

State: WEST BENGAL

Agriculture Contingency Plan for District: PASCHIM MEDINIPUR

1.0 District Agriculture profile				
1.1	Agro-Climatic/Ecological Zone			
	Agro Ecological Sub Region (ICAR)	Bengal and Assam plains, hot sub humid (moist) to humid (inclusion of per humid) eco-sub region (15.1) Eastern plateau (chhotanagpur) And Eastern Ghats, Hot Subhumid Eco-Region (12.3) Eastern Coastal Plain, Hot Subhumid To Semi-Arid Eco-Region (18.5)		
	Agro-Climatic Zone (Planning Commission)	Lower Gangetic Plain Region (III)		
	Agro Climatic Zone (NARP)	Coastal Saline Zone (WB-6) Red and laterite soil zone (wb-5) Old aluuvial zone (wb-3)		
	List all the districts or part thereof falling under the NARP Zone	24 Paraganas (North), Calcutta, Howrah and South 24 Paraganas, Bankura, Birbhum, Burdwan, Dakshin Dinajpur, Hooghly, Malda, Midnapur(west), Murshidabad, Nadia, Purulia, Uttar Dinajpur.		
	Geographic coordinates of district headquarters	Latitude 22° 25' 15.13" N	Longitude 87° 19' 33.92" E	Altitude 39 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	RRS (R&L) Zone, BCKV, Jhargram, Medinipur (W) -721 507		
	Mention the KVK located in the district	Seva Bharati Krishi Vigyan Kendra, Kapgari, Pashim Medinipur-721 505.		

1.2	Rainfall (Ten years average 1998-2007)	Normal RF(mm)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	1155.1	1 st week of June	4 th week of September
	NE Monsoon(Oct-Dec):	166.6		
	Winter (Jan- March)	79.7	-	-
	Summer (Apr-May)	168.1	-	-
	Annual	1569.5	-	-

1.3	Land use pattern of the district (latest statistics)	Geographical area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area ('000 ha)	928.53	597.39	171.94	157.55	1.13	5.46	9.26	1.70	18.74	4.10

1.4	Major Soils (common names like red sandy loam deep soils (etc.,))*	Area ('000 ha)	Percent (%) of total
	1. Clayey loamy	69.52	12%
	2. Gravelly loamy	5.92	84%
	3. Loamy	501.80	3%
	4.Loamy sandy	17.92	

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	558.70	168
	Area sown more than once	379.94	
	Gross cropped area	938.64	

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	82.4		
	Gross irrigated area	428.12		
	Rainfed area	510.52		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals		160.70	26.90
	Tanks	40401	25.31	4.24
	Open wells	14226	10.57	1.66
	Bore wells	5025	-	
	Lift irrigation schemes	-	189.79	31.76
	Micro-irrigation	-	-	-
	Other sources (please specify)	1650	41.75	6.98
	Total Irrigated Area	-	428.12	71.66
	Pump sets	-		
	No. of Tractors	-		
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited	-	-	Suitable
	Critical	-	-	-

	Semi- critical	1	-	-
	Safe	11	-	-
	Wastewater availability and use		-	-
	Ground water quality	Suitable, no contamination		
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

1.7 Area under major field crops & horticulture (as per latest figures) (year 2007 - 08)

1.7	Major field crops cultivated	Area ('000 ha)							
		<i>Kharif</i>			<i>Rabi</i>			Summer	Grand total
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
Rice	-	41.4	41.4	-	441.3	441.3	167.5	650.2	
Oilseeds	-	-	-	-	107.5	107.5	-	107.5	
Potato	-	-	-	-	70.6	70.6	-	70.6	
Wheat	-	-	-	-	6.5	6.5	-	6.5	
Pulses	-	-	-	-	5.6	5.6	-	5.6	
Dry chillies	-	5.6	5.6	-	-	-	-	5.6	

	Horticulture crops - Fruits	Area ('000 ha)		
		Total	Irrigated	Rainfed
	Mango	5.63	-	5.63
	Banana	1.49	-	1.49
	Guava	1.32	-	1.32
	Jackfruit	0.86	-	0.86
	Papaya	0.75	-	0.75
	Horticulture crops - Vegetables	Total	Irrigated	Rainfed
	Brinjal	9.35	9.35	-
	Cucurbits	9.11	9.11	-
	Cauliflower	4.78	4.78	-
	Cabbage	3.83	3.83	-
	Ladies finger	3.06	3.06	-
	Onion	1.98	1.98	-
	Medicinal and Aromatic crops	Total	Irrigated	Rainfed

		NA		
	Plantation crops	Total	Irrigated	Rainfed
	Fodder crops	Nil		
	Total fodder crop area	-		
	Grazing land	-		
	Sericulture etc	Nil		

1.8	Livestock (2007-08)	Male ('000)	Female ('000)	Total ('000)		
	Non descriptive Cattle (local low yielding)	860.5	1,290.9	2117417		
	Crossbred cattle	54.5	182.0	236529		
	Non descriptive Buffaloes (local low yielding)	49.7	17.4	51745		
	Graded Buffaloes	-	-	15405		
	Goat	-	-	1392049		
	Sheep	-	-	116575		
	Others (Camel, Pig, Yak etc.)	-	-	Horse-14, pig-72532, Rabbit - 895		
	Commercial dairy farms (Number)	-	-			
1.9	Poultry	No. of farms	Total No. of birds ('000)			
	Commercial	Broiler-1844, Improved Layer-43	In Farm: Broiler-3208294, Layer-1195668, Duck-3451 [District Total of Improved strains Fowl-3386445, Duck-62232, Quail-514, Other-6605]			
	Backyard	Fowl – 18, Duck (commercial + backyard)- 5	In Farm: Deshi Total Fowl-1676, Duck-3451 [District Total of Deshi Fowl-2651671, Duck-701011]			
1.10	Fisheries (Data source: Chief Planning Officer)					
	A. Capture					
	i) Marine (Data Source: Fisheries Department)	No. of fishermen	Boats		Nets	Storage facilities (Ice plants etc.)
			Mechanized	Non-mechanized		
		-	-	-	-	-
	ii) Inland (Data Source: Fisheries Department)	No. Farmer owned ponds (Under FFDA Scheme up to 08-09)		No. of Reservoirs	No. of village tanks	
		No. of Farmer: 32139				

	Area of Pond (ha.) : 6681.932	Nil	Record not available
B. Culture			
	Water Spread Area (ha)	Yield (t/ha)	Production ('000 tons)
i) Brackish water (Data Source: MPEDA/ Fisheries Department)	Nil		16 ton prawn (Freshwater) (2008-09)
ii) Fresh water (Data Source: Fisheries Department)	Culturable area: 10325.18 ha. Semi-Derelict area: 6667.30ha. Derelict area: 1827.52 ha. Total area: 18820.00 ha.	From Ponds under FFDA Scheme= 4.4 t/ ha.	61048 ton Fish (2008-09) Fish Seed Production (08-09)= 349 million
Others	(River) 2800.28 ha. (Canal) 1199.72 ha. (Beel/Baor) 404.00 ha.	-	-

1.11 Production and Productivity of major crops (Average of last 5 years: 2004 - 08)

1.11	Name of crop	Kharif		Rabi		Summer		Total	
		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)									
	Rice	84.83	2063	1205.30	2505	452.29	3156	1742.42	7724
	Wheat	-	-	17.68	2141	-	-	17.68	2141
	Jute	66.29*	2845	-	-	-	-	66.29	2845
	Pulses	-	-	4.33	659	-	-	4.33	659
	Oilseeds	-	-	102.47	1055	-	-	102.47	1055
	Potato	-	-	1412.56	19484	-	-	1412.56	19484
Major Horticultural crops (Crops to be identified based on total acreage)									
	Brinjal	-	-	180.99	19566	-	-	180.99	19566
	Cucurbits	-	-	100.90	11087	-	-	100.90	11087
	Cauliflower	-	-	98.98	20707	-	-	98.98	20707

	Cabbage	-	-	106.58	27827	-	-	106.58	27827
	Okra	-	-	42.03	13735	-	-	42.03	13735

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Rice	Wheat	Oilseeds	Pulses	Potato
	Kharif- Rainfed	July 1 st to 4 th week	-	-	-	-
	Kharif-Irrigated	July 1 st to 4 th week	-	-	-	-
	Rabi- Rainfed		Nov. 1 st to 2 nd week	Oct. 2 nd week to Nov. 3 rd week	Oct. 3 rd week to Nov. 3 rd week	-
	Rabi-Irrigated	Jan. 1 st to 4 th week	Nov. 1 st to 2 nd week	Oct. 2 nd week to Nov. 3 rd week	Oct. 3 rd week to Nov. 3 rd week	Nov. 1 st to 4 th week

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

1.14	Include Digital maps of the district for	Location map of district within State, Annexure I	Enclosed: Yes
		Agroclimatic Zones of West Bengal, Annexure 2	Enclosed: Yes
		Mean annual rainfall, Annexure 3	Enclosed: Yes
		Soil map of West Bengal, Annexure 4	Enclosed: Yes

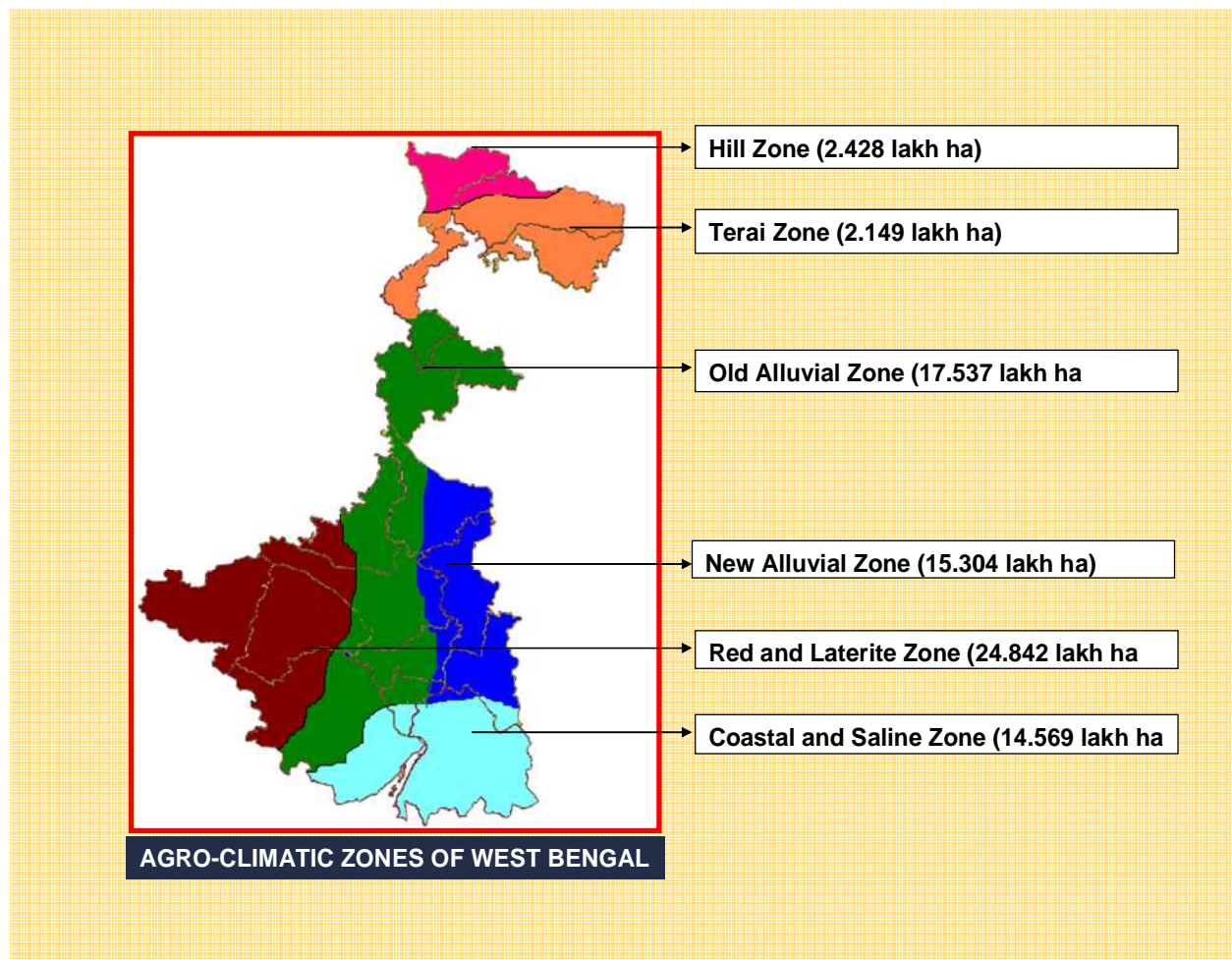
Annexure -I

Location map of Paschim Medinipur district

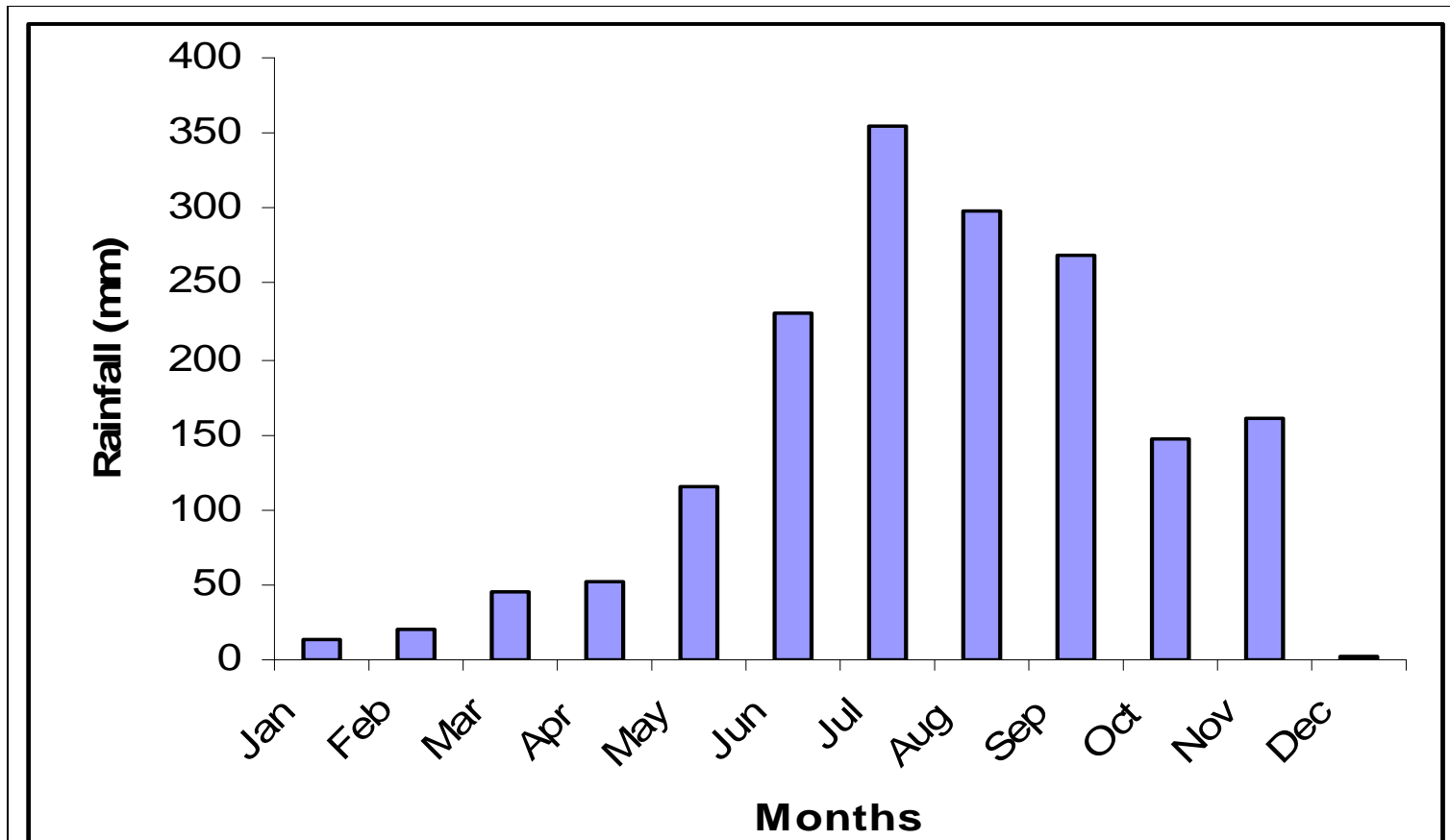


Annexure-II

Agroclimatic Zones of West Bengal



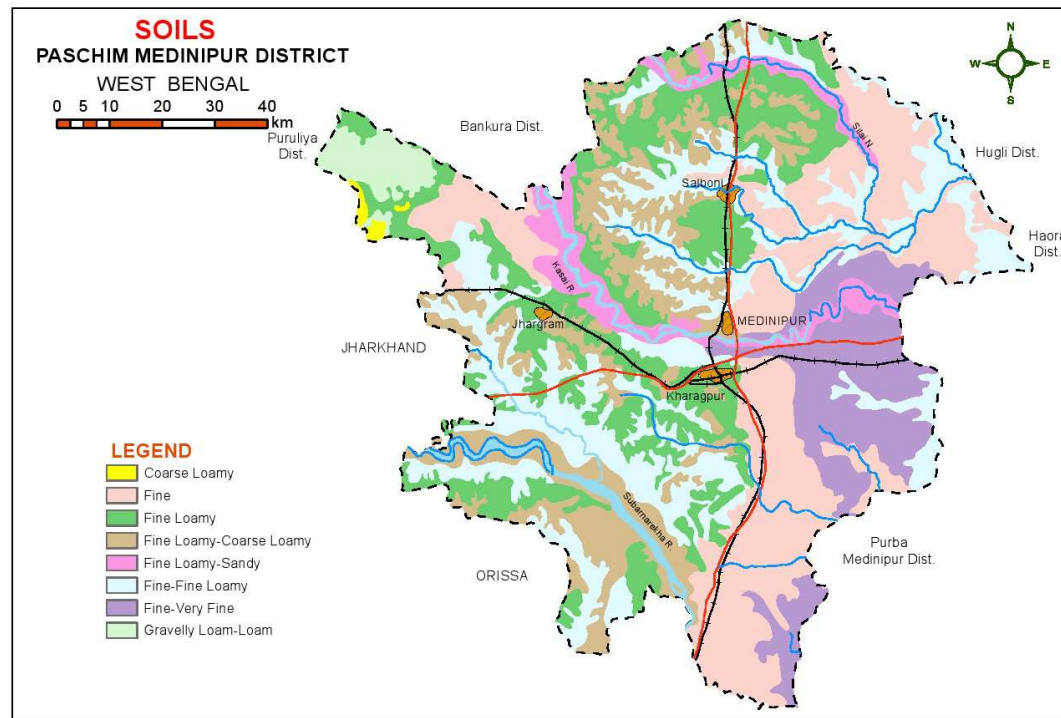
Annexure – III



Mean monthly rainfall of Paschim Medinipur

Annexure-IV

Soil map of Paschim Medinipur district



Source: NBSS&LUP Regional Centre, Kolkata

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Suggested Contingency measures	Remarks on Implementation
Early season drought (delayed onset)					
Delay by 2 weeks 3 rd week of June	Red & laterite soils, undulated land. Shallow to moderately deep coarse loamy fine loamy soils (hillocks, gravelly situation)	Aman rice- fallow	No change	<ul style="list-style-type: none"> Transplant 2-3 seedlings/hill 	Linkage with NSC, WBSC, BCKVV for supply of seed
		Aman rice-wheat/ mustard/ vegetables	Nochange	-do-	
		Cauliflower	No change. Prefer varieties like Early Kunwari, Pusa Early Synthetic, Synthetic 78-1	<ul style="list-style-type: none"> Raising of seed bed under transparent plastic cover Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water) Transplant healthy seedlings of 35-40 days old Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting 	
		Okra	No change. Prefer varieties like Arka Anamika, Arka Abhay, Pusa A-4, VRO-6, Azad Krishna (OP), Mahyco-12, No-152 (Hybrid)	<ul style="list-style-type: none"> Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease; 4-5 foliar sprays of Imidachlorpid (3.5 ml/ 10 l or Thiomethoxam (3.5 ml/ 10 l) to control whitefly 	
		Cucurbits (Cucumber, r Ridge gourd, Bottle gourd, Bitter gourd etc.)	No change. Prefer local cultivars	<p>Prepare mounds in the furrow for sowing of seeds</p> <p>Application of 150-250 ppm Ethrel (1.5-2.0 ml/10 l of water), 400 ppm (4 ml/10 l of water) maleic hydrazide twice, first at two true leaves of the plants i.e. 15 days after sowing and subsequently repeated 7 days after helps in increasing the yield</p> <p>The crop needs to be trained over low trellis of 1.5 m</p>	

				high above the ground After 85 to 90 days of sowing, older leaves near the bottom of the vine are pruned Timely control of downy mildew disease.	
Red & laterite soils, undulated land. Moderately deep to deep coarse loamy to fine loamy red soils	Aman rice- fallow	No change		Dry seeding of rice/ drum seeding if the damage is severe. Proper weeding.	
	Aman rice-wheat/ mustard/ vegetables	-do-		-do-	
	Cauliflower	No change. Prefer varieties like Early Kunwari, Pusa Early Synthetic, Synthetic 78-1.		<ul style="list-style-type: none"> • Raising of seed bed under transparent plastic cover • Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water) • Transplant healthy seedlings of 35-40 days old • Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting 	
	Okra	No change. Prefer varieties like Arka Anamika, Arka Abhay, Pusa A-4, VRO-6, Azad Krishna (OP), Mahyco-12, No-152 (Hybrid)		<ul style="list-style-type: none"> • Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease; • 4-5 foliar sprays of Imidachlorpid (3.5 ml/ 10 l or Thiomethoxam (3.5 ml/ 10 l) to control whitefly 	
	Cucurbits (Cucumber, Ridge gourd, Bottle gourd, Bitter gourd etc.)	No change. Prefer local cultivars		<p>Prepare mounds in the furrow for sowing of seeds</p> <p>Application of 150-250 ppm Ethrel (1.5-2.0 ml/10 l of water), 400 ppm (4 ml/10 l of water) maleic hydrazide twice, first at two true leaves of the plants i.e. 15 days after sowing and subsequently repeated 7 days after helps in increasing the yield</p> <p>The crop needs to be trained over low trellis of 1.5 m high above the ground</p> <p>After 85 to 90 days of sowing, older leaves near the bottom of the vine are pruned</p> <p>Timely control of downy mildew disease.</p>	
Red & laterite soils,	Aman rice- fallow	No change		<ul style="list-style-type: none"> • Transplant 2-3 seedlings/hill 	
	Aman rice-	No change		-do-	

undulated land. Shallow to moderately deep loamy soils	wheat/ mustard/ vegetables			
	Cauliflower	-do-		-do-
	Okra	No change. Prefer varieties like Early Kunwari, Pusa Early Synthetic, and Synthetic 78-1.		<ul style="list-style-type: none"> Raising of seed bed under transparent plastic cover Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water) Transplant healthy seedlings of 35-40 days old Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting
	Cucurbits (Cucumber, Ridge gourd, Bottle gourd, Bitter gourd etc.)	No change. Prefer varieties like Arka Anamika, Arka Abhay, Pusa A-4, VRO-6, Azad Krishna (OP), Mahyco-12, No-152 (Hybrid)		<ul style="list-style-type: none"> Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease; 4-5 foliar sprays of Imidachlorpid (3.5 ml/ 10 l or Thiomethoxam (3.5 ml/ 10 l) to control whitefly

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Delay by 4 weeks 1 st week of July	Red & laterite soils, undulated land. Shallow to moderately deep coarse loamy fine loamy soils (hillocks, gravelly situation)	Aman rice- fallow	No change	<ul style="list-style-type: none"> Follow staggered dry nursery to fill up the gaps. Dry seeding of rice/ drum seeding if the damage is severe. Proper weeding. 	Linkage with NSC, WBSC, BCKVV for supply of seed
		Aman rice- wheat/ mustard/ vegetables	-do-	-do-	
		Cauliflower	No change. Prefer varieties like Pusa Deepali, Pusa Katki	<ul style="list-style-type: none"> Raising of seed bed under transparent plastic cover Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water) Transplant healthy seedlings of 35-40 days old Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting 	
		Okra	No change. Prefer varieties like	<ul style="list-style-type: none"> Soaking the seeds in 0.2% Bavistin over night to 	

			Arka Anamika, Arka Abhay, Pusa A-4, VRO-6, Azad Krishna (OP), Mahyco-12, No-152 (Hybrid)	<ul style="list-style-type: none"> protect the seedlings from wilt disease; 4-5 foliar sprays of Imidachlorpid (3.5 ml/ 10 l or Thiomethoxam (3.5 ml/ 10 l) to control whitefly 	
		Cucurbits (Cucumber, ridge gourd, bottle gourd, bitter gourd etc.)	No change. Prefer local cultivars	<ul style="list-style-type: none"> Prepare mounds in the furrow for sowing of seeds Application of 150-250 ppm Ethrel (1.5-2.0 ml/10 l of water), 400 ppm (4 ml/10 l of water) maleic hydrazide twice, first at two true leaves of the plants i.e. 15 days after sowing and subsequently repeated 7 days after helps in increasing the yield The crop needs to be trained over low trellis of 1.5 m high above the ground After 85 to 90 days of sowing, older leaves near the bottom of the vine are pruned Timely control of downy mildew disease. 	
		Cabbage	High temperature tolerant hybrids	<ul style="list-style-type: none"> Raising of seed bed under transparent plastic cover; Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water); Transplant healthy seedlings of 35-40 days old ; Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting; 	
Red & laterite soils, undulated land. Moderately deep to deep coarse loamy to fine loamy red soils	Aman rice- fallow	No change	<ul style="list-style-type: none"> Transplant 2-3 seedlings/hill 		
	Aman rice- wheat/ mustard/ vegetables	-do-	-do-		
	Cauliflower	No change. Prefer varieties like Early Kunwari, Pusa Early Synthetic, Synthetic 78-1	<ul style="list-style-type: none"> Raising of seed bed under transparent plastic cover Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water) Transplant healthy seedlings of 35-40 days old Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting 		
	Okra	No change. Prefer varieties like Arka Anamika, Arka Abhay,	<ul style="list-style-type: none"> Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease; 		

			Pusa A-4, VRO-6, Azad Krishna (OP), Mahyco-12, No-152 (Hybrid)	<ul style="list-style-type: none"> 4-5 foliar sprays of Imidachlorpid (3.5 ml/ 10 l or Thiomethoxam (3.5 ml/ 10 l) to control whitefly 		
		Cucurbits (Cucumber, ridge gourd, bottle gourd, bitter gourd etc.)	No change. Prefer local cultivars	<ul style="list-style-type: none"> Prepare mounds in the furrow for sowing of seeds Application of 150-250 ppm Ethrel (1.5-2.0 ml/10 l of water), 400 ppm (4 ml/10 l of water) maleic hydrazide twice, first at two true leaves of the plants i.e. 15 days after sowing and subsequently repeated 7 days after helps in increasing the yield The crop needs to be trained over low trellis of 1.5 m high above the ground After 85 to 90 days of sowing, older leaves near the bottom of the vine are pruned Timely control of downy mildew disease. 		
		Cabbage	High temperature tolerant hybrids	<ul style="list-style-type: none"> Raising of seed bed under transparent plastic cover; Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water); Transplant healthy seedlings of 35-40 days old ; Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting; 		
	Red & laterite soils, undulated land. Shallow to moderately deep loamy soils	Aman rice- fallow	No change	<ul style="list-style-type: none"> Follow staggered dry nursery to fill up the gaps. Dry seeding of rice/ drum seeding if the damage is severe. Proper weeding. 		
		Aman rice- wheat/ mustard/ vegetables	-do-	-do-		
		Cauliflower	-do-	-do-		
		Okra	No change. Prefer varieties like Early Kunwari, Pusa Early Synthetic, and Synthetic 78-1.	<ul style="list-style-type: none"> Raising of seed bed under transparent plastic cover Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water) Transplant healthy seedlings of 35-40 days old Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting 		

		Cucurbits (Cucumber, Ridge gourd, Bottle gourd, Bitter gourd etc.)	No change. Prefer varieties like Arka Anamika, Arka Abhay, Pusa A-4, VRO-6, Azad Krishna (OP), Mahyco-12, No-152 (Hybrid)	<ul style="list-style-type: none"> • Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease; • 4-5 foliar sprays of Imidachlorpid (3.5 ml/ 10 l or Thiomethoxam (3.5 ml/ 10 l) to control whitefly 	
		Cabbage	High temperature tolerant hybrids	<ul style="list-style-type: none"> • Raising of seed bed under transparent plastic cover; • Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water); • Transplant healthy seedlings of 35-40 days old ; • Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting; 	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Delay by 6 weeks 3 rd week of july	Red & laterite soils, undulated land. Shallow to moderately deep coarse loamy fine loamy soils (hillocks, gravelly situation)	Aman rice-fallow	No change. Grow maize, Ground nut, black gram in high land situation.	<ul style="list-style-type: none"> • Transplant 3-4 aged seedlings per hill • Follow Dapog & SRI method. • Direct dry seeding of early duration rice. • Use of herbicides/ harrowing. 	Linkage with seed farms, Department of agriculture, Karshak societies NSC, WBSC, BCKV for supply of seed
		Aman rice-wheat/ mustard/ vegetables	-do-	-do-	
		Cauliflower	No change. Prefer varieties like Hisar-1, Improved Japanese, Pusa Sharad, Pant Gobi-4, Pant Shubra.	<ul style="list-style-type: none"> • Raising of seed bed under transparent plastic cover • Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water) • Transplant healthy seedlings of 35-40 days old • Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting 	
		Cabbage	No change. Prefer varieties like Green Express, Green 621,	<ul style="list-style-type: none"> • Raising of seed bed under transparent plastic cover; • Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water); 	

				<ul style="list-style-type: none"> • Transplant healthy seedlings of 35-40 days old ; • Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting; 	
		Okra	No change. Prefer varieties like Arka Anamika, Arka Abhay, Pusa A-4, VRO-6, Azad Krishna (OP), Mahyco-12, No-152 (Hybrid)	<ul style="list-style-type: none"> • Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease; • Gap fill with the same varieties if population is <50%. • 4-5 foliar sprays of Imidachlorpid (3.5 ml/ 10 l or Thiomethoxam (3.5 ml/ 10 l) to control whitefly 	
		Brinjal	No change. Prefer varieties Muktakeshi, BCB-11, BCB-30; Bhangar, Patakata	<ul style="list-style-type: none"> • Raising of seed bed under transparent plastic cover; • After transplanting two foliar sprays of 0.5% ZnSO₄ and single spray of 0.15% CuSO₄ increase yield and quality of fruits. 	
	Red & laterite soils, undulated land. Moderately deep to deep coarse loamy to fine loamy red soils	Aman rice-fallow	No change. Grow maize, Ground nut, black gram in high land situation.	<ul style="list-style-type: none"> • Transplant 3-4 aged seedlings per hill • Follow Dapog & SRI method. • Direct dry seeding of early duration rice. • Use of herbicides/ harrowing. 	
		Aman rice-wheat/ mustard/ vegetables	-do-	-do-	
		Cauliflower	No change. Prefer varieties like Hisar-1, Improved Japanese, Pusa Sharad, Pant Gobi-4, Pant Shubra.	<ul style="list-style-type: none"> • Raising of seed bed under transparent plastic cover • Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water) • Transplant healthy seedlings of 35-40 days old • Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting 	
		Cabbage	No change. Prefer varieties like Green Express, Green 621,	<ul style="list-style-type: none"> • Raising of seed bed under transparent plastic cover; • Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water); • Transplant healthy seedlings of 35-40 days old ; • Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting; 	
		Okra	No change. Prefer varieties like Arka Anamika, Arka Abhay, Pusa A-4, VRO-6, Azad Krishna (OP), Mahyco-12, No-152	<ul style="list-style-type: none"> • Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease; • Gap fill with the same varieties if population is <50%. • 4-5 foliar sprays of Imidachlorpid (3.5 ml/ 10 l or Thiomethoxam (3.5 ml/ 10 l) to control whitefly 	

			(Hybrid)		
		Brinjal	No change. Prefer varieties Muktakeshi, BCB-11, BCB-30; Bhangar, Patakata	<ul style="list-style-type: none"> • Raising of seed bed under transparent plastic cover; • After transplanting two foliar sprays of 0.5% ZnSO₄ and single spray of 0.15% CuSO₄ increase yield and quality of fruits. 	
	Red & laterite soils, undulated land. Shallow to moderately deep loamy soils	Aman rice-fallow	No change	<ul style="list-style-type: none"> • Dry seeding of rice/ drum seeding if the damage is severe. • Proper weeding. 	
		Aman rice-wheat/ mustard/ vegetables	-do-	-do-	
		Cauliflower	-do-	-do-	
		Cabbage	No change. Prefer varieties like Green Express, Green 621,	<ul style="list-style-type: none"> • Raising of seed bed under transparent plastic cover; • Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water); • Transplant healthy seedlings of 35-40 days old ; • Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting; 	
		Okra	No change. Prefer varieties like Early Kunwari, Pusa Early Synthetic, and Synthetic 78-1.	<ul style="list-style-type: none"> • Raising of seed bed under transparent plastic cover • Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water) • Transplant healthy seedlings of 35-40 days old • Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting 	
		Brinjal	No change. Prefer varieties Muktakeshi, BCB-11, BCB-30; Bhangar, Patakata	<ul style="list-style-type: none"> • Raising of seed bed under transparent plastic cover; • After transplanting two foliar sprays of 0.5% ZnSO₄ and single spray of 0.15% CuSO₄ increase yield and quality of fruits. 	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation

Delay by 8 weeks 1 st week of oct	Red & laterite soils, undulated land. Shallow to moderately deep coarse loamy fine loamy soils (hillocks, gravelly situation)	Aman rice-fallow	Vegetables / short duration rice in upland & medium land situation	<ul style="list-style-type: none"> • Transplant 3-4 aged seedlings per hill • Follow Dapog & SRI method. • Direct dry seeding of early duration rice. • Use of herbicides/ harrowing. 	Linkage with NSC, WBSC, seed farms of department of agriculture, karshak societies and BCKVV for supply of seed
		Aman rice-wheat/ mustard/ vegetables	-do-	-do-	
		Aman (winter rice) rice-Fallow	-do-	-do-	
		Cauliflower	No change. Prefer varieties like Pusa Synthetic, Pusa Himjyoti, Pusa Shubhra,	<ul style="list-style-type: none"> • Raising of seed bed under transparent plastic cover • Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water) • Transplant healthy seedlings of 35-40 days old • Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting 	
		Cabbage	No change. Prefer varieties like Green Express, KK cross, Green-621, Royal Challenger	<ul style="list-style-type: none"> • Raising of seed bed under transparent plastic cover; • Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water); • Transplant healthy seedlings of 35-40 days old ; • Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting; 	
		Brinjal	No change. Prefer varieties like Muktakeshi, BCB-11, BCB-30; Bhangar, Patakata	<ul style="list-style-type: none"> • Raising of seed bed under transparent plastic cover; • After transplanting two foliar sprays of 0.5% ZnSO₄ and single spray of 0.15% CuSO₄ increase yield and quality of fruits. 	
		Tomato	No change. Prefer varieties like TLBRH-6, JKTH-3098, BCTH-4 (All leaf curl tolerant hybrids)	<ul style="list-style-type: none"> • Raising of seed bed under 50 mesh nylon net ; • 4-5 foliar sprays of Imidachlorpid (3.5 ml/ 10 l of water or Thiomethoxam (3.5 ml/ 10 l of water) to control whitefly 	
		Chilli	No change. Prefer varieties like BCC-1, BCCH SI-4, Beldanga local	<ul style="list-style-type: none"> • Raising of seed bed under 50 mesh nylon net ; • Spraying of Diafenthiuron @ 0.5 g/l of water and Dicofol @ 2.5 ml/l of water to control thrips and yellow mite, respectively. 	
	Red & laterite soils,	Aman rice-fallow	Vegetables / short duration rice in upland & medium	<ul style="list-style-type: none"> • Transplant 3-4 aged seedlings per hill • Follow Dapog & SRI method. 	

undulated land. Moderately deep to deep coarse loamy to fine loamy red soils		land situation	<ul style="list-style-type: none"> • Direct dry seeding of early duration rice. • Use of herbicides/ harrowing.
	Aman rice-wheat/ mustard/ vegetables	-do-	-do-
	Aman (winter rice) rice-Fallow	-do-	-do-
	Cauliflower	-do-	-do-
	Cabbage	No change. Prefer varieties like Pusa Synthetic, Pusa Himjyoti, Pusa Shubhra,	<ul style="list-style-type: none"> • Raising of seed bed under transparent plastic cover • Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water) • Transplant healthy seedlings of 35-40 days old • Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting
	Brinjal	No change. Prefer varieties like Arka Anamika, Arka Abhay, Pusa A-4, VRO-6, Azad Krishna (OP), Mahyco-12, No-152 (Hybrid)	<ul style="list-style-type: none"> • Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease; • Gap fill with the same varieties if population is <50%. • 4-5 foliar sprays of Imidachlorpid (3.5 ml/ 10 l or Thiomethoxam (3.5 ml/ 10 l) to control whitefly
	Tomato	No change. Prefer varieties like TLBRH-6, JKTH-3098, BCTH-4 (All leaf curl tolerant hybrids)	<ul style="list-style-type: none"> • Raising of seed bed under 50 mesh nylon net ; • 4-5 foliar sprays of Imidachlorpid (3.5 ml/ 10 l of water or Thiomethoxam (3.5 ml/ 10 l of water) to control whitefly
	Chilli	No change. Prefer varieties like BCC-1, BCCH SI-4, Beldanga local	<ul style="list-style-type: none"> • Raising of seed bed under 50 mesh nylon net ; • Spraying of Diafenthiuron @ 0.5 g/l of water and Dicofol @ 2.5 ml/l of water to control thrips and yellow mite, respectively.
Red & laterite soils, undulated land. Shallow to moderately deep loamy soils	Aman rice-fallow	Vegetables / short duration rice in upland& medium land situation	<ul style="list-style-type: none"> • Transplant 3-4 aged seedlings per hill • Follow Dapog & SRI method. • Direct dry seeding of early duration rice. • Use of herbicides/ harrowing.
	Aman rice-wheat/ mustard/ vegetables	-do-	-do-

		Aman (winter rice) rice-Fallow	-do-	-do-	
		Cauliflower	-do-	-do-	
		Cabbage	No change. Prefer varieties like Pusa Synthetic, Pusa Himjyoti, Pusa Shubhra,	<ul style="list-style-type: none"> • Raising of seed bed under transparent plastic cover • Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water) • Transplant healthy seedlings of 35-40 days old • Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting 	
		Brinjal	No change. Prefer varieties like Muktakeshi, BCB-11, BCB-30; Bhangar, Patakata	<ul style="list-style-type: none"> • Raising of seed bed under transparent plastic cover; • After transplanting two foliar sprays of 0.5% ZnSO₄ and single spray of 0.15% CuSO₄ increase yield and quality of fruits. 	
		Tomato	No change. Prefer varieties like TLBRH-6, JKTH-3098, BCTH-4 (All leaf curl tolerant hybrids)	<ul style="list-style-type: none"> • Raising of seed bed under 50 mesh nylon net ; • 4-5 foliar sprays of Imidachlorpid (3.5 ml/ 10 l of water or Thiomethoxam (3.5 ml/ 10 l of water) to control whitefly 	
		Chilli	No change. Prefer varieties like BCC-1, BCCH SI-4, Beldanga local	<ul style="list-style-type: none"> • Raising of seed bed under 50 mesh nylon net ; • Spraying of Diafenthiuron @ 0.5 g/l of water and Dicofol @ 2.5 ml/l of water to control thrips and yellow mite, respectively. 	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Red & laterite soils, undulated land. Shallow to moderately deep coarse loamy fine loamy soils (hillocks, gravelly)	Aman rice- fallow	<ul style="list-style-type: none"> • Take up gap filling with seedlings either with available nursery or by splitting the tillers from the surviving hills • Interculture / weeding 	<ul style="list-style-type: none"> • Apply 30-50 kg N /ha after relief of drought. • Supplemental irrigation 	Linkage with State dept. of agriculture for seed and weeding equipments
		Aman rice-wheat/ mustard/ vegetables	-do-	-do-	

	situation)				
	Red & laterite soils, undulated land. Moderately deep to deep coarse loamy to fine loamy red soils	Aman rice- fallow	-do-	-do-	
		Aman rice- wheat/ mustard/ vegetables	-do-	-do-	
	Red & laterite soils, undulated land. Shallow to moderately deep loamy soils	Aman rice- fallow	-do-	-do-	
		Aman rice- wheat/ mustard/ vegetables	-do-	-do-	

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested Contingency measures		
Early season drought (Normal onset)	Major Farming situation	Normal Crop/ cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Mid season dry spell at Vegetative stage	Red & laterite soils, undulated land. Shallow to moderately deep coarse loamy fine loamy soils (hillocks, gravelly situation)	Aman rice- fallow	<ul style="list-style-type: none"> Take up gap filling with the seedlings available either with nursery or by splitting the tillers from the surviving hills Interculture / weeding Supplemental irrigation. 	Apply 30-50 kg N /ha after relief of drought.	Linkage with seed farms ,department of agriculture,BCKV, NFSM, ISOPOM, NREGS, for good quality seed . Link with watershed programme for support of farm pond technology.
		Aman rice- wheat/ mustard/ vegetables	-do-	-do-	
	Red & laterite soils, undulated land. Moderately deep to deep coarse loamy to fine loamy red soils	Aman rice- fallow	-do-	-do-	
		Aman rice- wheat/ mustard/ vegetables	-do-	-do-	

	Red & laterite soils, undulated land. Shallow to moderately deep loamy soils	Aman rice- fallow	-do-	-do-	
		Aman rice- wheat/ mustard/ vegetables	-do-	-do-	

Early season drought (Normal onset)	Major Farming situation	Normal Crop/ cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Mid season dry spell at Flowering stage	Red & laterite soils, undulated land. Shallow to moderately deep coarse loamy fine loamy soils (hillocks, gravelly situation)	Aman rice-fallow	<ul style="list-style-type: none"> Supplemental irrigation Plan for land preparation to sow the fodder crops like maize and sorghum 	<ul style="list-style-type: none"> Spray 2% urea or DAP Top dressing of 50 kg N/ha after the relief of dry spell Need based pesticide application 	Linkage with seed farms ,department of agriculture,BCKV, NFSM, ISOPOM, NREGS, for good quality seed . Link with watershed programme for support of farm pond technology
		Aman rice-wheat/ mustard/ vegetables	If the damage is severe, prepare land for <i>rabi</i> vegetables	-do-	
	Red & laterite soils, undulated land. Moderately deep to deep coarse loamy to fine loamy red soils	Aman rice-fallow	<ul style="list-style-type: none"> Supplemental irrigation Plan for land preparation to sow the fodder crops like maize and sorghum 	-do-	
		Aman rice-wheat/ mustard/ vegetables	If the damage is severe, prepare land for <i>rabi</i> vegetables	-do-	
	Red & laterite soils, undulated land. Shallow to moderately deep loamy soils	Aman rice-fallow	<ul style="list-style-type: none"> Supplemental irrigation Plan for land preparation to sow the fodder crops like maize and sorghum 	-do-	
		Aman rice-wheat/ mustard/ vegetables	If the damage is severe, prepare land for <i>rabi</i> vegetables	-do-	

Condition			Suggested Contingency measures
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	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning	Remarks on Implementation
Terminal drought (Early withdrawal of monsoon)	Red & laterite soils, undulated land. Shallow to moderately deep coarse loamy fine loamy soils (hillocks, gravelly situation)	Aman rice- fallow	Supplemental irrigation with farm pond water / other sources	<ul style="list-style-type: none"> Plan for landpreparation of rabi crops Sowing of linseed/ Khesari as paira crop Sowing of short duration rapeseed var- Sanjucta, Asech, B-54, Jhanti / Sowing of lentil 	Linkage with seed farms ,department of agriculture,BCKV,NFSM, ISOPOM, NREGS, for good quality seed . Link with watershed programme for support of farm pond technology
		Aman rice- wheat/ mustard/ vegetables	-do-	-do-	
	Red & laterite soils, undulated land. . Moderately deep to deep coarse loamy to fine loamy red soils	Aman rice- fallow	-do-	-do-	
		Aman rice- wheat/ mustard/ vegetables	-do-	-do-	
	Red & laterite soils, undulated land. Shallow to moderately deep loamy soils	Aman rice- fallow	-do-	-do-	
		Aman rice- wheat/ mustard/ vegetables	-do-	-do-	

2.1.2 Drought - Irrigated situation

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		Remarks on Implementation
			Change in crop/cropping system	Agronomic measures	
Delayed release of water in canals due to low rainfall	Red & laterite soils, undulated land. Shallow to moderately deep coarse loamy fine	Aman rice-fallow	No change. Prefer direct sowing of short duration rice varieties like rasi ,khitish ,kiron and bhupen	<ul style="list-style-type: none"> Adopt SRI method Adopt alternate wetting and drying upto primordial initiation stage to save water Better weed Management. 	Linkage with seed farms ,department of agriculture ,BCKV,NFSM, ISOPOM, NREGS, for good quality

	loamy soils (hillocks, gravelly situation)	Aman rice-wheat/ mustard/ vegetables	-do-	<ul style="list-style-type: none"> • Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed management • If rice crop cannot be taken, select fodder crops like maize and sorghum or prepare land for <i>rabi</i> wheat / mustard 	seed . Link with watershed programme for support of farm pond technology
	Red & laterite soils, undulated land.	Aman rice-fallow	-do-	<ul style="list-style-type: none"> • Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed Management. 	
	Moderately deep to deep coarse loamy to fine loamy red soils	Aman rice-wheat/ mustard/ vegetables	-do-	<ul style="list-style-type: none"> • Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed management • If rice crop cannot be taken, select fodder crops like maize and sorghum or prepare land for <i>rabi</i> wheat / mustard 	
	Red & laterite soils, undulated land.	Aman rice-fallow	-do-	<ul style="list-style-type: none"> • Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed Management. 	
	Shallow to moderately deep loamy soils	Aman rice-wheat/ mustard/ vegetables	-do-	<ul style="list-style-type: none"> • Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed management • If rice crop cannot be taken, select fodder crops like maize and sorghum or prepare land for <i>rabi</i> wheat / mustard 	

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in canals due to low rainfall	Red & laterite soils, undulated land. Shallow to moderately deep coarse loamy fine loamy soils	Aman rice-fallow	No change. Prefer direct sowing of short duration rice varieties like rasi, khitish, kiron and bhupen	<ul style="list-style-type: none"> • Adopt SRI method • Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed Management. 	Linkage with seed farms ,department of agriculture ,BCKV,NFSM, ISOPOM, NREGS, for good quality seed . Link with

	(hillocks, gravelly situation)	Aman rice-wheat/ mustard/ vegetables	-do-	<ul style="list-style-type: none"> • Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed management • If rice crop cannot be taken, select fodder crops like maize and sorghum or prepare land for <i>rabi</i> wheat / mustard 	watershed programme for support of farm pond technology
	Red & laterite soils, undulated land. Moderately deep to deep coarse loamy to fine loamy red soils	Aman rice-fallow	-do-	<ul style="list-style-type: none"> • Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed Management. 	
		Aman rice-wheat/ mustard/ vegetables	-do-	<ul style="list-style-type: none"> • Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed management • If rice crop cannot be taken, select fodder crops like maize and sorghum or prepare land for <i>rabi</i> wheat / mustard 	
	Red & laterite soils, undulated land. Shallow to moderately deep loamy soils	Aman rice-fallow	-do-	<ul style="list-style-type: none"> • Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed Management. 	
		Aman rice-wheat/ mustard/ vegetables	-do-	<ul style="list-style-type: none"> • Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed management • If rice crop cannot be taken, select fodder crops like maize and sorghum or prepare land for <i>rabi</i> wheat / mustard 	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	Red & laterite soils, undulated land. Shallow to moderately deep coarse loamy fine loamy soils (hillocks, gravelly situation)	Aman rice-fallow	No change	<ul style="list-style-type: none"> • Adopt SRI method • Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed Management. 	Linkage with seed farms ,department of agriculture ,BCKV,NFSM, ISOPOM, NREGS, for good quality seed . Link with watershed programme for support of farm
		Aman rice-wheat/ mustard/ vegetables	Rice – khesari / linseed. or Rice – pulses or Rice – oilseed (mustard / rape seed)	<ul style="list-style-type: none"> • Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed management • If rice crop cannot be taken, select fodder crops like maize and sorghum or prepare land for <i>rabi</i> wheat / mustard 	

	Red & laterite soils, undulated land. Moderately deep to deep coarse loamy to fine loamy red soils	Aman rice-fallow	No change	<ul style="list-style-type: none"> • Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed Management. 	pond technology
		Aman rice-wheat/ mustard/ vegetables	Rice – khesari / linseed. or Rice – pulses or Rice – oilseed (mustard / rape seed)	<ul style="list-style-type: none"> • Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed management • If rice crop cannot be taken, select fodder crops like maize and sorghum or prepare land for <i>rabi</i> wheat / mustard 	
	Red & laterite soils, undulated land. Shallow to moderately deep loamy soils	Aman rice-fallow	No change	<ul style="list-style-type: none"> • Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed Management. 	
		Aman rice-wheat/ mustard/ vegetables	Rice – khesari / linseed. or Rice – pulses or Rice – oilseed (mustard / rape seed)	<ul style="list-style-type: none"> • Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed management • If rice crop cannot be taken, select fodder crops like maize and sorghum or prepare land for <i>rabi</i> wheat / mustard 	

Condition	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Suggested Contingency measures	
				Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall Any other condition	Red & laterite soils, undulated land. Shallow to moderately deep coarse loamy fine loamy soils (hillocks, gravelly situation)	Aman rice-fallow	Rice – khesari / linseed. Rice – pulses. Rice – oilseed (mustard / rape seed)	<ul style="list-style-type: none"> • Adopt SRI method • Use of improved seed • Balance fertilizer. • Timely intercultural Operation. • Adopt alternate wetting and drying upto primordial initiation stage to save water 	Linkage with seed farms ,department of agriculture ,BCKV,NFSM, ISOPOM, NREGS, for good quality seed . Link with watershed programme for support of farm pond technology
		Aman rice-wheat/ mustard/ vegetables	-do-	-do-	
	Red & laterite soils, undulated	Aman rice-fallow	-do-	-do-	

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
	land. Moderately deep to deep coarse loamy to fine loamy red soils	Aman rice-wheat/ mustard/ vegetables	-do-	-do-	
	Red & laterite soils, undulated land.	Aman rice-fallow	-do-	-do-	
	Shallow to moderately deep loamy soils	Aman rice-wheat/ mustard/ vegetables	-do-	-do-	

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

Condition - Continuous high rainfall in a short span leading to water logging				
Crop	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Rice	<ul style="list-style-type: none"> Drain excess water Post pone topdressing of N fertilizer till water recedes Takeup gap filling either with available nursery or splitting the tillers from surviving hills 	Drain excess water	<ul style="list-style-type: none"> Drain excess water Immediate harvesting + kept under shed with airy places. Spray 2% brine solution to prevent premature germination in the field 	<ul style="list-style-type: none"> Spray 2% brine solution to prevent premature germination in the field Allow the crop to dry completely before harvesting Dry the grain to proper moisture content before bagging and storage
Wheat	<ul style="list-style-type: none"> Drain excess water Takeup gap filling if population is < 75% 	Drain excess water	<ul style="list-style-type: none"> Drain excess water Allow the crop to dry completely before harvesting 	Dry the grain to proper moisture content before bagging and storage
Mustard & other oil seed	<ul style="list-style-type: none"> Drain excess water Take intercultivation at optimum soil moisture condition to loosen and 	<ul style="list-style-type: none"> Drain excess water Take intercultivation at optimum soil moisture condition to loosen and 	<ul style="list-style-type: none"> Drain excess water Allow the crop to dry completely before harvest 	Dry the grain to proper moisture content before bagging and storage

	<p>aerate the soil and to control weeds</p> <ul style="list-style-type: none"> • Spray Mancozeb (0.25 %) to control fungal diseases 	<p>aerate the soil and to control weeds</p>		
Horticulture				
Cauliflower	<ul style="list-style-type: none"> • Drain excess water • Three sprays of 0.1% Ammonium molybdate 15, 30 and 45 days after transplanting. 	<ul style="list-style-type: none"> • Drain excess water • Blanching i.e. covering the curd through tying the outer leaves up over the curd improve curd colour and quality. 	Early harvesting	Large leaves are trimmed away leaving only sufficient jacket leaves to protect the curd from bruising and other mechanical injury in transport.
Condition-Heavy rainfall with high speed winds in a short span				
Rice	Drain out excess water	Drain excess water	<ul style="list-style-type: none"> • Immediate harvesting • Arrange for drying of the produce in airy sheds 	<ul style="list-style-type: none"> • Spray 2% brine solution to prevent premature germination in the field • Allow the crop to dry completely before harvesting • Dry the grain to proper moisture content before bagging and storage
Horticulture				
Cauliflower	Drain excess water	<ul style="list-style-type: none"> • Drain excess water • Spraying the crop with Copper-oxychloride (0.3%) or Mancozeb (0.25 %)/ Chlorothalonil (0.2%) or Difenconazole (0.5g/lit) with sticker at 10 days interval to prevent curd blight. 	Immediate harvesting	Maintain optimum moisture before marketing
Cabbage	Drain excess water	Spraying the crop with Cypermethrin @ 0.1% with sticker to control cabbage borer	-do-	-do-
Okra	Drain out excess water	Spraying the crop with Cypermethrin @ 0.1% to	-do-	-do-

		control fruit borer.		
Brinjal	Drain out excess water	Clipping off the infested shoot by brinjal fruit and shoot borer at regular interval and spraying the crop with Cartap hydrochloride @ 1 g/l of water / Spinosad @ (0.15ml/l), 0.25% Carbaryl or 0.05% Endosulfan at the early flowering stage and after harvesting of fruits during bearing stage is very effective	Immediate harvesting	-
Outbreak of pests and diseases due to unseasonal rains				
Okra	Four spraying of systemic insecticides starting from 20 days after sowing at 10 days interval	Spraying the crop with Cypermethrin @ 0.1% to control fruit borer	Spraying the crop with Cypermethrin @ 0.1% to control fruit borer	-
Cucurbits	Two sprays of 0.25% Fosetyl Al or Cyamoxanil- Mancozeb or Metalaxyl- Mancozeb at 10 days interval effectively control downy mildew disease.		Apply poison bait. Bait is prepared by mixing 20 g Malathion 50% WP with 500 g molasses + 20 g yeast hydrolysate. This mixture is mixed with 2 litres of water for poison baiting and 20 liters of water for bait spray for the control of fruit fly.	-
Chilli	Spraying of Prophenophos @ 1ml/litre/ Diafenthuron @ 1 g/litre/ Prlopergite @ 1 g/litre for the control of thrips and mites at 15-20 days interval		Spray the crop with Hexaconazole 0.1% followed by 0.3% Blitox after removal of the infected twigs at 10 days interval for the control of dieback or anthracnose	-
Okra	Four spraying of systemic insecticides starting from 20 days after sowing at 10 days interval	Spraying the crop with Cypermethrin @ 0.1% to control fruit borer	Spraying the crop with Cypermethrin @ 0.1% to control fruit borer	

2.3 Flood: Not applicable

2.4 Extreme events: Heat wave / Cold wave/Frost/ Hailstorm /Cyclone -Not applicable

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	<u>Suggested</u> contingency measures		
	Before the event^s	During the event	After the event
Drought			
Feed and fodder availability	<p>Cultivation of perennial fodder in barren lands and on the bank of the rivers; feeding of unconventional and tree leaf fodder in natural disadvantageous situation,</p> <p>Insurance of livestock</p> <p>Alert nearby Govt. fodder farms to stock straw and fodder and make necessary arrangements</p> <p>Irrigation by installing deep tube wells</p> <p>Strengthening of Govt. fodder farms to cultivate unconventional fodders</p>	<p>Establishing Control Room,</p> <p>Feed fodder from nearby Govt. fodder farms, perennial fodder.</p> <p>Collect fodder from nearby less affected areas</p> <p>Feed region specific concentrated feed supplements</p> <p>Distribute fodder through cattle shed in organized manner through BLDOs (1 shed per 4-5 villages)</p>	<p>Claim insurance</p> <p>Feed supplements</p> <p>Cull the unproductive stock</p> <p>Repayment of Credit for livestock rearing may be waived or extended for long time</p>
Drinking water	<p>Dig deep tube wells in the pockets of water sheds and use on community basis</p> <p>Pond preparation / reclamation</p> <p>Conservation of Rain water</p>	<p>Use water from deep tube well, river or other water reservoirs.</p> <p>Treatment of water.</p> <p>Receive water supply from nearby less affected places</p>	<p>Sterilize drinking water, if possible</p>
Health and disease management	<p>Make alert for the Govt. & Non-Govt departments for adequate storage of medicines, vaccines, saline/dextrose</p> <p>Make provisions of cattle shed on community basis</p> <p>Constitute Departmental Disaster Management Committee at the Block, Sub-division & District level for planning, management & stocking of medicine/vaccines etc.</p>	<p>Organize health camp, treatment of animals in community cattle sheds.</p> <p>Use stress relieving medicines & protect animal houses from extreme hot air</p> <p>Use Departmental committee and form Control room</p>	<p>Treat sick animals</p> <p>Cull permanently unproductive animals</p> <p>Introduce new stock from the unaffected areas</p>

Floods			
Feed and fodder availability	Stock dry straw in the nearby Govt. fodder farms, ask the private parties to stock straw, Insurance of livestock Alert nearby Govt. fodder farms to stock straw and also insist upon ample production of green fodder Constitute Departmental Disaster Management Committee at the Block, Sub-division & District level for planning of management action	Supply fodder from nearby Govt. fodder farms, private parties, community fodder bank etc. Feed region specific concentrated feed supplements Establish Control Room at the Block, Sub-division & District level for prompt management action	Claim insurance Feed supplements Cull the unproductive stock Introduce new stock from the unaffected areas
Drinking water	Establish water reservoir from the ground water or river or rain water harvesting in water sheds on community basis	Use water from deep tube well, river or other water reservoirs, In devastating areas use ground water after local people	Ground water disinfection Use disinfection of nearby water sources
Health and disease management	Make alert for the Govt. & Non-Govt departments for adequate storage of medicines, vaccines, saline/dextrose Organize awareness camp Utilize Departmental Disaster Management Committee at different levels for prevention & therapy of animals	Organize health camp, treatment of animals, Mass use of protective and curing medicines for gut sterilization Use Departmental Disaster Management Committee at different levels for prompt therapy	Treat sick animals Cull permanently unproductive animals
Cyclone			
Feed and fodder availability	Stocking of green and dry fodder in Govt. & Private farms. Insurance of livestock Better forecasting for fodder farms Constitute Departmental Disaster Management Committee	Supply fodder from nearby Govt. fodder farms, private parties, prepared hay or silage, community fodder bank etc. Feed region specific concentrated feed supplements Establish Control Room at the Block, Sub-division & District level for prompt management action	Claim insurance Feed supplements Cull the unproductive stock Introduce new stock from the unaffected areas
Drinking water	Establish water reservoir on community basis	Use water from safe source	Ground water disinfection Use disinfection of nearby water sources
Health and disease	Make alert for the Govt. & Non-Govt.	Organize health camp, treatment of	Treat sick animals

management	departments for adequate storage of medicines, vaccines, saline/dextrose Organize awareness camp Utilize Departmental Disaster Management Committee at different levels for prevention & therapy of animals	animals, Mass use of protective and curing medicines for gut sterilization Use Departmental Disaster Management Committee at different levels for prompt therapy	Cull permanently unproductive animals
Heat wave and cold wave			
Shelter/environment management	Make arrangements of safe drinking water. Preparation of animal houses on scientific manner. Establish shelters at safe position in the areas for avoidance of heat/cold wave. Plant the trees giving shed to the houses Use protection of curtains over the windows	Give ample green fodder during heat wave, Make arrangements of ample drinking water, Feed ample water mixed with molasses and common salt, Give shed of straw over roof of animal house, In cold wave give drinking water with concentrate mixture to feed.	Creation of awareness for scientific management practices and construction of animal shelter on community basis
Health and disease management	Store medicine, saline etc. House animals in safe & comfortable area	Administer stress removing medicaments	Awareness on Scientific management practices & disease control

2.5.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event ^a	During the event	After the event	
Drought				
Shortage of feed ingredients	Assessment of cage management in shed areas Insurance Bank linkage Instruct Govt. feed supplies to stock feed for urgency	Establishing Control Room, Feed from stocked feed Keep the birds in specifically constructed shed with provision of saline water & feed ingredients.	Avail insurance Introduce new stock from the unaffected areas	ASCAD
Drinking water	Install bore well In city area seek drinking water supply	Use drinking water from different kind of water reservoirs	Use disinfection and sterilization of drinking water	

Health and disease management	Emergency preparedness of Govt. department Organise awareness camp Formulate Departmental Disaster Management Committee at Block, Sub-division & District levels for proper planning & give requisition of medicine, vaccines, biologicals beforehand for the Govt. supplies Bio-security measurers must be in action for prevention of emerging diseases to obstacle in the transmission of disease	Undisrupted supply of medicines Organise mass health camp & treat birds Utilize Departmental Disaster Management Committee for prompt therapy & control of diseases	Treatment of affected birds. Culling of affected birds & subsequent disposal	
Floods				
Shortage of feed ingredients	Establishing shed for keeping of birds on community basis. Emergency preparedness for Govt. feed plants and also for non-Govt. companies	Supply from nearby Private or Govt. feed plants	Cull dead and affected birds and subsequently to be buried in isolated place Introduce new stock from the unaffected areas	
Drinking water	Sterilization of drinking water. Dig deep tube wells.	Use water from dig well after disinfection & supply it	Awareness on hygienic water conservation	
Health and disease management	Store medicines & vaccines. Arrangement of vehicle, police, local administrations. Organise awareness cap Obtain allotment of fund from Head Quarter upto Block level for feed,	Control room. Organise mass health camp & treat birds	Culling of affected birds & subsequent disposal	

	medicine, vaccines etc.			
Cyclone				
Shortage of feed ingredients	Arrangement of poultry feed ingredients and more production of poultry feed for future usage	Ample supply of poultry feed in the affected areas	Awareness on preparation of poultry feed using unconventional feed ingredients and	
Drinking water	Arrangements of hygienic potable water and conservation of water	Ample supply of safe water	Awareness of water conservation	
Health and disease management	Group Insurance or Community Insurancing for affected animals against diseases of birds . Mass vaccination.	Adopt scientific rearing practices. Supply of medicines and vaccines	Awareness on poultry disease prevention & control in natural disaster	
Heat wave and cold wave				
Shelter/environment management	Construct houses at safe place for emergency housing of poultry birds one per 4-5 villages. Establish shelters at safe position in the upland at Block/Sub-division/District level Bio-security system should be practiced in all the occasions of emerging poultry diseases	Avoid further spread of disease by housing the birds in the safe location outside the infected zone	Re-introduce birds from unaffected areas	
Health and disease management	Preparedness for timely supply of medicines/ vaccines/ biologicals is essential	Ample supply of medicines & vaccines	Awareness creation on scientific managerial practices and disease control measurers	

2.5.3

Fisheries/ Aquaculture

	Suggested contingency measures
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	Before the event ^a	During the event	After the event
1) Drought			
A. Capture			
Marine	Not applicable	Not applicable	Not applicable
Inland			
(i) Shallow water depth due to insufficient rains/inflow	Proposed for excavation of earth from periphery areas so that water can retain in the deep pockets and building of high embankment	Supply of water into the water body from tube well, nearby river etc. and observe mortality of fish and proper management of the said water body.	Proper post-event management, retention of water, disinfecting water (if possible) to prevent disease out-breaks.
(ii) Changes in water quality	Water and soil quality tests suggested from time to time.	Proper management in ponds for soil and water as per the test report.	Proper disinfection of water and maintenance of water temperature and plankton quantity.
(iii) Any other	Nil	Nil	Nil
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	Proposed for excavation of earth from the pond so that water can retain during drought and supply of water in to the pond from tube well / river etc.	Control of pond water quality parameters and maintenance of optimum level of planktons (fish food) in the pond through proper fertilization (if required)	Suggested for disinfection of pond water through liming and periodic netting to assess the biomass.
(ii) Impact of salt load build up in ponds / change in water quality	Not applicable (No saline water nearby)	Not applicable (No saline water nearby)	Not applicable (No saline water nearby)
(iii) Any other	Nil	Nil	Nil
2) Floods			
A. Capture			
Marine	Not applicable (No marine fishery resource)	Not applicable (No marine fishery resource)	Not applicable (No marine fishery resource)
Inland			
(i) Average compensation paid due to loss of human life	Creating awareness among the fishermen on emergency strategies to be adopted in the case of flood.	Advise to shift to high land / flood shelter camps to save life.	Monetary compensation to the affected family for loss of life.
(ii) No. of boats / nets/damaged	Training fishermen on protection of boats, nets etc. in case of occurrence of flood.	Keeping the boat / net in dry / high places during flood situation.	Damage reports are to be sent to higher authority for compensation.
(iii) No. of houses damaged	Nil	Nil	Damage reports are to be sent to higher

			authority for compensation.
(iv) Loss of stock	Advise to strengthen protection dyke so that during flood dyke remains safe and fish stock are not affected. Placing fish aggregation devices in the deeper zones so that fish are accumulated there.	Advise to protect fish stock from escaping by putting nets in the areas where dyke is damaged.	Assessing the residual fish stock after the flood and taking proper management strategies as per the advice of Fishery Department.
(v) Changes in water quality	Nil	Nil	Application of lime / other disinfectants in the water body
(vi) Health and diseases	Nil	Nil	Monitoring and taking preventive measures against out-break of disease
B. Aquaculture			
(i) Inundation with flood water	Raising the height of the pond dyke in the flood prone areas, Harvesting the stock before onset of monsoon.	Placing nets to prevent escape of fish from the culture ponds.	Repair of pond dyke.
(ii) Water contamination and changes in water quality	Nil	Nil	Suggested for water testing and advice for corrective measures.
(iii) Health and diseases	Nil	Nil	Suggested for water treatment through liming and other disinfectants and monitoring of health of fish stock..
(iv) Loss of stock and inputs (feed, chemicals etc)	Arrangement for keeping feeds / chemicals in dry & safe place.	Immediately shift the inputs to high / safe place. Sundry (if possible) the wet inputs.	Recommending to higher authority for supplying mini kit (fingerlings, lime & other critical inputs)
(v) Infrastructure damage (pumps, aerators, huts etc)	Keeping them in safe place after use.	Immediately shift the pump / aerator from the pond to safe place. Remove the other valuable items from the hut in case possibilities of flood water entering to the hut	Recommending to higher authority for compensation against the loss.
(vi) Any other	Insurance for aquaculture activities. Constitute Departmental Disaster Management Committee at the Block, Sub-division & District level for planning management action.	Establish Control Room at the Block, Sub-division & District level for prompt management action. Cancel leaves for the employees	Claim insurance
3. Cyclone / Tsunami			
A. Capture			

Marine	Not applicable	Not applicable	Not applicable
Inland			
(i) Average compensation paid due to loss of fishermen lives	Creating awareness among the fishermen on emergency strategies to be adopted in the case of cyclone.	Advise to shift to high land / flood shelter camps to save life.	Monetary compensation to the affected family for loss of life.
(ii) Avg. no. of boats / nets/damaged	Training fishermen on protection of boats, nets etc. in case of occurrence of cyclone.	Keeping the boat / net in dry / high places during flood situation.	Damage reports are to be sent to higher authority for compensation.
(iii) Avg. no. of houses damaged	Nil	Nil	Damage reports are to be sent to higher authority for compensation.
B. Aquaculture			
(i) Overflow / flooding of ponds	Raising the height of the pond dyke in the flood prone areas, Harvesting the stock before onset of monsoon.	Placing nets to prevent escape of fish from the culture ponds.	Repair of pond dyke.
(ii) Changes in water quality (fresh water / brackish water ratio)	Not applicable (No brackish water source nearby)	Not applicable (No brackish water source nearby)	Not applicable (No brackish water source nearby)
(iii) Health and diseases	Nil	Nil	Monitoring and taking preventive measures against out-break of disease
(iv) Loss of stock and inputs (feed, chemicals etc)	Arrangement for keeping feeds / chemicals in dry & safe place.	Immediately shift the inputs to high / safe place. Sundry (if possible) the wet inputs.	Recommending to higher authority for supplying mini kit (fingerlings, lime & other critical inputs)
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)	Keeping them in safe place after use.	Immediately shift the pump / aerator from the pond to safe place. Remove the other valuable items from the hut in case possibilities of flood water entering to the hut	Recommending to higher authority for compensation against the loss.
(vi) Any other	Insurance for aquaculture activities. Constitute Departmental Disaster Management Committee at the Block, Sub-division & District level for planning management action.	Establish Control Room at the Block, Sub-division & District level for prompt management action. Cancel leaves for the employees	Claim insurance

4. Heat wave and cold wave

A. Capture			
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Marine	Not applicable	Not applicable	Not applicable
Inland	Harvesting of fish stock to minimize the loss due to heat / cold wave.	Placing the tree branches, old pipes etc. in the deeper zone so that fish can take shelter in the cool places.	Nil
B. Aquaculture			
(i) Changes in pond environment (water quality)	Increase pond water depth by pumping water in to the pond during summer months.	During heat wave, place the tree branches, old pipes etc. in the deeper zone so that fish can take shelter in the cool places. If pond water depth reduces, partially harvest stock, reduce / stop supplementary feeding, reduce / stop fertilization, watch out for Dissolve oxygen (DO) depletion.	Try to increase the pond water depth, take necessary measure for improving pond water quality parameters.
(ii) Health and Disease management	Be vigilant for fish disease	Do not go for additional stocking. Take appropriate treatment for the diseased fish after consulting fishery expert / Fishery Extension Officer.	Watch out for health status of fish stock through netting.
(iii) Any other	Nil	Nil	Nil