO 51, Gomati) Single crossed hybrid maize can be introduced.	Conservation practices should be encouraged instead of burning decomposition of plant parts should be encouraged. Mulching, Community Paddy nursery, inter cropping of cow pea can be encouraged along with maize.	IWMP, RKVY, MGNREGA, NFSM
	Gently to moderately sloping undulating plains with deep fine loamy soils	Crops: Paddy/Maize - Mustard/Lentil/Pea/Ground nut/Maize Cropping system: Paddy/Maize – Lentil/Pea/Maize/Mustard/Rape Seed/Fallow	No change. Preference should be given to medium duration paddy varieties.	Adopt SRI paddy cultivation, Adopt zero or minimum tillage in case of lentil, mustard, Use paddy transplanter for timely quick sowing, Promote community paddy nursery bed	RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS,NFSM

	Very gently sloping flood plains with very deep fine loamy soils	Crops: Paddy –Mustard/Pea/Lentil/Winter Vegetables/Ground nut/Paddy/Fallow Cropping System: Paddy-Pea/lentil/Mustard/Rape Seed/Maize/Vegetables/Paddy/Fallow	No change, prefer medium duration HYV paddy varieties.	Timely land preparation, sowing & Transplanting. Rain water harvesting by 30 cm high bunding. Utilization of waters for irrigation from nearby beels, ponds, rivers, natural depressions etc, SRI Technology should be properly adopted, Timely weeding, at critical growth stages and short duration drought tolerant crops should be grown.	AAU, IIPR, CRRI, ICAR-Tripura centre, HRS, (MGNREGA, RKVY, IWMP, NHM,NFSM)

		Crops: Paddy –Mustard/Pea/Lentil/Winter Vegetables/Ground nut/Paddy Cropping System: Paddy-Pea/lentil/Mustard/Rape Seed/Maize/Vegetables/Paddy/Fallow	No change, prefer medium duration HYV paddy varieties.	Preparation of seed bed & main field immediately after rainfall. Rain water harvesting by 30 cm high bunding. Utilization of waters for irrigation from nearby beels, ponds, rivers, natural depressions etc. Keep constant visit in the field to check any cracks & crevices and take immediate measures by repairing/mud plastering. SRI Technology should be properly adopted, Timely weeding, at critical growth stages and short duration drought tolerant crops should be grown.	RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS,NFSM AAU, IIPR, CRRI, ICAR-Tripura centre, HRS, (MGNREGA, RKVY, IWMP, NHM,NFSM)

Condition			**Suggested Contingency measures**		
Early season Drought (delayed onset)	**Major Farming Situation[a]**	**Normal Crop/Cropping System[b]**	**Change in crop/cropping System[c]**	**Agronomic Measures[d]**	**Remarks on Implementation[e]**
Delay by 4 Weeks (Specify Month) July 1st week	Moderately steeply sloping hill top and hill slopes with deep to very deep fine loamy soils	Jhum cultivation of rice, maize. Cropping system: Mono cropping of Paddy/Maize	Short or medium duration HYV paddy (var. Gomati, CO 51) should be introduced, Single crossed hybrid maize can be introduced.	Conservation practices should be encouraged instead of burning decomposition of plant parts should be encouraged. Mulching, Community Paddy nursery,inter cropping of cow pea can be encouraged along with maize.	RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS,IWMP, MGNREGA, RKVY, NHM,NFSM
	Gently to moderately sloping undulating plains with deep fine loamy soils	Crops: Paddy/Maize - Mustard/Lentil/Pea/Ground nut/Maize Cropping system: Paddy/Maize – Lentil/Pea/Maize/Mustard/Rape Seed/Fallow	No change. Prefer short duration varieties **(**MTU 1010, Naveen), Adopt relay cropping in rabi season in pulses and oil seeds.	Transplant 3-4 seedlings/hill in conventional cultivation of paddy, Adopt SRI paddy cultivation, Adopt zero or minimum tillage in lentil and mustard, Use paddy transplanter machine for timely quick sowing, Promote community seed bed	RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS

	Very gently sloping flood plains with very deep fine loamy soils Very gently sloping flood plains with deep clayey soils	Crops: Paddy – Mustard/Pea/Lentil/Winter Vegetables/Ground nut/Paddy/Fallow Cropping System: Paddy-Pea/lentil/Mustard/Rape Seed/Maize/Vegetables/Paddy/Fallow	No change, prefer short duration paddy variety	Resowing or delay sowing , Timely weeding, Community paddy nursery, proper adaptation of SRI, Early sowing of rapeseed. Soil & moisture conservation measures (Organic mulches + more FYM).Timely land preparation & sowing. Seed soaking for toria. Weeding & breaking of soil mulch by finger weeder. Ridge & furrow cultivation of Maize. Grow short duration pulses (Black gram, Pea etc.). Utilization of waters for irrigation from nearby beels, ponds, rivers, natural depressions etc.	DMR, RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HR MGNREGA (RKVY, IWMP, NHM,NFSM)
Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming Situation[a]**	**Normal Crop/Cropping System[b]**	**Change in crop/cropping System[c]**	**Agronomic Measures[d]**	**Remarks on Implementation[e]**

Delay by 6 Weeks (Specify Month July 3rd week	Moderately steeply sloping hill top and hill slopes with deep to very deep fine loamy soils	Jhum cultivation of rice, maize. Cropping system: Mono cropping of Paddy/Maize	Cultivation of short duration rice variety (NDR 97, Luit, Disang), Single cross hybrid (var. Ganga 4, Ganga 5) for maize.	Conservation practices should be encouraged instead of burning decomposition of plant parts should be encouraged. Mulching, Community Paddy nursery,inter cropping of cow pea can be encouraged along with maize.	RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS NHM, , MGNREGA RKVY,NFSM, State Agril. department
	Gently to moderately sloping undulating plains with deep fine loamy soils	Crops: Paddy/Arahar/Maize/Ground nut.-Mustard/Lentil/Pea-Fallow Cropping system: Paddy/Maize – Lentil/Pea/Maize/Mustard/Rape Seed/Fallow	Cultivation of paddy may be withdrawn, if paddy is considered only very short duration i.e. 90-110 days variety to be sown, no change for maize-pulse cropping system	Adopt DSR technique, zero tillage, , relay cropping in next to paddy, community nursery bed	RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS
	Very gently sloping flood plains with very deep fine loamy soils	Crop: Paddy,Maize,Ground nut Vegetables Cropping System: Paddy-Pea/lentil/Mustard/Rape Seed/Maize/Vegetables/Paddy/Fallow	Cultivation of paddy may be withdrawn, if paddy is considered only very short duration i.e. 90-110 days variety to be sown, no change for maize and in place of paddy kharif pulse or Groundnut may be taken as alternative crop	Adopt DSR technique, zero tillage in next to paddy , , relay cropping in lentil and mustard, community nursery bed	RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS,NFSM
	Very gently sloping flood plains with deep clayey soils	Crops: Paddy – Mustard/Pea/Lentil/Winter Vegetables/Ground nut/Paddy Cropping System: Paddy-Pea/lentil/Mustard/Rape Seed/Maize/Vegetables/Paddy/Fallow	Cultivation of paddy may be withdrawn, if paddy is considered only very short duration i.e. 90-110 days variety to be sown, no change for maize and in place of paddy kharif pulse or Groundnut may be taken as alternative crop	Adopt DSR technique, zero tillage in next to paddy , relay cropping in lentil and mustard, community nursery bed	RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS,NFSM

***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 1st wk	June 3rd wk	July 1st wk	July 3rd wk	Aug 1st wk
June 2nd wk	June 4th wk	July 2nd wk	July 4th wk	Aug 2nd wk
June 3rd wk	July 1st wk	July 3rd wk	Aug 1st d wk	Aug 3rd wk
June 4th wk	July 2nd wk	July 4th wk	Aug 2nd wk	Aug 4th wk
July 1st wk	July 3rd wk	Aug 1st wk	Aug 3rd wk	Sep 1st wk
July 2nd wk	July 4th wk	Aug 2nd wk	Aug 4th wk	Sep 2nd wk

Condition			**Suggested Contingency measures**		
Early season Drought (Normal Onset)	**Major Farming Situation[a]**	**Normal Crop/Cropping System[b]**	**Crop Management[c]**	**Soil Nutrient & Moisture conservation measures[d]**	**Remarks on Implementation[e]**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination /crop stand etc.	Moderately steeply sloping hill top and hill slopes with deep to very deep fine loamy soils	Jhum cultivation including rice, maize. Cropping system: Mono cropping of Paddy/Maize	Gap filling or retranslating, Timely weeding	Straw mulching in maize.use of erosion resisting crop like cow pea can be grown as inter crop with Maize.	RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS

	Gently to moderately sloping undulating plains with deep fine loamy soils	Crops: Paddy/Arahar/Maize/Ground nut.-Mustard/Lentil/Pea-Fallow Cropping system: Paddy/Maize – Lentil/Pea/Maize/Mustard/Rape Seed/Fallow	Transplant the seedlings in gaps raised from available nursery or by splitting the tillers from the surviving hills, Timely weeding, Gap filling or resowing	Foliar spray with 2% Urea during the dry spell, Postpone top dressing with N, Life saving irrigation (fertigation)	RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS
	Very gently sloping flood plains with very deep fine loamy soils Very gently sloping flood plains with deep clayey soils	Crop: Paddy,Arahar,MaizeGround nut Vegetables Cropping System: Paddy-Pea/lentil/Mustard/Rape Seed/Maize/Vegetables/Paddy/Fallow	Transplant the seedlings in gaps raised from available nursery or by splitting the tillers from the surviving hills, Timely weeding, Gap filling or resowing	Foliar spray with 2% Urea during the dry spell, Postpone top dressing with N, Life saving irrigation (fertigation)	RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS

Condition			**Suggested contingency measures**		
Mid season Drought (long dry spell, Consecutive 2 weeks rainless (>2.5 mm) Period)	**Major Farming Situation[a]**	**Normal Crop/Cropping System[b]**	**Crop Management[c]**	**Soil Nutrient & Moisture conservation measures[d]**	**Remarks on Implementation[e]**
At vegetative stage	Moderately steeply sloping hill top and hill slopes with deep	Jhum cultivation including rice, maize. Cropping system: Mono cropping of	Weeding, Transplant the seedlings from available nursery	Mulching in maize, life saving irrigation in paddy.	RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS

	to very deep fine loamy soils	Paddy/Maize			
	Gently to moderately sloping undulating plains with deep fine loamy soils	Crops: Paddy/Arahar/Maize/Ground nut.-Mustard/Lentil/Pea-Fallow Cropping system: Paddy/Maize – Lentil/Pea/Maize/Mustard/Rape Seed/Fallow	Transplant the seedlings in gaps raised from available nursery or by splitting the tillers from the surviving hills, Timely weeding, Gap filling or resowing	Postpone top dressing with N, Life saving irrigation (fertigation),application of anti transpirant and mulching.	RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS
	Very gently sloping flood plains with very deep fine loamy soils Very gently sloping flood plains with deep clayey soils	Crop: Paddy,Arahar,MaizeGround nut Vegetables Cropping System: Paddy-Pea/lentil/Mustard/Rape Seed/Maize/Vegetables/Paddy/Fallow	Transplant the seedlings in gaps raised from available nursery or by splitting the tillers from the surviving hills, Timely weeding, Gap filling or resowing,Relay cropping(Lentil and Mustard)	Postpone top dressing with N, Life saving irrigation (fertigation), application of anti transpirant and mulching.	RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS

Condition			**Suggested Contingency measures**		
Mid season Drought(long dry spell)	**Major Farming Situation[a]**	**Normal Crop/Cropping System[b]**	**Crop Management[c]**	**Soil Nutrient & Moisture conservation measures[d]**	**Remarks on Implementation[e]**
Flowering stage	Moderately steeply sloping hill top and hill slopes with deep to very deep fine loamy soils	Jhum cultivation including rice, maize. Cropping system: Mono cropping of Paddy/Maize	Life saving irrigation should be given, In extreme condition crops should be harvested for fodder.	In maize cobs should be plucked early, lower leaves should be nipped off to save moisture, in paddy antitransperant can be used.	DMR, RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS, (MGNREGA, RKVY, IWMP, NHM)
	Gently to moderately sloping undulating plains with deep fine loamy soils	Crops: Paddy/Arahar/Maize/Ground nut.-Mustard/Lentil/Pea-Fallow Cropping system: Paddy/Maize – Lentil/Pea/Maize/Mustard/Rape Seed/Fallow	Life saving irrigation should be given, In extreme condition crops should be harvested for fodder	In maize cobs should be plucked early, lower leaves should be nipped off to save moisture, in paddy antitransperant can be used in case of crops like lentil and mustard zero tillage cultivation should be practiced.	DMR, RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS, (MGNREGA, RKVY, IWMP, NHM)
	Very gently sloping flood plains with very deep fine loamy soils Very gently sloping flood plains with deep clayey soils	Crop: Paddy,MaizeGround nut Vegetables Cropping System: Paddy-Pea/lentil/Mustard/Rape Seed/Maize/Vegetables/Paddy/Fallow	Life saving irrigation should be given,In extreme condition crops should be harvested for fodder	In maize cobs should be plucked early, lower leaves should be nipped off to save moisture, in paddy antitransperant can be used in case of crops like lentil and mustard zero tillage cultivation should be practiced in harvested water from water bodies should be utilized in case of vegetables.	DMR, RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS, (MGNREGA, RKVY, IWMP, NHM

Condition			Suggested Contingency measures		
Terminal drought	**Major Farming Situation[a]**	**Normal Crop/Cropping System[b]**	**Crop Management[c]**	**Soil Nutrient & Moisture conservation measures[d]**	**Remarks on Implementation[e]**
	Moderately steeply sloping hill top and hill slopes with deep to very deep fine loamy soils	Jhum cultivation including rice, maize. Cropping system: Mono cropping of Paddy/Maize	In maize cobs should be plucked early, in extreme condition crops should be harvested for fodder, lower leaves should be nipped off to save moisture,	Apply a life saving irrigation, control pests and diseases, reduce plant population, control weed,	DMR, RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS, (MGNREGA, RKVY, IWMP, NHM).
	Gently to moderately sloping undulating plains with deep fine loamy soils	Crops: Paddy/Arahar/Maize/Ground nut.-Mustard/Lentil/Pea-Fallow Cropping system: Paddy/Maize – Lentil/Pea/Maize/Mustard/Rape Seed/Fallow	In maize cobs should be plucked early, in extreme condition crops should be harvested for fodder, lower leaves should be nipped off to save moisture,	Apply a life saving irrigation, control pests and diseases, reduce plant population, control weed,	DMR, RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS, (MGNREGA, RKVY, IWMP, NHM)

Notes:

a. Describe the major farming situation such as shallow red soils, deep blac. k soils, uplands, medium lands, eroded hill slopes etc. tank frd 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 and variety if known.

c. Describe the alternative crop or variety 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 drought 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 alternative 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 Vikash Yojana(RKVY), National Food Security Mission(NFSM), Integrated Schemes 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 Irrigated situation (Pre-Kharif)

Condition			**Suggested Contigency merasures**		
	Major Farming Situation[f]	**Normal Crop/Cropping System[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Delayed release Of water in Canals due to Low rainfall	Not applicable				
Limited release of water in canals due to low rainfall	Not applicable				
Non release of water in canals under delayed onset of monsoon in catchment	Not applicable				

Lack of inflows into streams due to Insufficient/ delayed onset of monsoon	Very gently sloping flood plains with very deep fine loamy soils	Crops: Summer Vegetables,Aus Paddy Cropping System: Fallow/Summer Vgetables-Aus Paddy-Fallow/Winter Vegetables/Mustard/Lentil/Pea/Paddy	Summer Green gram can be cultivated in the fallow areas and Dhaincha can be grown as green manuring crop instead of keeping lands fallow.	Use more organic manure to improve water holding capacity of soil and use of life saving irrigation.	DMR, RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS, (MGNREGA, RKVY, IWMP, NHM, NFSM, ISOPOM).
	Very gently sloping flood plains with deep clayey soils	Aush paddy, Summer Vegetables Cropping System: Aus Paddy/Summer Vegetables-Aman Paddy-Boro Paddy/Winter Vegetables	Photosensitive rice varieties up to 45 days old seedling can be transplanted, double transplanting of rice with 45 days old seedlings of long duration variety (Gomati).	Delay sowing and transplanting, use ground water, apply low dose of nitrogen,	DMR, RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS, (MGNREGA, RKVY, IWMP, NHM, NFSM, ISOPOM).

2.1.3 Irrigated situation (Kharif)

Condition			**Suggested Contingency measures**		
	Major Farming Situation[f]	**Normal Crop/Cropping System[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Insufficient ground Water recharge due to low rainfall	Very gently sloping flood plains with very deep fine loamy soils	Crops: Paddy – Mustard/Pea/Lentil/Winter Vegetables/Ground nut/Paddy Cropping System: Paddy-Pea/lentil/Mustard/Rape Seed/Maize/Vegetables/Paddy	No change, prefer medium duration HYV paddy varieties	SRI in Paddy.	DMR, RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS, (MGNREGA, RKVY, IWMP, NHM, NFSM, ISOPOM).

	Very gently sloping flood plains with deep clayey soils	Crops:Aush paddy,Aman Paddy,Boro Paddy Cropping Pattern: Paddy-Paddy	HYV paddy varieties should be introduced.	SRI in Paddy.	DMR, RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS, (MGNREGA, RKVY, IWMP, NHM, NFSM, ISOPOM).

Condition			**Suggested Contigency merasures**		
	Major Farming Situation[f]	**Normal Crop/Cropping System[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Delayed release Of water in Canals due to Low rainfall	Not applicable				
Limited release of water in canals due to low rainfall	Not applicable				
Non release of water in canals under delayed onset of monsoon in catchment	Not applicable				
Lack of inflows into streams due to Insufficient/ delayed onset of monsoon	Very gently sloping flood plains with very deep fine loamy soils	Crops: Paddy – Mustard/Pea/Lentil/Winter Vegetables/Ground nut/Paddy Cropping System: Paddy-Pea/lentil/Mustard/Rape Seed/Maize/Vegetables/Paddy	Photosensitive rice varieties up to 45 days old seedling can be transplanted, double transplanting of rice with 45 days old seedlings of long duration variety	Delay sowing and transplanting, use ground water, apply low dose of nitrogen and SRI in paddy.	DMR, RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS, (MGNREGA, RKVY, IWMP, NHM, NFSM, ISOPOM).

			(Gomati).		
	Very gently sloping flood plains with deep clayey soils	Crops:Aush paddy,Aman Paddy,Boro Paddy Cropping Pattern: Paddy-Paddy	Photosensitive rice varieties up to 45 days old seedling can be transplanted, double transplanting of rice with 45 days old seedlings of long duration variety (Gomati).	Delay sowing and transplanting, use ground water, apply low dose of nitrogen,	DMR, RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS, (MGNREGA, RKVY, IWMP, NHM, NFSM, ISOPOM).

Condition			**Suggested Contingency measures**		
	Major Farming Situation[f]	**Normal Crop/Cropping System[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Insufficient ground Water recharge due to low rainfall	Very gently sloping flood plains with very deep fine loamy soils	Crops: Paddy – Mustard/Pea/Lentil/Winter Vegetables/Ground nut/Paddy Cropping System: Paddy-Pea/lentil/Mustard/Rape Seed/Maize/Vegetables/ Paddy	Photosensitive rice varieties up to 45 days old seedling can be transplanted, double transplanting of rice with 45 days old seedlings of long duration variety (Gomati).	SRI,Direct sowing of rice, tillage practices to minimize run-off and evapo-transpiration. Increase row spacing,	DMR, RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS, MGNREGA , RKVY, IWMP, NHM, NFSM, ISOPOM).
	Very gently sloping flood plains with deep clayey soils	Crops:Aush paddy,Aman Paddy,Boro Paddy Cropping Pattern: Paddy-Paddy	Photosensitive rice varieties up to 45 days old seedling can be transplanted, double transplanting of rice with 45 days old seedlings of long duration variety (Gomati).	SRI,Direct sowing of rice, tillage practices to minimize run-off and evapo-transpiration. Increase row spacing,	DMR, RARS-AAU, IIPR, CRRI, ICAR-Tripura centre, HRS, (MGNREGA, RKVY, IWMP, NHM, NFSM, ISOPOM).

Notes:

[f] Describe such as uplands, medium and lowlands and source of irrigation such as tank fed medium or deep black /alluvial/red soils, tube well irrigated alluvial soils, canal irrigated red soils, well irrigated black soils etc.

[g] The normal crop or cropping systems grown in a given irrigated situation.
[h] Suggested change in crop, variety or cropping system in view of delay in release of irrigation water, less water availability etc.
[i] 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.
[j] 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 and central schemes like National Rural Employment Guarantee Schemes(NREGS), Rashtriya Krishi Vikash 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 measures**			
Continuous high rainfall in a short span leading to water logging	**Vegetable stage[k]**	**Flowering stage[l]**	**Crop maturity stage[m]**	**Post harvest[n]**
Crop 1. Rice. Crop 2. Maize Crop 3. Cow Pea Crop 4.Green gram	1. Proper drainage. 2. Raised bed 3. Proper drainage 4. Proper drainage	Application of hormones/nutrient sprays to prevent flower drop or promote quick flowering/fruiting	Shifting of produce to safer place and protection against pest/disease damage in storage etc.	Shifting of produce to safer place for drying and maintaining the quality of grain/fodder and protection against pest/disease damage in storage etc.
Horticulture				
Crop 1. Pine apple Crop 2. Orange Crop 3. Mango Crop 4. Crop 5.	Proper drainage of the basin	Application of hormones/nutrient sprays to prevent flower drop or promote quick flowering/fruiting	Shifting of produce to safer place and protection against pest/disease damage in storage etc.	Shifting of produce to safer place for drying and maintaining the quality of grain/fodder and protection against pest/disease damage in storage etc.
Heavy rainfall with high speed winds in a short span[2]				
Crop 1. Rice. Crop 2. Maize Crop 3. Cow Pea Crop 4.Green gram	Proper drainage of the soil.	Application of hormones/nutrient sprays to prevent flower drop or promote quick	Measures for preventing seed germination, shifting produce to	Shifting of produce to safer place for drying and maintaining the quality of grain/fodder and

		flowering/fruiting, staking the maize plants.	safer place and protection against pest/disease damage in storage etc.	protection against pest/disease damage in storage etc.
Horticulture				
Crop 1. Pine apple Crop 2. Orange Crop 3. Mango Crop 4. Crop 5.	Proper drainage of the soil,	Application of hormones/nutrient sprays to prevent flower drop or promote quick flowering/fruiting	Measures for preventing seed germination, shifting produce to safer place and protection against pest/disease damage in storage etc.	Shifting of produce to safer place for drying and maintaining the quality of grain/fodder and protection against pest/disease damage in storage etc.
Outbreak of pests and diseases due to unseasonal rains				
Crop 1. Rice. Crop 2. Maize Crop 3. Cow Pea Crop 4.Green gram	Foliar spray with systemic fungicide like carbendazim @0.3%, Soil application of bioagent like *Trichoderma* spp @5g/lit along with CMC @0.2% (W/V), *Pseudomonas* @5 g/lit, neem based insecticides.	Foliar spray of chlorpyriphos @ 2 ml/ lit, neem based insecticides, use of bird perches,	Harvest at proper stage of maturity, spraying of imidaclorprid @ 4 ml/10 lit, chlorpyriphos @ 2 ml/lit, NSKE 5% at 10 days intervals.	1. Clean & white wash the store before storing. 2. Cleared dry garon with <12 % moisture should stored. 3. Gunny bag treatment with malathion 1ml/li of water or dichlorvos @2ml/lit of water. 4. Spraying godown wall with malathion @ 2ml/lit of water. 5. Disinfect the storage with formaldehyde @4%. 6. Use improved storage bin. 7. Rodent management by using rodent trap or

				poison bait.
Horticulture				
Crop 1. Pine apple Crop 2. Orange Crop 3. Mango Crop 4. Crop 5.	Spray mancozeb 75 WP @ 2g/lit, blitox @ 4g/lit	Use of NAA @200 ppm, ANAA @ 1ml/4.5 lit of water. @ 1ml/ lit,	Spray malathion @ 1 ml/lit of water. Use Ethephon @ 100 ppm for uniform ripening.	Shift the freshly harvested produce to dry and cool place. Damaged, diseased harvest should not kept storage. Value addition to the harvest. Vacuum packaging.

Notes:

[K] Such as drainage in black soils, indicate taking up need based inter- culture operations, outbreak of pests/diseases along with their management etc.

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

[m] 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.

[n] 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[o]**			
Transient water logging/ partial inundation[1]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Crop1 Rice, Maize, Blackgram	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 The product
Horticulture				
Crop1 Tomato, Chilli, Cowpea, Okra, Brinjal, Cole Crops	Cleaning of channels in between the raised nursery bed.	Drain out excess water	Drain out excess water	Drain out excess water

Crop2 Citrus, Jackfruit, mango.	Provision for proper drainage	Drain out excess water	Drain out excess water	Drain out excess water
Continuous submergence for more than 2 days[2]				
Crop1 Rice	Drain out excess water	Drain out excess water, Weeding and top dressing application of 40 kg urea and 40 kg MOP/ha after drain of excess water	Drain out excess water; Tying up of lodged plants	Drain out excess water, Tying up of lodged plants drying of earheads and Harvesting
Crop 2 Blackgram, Maize	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
Horticulture				
Crop1 Tomato, Chilli, Cowpea, Okra, Brinjal, Cole Crops.	Crop cannot survive. New seedling should be transplanted.	-	-	-
Sea water intrusion[3]				
Crop1 Not Applicable		-	-	-

[1] Water logging due to heavy rainfall, poor drainage in vertisols, flash floods in streams and rivers due to high rainfall, breach of embankments.

[2] If the water remains in the field due to continuous rains, poor infiltration and push back effect.

[3] Entry of sea water into cultivated fields in coastal districts due to tidal wave during cyclones or tsunami

[O] 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[r]			
	Seedling/nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave[p]	**NA**	**NA**	**NA**	**NA**
Crop 1	-	-	-	-
Crop 2	-	-	-	-
Crop 3	-	-	-	-
Crop 4	-	-	-	-
Crop 5	-	-	-	-
Horticulture	-	-	-	-
Crop 1 (specify)	-	-	-	-
Crop 2	-	-	-	-
Crop 3	-	-	-	-
Cold Wave[q]	**NA**	**NA**	**NA**	**NA**
Crop 1	-	-	-	-
Crop 2	-	-	-	-
Crop 3	-	-	-	-
Crop 4	-	-	-	-
Crop 5	-	-	-	-
Horticulture	-	-	-	-
Crop 1 (specify)	-	-	-	-
Crop 2	-	-	-	-
Crop 3	-	-	-	-
Frost	**NA**	**NA**	**NA**	**NA**
Crop 1	-	-	-	-
Crop 2	-	-	-	-
Crop 3	-	-	-	-
Crop 4	-	-	-	-
Crop 5	-	-	-	-
Horticulture	-	-	-	-
Crop 1 (specify)	-	-	-	-
Crop 2	-	-	-	-
Crop 3	-	-	-	-

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

Notes:

[P] 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.

[q] In regions where normal minimum temperature remains 10oC or above, if the minimum temperature remains 5oC 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 10oC, if the minimum temperature remains 3oC lower than normal it is considered as cold wave,

r 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[s]	**During the event**	**After the event**
Drought			
Feed and fodder availability	Quantification of requirement and availability, preservation of fodder	Efficient utilization of preserved and unconventional fodder and feeds	Evaluate the suitability of measures taken during draught and application during next event.
Drinking water	Awareness programme to conserve water resource like rain water harvesting and reduced wastage of water	Application of techniques to reduce water loss, reduce sweating.	Programme to aware people to realize the last havoc and feel the importance of water conservation.
Health and disease management	Awareness programme on draught preparedness.	Application of measures suggested by health professionals and veterinarians.	Programme to aware people to realize the last havoc and feel the importance of water conservation.
Floods NA			
Cyclone			
Feed and fodder availability	Weather forecast to the general people along with advice	-	Rehabilitation programme based on damage assessed.
Drinking water	Weather forecast to the general people along with advice	Drinking of sterilized and filtered water.	Dispose the dead animals properly away from water source.
Health and disease management	Keep first Aid medicines	Keep vigil on animals	Health camps
Heat wave and cold wave			
Shelter/environment management	Awareness programmes to cop up with the events	Vigilance on casuality and rectification of the faults.	Aware the people to cop up with next event.
Health and disease management	Awareness programmes to cop up with the events	Vigilance on casuality and rectification of the faults.	Aware the people to cop up with next event.

[S]based on forewarning wherever available

2.5.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs,if any
	Before the event	**During the event**	**After the event**	
Drought				
Shortage of feed ingredients	Stocking of feed after quantifying the requirement.	Efficient utilization of stocked feed.	Cultivation of draught resistant feed ingredients.	Preparation of low cost feed with locally available ingredients.
Drinking water	Awareness programme to conserve water resource like rain water harvesting etc.	Utilization of conserved water.	Let the people feel about the importance of water preservation.	Awareness programme on draught.
Health and disease management	Awareness programme on health and hygiene.	Vigilance by veterinarian.	Dispose the dead bodies properly.	Awareness programme on health and hygiene.
Floods				
Shortage of feed ingredients	To grow flood resistant variety of feed ingredients.	Efficient utilization of stocked feed.	Evaluate the suitability of measures taken during flood and application during next event	Preparation of low cost feed with locally available ingredients.
Drinking water	Awareness programme on filtration techniques of water.	Proper utilization of sterilization and filtration of water.	Health camps.	Vaccination and health camps.
Health and disease management	Flood preparedness, awareness camps.	Health camps and proper disposal of dead bird.	Health camps and awareness programme to cop up with the last event.	Vaccination and health camps.
Cyclone				
Shortage of feed ingredients	Weather forecast along with advice.	-	Dispose the dead bird properly.	Health camps
Drinking water	Awareness programme on filtration of water.	Provide sterilized and filtered water.	Dispose the dead bird away from water source.	-
Health and disease management	Keep first Aid medicines	Keep the bird inside	Health camps	Health camps.

	ready.	secured shelter.		
Heat wave and cold wave				
Shelter/environment management	Awareness programme to cop up these events.	Vigil on casuality and correction of faults.	Aware the people about preparedness to meet event.	-
Health and disease management	Awareness programme to cop up these events.	Vigil on casuality and correction of faults.	Aware the people about preparedness to meet event.	Awareness programme on health and hygiene.

[a] based on forewarning wherever available

2.5.3. Fisheries/Aquaculture

	Suggested contingency measures		
	Before the event[a]	During the event	After the event
1.Drought			
A. Capture			
Marine	NA	NA	NA
Inland			
(i) Shallow water depth due to insufficient rains/inflow	Reduce stocking density	De-silting, renovation etc.	Application of full package of practices
ii. Changes in water quality	Liming	Ploughing, proper dose of lime application	Application of full package of practices
iii. Any other	-	-	-
B. Aquaculture			
i. Shallow water in ponds due to insufficient rains/inflow	Reduce stocking density	De-silting, renovation etc.	Application of full package of practices
ii. Impact of salt load build up in ponds/change in water quality	Liming	Ploughing, proper dose of lime application	Application of full package of practices
iii. Any other	-	-	-
2. Floods			
A. Capture			
Marine	NA	NA	NA
Inland			
i. Average compensation paid due to loss of human life	Awareness programme	Rescue and relief	Health camp
ii. No.of boats/nets/damaged	Repairing	Proper handling of boats and nets etc.	Repairing and knitting

iii. No.of houses damaged	Awareness programme	Rescue	Rehabitation
iv. Loss of stock	Reduce stocking density	Harvesting fish and proper guarding by mess nets	Cleaning of aquatic weeds, application of lime, $KMnO_4$ and catching weed and predatory fishes
v. Changes in water quality	Proper maintenance of pond embankments	Proper guard by mess nets	Application of bleaching powder
vi. Health and diseases	Reduce stocking density	Proper guard by mess nets	Netting and sorting programme
B. Aquaculture			
(i) Inundation with flood water	Proper maintenance of pond embankments	Checking and repairing	Application of lime and $KMnO_4$
ii. Water continuation and changes in water quality	Proper maintenance of pond embankments	Checking and repairing	Application of lime and $KMnO_4$
iii. Health and diseases	Reduce stocking density	Proper guard by mess nets	Netting and sorting programme
iv. Loss of stock and inputs (feed, chemicals etc.)	Reduce stock and less application of inputs	Withdraw feed and chemicals	Assessment and fixing of stocking density and proper dose of inputs
v.. Infrastructure damage(pumps, aerators, huts etc.)	Keep these in secured place	Keep these in secured place	Checking and reinstallation
vi. Any other	-	-	-
3. Cyclone/ Tsunami			
A. Capture			
Marine	NA	NA	NA
i. Average compensation paid due to loss of fishermen lives			
ii. Avg. no. of boats/nets/damaged			
Inland			
B. Aquaculture			
i. Overflow/flooding of ponds	Reduce stocking density	Arrange outflow	Assessment of stocking density
ii. Changes in water quality(fresh water/brackish water ratio)	Maintain pond embankments	Checking and repairing	Application of lime and $KMnO_4$
iii. Health and diseases	Reduce stocking density	Proper guard by mess nets	Application of bleaching powder
iv. Loss of stock and inputs(feed, chemicals etc.)	Reduce stock and less application of inputs	Withdraw feed and chemicals	Assessment and fixing of stocking density and proper dose of inputs
v. Infrastructure damage(pumps,aerators, shelters/huts etc.)	Keep these in secured place	Keep these in secured place	Checking and reinstallation
vi. Any other	-	-	-
4. Heat wave and cold wave			
A. Capture			

Marine	NA	NA	NA
Inland			
B. Aquaculture			
i. Changes in pond environment(water quality)	Influx of water from nearby channels during heat wave and reduce stocking density in cold	Harvesting of fish during both heat and cold wave	Harvesting of fish during both heat and cold wave and water quality maintenance
ii. Health and Diseases management	-	-	-
iii. Any other	-	-	-

[a]based on forewarning wherever available

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