State: WEST BENGAL

Agriculture Contingency Plan for District: PURULIA

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	Eastern plateau (chhotanagpur) And Eastern Ghats, Hot Subhumid Eco-Region (12.3)		
	Agro-Climatic Zone (Planning Commission)	Lower Gangetic Plain Region (III)		
	Agro Climatic Zone (NARP)	Red and Laterite soil Zones (WB-5)		
	List all the districts or part thereof falling under the NARP Zone	Purulia, Bankura, Birbhum, BURDWAN, Midnapur (West), Murshidabad		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		23º20' 00.00 " N	86º 22' 00.00" E	228 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	RRS (R & L Z), BCKV, Jhargam, 721507, Paschim Medinipur, 03221-. 255593(O)		
	Mention the KVK located in the district	Kalyan Krishi Bigan Kandra Purulia-723 147		

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):	1024.7	3rd week of June	4th week of September
	NE Monsoon(Oct-Dec):	123.6	-	-
	Winter (Jan- March)	65.1	-	-
	Summer (Apr-May)	113.5	-	-
	Annual	1328.9	-	-

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)	625.65	428.36	75.05	109.32	3.10	7.90	2.50	4.31	105.53	5.83

1. 4	**Major Soils (common names like red sandy loam deep soils (etc.,)***	**Area (‘000 ha)**	**Percent (%) of total**
	Shallow to moderately deep coarse loamy fine loamy soils (hillocks, gravelly situation)	4.39	1%
	Moderately deep to deep coarse loamy to fine loamy red soils	175.60	40%
	Shallow to moderately deep loamy soils	259.01	59%

1.5	**Agricultural land use**	Area (‘000 ha)	Cropping intensity %
	Net sown area	317.00	118
	Area sown more than once	57	
	Gross cropped area	374.00	

1.6	**Irrigation**	Area (‘000 ha)		
	Net irrigated area	71.13		
	Gross irrigated area	231.74		
	Rainfed area	142.26		
	Sources of Irrigation	Number	Area (‘000 ha)	Percentage of total irrigated area
	Canals	-	28.83	6.56
	Tanks	-	28.85	6.57
	Open wells	-	-	-
	Bore wells	-	-	-
	Lift irrigation schemes	-	4.41	0.93
	Micro-irrigation	-	-	-
	Other sources	-	9.04	2.05
	Total Irrigated Area	-	71.13	16.20
	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	-	-	Fluoride level 1.01-3.38 mg/lit
	Critical	-	-	Fluoride depth range 6-45 mblgl

	Semi- critical	-	-	-
	Safe	28	-	-
	Wastewater availability and use	22	-	-
	Ground water quality	Ground Water contaminated with Fluoride in 15 blocks		
*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 2008-09)

1.7	**Major field crops cultivated**	**Area ('000 ha)**							
		Kharif			***Rabi***				
		Irrigated	**Rainfed**	**Total**	**Irrigated**	**Rainfed**	**Total**	**Summer**	**Grand total**
	Rice (Transplanted)	-	308.7	308.7	-	-	-	5.0	313.7
	Maize	-	-	-	-	-	-	-	7.2
	Pulses (Black gram and red gram)	-	-	-	-	12.4	12.4	-	12.4
	Oilseeds (Mustard)	-	-	-	-	4.8	4.8	-	4.8
	Potato	-	-	-	1.1	-	1.1	-	1.1

	Horticulture crops - Fruits	**Area ('000 ha)**		
		Total	**Irrigated**	**Rainfed**
	Mango	1.46	-	1.46
	Papaya	0.41	-	0.41
	Banana	0.03	-	0.03
	Pineapple	0.04	-	0.04
	Guava	0.67	-	0.67
	Horticulture crops - Vegetables	**Total**	**Irrigated**	**Rainfed**
	Brinjal	8.51	-	8.51
	Cucurbits	8.55	-	8.55
	Tomato	5.82	-	5.82
	Cabbage	2.10	-	2.10
	Cauliflower	1.23	-	1.23
	Ladiesfinger	3.03	-	3.03
	Medicinal and Aromatic crops	Nil	-	-
	Plantation crops	Nil	-	-
	Fodder crops	Nil	-	-

1.8	**Livestock (2007-08)**	**Male (‘000)**	**Female (‘000)**	**Total (‘000)**
	Non descriptive Cattle (local low yielding)	564.0	363.7	916952
	Crossbred cattle	5.2	11.1	16358
	Non descriptive Buffaloes (local low yielding)	83.2	17.4	87669
	Graded Buffaloes	-	-	12907
	Goat	-	-	813191
	Sheep	-	-	285383
	Others (Camel, Pig, Yak etc.)	-	-	Horse-20, Pig-58591, Rabbit-260
	Commercial dairy farms (Number)	-	-	-
1.9	**Poultry**	**No. of farms**	**Total No. of birds (‘000)**	
	Commercial	Broiler-222, Improved Layer-11	In Farm: Broiler-228617, Layer-12667 [District Total of Improved strains Fowl-230019, Duck-31184, Quail-2, Other-6766]	
	Backyard	Fowl – 2, Duck -0	In Farm: Deshi Total Fowl-1500 [District Total of Deshi Fowl-1872822, Duck-460500]	

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	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
		-	-	-	-	-	-
		-	-	-	-	-	-
	ii) Inland (Data Source: Fisheries Department	**No. Farmer owned ponds**		**No. of Reservoirs**		**No. of village tanks**	
		No. of Farmer: 30201 Area of Pond (ha.) : 9369.39		24 Nos. (Total 5528.32 ha.)		Record not available	
	B. Culture						
		Water Spread Area (ha)		**Yield (t/ha)**		**Production (‘000 tons)**	
	i) **Brackish water** (Data Source: MPEDA/ Fisheries Department)	Nil		-		Prawn- Nil	

	ii) **Fresh water** (Data Source: Fisheries Department)	Culturable area: 4398.68 ha. Semi-Derelict area: 9229.64ha. Derelict area: 4947.37 ha. Total area: 18575.69 ha.	From Ponds under FFDA Scheme= 4.32 t/ ha.	42497 ton Fish (2008-09) Fish Seed Production (08-09)= 170 million
	Others	3707.29 ha. (River)	-	

1.11 Production and Productivity of major crops (Average of last 5 years: 2004, 05, 06, 07, 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	2.76	1383	669.88	2354	3.52	2121	676.16	2246
	Maize	14.707	1417	-	-	-	-	14.707	1417
	Pulses	5.199	389	-	-	-	-	5.199	389
	Oilseeds	-	-	3.49	-	-	-	3.49	549
	Potato	-	-	13.851	-	-	-	13.851	10560
	Major Horticultural crops (Crops to be identified based on total acreage)								
	Brinjal	-	-	168.75	19829	-	-	168.75	19829
	Cucurbits	-	-	104.93	12272	-	-	104.93	12272
	Tomato	-	-	76.69	14415	-	-	76.69	14415
	Okra	-	-	37.74	12455	-	-	37.74	12455
	Cabbage	-	-	61.77	29414	-	-	61.77	29414

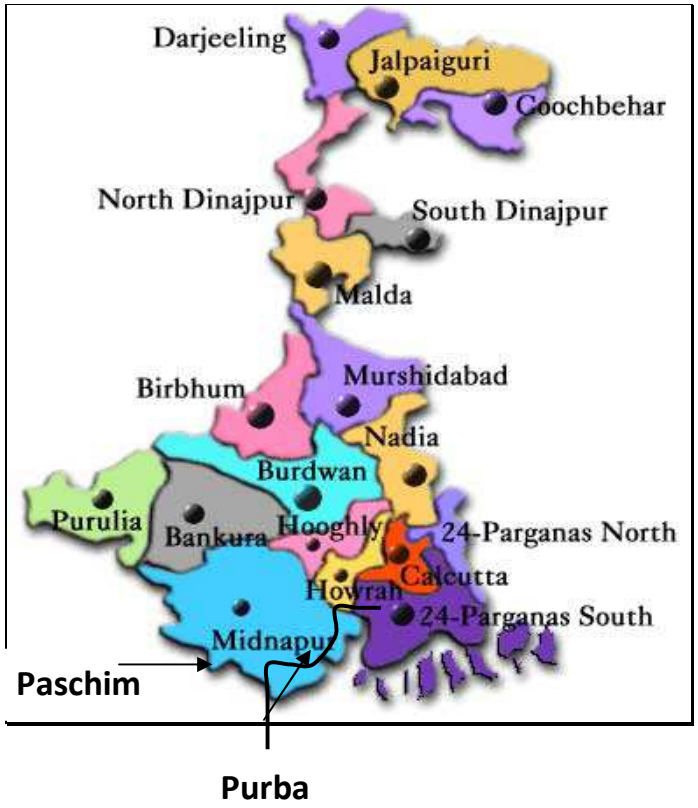
1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	Rice	Maize	Pulse	Oilseeds	Wheat
	Kharif- Rainfed	July 2nd week to Aug 1st week	July 1st week to 3rd week	-	-	-
	Kharif-Irrigated	-	-	-	-	-
	Rabi- Rainfed	-	-	Oct 2nd week to Nov 2nd week	Oct 2nd week to Nov 2nd week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

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

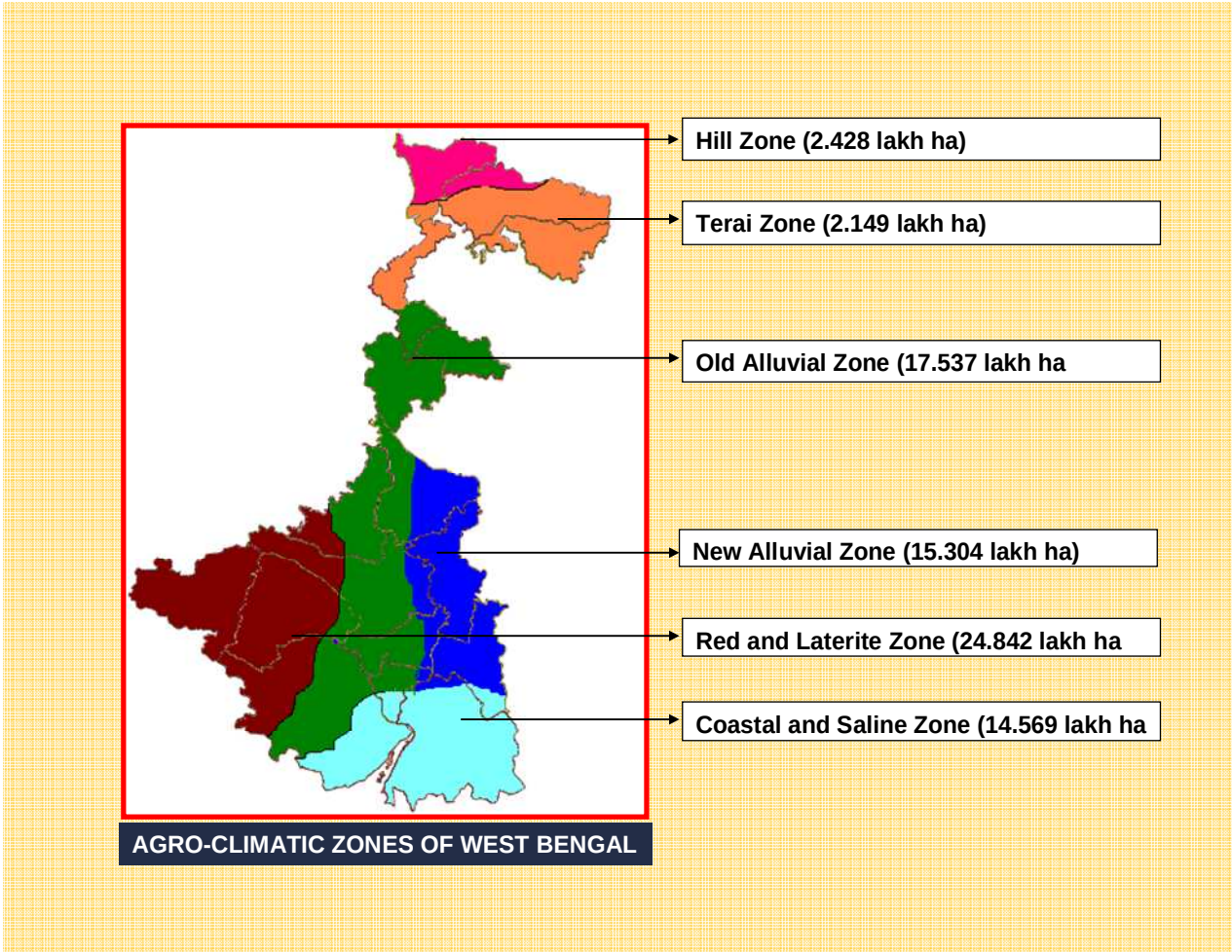
Annexure –I

Location map of Purulia district

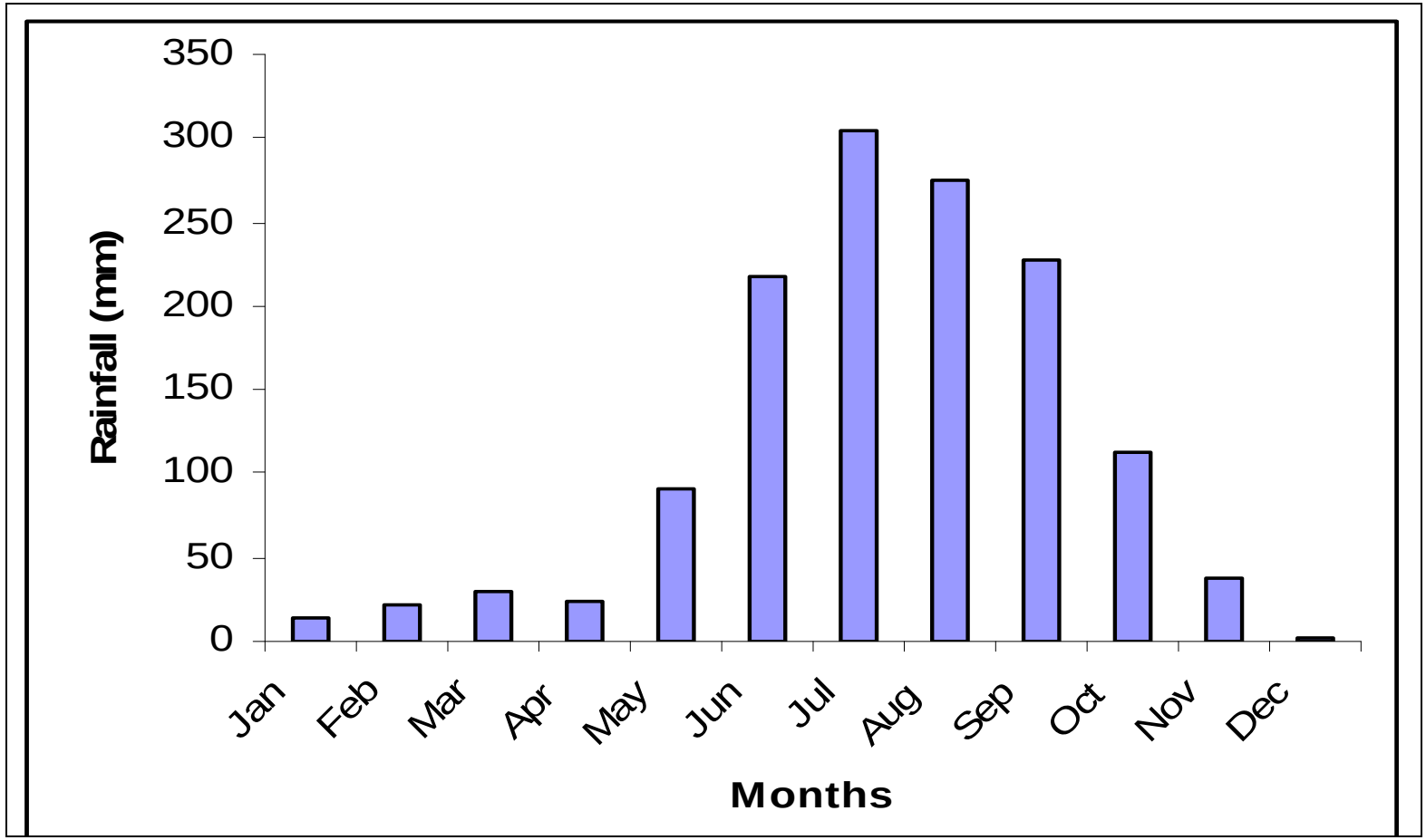


Annexure-II

Agroclimatic Zones of West Bengal



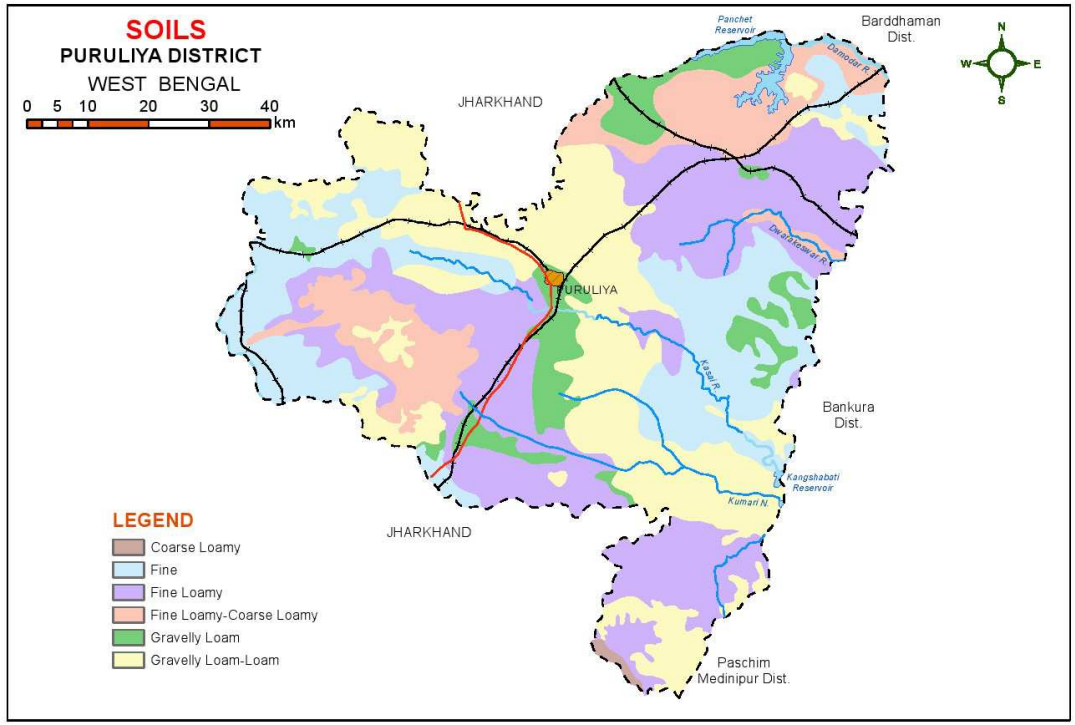
Annexure-III



Mean monthly rainfall of Purulia district

Annexure-IV

Soil map of Purulia district



Source: NBSS&LUP Regional Centre, Kolkata

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

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 2 weeks 3rd 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	• Dry seeding of rice/ drum seeding. • Timely weed control.	Linkage with Seed farms, Department of Agriculture, NSC, WBSC, BCKVV for supply of seed
		Aman rice-Wheat/ Mustard/ Vegetables	-do-	-do-	
		Cauliflower	No change. Prefer varieties like Early Kunwari, Pusa Early Synthetic, Synthetic 78-1	• 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)	• Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease; • 4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l or Thiamethoxam (3.5 ml/ 10 l) to control whitefly	
		Cucurbits (Cucumber, ridge gourd, bottle gourd, bitter gourd etc.)	No change. Prefer local cultivars	• Prepare mounds in the furrow for sowing of seeds • Application of 150-20-50 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 stage of 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 to be 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	• Transplant 2-3 seedlings/hill • Timely weed control..	
		Aman rice-Wheat/ Mustard/ Vegetables	-do-	-do-	
		Cauliflower	No change. Prefer varieties like Early Kunwari, Pusa Early Synthetic, Synthetic 78-1	• 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)	• Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease; • 4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l or Thiamethoxam (3.5 ml/ 10 l) to control whitefly	
		Cucurbits (Cucumber, Ridge gourd, Bottle gourd, Bitter gourd etc.)	No change. Prefer local cultivars	• Prepare mounds in the furrow for sowing of seeds • Application of 150-20-50 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 stage of 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 to be pruned • Timely control of downy mildew disease	
	Red & laterite soils, undulated land. Shallow to moderately deep loamy soils	Aman rice-Fallow	No change	• Transplanting 4-5 seedlings/hill • Timely weed control.	
		Aman rice-Wheat/ Mustard/ Vegetables	-do-	-do-	

		Cauliflower	No change. Prefer varieties like Early Kunwari, Pusa Early Synthetic, Synthetic 78-1	• 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)	• Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease; • 4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l or Thiamethoxam (3.5 ml/ 10 l) to control whitefly	
		Cucurbits (Cucumber, Ridge gourd, Bottle gourd, Bitter gourd etc.)	No change. Prefer local cultivars	• Prepare mounds in the furrow for sowing of seeds • Application of 150-20-50 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 stage of 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 to be pruned • Timely control of downy mildew disease	

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 1st 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	Transplant 3-4 seedlings/hill	Linkage with Seed farms, Department of Agriculture, NSC, WBSC, BCKVV for supply of seed
		Aman rice-Wheat/ Mustard/ Vegetables	-do-	-do-	
		Cauliflower	No change. Prefer varieties like Pusa	• Raising of seed bed under transparent plastic cover • Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of	

			Deepali, Pusa Katki	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)	• Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease; • 4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l or Thiamethoxam (3.5 ml/ 10 l) to control whitefly	
		Cucurbits (Cucumber, Ridge gourd, Bottle gourd, Bitter gourd etc.)	No change. Prefer local cultivars	• Prepare mounds in the furrow for sowing of seeds • Application of 150-20-50 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 stage of 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 to be pruned • Timely control of downy mildew disease	
		Cabbage	High temperature tolerant hybrids	• 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	• 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	No change. Prefer varieties like Early Kunwari, Pusa Early Synthetic, Synthetic 78-1	• 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)	• 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 Imidacloprid (3.5 ml/ 10 l or Thiamethoxam (3.5 ml/ 10 l) to control whitefly	
		Cucurbits (Cucumber, Ridge gourd, Bottle gourd, Bitter gourd etc.)	No change. Prefer local cultivars	• Prepare mounds in the furrow for sowing of seeds • Application of 150-20-50 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 stage of 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 to be pruned • Timely control of downy mildew disease	
		Cabbage	High temperature tolerant hybrids	• 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	Transplant 3-4 seedlings/hill	
		Aman rice-Wheat/ Mustard/ Vegetables	-do-	-do-	
		Cauliflower	No change. Prefer varieties like Early Kunwari, Pusa Early Synthetic, Synthetic 78-1	• 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)	• Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease; • 4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l or Thiamethoxam (3.5 ml/ 10 l) to control whitefly	
		Cucurbits (Cucumber, Ridge gourd, Bottle gourd, Bitter gourd etc.)	No change. Prefer local cultivars	• Prepare mounds in the furrow for sowing of seeds • Application of 150-20-50 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 stage of 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 to be pruned • Timely control of downy mildew disease	
		Cabbage	High temperature tolerant hybrids	• 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 3rd week of July	Red & laterite soils, undulated land. Shallow to moderately deep coarse loamy fine loamy soils	Aman rice-Fallow	No change. Grow maize, Ground nut, black gram in high land situation.	• Transplant 4-5 aged seedlings per hill • Follow Dapog & SRI method.	Linkage with Seed farms, Department of Agriculture, NSC, WBSC, BCKVV for supply of seed
		Aman rice-Wheat/ Mustard/ Vegetables	-do-	-do-	
		Cauliflower	No change. Prefer varieties like Hisar-1,	• Raising of seed bed under transparent plastic cover • Spray the 15 days old seedlings with the starter solution	

	(hillocks, gravelly situation)		Improved Japanese, Pusa Sharad, Pant Gobi-4, Pant Shubra.	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,	• 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)	• Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease; • 4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l or Thiamethoxam (3.5 ml/ 10 l) to control whitefly	
		Brinjal	No change. Prefer varieties Muktakeshi, BCB-11, BCB-30; Bhangar, Patakata	• Raising of seed bed under transparent plastic cover; • After transplanting two foliar sprays of 0.5% $ZnSO_4$ and single spray of 0.15% $CuSO_4$ 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.	• Transplant 3-4 aged seedlings per hill • Follow Dapog & SRI method.	
		Aman rice-Wheat/ Mustard/ Vegetables	-do-	-do-	
		Cauliflower	No change. Prefer varieties like Hisar-1, Improved Japanese, Pusa Sharad, Pant Gobi-4, Pant Shubra.	• 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,	-do-	
		Okra	No change. Prefer varieties like Arka Anamika, Arka Abhay,	• Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease; • 4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l or	

			Pusa A-4, VRO-6, Azad Krishna (OP), Mahyco-12, No-152 (Hybrid)	Thiamethoxam (3.5 ml/ 10 l) to control whitefly	
		Brinjal	No change. Prefer varieties Muktakeshi, BCB-11, BCB-30, Bhangar, Patakata	• Raising of seed bed under transparent plastic cover; • After transplanting two foliar sprays of 0.5% $ZnSO_4$ and single spray of 0.15% $CuSO_4$ increase yield and quality of fruits.	
	Red & laterite soils, undulated land. Shallow to moderately deep loamy soils	Aman rice-Fallow	No change	• Dry seeding of rice/ drum seeding if the damage is severe. • Timely weed control.	
		Aman rice-Wheat/ Mustard/ Vegetables	-do-	-do-	
		Cauliflower	No change. Prefer varieties like Hisar-1, Improved Japanese, Pusa Sharad, Pant Gobi-4, Pant Shubra.	• 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,	-do-	
		Okra	No change. Prefer varieties like Arka Anamika, Arka Abhay, Pusa A-4, VRO-6, Azad Krishna (OP), Mahyco-12, No-152 (Hybrid)	• Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease; • 4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l or Thiamethoxam (3.5 ml/ 10 l) to control whitefly	
		Brinjal	No change. Prefer varieties Muktakeshi, BCB-11, BCB-30, Bhangar, Patakata	• Raising of seed bed under transparent plastic cover; • After transplanting two foliar sprays of 0.5% $ZnSO_4$ and single spray of 0.15% $CuSO_4$ 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 1st week of August	Red & laterite soils, undulated land. Shallow to moderately deep coarse loamy fine loamy soils (hillocks, gravelly situation)	Aman rice- Fallow	Vegetables / short duration rice(Raasi, Khitesh, Kiron, Bhupen) in upland& medium land situation	Transplant 4-5 aged seedlings per hill	Linkage with Seed farms, Department of Agriculture, NSC, WBSC, 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,	• 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	-do-	
		Brinjal	No change. Prefer varieties like Muktakeshi, BCB-11, BCB-30; Bhangar, Patakata	• Raising of seed bed under transparent plastic cover; • After transplanting two foliar sprays of 0.5% $ZnSO_4$ and single spray of 0.15% $CuSO_4$ increase yield and quality of fruits.	
		Tomato	No change. Prefer varieties like TLBRH-6, JKTH-3098, BCTH-4 (All leaf curl tolerant hybrids)	• Raising of seed bed under 50 mesh nylon net ; • 4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l of water or Thiamethoxam (3.5 ml/ 10 l of water) to control whitefly	
		Chilli	No change. Prefer varieties like BCC-1,	• Raising of seed bed under 50 mesh nylon net ; • Spraying of Diafenthiuron @ 0.5 g/l of water	

			BCCH Sl-4, Beldanga local	and Dicofol @ 2.5 ml/l of water to control thrips and yellow mite, respectively.	
	Red & laterite soils, undulated land. Moderately deep to deep coarse loamy to fine loamy red soils	Aman rice- Fallow	Vegetables / short duration rice(Raasi, Khitesh, Kiron, Bhupen) in upland & medium land situation	Transplant 4-5 aged seedlings per hill	
		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	• 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	-do-	
		Brinjal	No change. Prefer varieties like Arka Anamika, Arka Abhay, Pusa A-4, VRO-6, Azad Krishna (OP), Mahyco-12, No-152 (Hybrid)	• Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease • 4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l or Thiamethoxam (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)	• Raising of seed bed under 50 mesh nylon net • 4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l of water or Thiamethoxam (3.5 ml/ 10 l of water) to control whitefly	
		Chilli	No change. Prefer varieties like BCC-1, BCCH Sl-4, Beldanga local	• 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(Raasi, Khitesh, Kiron, Bhupen) in upland & medium land situation	Transplant 4-5 aged seedlings per hill	
		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	• 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	-do-	
		Brinjal	No change. Prefer varieties like Muktakeshi, BCB-11, BCB-30; Bhangar, Patakata	• Raising of seed bed under transparent plastic cover; • After transplanting two foliar sprays of 0.5% $ZnSO_4$ and single spray of 0.15% $CuSO_4$ increase yield and quality of fruits.	
		Tomato	No change. Prefer varieties like TLBRH-6, JKTH-3098, BCTH-4 (All leaf curl tolerant hybrids)	• Raising of seed bed under 50 mesh nylon net ; • 4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l of water or Thiamethoxam (3.5 ml/ 10 l of water) to control whitefly	
		Chilli	No change. Prefer varieties like BCC-1, BCCH Sl-4, Beldanga local	• 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			Suggested contingency measures	
Early season drought (Normal onset)	**Major Farming situation**	**Normal Crop/ cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**
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 situation)	Aman rice- Fallow	• Take up gap filling either with available nursery or by splitting the tillers from the surviving hills • Interculture / weeding • Supplemental irrigation.	Apply 30-50 kg N /ha after relief of drought.
		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-

Condition			Suggested contingency measures	
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation**	**Normal Crop/ cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**
Vegetative stage	Red & laterite soils, undulated land. Shallow to moderately deep coarse loamy fine loamy soils	Aman rice- Fallow	• Take up gap filling either with available nursery or by splitting the tillers from the surviving hills • Interculture / weeding • Supplemental irrigation.	Apply 30-50 kg N /ha after relief of drought.
		Aman rice- Wheat/ Mustard/ Vegetables	-do-	-do-

	(hillocks, gravelly 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			**Suggested contingency measures**	
Mid season drought (long dry spell)	**Major Farming situation**	**Normal Crop/ cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**
At flowering/ fruiting stage	Red & laterite soils, undulated land. Shallow to moderately deep coarse loamy fine loamy soils (hillocks, gravelly situation)	Aman rice- fallow	• Supplemental irrigation • Plan for land preparation to sow the fodder crops like maize and sorghum	• Spray 2% urea or DAP • Top dressing of 50 kg N/ha after the relief of dry spell • Need based pesticide application
		Aman rice- wheat/ mustard/ vegetables	If the damage is severe, prepare land for rabi vegetables	-do-
	Red & laterite soils, undulated land. Moderately deep to deep coarse loamy to fine loamy red soils	Aman rice- fallow	• 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 *rabi* vegetables	-do-

	Red & laterite soils, undulated land. Shallow to moderately deep loamy soils	Aman rice- fallow	• 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 *rabi* vegetables	-do-

Condition			**Suggested contingency measures**	
	Major Farming situation	**Normal Crop/ cropping system**	**Crop management**	**Rabi Crop planning**
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	Sowing of linseed/ Khesari as paira crop
		Aman rice- Wheat/ Mustard/ Vegetables	-do-	• Sowing of short duration rapreseed varieties like Sanjucta, Asech, B-54, Jhanti • Sowing of lentil / wheat / mustard/ vegetables
	Red & laterite soils, undulated land. Moderately deep to deep coarse loamy to fine loamy red soils	Aman rice- Fallow	-do-	Sowing of linseed/ Khesari as paira crop
		Aman rice- wheat/ mustard/ vegetables	-do-	• Sowing of short duration rapreseed varieties like Sanjucta, Asech, B-54, Jhanti • Sowing of lentil / wheat / mustard/ vegetables
	Red & laterite soils, undulated land. Shallow to moderately deep loamy soils	Aman rice- fallow	-do-	Sowing of linseed/ Khesari as paira crop
		Aman rice- wheat/ mustard/ vegetables	-do-	• Sowing of short duration rapreseed varieties like Sanjucta, Asech, B-54, Jhanti • Sowing of lentil / wheat / mustard/ vegetables

2.1.2 Drought - Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delayed release of water in canals due to low rainfall	Red & laterite soils, undulated land. Shallow to moderately deep coarse loamy fine loamy soils (hillocks, gravelly situation)	Aman rice- fallow	No change. Prefer direct sowing of short duration rice variety.	• Adopt SRI method • Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed Management.	Linkage with NFSM, ISOPOM, NREGS
		Aman rice- wheat/ mustard/ vegetables	-do-	• 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 *rabi* wheat / mustard	
	Red & laterite soils, undulated land. Moderately deep to deep coarse loamy to fine loamy red soils	Aman rice- fallow	-do-	• Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed Management.	
		Aman rice- wheat/ mustard/ vegetables	-do-	• 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 *rabi* wheat / mustard	
	Red & laterite soils, undulated land. Shallow to moderately deep loamy soils	Aman rice- fallow	-do-	• Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed Management.	
		Aman rice- wheat/ mustard/ vegetables	-do-	• 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 *rabi* 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 (hillocks, gravelly situation)	Aman rice- fallow	No change. Prefer direct sowing of short duration rice variety.	• Adopt SRI method • Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed Management.	Linkage with NFSM, ISOPOM, NREGS
		Aman rice- wheat/ mustard/ vegetables	-do-	• 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 *rabi* wheat / mustard	
	Red & laterite soils, undulated land. Moderately deep to deep coarse loamy to fine loamy red soils	Aman rice- fallow	-do-	• Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed Management.	
		Aman rice- wheat/ mustard/ vegetables	-do-	• 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 *rabi* wheat / mustard	
	Red & laterite soils, undulated land. Shallow to moderately deep loamy soils	Aman rice- fallow	-do-	• Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed Management.	
		Aman rice- wheat/ mustard/ vegetables	-do-	• 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 *rabi* wheat / mustard	

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**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	No change. Prefer direct sowing of short duration rice variety.	• Adopt SRI method • 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 *rabi* wheat / mustard	Linkage with NFSM, ISOPOM, NREGS.
		Aman rice- wheat/ mustard/ vegetables	Prefer direct sowing of short duration rice variety to follow the crop sequences of Rice – khesari / linseed / pulses / oilseed (mustard / rape seed)	• Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed management	
	Red & laterite soils, undulated land. Moderately deep to deep coarse loamy to fine loamy red soils	Aman rice- fallow	No change. Prefer direct sowing of short duration rice variety.	• Adopt SRI method • 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 *rabi* wheat / mustard	
		Aman rice- wheat/ mustard/ vegetables	Prefer direct sowing of short duration rice variety to follow the crop sequences of Rice – khesari / linseed / pulses / oilseed (mustard / rape seed)	• Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed management	

	Red & laterite soils, undulated land. Shallow to moderately deep loamy soils	Aman rice- fallow	No change. Prefer direct sowing of short duration rice variety.	• Adopt SRI method • 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 *rabi* wheat / mustard	
		Aman rice- wheat/ mustard/ vegetables	Prefer direct sowing of short duration rice variety to follow the crop sequences of Rice – khesari / linseed / pulses / oilseed (mustard / rape seed)	• Adopt alternate wetting and drying upto primordial initiation stage to save water • Better weed management	

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	• 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	• Drain excess water • 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	• Drain excess water • Takeup gap filling if population is < 75% • Take intercultivation at optimum soil moisture condition to loosen and aerate the soil and to control weeds	• Drain excess water • Take intercultivation at optimum soil moisture condition to loosen and aerate the soil and to control weeds	• 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	• Drain excess water • Take intercultivation at	• Drain excess water • Take intercultivation at	• Drain excess water • Allow the crop to dry completely	Dry the grain to proper moisture content before bagging and storage

seed.	optimum soil moisture condition to loosen and aerate the soil and to control weeds • Spray Mancozeb (0.25 %) to control fungal diseases	optimum soil moisture condition to loosen and aerate the soil and to control weeds	before harvest	
Horticulture				
Cauliflower	• Drain excess water • Three sprays of 0.1% Ammonium molybdate 15, 30 and 45 days after transplanting.	• 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 excess water	Drain excess water	• Immediate harvesting • Arrange for drying of the produce in airy sheds	• 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	• Drain excess water • Spraying the crop with Copper-oxychloride (0.3%) or Mancozeb (0.25 %)/ Chlorothalonil (0.2%) or Difenconazole (0.5g/lt) 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 excess water	Spraying the crop with Cypermethrin @ 0.1% to control fruit borer.	-do-	-do-
Brinjal	Drain 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	-
Condition- 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/ Diafenthiuron @ 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	-

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

	Suggested contingency measures		
	Before the event[s]	**During the event**	**After the event**
Drought			
Feed and fodder availability	As the district is regularly prone to drought the following measure should be taken well in advance to mitigate the drought effect on livestock and their production Establishment of village level fodder banks with surplus paddy straw Preserving the green maize fodder as silage Cultivation of perennial fodder (Pusagaint, NB-21, IGFRI-3, IGFRI-6, 7, 10, BN-1, 2, 4, 6 and Co-1, paragrass)on the bank of the rivers Sowing of cereals (Sorghum/ Maize/Bajra) and leguminous crops Lucerne (Anand-2, T-9, Chetak)/Berseem (Mescavi, wardan etc)/ Rice bean (DagoreRani, S-8, S-9, K-1)/ Cowpea (Russian Giant, UPC-287, UPC 5286, C-30) during North-East monsoon for fodder production. Cultivation of JOB'S TEAR OR COIX (Bidhan Coixno. 1, PC-9, PC-23) with summer rains Encourage cultivate short-term fodder crops like sunhemp Promote Azola cultivation at backyard Formation of village Disaster Management Committee Capacity building and preparedness of the stakeholders and official staff for the drought/floods	Harvest and use biomass of dried up crops material as fodder Harvest all the top fodder available (Subabul, Glyricidia, Pipol, Prosopis etc) and feed the LS during drought Judicious use of available fodder from fodder banks Concentrate ingredients such as Grains, brans, chunnies & oilseed cakes, low grade grains etc. unfit for human consumption should be procured from Govt. Godowns for feeding as supplement for high productive animals during drought Promotion of cultivation of Horse gram as contingent crop and harvesting it at vegetative stage as fodder	Encourage progressive farmers to grow multi cut fodder crops of sorghum (Meethi Sudan, Raj Chari, PC-6, PC-9, PC-23)/maize (African Tall, J 1006, Vijay, Moti, Jawahar)/ Oats (OS-6, Kent, UPO 212, UPO 94, PO 3) Flushing the stock to recoup Replenish the feed and fodder banks
Drinking water	Establish water reservoir from the ground water or river on community basis	Adequate supply of drinking water. Restrict wallowing of animals in water	Watershed management practices shall be

	Adopt various water conservation methods at village level to improve the ground water level for adequate water supply. Identification of water resources Desilting of ponds Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals) Construction of drinking water tanks in herding places/village junctions/relief camp locations Community drinking water trough can be arranged in shandies /community grazing areas	bodies/resources Add alum in stagnated water bodies	promoted to conserve the rainwater. Bleach (0.1%) drinking water / water sources Provide clean drinking water
Health and disease management	Procure and stock emergency medicines and vaccines for important endemic diseases of the area All the stock must be immunized for endemic diseases of the area Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district Adequate refreshment training on draught management to be given to VAS, Jr.VAS, LI with regard to health & management measures Procure and stock multivitamins & area specific mineral mixture	Carryout deworming to all animals entering into relief camps Identification and quarantine of sick animals Constitution of Rapid Action Veterinary Force Performing ring vaccination (8 km radius) in case of any outbreak Restricting movement of livestock in case of any epidemic Tick control measures be undertaken to prevent tick borne diseases in animals Rescue of sick and injured animals and their treatment Organize with community, daily lifting of dung from relief camps	Keep close surveillance on disease outbreak. Undertake the vaccination depending on need Keep the animal houses and milking sheds clean and spray disinfectants Farmers should be advised to breed their milch animals during July-September so that the peak milk production does not coincide with mid summer
Floods	NA		
Cyclone	NA		
Heat wave and cold wave	NA		

[s] based on forewarning wherever available

2.5.2 Poultry

	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
Drought			
Shortage of feed ingredients	Storing of house hold grain like maize, broken rice etc, in to use as feed in case of severe drought	Supplementation only for productive birds with house hold grain Supplementation of shell grit (calcium) for laying birds Culling of weak birds	Supplementation to all survived birds
Drinking water	Adopt various water conservation methods at village level to improve the ground water level for adequate water supply.	Use water sanitizers or offer cool hygienic drinking water	Sanitation of drinking water
Health and disease management	Culling of sick birds. Deworming and vaccination against RD and IBD	Mixing of Vit. A,D,E, K and B-complex including vit C in drinking water (5ml in one litre water)	Hygienic and sanitation of poultry house Disposal of dead birds by burning / burying with lime powder in pit
Floods	NA		
Cyclone	NA		
Heat wave & cold wave	NA		

[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	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	Supply of water into the water body from tube well, nearby river etc. and observe mortality of fish	Proper post-event management, retention of water, disinfecting water (if possible) to prevent disease out-

	building of high embankment	and proper management of the said water body.	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	NA		
3. Cyclone / Tsunami			
4. Heat wave and cold wave	NA		

[a] based on forewarning wherever available