

**State: WEST BENGAL**  
**Agriculture Contingency Plan for District: BIRBHUM**

<b>1.0 District Agriculture profile</b>				
<b>1.1</b>	<b>Agro-Climatic/Ecological Zone</b>			
	Agro Ecological Sub Region (ICAR)	Assam And Bengal Plain, Hot Subhumid To Humid (Inclusion Of Perhumid) Eco-Region. (15.1) 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 Zone (WB-5)		
	List all the districts or part thereof falling under the NARP Zone	Bankura, Birbhum, Burdwan, Midnapur(West) ,Murshidabad and Purulia		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		23° 53' 13.61 " N	87° 34' 44.86 " E	54.86 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	RRS (Red &laterite zone), Jhargram, Medinipur (W)- 721507		
	Mention the KVK located in the district	Rathindra Krishi Vigyan Kendra, Sri Niketan, Birbhum-731236.		

<b>1.2</b>	<b>Rainfall</b>	Normal RF(mm)	Normal Onset ( specify week and month)	Normal Cessation (specify week and month)
	Ten years' average 1998-2007			
	SW monsoon (June-Sep):	1196.1	1 <sup>st</sup> week of June	4 <sup>th</sup> week of September
	NE Monsoon(Oct-Dec):	152.3		
	Winter (Jan- March)	67.1	-	-
	Summer (Apr-May)	157.4	-	-
	Annual	1572.9	-	-

<b>1.3</b>	<b>Land use pattern of the district</b> (latest statistics)	Geographical area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
		<b>Area ('000 ha)</b>	451.12	333.21	15.85	96.82	0.18	3.88	0.86	0.28	12.34

<b>1.4</b>	<b>Major Soils (common names like red sandy loam deep soils (etc.,))*</b>	<b>Area ('000 ha)</b>	<b>Percent (%) of total geographical area</b>
	1.Loamy	297.6	66.0
	2. Clayey-loamy	30.4	6.7
	3. Gravelly loamy	3.4	0.8
	4. Gravelly clay loamy	3.4	0.8
	5. Loamy sandy	3.4	0.8

<b>1.5</b>	<b>Agricultural land use</b>	<b>Area ('000 ha)</b>	<b>Cropping intensity %</b>
	Net sown area	318.5	176
	Area sown more than once	242.3	
	Gross cropped area	560.8	

<b>1.6</b>	<b>Irrigation</b>	<b>Area ('000 ha)</b>		
	Net irrigated area	315.93		
	Gross irrigated area	539.60		
	Rainfed area	21.04		
	<b>Sources of Irrigation</b>	<b>Number</b>	<b>Area ('000 ha)</b>	<b>Percentage of total irrigated area</b>
	Canals		184.66	89.99
	Tanks	14681	25.28	-
	Open wells	-	-	-
	Bore wells	-	-	-
	Lift irrigation schemes	18005	51.46	-
	Micro-irrigation		-	-
	Other sources (please specify)	-	54.53	-
	<b>Total Irrigated Area</b>		<b>315.93</b>	
	Pump sets	-		
	No. of Tractors	-		
	<b>Groundwater availability and use* (Data source: State/Central Ground water Department /Board)</b>	<b>No. of blocks/ Tehsils</b>	<b>(%) area</b>	<b>Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)</b>
	Over exploited	-	-	-
	Critical	Data not yet received	-	-

	Semi- critical	-	-	-
	Safe	-	-	-
	Wastewater availability and use	-	-	-
	Ground water quality	-	-	-
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

**1.7 Area under major field crops & horticulture (as per latest figures) (Specify year 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	-	4.8	4.8	315.0	-	315.0	74.2	394.0	
Pulses	-	-	-	17.8	-	17.8	-	17.8	
Wheat	-	-	-	32.1	-	32.1	-	32.1	
Oilseeds	-	-	-	36.3	-	36.3	-	36.3	
Potato	-	-	-	17.8	-	17.8	-	17.8	
Sugarcane	-	-	-	-	-	-	-	1.6	

Horticulture crops - Fruits	Area ('000 ha)
	Total
Mango	0.9
Banana	0.7
Papaya	0.5
Guava	0.9
Citrus	0.5
Horticulture crops - Vegetables	Total
Brinjal	9.9
Cucurbits	9.3
Ladies finger	3.9
Cabbage	2.6
Cauliflower	2.2
Tomato	1.9

<b>1.8</b>	<b>Livestock (2007-08)</b>		<b>Male ('000)</b>	<b>Female ('000)</b>	<b>Total ('000)</b>		
	Non descriptive Cattle (local low yielding)		544.6	507.7	1,052.3		
	Crossbred cattle		21.2	59.8	81.0		
	Non descriptive Buffaloes (local low yielding)		52.1	15.4	67.6		
	Goat		-	-	942.0		
	Sheep		-	-	216.9		
	Others (Camel, Pig, Yak etc.)		-	-	Horse-39, Pig-49177, Rabbit-276		
	Commercial dairy farms (Number)				-		
<b>1.9</b>	<b>Poultry</b>		<b>No. of farms</b>	<b>Total No. of birds ('000)</b>			
	Commercial		Broiler-475, Improved Layer-2	In Farm: Broiler-1437999, Layer-2250 [District Total of Improved strains Fowl-1164409, Duck-61552, Quail-302, Other-1307]			
	Backyard		Duck-02	In Farm: Deshi Total Fowl-0, Duck-1702 [District Total of Deshi Fowl-3572474, Duck-0]			
<b>1.10</b>	<b>Fisheries (Data source: District Fisheries Department)</b>						
	<b>A. Capture</b>						
	<b>i) Marine</b>	<b>No. of fishermen</b>	<b>Boats</b>		<b>Nets</b>		<b>Storage facilities (Ice plants etc.)</b>
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
	Inland Boat : 5						
		-	-	-	-	-	
	<b>ii) Inland</b> (Fish farmer-30112, Fishermen-200747, FC-20, SHG-391)	<b>No. Farmer owned ponds</b>		<b>No. of Reservoirs</b>		<b>No. of village tanks</b>	
		85504 (Tank & Pond)		6		-	
	<b>B. Culture</b>						
		<b>Water Spread Area (ha)</b>		<b>Yield (t/ha)</b>	<b>Production ('000 tons)</b>		
<b>i) Brackish water</b>	Nil			18 ton prawn			
<b>ii) Fresh water</b>	Culturable area: 15720.62 ha. Semi-Derelict area: 1596.57ha. Derelict area: 413.54 ha.		From Ponds under FFDA Scheme =4.4 t/ha.	115174 ton Fish (2008-09)			

		Total area: 17730.73 ha.		Fish Seed Production (08-09)= 200 million
	<b>Others</b>	(River) 795.63 ha. (Canal) 5695.85 ha. (Beel/Baor) 632.16 ha.		

**1.11 Production and Productivity of major crops** (Average of last 4 years: 2004-05, 05-06, 06-07, 07-08; years)

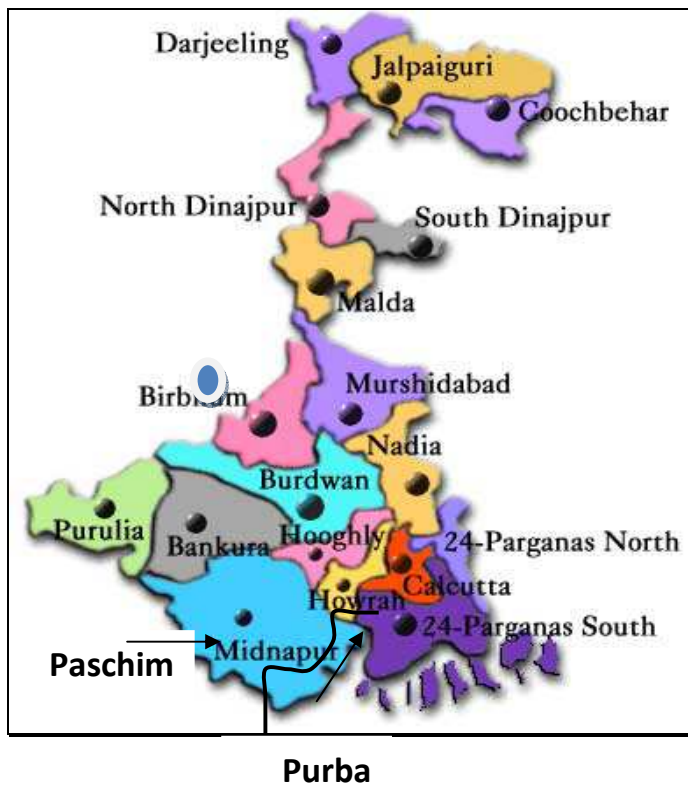
1.11	Name of crop	<i>Kharif</i>		<i>Rabi</i>		<b>Summer</b>		<b>Total</b>	
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)
<b>Major Field crops (Crops to be identified based on total acreage)</b>									
	Rice	13.8	2568	955.8	3043	209.2	3331	1178.8	2981
	Pulses	-	-	16.2	859	-	-	16.2	859
	Wheat	-	-	84.8	2702	-	-	84.8	2702
	Oilseeds	-	-	25.7	1025	-	-	25.7	1025
	Potato	-	-	272.6	17053	-	-	272.6	17053
<b>Major Horticultural crops (Crops to be identified based on total acreage)</b>									
	Brinjal	-	-	-	-	-	-	182.5	18525
	Cucurbits	-	-	-	-	-	-	145.5	15681
	Okra	-	-	-	-	-	-	34.2	8746
	Cabbage	-	-	-	-	-	-	67.2	26356
	Cauliflower	-	-	-	-	-	-	34.2	15751

1.12	<b>Sowing window for 5 major field crops</b> (start and end of normal sowing period)	Rice (Transplanting)	Potato	Wheat	Oilseeds	Pulses
	Kharif- Rainfed	-	-	-	-	-
	Kharif-Irrigated	July 1 <sup>st</sup> to 4 <sup>th</sup> week	-	-	-	-
	Rabi- Rainfed	-	-	-	-	-
	Rabi-Irrigated	January 3 <sup>rd</sup> to 4 <sup>th</sup> week	Nov 2 <sup>nd</sup> to 4 <sup>th</sup> week	Nov.1 <sup>st</sup> to 2 <sup>nd</sup> week	Nov.1 <sup>st</sup> to 3 <sup>rd</sup> week	Nov. 2 <sup>nd</sup> to 4 <sup>th</sup> 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)	√	-	-
	Others (specify)	-	-	√

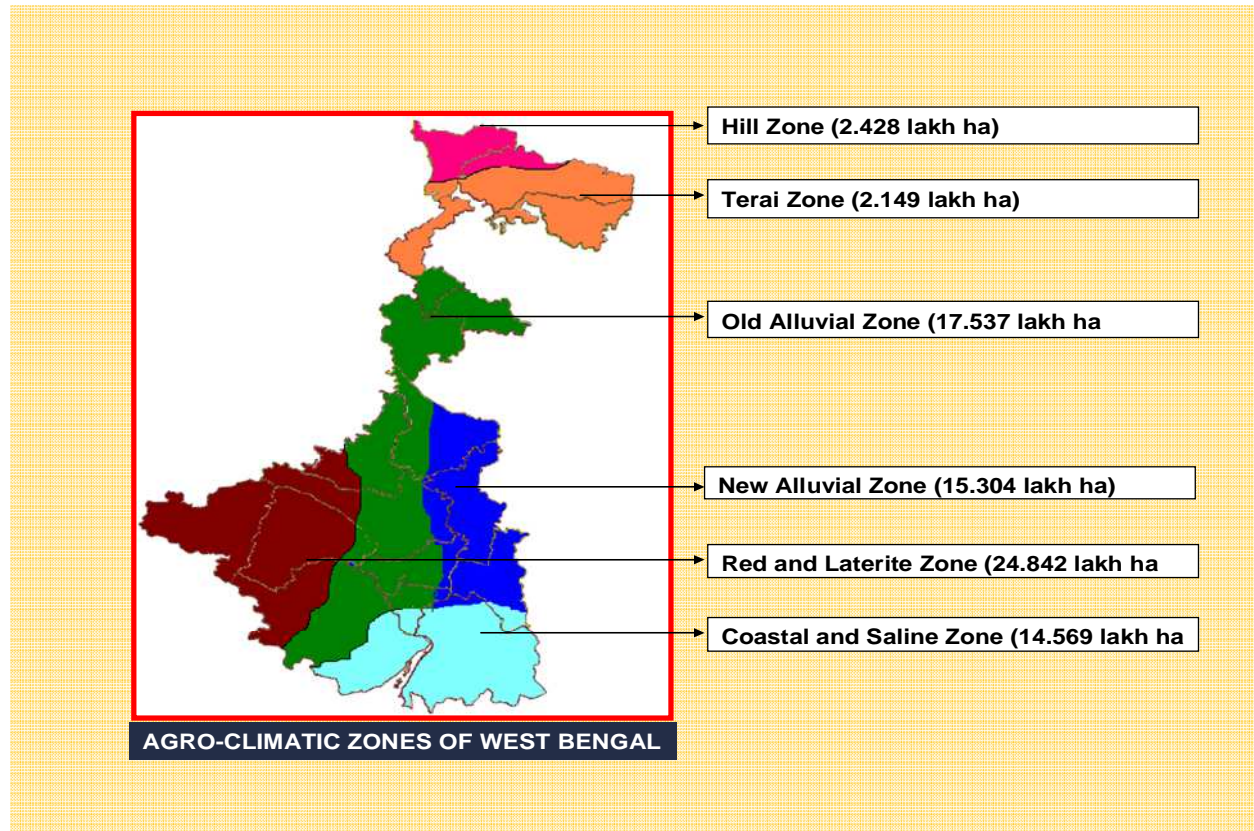
1.14	Include Digital maps of the district for		
		Location map of district within State, Annexure I	Enclosed: Yes
		Agro climatic Zones of West Bengal, Annexure II	Enclosed: Yes
		Mean Annual Rainfall, Annexure III	Enclosed: Yes
		Soil map of West Bengal, Annexure IV	Enclosed: Yes

Annexure –I  
Location map of Birbhum District



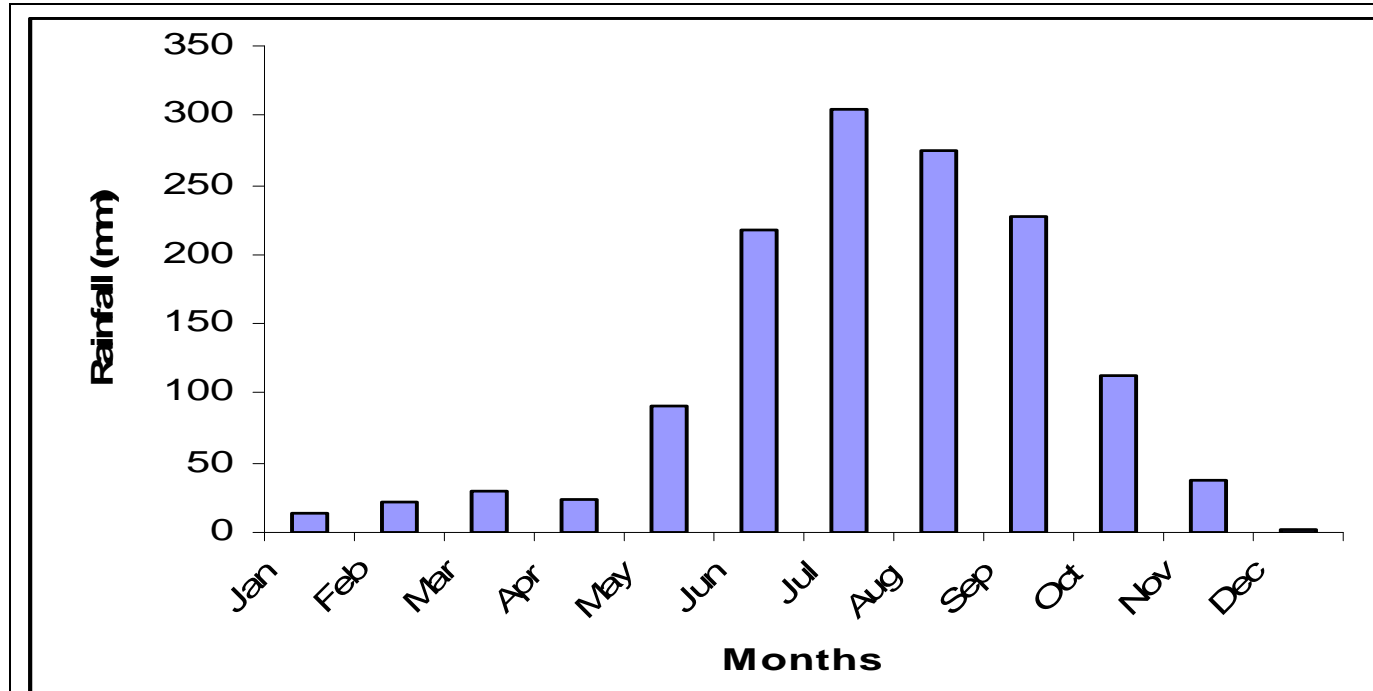
## Annexure-II

### Agroclimatic Zones of West Bengal





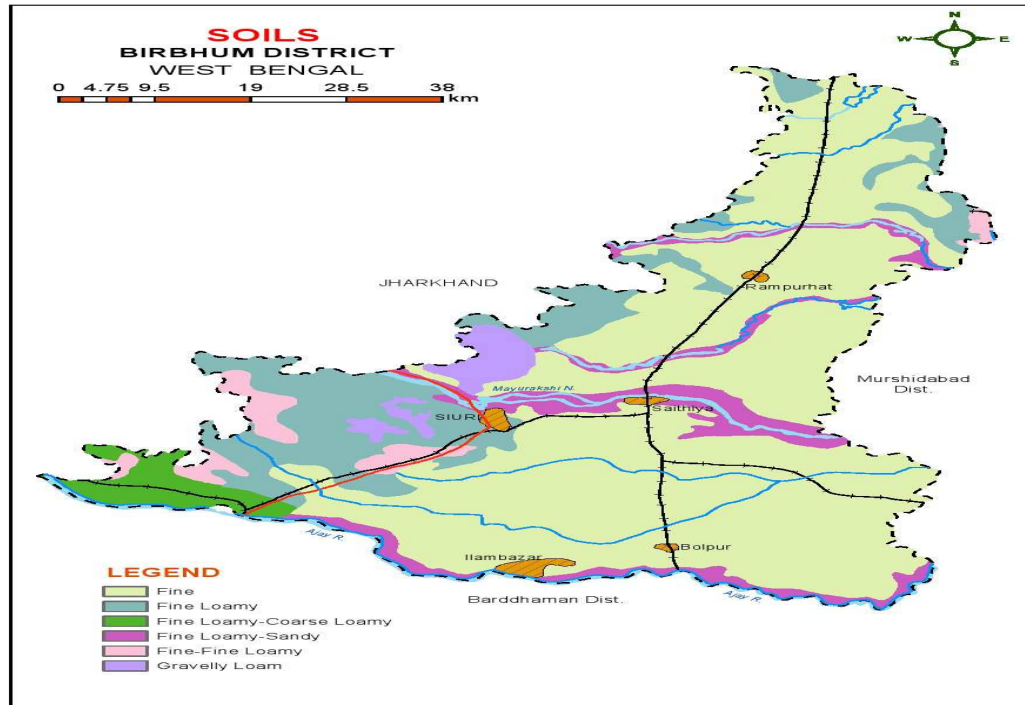
Annexure-III



Mean monthly rainfall of Birbhum district (1998-2007)

### Annexure-IV

### Soil map of Birbhum 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  3 <sup>rd</sup> 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"> <li>• Dry seeding of rice/ drum seeding.</li> <li>• Timely weed control.</li> </ul>		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	<ul style="list-style-type: none"> <li>• Raising of seed bed under transparent plastic cover</li> <li>• Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water)</li> <li>• Transplant healthy seedlings of 35-40 days old</li> <li>• Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting</li> </ul>		
		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"> <li>• Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease;</li> <li>• 4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l or Thiamethoxam (3.5 ml/ 10 l) to control whitefly</li> </ul>		
		Cucurbits (Cucumber, ridge gourd, bottle gourd, bitter gourd etc.)	No change. Prefer local cultivars	<ul style="list-style-type: none"> <li>• Prepare mounds in the furrow for sowing of seeds</li> <li>• 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</li> <li>• The crop needs to be trained over low trellis of 1.5 m high above the ground</li> <li>• After 85 to 90 days of sowing, older leaves near the bottom of</li> </ul>		

				<p>the vine are to be pruned</p> <ul style="list-style-type: none"> <li>• Timely control of downy mildew disease</li> </ul>	
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"> <li>• Transplant 2-3 seedlings/hill</li> <li>• Timely weed control..</li> </ul>	
	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"> <li>• Raising of seed bed under transparent plastic cover</li> <li>• Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water)</li> <li>• Transplant healthy seedlings of 35-40 days old</li> <li>• Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting</li> </ul>	
	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"> <li>• Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease;</li> <li>• 4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l or Thiamethoxam (3.5 ml/ 10 l) to control whitefly</li> </ul>	
	Cucurbits (Cucumber, Ridge gourd, Bottle gourd, Bitter gourd etc.)	No change. Prefer local cultivars		<ul style="list-style-type: none"> <li>• Prepare mounds in the furrow for sowing of seeds</li> <li>• 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</li> <li>• The crop needs to be trained over low trellis of 1.5 m high above the ground</li> <li>• After 85 to 90 days of sowing, older leaves near the bottom of the vine are to be pruned</li> <li>• Timely control of downy mildew disease</li> </ul>	
Red & laterite soils, undulated land. Shallow to moderately	Aman rice-Fallow	No change		<ul style="list-style-type: none"> <li>• Transplanting 4-5 seedlings/hill</li> <li>• Timely weed control.</li> </ul>	
	Aman rice-Wheat/Mustard/	-do-		-do-	

deep loamy soils	Vegetables		
	Cauliflower	No change. Prefer varieties like Early Kunwari, Pusa Early Synthetic, Synthetic 78-1	<ul style="list-style-type: none"> <li>Raising of seed bed under transparent plastic cover</li> <li>Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water)</li> <li>Transplant healthy seedlings of 35-40 days old</li> <li>Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting</li> </ul>
	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"> <li>Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease;</li> <li>4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l or Thiamethoxam (3.5 ml/ 10 l) to control whitefly</li> </ul>
Cucurbits (Cucumber, Ridge gourd, Bottle gourd, Bitter gourd etc.)	No change. Prefer local cultivars	<ul style="list-style-type: none"> <li>Prepare mounds in the furrow for sowing of seeds</li> <li>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</li> <li>The crop needs to be trained over low trellis of 1.5 m high above the ground</li> <li>After 85 to 90 days of sowing, older leaves near the bottom of the vine are to be pruned</li> <li>Timely control of downy mildew disease</li> </ul>	

Condition	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Suggested Contingency measures Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)					
Delay by 4 weeks	Red & laterite soils, undulated	Aman rice-Fallow	No change	Transplant 3-4 seedlings/hill	Linkage with Seed farms, Department of Agriculture, NSC, WBSC, BCKVV for supply of seed
1 <sup>st</sup> week of July	land. Shallow to moderately	Aman rice-Wheat/ Mustard/	-do-	-do-	

deep coarse loamy fine loamy soils (hillocks, gravelly situation)	Vegetables		
	Cauliflower	No change. Prefer varieties like Pusa Deepali, Pusa Katki	<ul style="list-style-type: none"> <li>Raising of seed bed under transparent plastic cover</li> <li>Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water)</li> <li>Transplant healthy seedlings of 35-40 days old</li> <li>Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting</li> </ul>
	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"> <li>Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease;</li> <li>4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l or Thiamethoxam (3.5 ml/ 10 l) to control whitefly</li> </ul>
	Cucurbits (Cucumber, Ridge gourd, Bottle gourd, Bitter gourd etc.)	No change. Prefer local cultivars	<ul style="list-style-type: none"> <li>Prepare mounds in the furrow for sowing of seeds</li> <li>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</li> <li>The crop needs to be trained over low trellis of 1.5 m high above the ground</li> <li>After 85 to 90 days of sowing, older leaves near the bottom of the vine are to be pruned</li> <li>Timely control of downy mildew disease</li> </ul>
	Cabbage	High temperature tolerant hybrids	<ul style="list-style-type: none"> <li>Raising of seed bed under transparent plastic cover</li> <li>Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water)</li> <li>Transplant healthy seedlings of 35-40 days old</li> <li>Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting</li> </ul>
Red & laterite soils, undulated land. Moderately deep to deep coarse loamy to fine loamy	Aman rice-Fallow	No change	<ul style="list-style-type: none"> <li>Follow staggered dry nursery to fill up the gaps.</li> <li>Dry seeding of rice/ drum seeding if the damage is severe.</li> <li>Proper weeding.</li> </ul>
	Aman rice-Wheat/ Mustard/ Vegetables	-do-	-do-
	Cauliflower	No change. Prefer	<ul style="list-style-type: none"> <li>Raising of seed bed under transparent plastic cover</li> </ul>

red soils		varieties like Early Kunwari, Pusa Early Synthetic, Synthetic 78-1	<ul style="list-style-type: none"> <li>Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water)</li> <li>Transplant healthy seedlings of 35-40 days old</li> <li>Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting</li> </ul>
	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"> <li>Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease;</li> <li>Gap fill with the same varieties if population is &lt;50%.</li> <li>4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l or Thiamethoxam (3.5 ml/ 10 l) to control whitefly</li> </ul>
	Cucurbits (Cucumber, Ridge gourd, Bottle gourd, Bitter gourd etc.)	No change. Prefer local cultivars	<ul style="list-style-type: none"> <li>Prepare mounds in the furrow for sowing of seeds</li> <li>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</li> <li>The crop needs to be trained over low trellis of 1.5 m high above the ground</li> <li>After 85 to 90 days of sowing, older leaves near the bottom of the vine are to be pruned</li> <li>Timely control of downy mildew disease</li> </ul>
	Cabbage	High temperature tolerant hybrids	<ul style="list-style-type: none"> <li>Raising of seed bed under transparent plastic cover</li> <li>Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water)</li> <li>Transplant healthy seedlings of 35-40 days old</li> <li>Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting</li> </ul>
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	<ul style="list-style-type: none"> <li>Raising of seed bed under transparent plastic cover</li> <li>Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water)</li> </ul>

			Synthetic, Synthetic 78-1	<ul style="list-style-type: none"> <li>• Transplant healthy seedlings of 35-40 days old</li> <li>• Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting</li> </ul>	
		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"> <li>• Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease;</li> <li>• 4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l or Thiamethoxam (3.5 ml/ 10 l) to control whitefly</li> </ul>	
		Cucurbits (Cucumber, Ridge gourd, Bottle gourd, Bitter gourd etc.)	No change. Prefer local cultivars	<ul style="list-style-type: none"> <li>• Prepare mounds in the furrow for sowing of seeds</li> <li>• 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</li> <li>• The crop needs to be trained over low trellis of 1.5 m high above the ground</li> <li>• After 85 to 90 days of sowing, older leaves near the bottom of the vine are to be pruned</li> <li>• Timely control of downy mildew disease</li> </ul>	
		Cabbage	High temperature tolerant hybrids	<ul style="list-style-type: none"> <li>• Raising of seed bed under transparent plastic cover</li> <li>• Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water)</li> <li>• Transplant healthy seedlings of 35-40 days old</li> <li>• Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting</li> </ul>	

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)					
Delay by 6 weeks 3 <sup>rd</sup> week of	Red & laterite soils, undulated land.	Aman rice-Fallow	No change. Grow maize, Ground nut, black gram in high land situation.	<ul style="list-style-type: none"> <li>• Transplant 4-5 aged seedlings per hill</li> <li>• Follow Dapog &amp; SRI method.</li> </ul>	Linkage with Seed farms, Department of Agriculture, NSC, WBSC,



July	Shallow to moderately deep coarse loamy fine loamy soils (hillocks, gravelly situation)	Aman rice- Wheat/ Mustard/ Vegetables	-do-	-do-	BCKVV for supply of seed
		Cauliflower	No change. Prefer varieties like Hisar-1, Improved Japanese, Pusa Sharad, Pant Gobi-4, Pant Shubra.	<ul style="list-style-type: none"> <li>Raising of seed bed under transparent plastic cover</li> <li>Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water)</li> <li>Transplant healthy seedlings of 35-40 days old</li> <li>Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting</li> </ul>	
		Cabbage	No change. Prefer varieties like Green Express, Green 621,	<ul style="list-style-type: none"> <li>Raising of seed bed under transparent plastic cover;</li> <li>Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water);</li> <li>Transplant healthy seedlings of 35-40 days old ;</li> <li>Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting;</li> </ul>	
		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"> <li>Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease;</li> <li>4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l or Thiamethoxam (3.5 ml/ 10 l) to control whitefly</li> </ul>	
		Brinjal	No change. Prefer varieties Muktakeshi, BCB-11, BCB-30; Bhangar, Patakata	<ul style="list-style-type: none"> <li>Raising of seed bed under transparent plastic cover;</li> <li>After transplanting two foliar sprays of 0.5% ZnSO<sub>4</sub> and single spray of 0.15% CuSO<sub>4</sub> increase yield and quality of fruits.</li> </ul>	
	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"> <li>Transplant 3-4 aged seedlings per hill</li> <li>Follow Dapog &amp; SRI method.</li> </ul>	
		Aman rice- Wheat/ Mustard/ Vegetables	-do-	-do-	
		Cauliflower	No change. Prefer varieties like Hisar-1, Improved Japanese, Pusa Sharad, Pant	<ul style="list-style-type: none"> <li>Raising of seed bed under transparent plastic cover</li> <li>Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water)</li> <li>Transplant healthy seedlings of 35-40 days old</li> </ul>	

			Gobi-4, Pant Shubra.	<ul style="list-style-type: none"> <li>Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting</li> </ul>
		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)	<ul style="list-style-type: none"> <li>Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease;</li> <li>4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l or Thiamethoxam (3.5 ml/ 10 l) to control whitefly</li> </ul>
		Brinjal	No change. Prefer varieties Muktakeshi, BCB-11, BCB-30, Bhangar, Patakata	<ul style="list-style-type: none"> <li>Raising of seed bed under transparent plastic cover;</li> <li>After transplanting two foliar sprays of 0.5% ZnSO<sub>4</sub> and single spray of 0.15% CuSO<sub>4</sub> increase yield and quality of fruits.</li> </ul>
Red & laterite soils, undulated land. Shallow to moderately deep loamy soils	Aman rice-Fallow	No change		<ul style="list-style-type: none"> <li>Dry seeding of rice/ drum seeding if the damage is severe.</li> <li>Timely weed control.</li> </ul>
	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"> <li>Raising of seed bed under transparent plastic cover</li> <li>Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water)</li> <li>Transplant healthy seedlings of 35-40 days old</li> <li>Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting</li> </ul>
	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)		<ul style="list-style-type: none"> <li>Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease;</li> <li>4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l or Thiamethoxam (3.5 ml/ 10 l) to control whitefly</li> </ul>

		Brinjal	No change. Prefer varieties Muktakeshi, BCB-11, BCB-30, Bhangar, Patakata	<ul style="list-style-type: none"> <li>Raising of seed bed under transparent plastic cover;</li> <li>After transplanting two foliar sprays of 0.5% ZnSO<sub>4</sub> and single spray of 0.15% CuSO<sub>4</sub> increase yield and quality of fruits.</li> </ul>	
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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 <sup>st</sup> week of September	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,	<ul style="list-style-type: none"> <li>Raising of seed bed under transparent plastic cover</li> <li>Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water)</li> <li>Transplant healthy seedlings of 35-40 days old</li> <li>Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting</li> </ul>	
		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,	<ul style="list-style-type: none"> <li>Raising of seed bed under transparent plastic cover;</li> <li>After transplanting two foliar sprays of 0.5% ZnSO<sub>4</sub> and single spray of 0.15% CuSO<sub>4</sub> increase yield and quality of fruits.</li> </ul>	

		Patakata	
	Tomato	No change. Prefer varieties like TLBRH-6, JKTH-3098, BCTH-4 (All leaf curl tolerant hybrids)	<ul style="list-style-type: none"> <li>Raising of seed bed under 50 mesh nylon net ;</li> <li>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</li> </ul>
	Chilli	No change. Prefer varieties like BCC-1, BCCH SI-4, Beldanga local	<ul style="list-style-type: none"> <li>Raising of seed bed under 50 mesh nylon net ;</li> <li>Spraying of Diafenthiuron @ 0.5 g/l of water and Dicofol @ 2.5 ml/l of water to control thrips and yellow mite, respectively.</li> </ul>
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	<ul style="list-style-type: none"> <li>Raising of seed bed under transparent plastic cover</li> <li>Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water)</li> <li>Transplant healthy seedlings of 35-40 days old</li> <li>Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting</li> </ul>
	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-	<ul style="list-style-type: none"> <li>Soaking the seeds in 0.2% Bavistin over night to protect the seedlings from wilt disease</li> <li>4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l or Thiamethoxam (3.5 ml/ 10 l) to control whitefly</li> </ul>

		152 (Hybrid)	
	Tomato	No change. Prefer varieties like TLBRH-6, JKTH-3098, BCTH-4 (All leaf curl tolerant hybrids)	<ul style="list-style-type: none"> <li>Raising of seed bed under 50 mesh nylon net</li> <li>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</li> </ul>
	Chilli	No change. Prefer varieties like BCC-1, BCCH SI-4, Beldanga local	<ul style="list-style-type: none"> <li>Raising of seed bed under 50 mesh nylon net</li> <li>Spraying of Diafenthiuron @ 0.5 g/l of water and Dicofol @ 2.5 ml/l of water to control thrips and yellow mite, respectively.</li> </ul>
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	<ul style="list-style-type: none"> <li>Raising of seed bed under transparent plastic cover</li> <li>Spray the 15 days old seedlings with the starter solution of ammonium sulphate (50g/10litres of water)</li> <li>Transplant healthy seedlings of 35-40 days old</li> <li>Three foliar sprays of 0.3% borax after 20, 35 and 50 days after transplanting</li> </ul>
	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	<ul style="list-style-type: none"> <li>Raising of seed bed under transparent plastic cover;</li> <li>After transplanting two foliar sprays of 0.5% ZnSO<sub>4</sub> and single spray of 0.15% CuSO<sub>4</sub> increase yield and quality of fruits.</li> </ul>
	Tomato	No change. Prefer varieties like TLBRH-	<ul style="list-style-type: none"> <li>Raising of seed bed under 50 mesh nylon net ;</li> <li>4-5 foliar sprays of Imidacloprid (3.5 ml/ 10 l of water or</li> </ul>

			6, JKTH-3098, BCTH-4 (All leaf curl tolerant hybrids)	Thiamethoxam (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"> <li>• Raising of seed bed under 50 mesh nylon net ;</li> <li>• Spraying of Diafenthiuron @ 0.5 g/l of water and Dicofol @ 2.5 ml/l of water to control thrips and yellow mite, respectively.</li> </ul>	

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.	Low land situation	Aman rice- Fallow	<ul style="list-style-type: none"> <li>• Gap filling with seedlings from community nurseries</li> <li>• Stop N top dressing to Rice</li> <li>• Control weeds either manually or by using herbicides</li> </ul>	No measure to be taken
		Aman rice- Oil seeds	-do-	-
		Aman rice- Pulses	-do-	-
	Medium land situation	Aman rice-Pulses	-do-	<ul style="list-style-type: none"> <li>• Protective irrigation either through farm water / other sources of irrigation</li> <li>• Harrowing /intercultivation to control weeds</li> </ul>
		Aman rice- Oilseeds	-do-	-do-
	Up land situation	Aman rice- Vegetables	<ul style="list-style-type: none"> <li>• Gap filling with seedlings from community nurseries</li> <li>• Spading &amp; harrowing</li> </ul>	<ul style="list-style-type: none"> <li>• Stop top dressing of N</li> <li>• Mulching with crop residues if possible.</li> <li>• Protective irrigation either through farm water / other sources of irrigation</li> </ul>
		Vegetables- vegetables	<ul style="list-style-type: none"> <li>• Gap filling with same variety</li> <li>• Intercultivation / harrowing</li> </ul>	<ul style="list-style-type: none"> <li>• Protective irrigation either through farm water / other sources of irrigation</li> <li>• Stop N application during dry spell</li> <li>• Mulching with crop residues</li> </ul>

Condition			Suggested contingency measures	
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures
At vegetative stage	Low land situation	Aman rice- Fallow	Gap fill with seedlings @ 2-3 per hill by splitting tillers from surviving hills	<ul style="list-style-type: none"> <li>Apply N top dressing to @ 30-50 kg/ha after the relief of dry spell</li> <li>Protective irrigation either from farm ponds or other sources</li> </ul>
	Medium land situation	Aman rice- Oil seeds	Weeding	<ul style="list-style-type: none"> <li>Protective irrigation either from farm ponds or other sources</li> <li>Spray 2% urea or DAP to pulses</li> </ul>
		Aman rice- Pulses	-do-	-do-
	Up land situation	Aman rice- Vegetables	Spading/harrowing of soil if possible	<ul style="list-style-type: none"> <li>Stop fertilizer application during dry spell</li> <li>Spray 2% urea or DAP during dry spell</li> <li>Protective irrigation either from farm ponds or other sources</li> <li>Use mulch materials with locally available</li> </ul>
		Vegetables- vegetables/ Fruits	-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	Low land situation	Aman rice- Fallow	Weeding manually/ herbicides	<ul style="list-style-type: none"> <li>Protective irrigation either from farm ponds or other sources</li> <li>Apply N @ 30-50 kg/ha after relief of dry spell</li> </ul>
	Medium land situation	Aman rice- Oil seeds	Inter cultivation / weed control by harrowing or with herbicides	<ul style="list-style-type: none"> <li>Protective irrigation either from farm ponds or other source</li> <li>Apply N @ 30-50 kg/ha after relief of dry spell</li> <li>Spray 2% urea or DAP during dry spell</li> </ul>

		Aman rice- Pulses	-do-	-do-
		Jute- Vegetables	-do-	<ul style="list-style-type: none"> <li>• Spray 2% urea or DAP during dry spell</li> <li>• Mulching with crop residues for vegetables</li> <li>• Protective irrigation either from farm ponds or other source</li> </ul>
	Up land situation	Aman rice-vegetables	-do-	-do-
		Vegetables-vegetables	-do-	-do-

Condition			Suggested contingency measures	
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning
	Low land situation	Aman rice-fallow	<ul style="list-style-type: none"> <li>• Protective irrigation either from farm ponds or other source</li> <li>• Harvest rice crop at physiological maturity</li> </ul>	Sowing of linseed/ Khesari as paira crop
	Medium land situation	Aman rice- oil seeds	-do-	<ul style="list-style-type: none"> <li>• Sowing of short duration rapreseed var-Sanjuncta, Asech, B-54, Jhanti / lentil</li> <li>• Land preparation for rabi oil seed crops like lentil</li> </ul>
		Aman rice-pulses	-do-	<ul style="list-style-type: none"> <li>• Land preparation for rabi pulses</li> <li>• Sowing of short duration pulse varieties</li> </ul>
	Up land situation	Aman rice-vegetables	-do-	<ul style="list-style-type: none"> <li>• Land preparation for rabi vegetables</li> <li>• Sowing of short duration vegetable varieties</li> </ul>
		Vegetables-vegetables	Protective irrigation either from farm ponds or other source	-do-



### 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	Uneven rain and Lateritic soil.	Aman rice – Boro rice	Rice – Linseed – Green gram	<ul style="list-style-type: none"> <li>• Prefer short duration varieties of rice</li> <li>• Adopt SRI method of cultivation</li> <li>• Give irrigation at critical crop growth stages</li> <li>• Adopt alternate wetting and drying upto primordial initiation stage to save water</li> <li>• Timely sowing of Seed &amp; transplanting of seedling</li> <li>• Proper inter culture operation</li> <li>• Balance fertilizer application.</li> </ul>	<ul style="list-style-type: none"> <li>• Linkage with NSC, WBSC, BCKVV for supply of seed</li> <li>• Link with watersheds, NRGES for the support of farm pond technology</li> </ul>
		Aman rice – Wheat/Mustard/ Ground nut/Oil seed	Rice – rape seed- sesame	-do-	
		Aman rice – Oil seed	Rice – vegetables /	-do-	
			Vegetables - vegetables	-do-	

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	Uneven rain high land lateritic soil	Rice- Fallow	Rice- khesari/ kalai as Paira crop	<ul style="list-style-type: none"> <li>• Prefer short duration varieties of rice</li> <li>• Adopt SRI method of cultivation</li> <li>• Give irrigation at critical crop growth stages</li> <li>• Adopt alternate wetting and drying upto primordial initiation stage to save water</li> <li>• Proper inter culture operation</li> </ul>	<ul style="list-style-type: none"> <li>• Linkage with NSC, WBSC, BCKVV for supply of seed</li> <li>• Link with watersheds,</li> </ul>

	Uneven rain medium land lateritic soil	Rice – Potato – Sesame	Rice – Mustard – Sesame	<ul style="list-style-type: none"> <li>• Adopt SRI method of cultivation</li> <li>• Adopt alternate wetting and drying upto primordial initiation stage to save water</li> <li>• Harvest rice at physiological maturity</li> <li>• Minimum tillage for timely sowing of <i>rabi</i> crops</li> </ul>	NRGES for the support of farm pond technology
		Rice – Rape seed	Rice – Linseed – Green gram	-do-	
		Rice – Wheat/ Pulses	Rice – oilseed (Mustard / Rape seed)	-do-	

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	Uneven rain high land lateritic soil	Rice- Fallow	No change. Prefer short duration varieties of rice like Raasi, Khitesh, Kiron, Bhupen	<ul style="list-style-type: none"> <li>• Adopt SRI method of cultivation</li> <li>• Adopt alternate wetting and drying upto primordial initiation stage to save water</li> <li>• Proper inter culture operation</li> </ul>	<ul style="list-style-type: none"> <li>• Linkage with NSC, WBSC, BCKVV for supply of seed</li> <li>• Link with watersheds, NRGES for the support of farm pond technology</li> </ul>
	Uneven rain medium land lateritic soil	Rice – Potato – Sesame	Rice – Pulses	<ul style="list-style-type: none"> <li>• Adopt SRI method of cultivation</li> <li>• Adopt alternate wetting and drying upto primordial initiation stage to save water</li> <li>• Harvest rice at physiological maturity</li> <li>• Minimum tillage for timely sowing of <i>rabi</i> crops</li> </ul>	
		Rice – Wheat/ Pulses	Rice – Oilseed (Mustard / Rape seed)	-do-	

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measure	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Uneven rain high land lateritic soil	Rice- Fallow	No change. Prefer short duration varieties of rice like Raasi, Khitesh, Kiron, Bhupen	<ul style="list-style-type: none"> <li>• Adopt SRI method of cultivation</li> <li>• Adopt alternate wetting and drying upto primordial initiation stage to save water</li> <li>• Timely sowing of Seed &amp; transplanting of seedling</li> <li>• Proper inter culture operation.</li> </ul>	<ul style="list-style-type: none"> <li>• Linkage with NSC, WBSC, BCKVV for supply of seed</li> <li>• Link with watersheds, NRGES for the support of farm pond technology</li> </ul>
	Uneven rain medium land lateritic soil	Rice – Potato – Sesame	Rice – pulses.	<ul style="list-style-type: none"> <li>• Adopt SRI method of cultivation</li> <li>• Adopt alternate wetting and drying upto primordial initiation stage to save water</li> <li>• Harvest rice at physiological maturity</li> <li>• Minimum tillage for timely sowing of <i>rabi</i> crops</li> </ul>	
		Rice – Wheat/ Pulses	Rice – oilseed (Mustard / Rape seed)	-do-	

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measure	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	Uneven rain high land lateritic soil	Rice- Fallow	No change. Prefer short duration varieties of rice like Raasi, Khitesh, Kiron, Bhupen	<ul style="list-style-type: none"> <li>• Adopt SRI method of cultivation</li> <li>• Adopt alternate wetting and drying upto primordial initiation stage to save water</li> <li>• Timely sowing of Seed &amp; transplanting of seedling</li> <li>• Proper inter culture operation</li> </ul>	<ul style="list-style-type: none"> <li>• Linkage with NSC, WBSC, BCKVV for supply of seed</li> <li>• Link with watersheds, NRGES for the support of farm pond technology</li> </ul>
	Uneven rain medium land lateritic soil	Rice – Potato – Sesame	Rice – Pulses	<ul style="list-style-type: none"> <li>• Adopt SRI method of cultivation</li> <li>• Adopt alternate wetting and drying upto primordial initiation stage to save water</li> <li>• Harvest rice at physiological maturity</li> <li>• Minimum tillage for timely sowing of <i>rabi</i> crops</li> </ul>	
		Rice – Wheat/ Pulses	Rice – oilseed (Mustard / Rape seed)	-do-	

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

<b>Condition - Continuous high rainfall in a short span leading to water logging</b>				
<b>Crop</b>	<b>Suggested contingency measure</b>			
	<b>Vegetative stage</b>	<b>Flowering stage</b>	<b>Crop maturity stage</b>	<b>Post harvest</b>
Rice	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Post pone topdressing of N fertilizer till water recedes</li> <li>• Take up gap filling either with available nursery or splitting the tillers from surviving hills</li> </ul>	Drain excess water	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Immediate harvesting + kept under shed with airy places.</li> <li>• Spray 2% brine solution to prevent premature germination in the field</li> <li>• Allow the crop to dry completely before harvesting</li> </ul>	Dry the grain to proper moisture content before bagging and storage
Wheat	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Take up gap filling if population is &lt; 75%</li> <li>• Take intercultivation at optimum soil moisture condition to loosen and aerate the soil and to control weeds</li> </ul>	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Take intercultivation at optimum soil moisture condition to loosen and aerate the soil and to control weeds</li> </ul>	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Allow the crop to dry completely before harvesting</li> </ul>	Dry the grain to proper moisture content before bagging and storage
Mustard & other oil seed.	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Take intercultivation at optimum soil moisture condition to loosen and aerate the soil and to control weeds</li> <li>• Spray Mancozeb (0.25 %) to control fungal diseases</li> </ul>	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Take intercultivation at optimum soil moisture condition to loosen and aerate the soil and to control weeds</li> </ul>	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Allow the crop to dry completely before harvest</li> </ul>	Dry the grain to proper moisture content before bagging and storage
<b>Horticulture</b>				
Cauliflower	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Three sprays of 0.1% Ammonium molybdate 15, 30 and 45 days after transplanting.</li> </ul>	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Blanching i.e. Covering the curd through tying the outer leaves up over the curd improve curd colour and quality.</li> </ul>	Early harvesting	Large leaves are trimmed away leaving only sufficient jacket leaves to protect the curd from bruising and other mechanical injury in transport.

<b>Condition-Heavy rainfall with high speed winds in a short span</b>				
Rice	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Takeup gap filling either with available nursery or splitting the tillers from surviving hills</li> </ul>	Drain excess water	<ul style="list-style-type: none"> <li>• Immediate harvesting</li> <li>• Arrange for drying of the produce in airy sheds</li> <li>• Spray 2% brine solution to prevent premature germination in the field</li> </ul>	Dry the grain to proper moisture content before bagging and storage
<b>Horticulture</b>				
Cauliflower	Drain excess water	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Spraying the crop with Copper-oxychloride (0.3%) or Mancozeb (0.25 %)/ Chlorothalonil (0.2%) or Difenconazole (0.5g/l) with sticker at 10 days interval to prevent curd blight.</li> </ul>	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	-

<b>Condition-Outbreak of pests and diseases due to unseasonal rains</b>				
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	-

### 2.3 Floods (NA)

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation <sup>1</sup>				
Sea water intrusion <sup>3</sup>	NA			

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

Extreme event type	Suggested contingency measure <sup>r</sup>			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave	NA			
Horticulture				
Cold wave	NA			
Horticulture				

<b>Frost</b>	NA			
Horticulture				
<b>Hailstorm</b>	NA			
Horticulture				
<b>Cyclone</b>	NA			
Horticulture				

## 2.5 Contingent strategies for Livestock, Poultry & Fisheries

### 2.5.1 Livestock

	Suggested contingency measures		
	Before the event <sup>s</sup>	During the event	After the event
<b>Drought</b>			
Feed and fodder availability	Cultivation of perennial fodder in waste lands and on the bank of the rivers; preparation of hay & silage of excess left over fodder for use in natural disadvantageous situation, Insurance of livestock Alert nearby Govt. fodder farms to stock straw	Feed fodder from nearby Govt. fodder farms, perennial fodder, prepared hay or silage etc. Collect fodder from nearby less affected areas Feed region specific concentrated feed supplements	Claim insurance Feed supplements Cull the unproductive stock Repayment of Credit for livestock rearing may be waived or extended for long time
Drinking water	Dig bore well & establish water reservoir from the ground water or river on community basis	Use water from dig well, river or other water reservoirs	Sterilize drinking water, if possible
Health and disease management	Make alert for the Govt. & Non-Govt departments for adequate storage of medicines, vaccines, saline/dextrose Organize awareness camp Constitute Departmental Disaster Management Committee at the Block, Sub-division & District level for planning, management & stocking of medicine/vaccines etc.	Organize health camp, treatment of animals, Use stress relieving medicines & protect animal houses from extreme hot air Use Departmental committee and form Control room	Treat sick animals Cull permanently unproductive animals Introduce new stock from the unaffected areas
<b>Floods</b>			
Feed and fodder availability	Stock dry straw in the nearby Govt. fodder farms,	Supply fodder from nearby Govt. fodder	Claim insurance

	ask the private parties to stock straw, Preparation of hay & silage of excess left over fodder for use in natural disadvantageous situation, Insurance of livestock Alert nearby Govt. fodder farms to stock straw Constitute Departmental Disaster Management Committee at the Block, Sub-division & District level for planning of management action	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	Feed supplements Cull the unproductive stock Introduce new stock from the unaffected areas
Drinking water	Establish water reservoir from the ground water or river on community basis	Use water from dig 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
<b>Cyclone</b>	-	-	-
<b>Heat wave and cold wave</b>			
Shelter/environment management	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	Use window curtains made up of locally available materials	

### 2.5.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event <sup>a</sup>	During the event	After the event	
<b>Drought</b>				
Shortage of feed	Insurance	Feed from stocked feed	Avail insurance	-



ingredients	Bank linkage Instruct Govt. feed supplies to stock feed for urgency		Introduce new stock from the unaffected areas	
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 measures must be in action for prevention of emerging diseases to obstacle in the transmission of disease	Organise mass health camp & treat birds Utilize Departmental Disaster Management Committee for prompt therapy & control of diseases	Culling of affected birds & subsequent disposal	-
<b>Floods</b>				
Shortage of feed ingredients	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	Install dig well or bore well close to farm Establish shallow tube wells in the vicinity of farm	Use water from dig well after disinfection		-
Health and disease management	Emergency preparedness of Govt. department Organise awareness cap Obtain allotment of fund from Head Quarter upto Block level for feed, medicine, vaccines etc.	Organise mass health camp & treat birds	Culling of affected birds & subsequent disposal	-
<b>Cyclone</b>				
Health and disease	Group Insurance or Community Insurancing	-	-	-

management	for affected animals against diseases of birds			
<b>Heat wave and cold wave</b>				
Shelter/environment management	Construct houses at safe place for emergency housing of poultry birds at district level atleast 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	-	-	-

### 2.5.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	During the event	After the event	
<b>Drought</b>				
Shortage of feed ingredients	Insurance Bank linkage Instruct Govt. feed supplies to stock feed for urgency	Feed from stocked feed	Avail insurance Introduce new stock from the unaffected areas	-
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	Organise mass health camp & treat birds Utilize Departmental Disaster Management Committee for prompt therapy & control of diseases	Culling of affected birds & subsequent disposal	-

	Bio-security measurers must be in action for prevention of emerging diseases to obstacle in the transmission of disease			
<b>Floods</b>				-
Shortage of feed ingredients	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	Install dig well or bore well close to farm Establish shallow tube wells in the vicinity of farm	Use water from dig well after disinfection		-
Health and disease management	Emergency preparedness of Govt. department Organise awareness cap Obtain allotment of fund from Head Quarter upto Block level for feed, medicine, vaccines etc.	Organise mass health camp & treat birds	Culling of affected birds & subsequent disposal	-
<b>Cyclone</b>	-	-	-	-
<b>Heat wave and cold wave</b>				
Shelter/environment management	Construct houses at safe place for emergency housing of poultry birds at district level atleast 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/biological is essential	-	-	-

### 2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event <sup>a</sup>	During the event	After the event
1) Drought	-	-	-
2) Floods	-	-	-
B. Aquaculture	-	-	-
3. Cyclone / Tsunami	-	-	-
4. Heat wave and cold wave	-	-	-