

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

1.0 District Agriculture profile				
1.1	<b>Agro-Climatic/Ecological Zone</b>			
	Agro Ecological Sub Region (ICAR)	Assam And Bengal Plain, Hot Subhumid To Humid (Inclusion Of Perhumid) Eco-Region. (15.3) Eastern Himalayas, Warm Perhumid Eco-Region (16.1)		
	Agro-Climatic Zone (Planning Commission)	Eastern Himalayan Region (II) Lower Gangetic Plain Region (III)		
	Agro Climatic Zone (NARP)	Terai Zone (WB-2) New Alluvial Zone (WB-4)		
	List all the districts or part thereof falling under the NARP Zone	Jalpaiguri, Siliguri sub division, Cooch Behar, Malda, Murshidabad, Nadia, Uttar Dinajpur		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		26°31'19.27" N	88°43'02.88" E	75 M
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Regional Research Sub-Station (Terai Zone), UBKV, Khoribari, Darjeeling- 734427		
Mention the KVK located in the district	Ramsai , Jalpaiguri district- 735219,			

1.2	Rainfall	Normal RF(mm)	Normal Rainy days (number)	Normal Onset ( specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-September):	640.3	66	First week of June	Last week of September
	NE Monsoon(October-December):	25.1	9	-	-
	Winter (January- February)	68.5	12		
	Summer (March-May)	398.5	30		
	Annual	1132.4	117		

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)	622.7	351.74	179.0	83.5	-	0.1	5.0	3.3	16.0	0.04

<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. Shallow to moderately coarse loam soils	268.028	43.04
	2. Deep to very deep clay loamy soils	121.486	19.05
	3. Deep to very deep clayey soils	195.461	31.38

<b>1.5</b>	<b>Agricultural land use</b>	<b>Area ('000 ha)</b>	<b>Cropping intensity %</b>
	Net sown area	335.7	142
	Area sown more than once	140.7	
	Gross cropped area	476.4	

<b>1.6</b>	<b>Irrigation</b>	<b>Area ('000 ha)</b>		
	Net irrigated area	87.7		
	Gross irrigated area	234.3		
	Rainfed area	242.1		
	<b>Sources of Irrigation</b>	<b>Number</b>	<b>Area ('000 ha)</b>	<b>Percentage of total irrigated area</b>
	Canals		58.4	62.4
	Tanks	18	2.1	2.2
	Open wells	3675	3.4	3.6
	Bore wells	264	0.6	0.6
	Lift irrigation schemes	278	8.9	9.5
	Micro-irrigation		0.2	0.2
	Other sources (please specify)	12345	14.1	15.1
	Total Irrigated Area	18325	87.7	
	Pump sets	50		
	No. of Tractors	440		
	<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	5		-
Semi- critical	-	-	-
Safe	8	42.7	-
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) (year 2008-09)

1.7	Major field crops cultivated	Area ('000 ha)							Summer	Grand total
		<i>Kharif</i>			<i>Rabi</i>					
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total			
	Paddy	41.3	7.5	48.8	36.2	-	36.2	17.4	102.4	
	Jute	4.1	33.3	37.5		-	-	-	37.5	
	Wheat	-	-	-	19.9	-	19.9	-	19.9	
	Maize	-	-	-		-	-	8.2	8.2	
	Rape & Mustard	-	-	-	10.4	-	10.4	-	10.4	
	Potato	-	-	-	-	39.6	-	39.6	39.6	
	<b>Horticulture crops - Fruits</b>	<b>Area ('000 ha)</b>								
		<b>Total</b>								
	Pine apple	0.1								
	Banana	0.1								
	Jack fruit	0.1								
	Black pepper	0.02								
	Arecanut	0.1								
	Ginger & Turmeric	0.1								
	<b>Horticulture crops – Vegetables</b>	<b>Total</b>								
	Tomato	1.3								
	Cauliflower	3.1								
	Brinjal	2.4								
	Cabbage	3.3								
	Cucumber	0.1								
	Pumpkin	0.5								
	<b>Medicinal and Aromatic crops</b>	<b>Total</b>								

	Turmeric	0.6
	Ginger	0.7
	Sarpogandha	0.3
	Black pepper	0.01
	Fenugreek	0.02
	<b>Plantation crops</b>	<b>Total</b>
	Coconut	0.8
	Arecanut	2.8
	Betelvine	0.2
	Eg., industrial pulpwood crops etc.	-
	<b>Fodder crops</b>	<b>Total</b>
	<b>Total fodder crop area</b>	-
	<b>Grazing land</b>	-
	<b>Sericulture etc</b>	-
	<b>Others (specify)</b>	-

<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)	401.4	520.1	921.5
	Crossbred cattle	21.6	72.8	94.4
	Non descriptive Buffaloes (local low yielding)	3.9	7.5	11.4
	Graded Buffaloes	-	-	-
	Goat	-	-	598.3
	Sheep	-	-	24.5
	Others (Camel, Pig, Yak etc.)	-	-	1,663.2
	Commercial dairy farms (Number)			
<b>1.9</b>	<b>Poultry</b>	<b>No. of farms</b>	<b>Total No. of birds ('000)</b>	
	Commercial	1 (Govt.)	2,50,740	
	Backyard	-	-	
<b>1.10</b>	<b>Fisheries (Data source: Chief Planning Officer)</b>			
	<b>A. Capture</b>			
	<b>i) Marine (Data Source: Fisheries)</b>	<b>No. of fishermen</b>	<b>Boats</b>	<b>Nets</b>

Department)		Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	(Ice plants etc.)
	18745	150	550	200	1300	NIL
<b>ii) Inland</b> (Data Source: Fisheries Department)	<b>No. Farmer owned ponds</b>		<b>No. of Reservoirs</b>		<b>No. of village tanks</b>	
	5,131		2,414		-	
<b>B. Culture</b>						
	<b>Water Spread Area (ha)</b>		<b>Yield (t/ha)</b>		<b>Production ('000 tons)</b>	
<b>i) Brackish water</b> (Data Source: MPEDA/ Fisheries Department)	6000		4751		98230 qt	
<b>ii) Fresh water</b> (Data Source: Fisheries Department)	4500		-		-	
<b>Others</b>	-		-		-	

**1.11 Production and Productivity of major crops** (Average of last 5 years: 2004, 05, 06, 07, 08; specify years)

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)
	Paddy	94.8	3320	335.9	3391	49.0	2815	470.8	9526
	Potato	-	-	-	27864	-	-	348.6	27864
	Wheat	-	-	31.8	255.0	-	-	31.8	2550
	Rape & Mustard	-	-	4.8	768	-	-	4.8	768
	Jute	-	-	505.1	2114	-	-	505.1	2114
	Maize	-	-	-	-	18.9	2315	22.5	2315

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Rice	Jute	Mustard	Potato	Wheat
	Kharif- Rainfed	Rice transplanted: June 3 <sup>rd</sup> week to Aug 3 <sup>rd</sup> week	March 3 <sup>rd</sup> week to April 4 <sup>th</sup> week	-	-	-
	Kharif-Irrigated	Rice transplanted: June 3 <sup>rd</sup> week	-	-	Nov 2 <sup>nd</sup> week to Dec	-

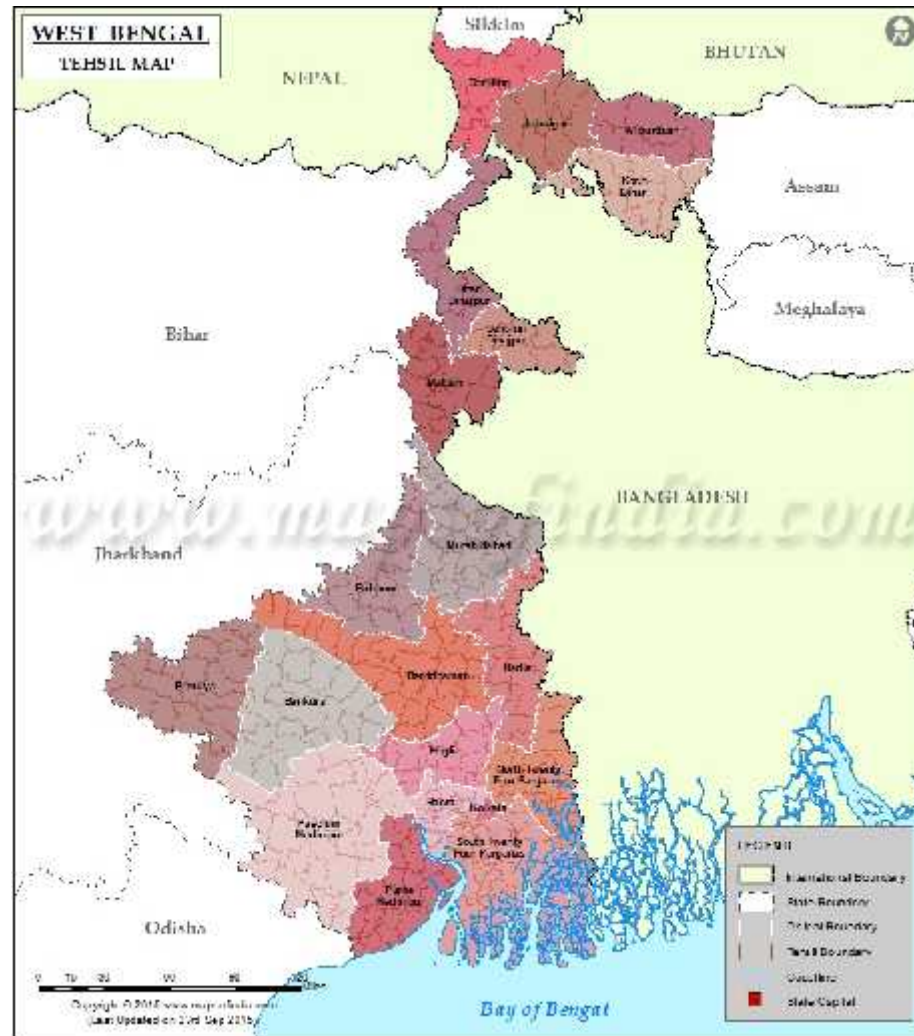
		to Aug 3 <sup>rd</sup> week			4 <sup>th</sup> week	
	Rabi- Rainfed	-	-	-	-	-
	Rabi-Irrigated	Pre kharif Rice transplanted march 2 <sup>nd</sup> week to April 4 <sup>th</sup> week	-	Oct 3 <sup>rd</sup> week to Nov 2 <sup>nd</sup> week	Sep 4 <sup>th</sup> week to Oct 4 <sup>th</sup> week	Nov 2 <sup>nd</sup> week to Dec 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	-		-
	Others (specify)	-	-	

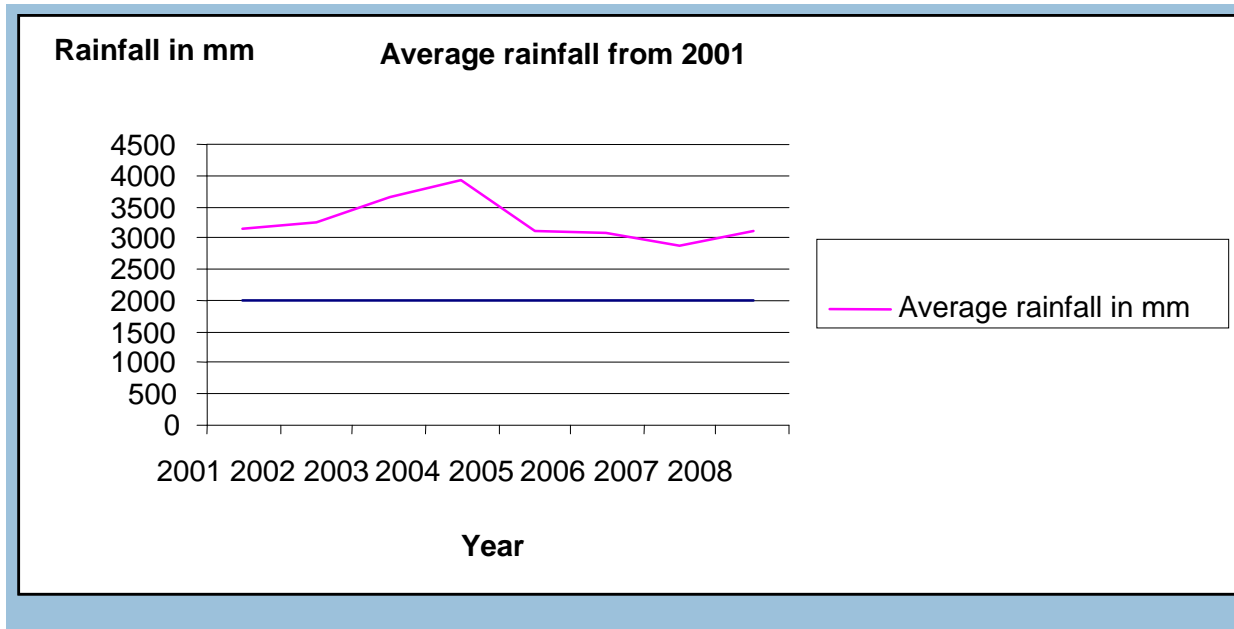
1.14	Include Digital maps of the district for		
		Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

## Annexure 1

### Location map of Alipurduar district



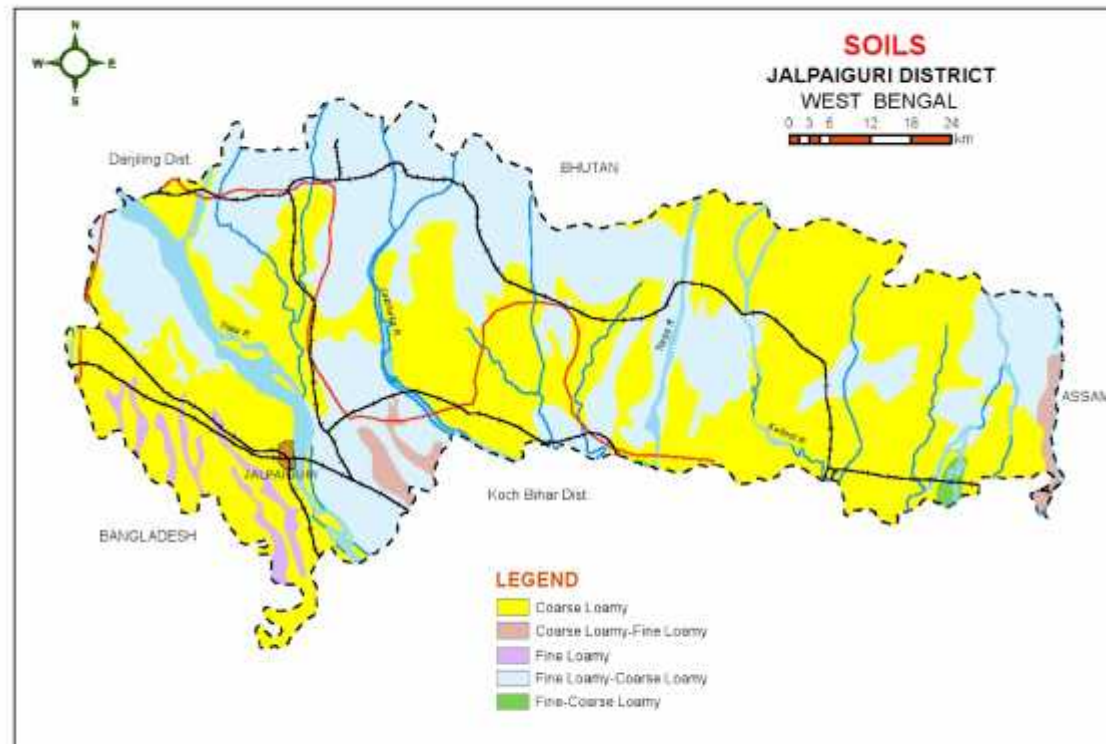
**Annexure 2**



**Mean annual rainfall of Alipurduar district**



**Annexure 3**  
**Soil Map**



Source: NBSS & LUP Regional Centre, Kolkata

## 2.0 Strategies for weather related contingencies

### 2.1 Drought

#### 2.1.1 Rainfed situation

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		Remarks on Implementation
			Change in crop / cropping system including variety	Agronomic measures	
Delay by 2 weeks  3 <sup>rd</sup> Week of June	Low Land (Deep to very deep clayey soils)	Jute – Rice	No change	Normal package of practices given by UBKV	Link with Govt. farm of department of agriculture, NSC, WBSC, RRS Pundibari farm UBKV for supply of seed
		Rice – Toria	No change	Normal transplanting of 2-3 seedlings/ hill in gaps	
	Medium Land (Deep to very deep clay loamy soils)	Jute – Rice	No change	Normal package of practices given by UBKV	
		Rice – Toria	No change	Normal transplanting of 2-3 seedlings/ hill in gaps	
Up Land (Shallow to moderately coarse loam soils)	Jute - Rice	No change	Normal package of practices given by UBKV		

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		Remarks on Implementation
			Change in crop / cropping system including variety	Agronomic measures	
Delay by 4 weeks  1 <sup>st</sup> week of July	Low Land (Deep to very deep clayey soils)	Jute – Rice	No change	Inter cultivation in between the rows of jute	Link with Govt. farm of department of agriculture, NSC, WBSC, RRS Pundibari farm UBKV for supply of seed
		Rice – Toria	No change	Transplanting with seedlings raised from community nursery/staggered nursery (4-5 seedlings / hill)	
	Medium Land (Deep to very deep clay loamy soils)	Jute – Rice	No change	Inter cultivation in between the rows of jute	
		Rice – Toria	No change	Prefer SRI system of cultivation	

	Up Land (Shallow to moderately coarse loam soils)	Jute - Rice	No change	Inter cultivation in between the rows of jute	
--	--	-------------	-----------	---	--

<b>Condition</b>	<b>Major Farming situation</b>	<b>Normal Crop / Cropping system</b>	<b>Change in crop / cropping system including variety</b>	<b>Suggested Contingency measures</b>	<b>Remarks on Implementation</b>
<b>Early season drought (delayed onset)</b>				<b>Agronomic measures</b>	
Delay by 6 weeks  3 <sup>rd</sup> week of July	Low Land (Deep to very deep clayey soils)	Jute – Rice	No change	Inter cultivation in between the rows of jute	Link with Govt. farm of department of agriculture, NSC, WBSC, RRS Pundibari farm UBKV for supply of seed
		Rice – Toria	No change. Prefer short duration varieties like Annada or Satabdi	Transplanting with 4-5 seedlings / hill	
	Medium Land (Deep to very deep clay loamy soils)	Jute – Rice	No change	Inter cultivation in between the rows of jute	
		Rice – Toria	No change. Prefer short duration varieties like Annada or Satabdi	<ul style="list-style-type: none"> <li>• Transplanting with 4-5 seedlings / hill</li> <li>• Direct sowing using drum seeder with short / medium variety (Khitish, Satabdi)</li> </ul>	
	Up Land (Shallow to moderately coarse loam soils)	Jute - Rice	No change	Inter cultivation in between the rows of jute	

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 August	Low Land (Deep to very deep clayey soils)	Jute – Rice	No change	Timely weed control in jute	Link with Govt. farm of department of agriculture, NSC, WBSC, RRS Pundibari farm UBKV for supply of seed
		Rice – Toria	No change. Prefer short duration varieties like Annada or Satabdi	Transplanting with 4-5 seedlings / hill	
	Medium Land (Deep to very deep clay loamy soils)	Jute – Rice	No change	Timely weed control in jute	
		Rice – Toria	No change. Prefer short duration varieties like Annada or Satabdi	Prefer SRI method of cultivation	
Up Land (Shallow to moderately coarse loam soils)	Jute - Rice	No change or Black gram (Sarda, sulata, Pant U 19-31)/ Green gram (Samrat, Bireshwar, Sukumar) or or Vegetable like Brinjal /Chilli	<ul style="list-style-type: none"> <li>• Timely weed control in jute</li> <li>• Need based plant protection measures to jute</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.	Deep to very deep fine loamy to clayey soils	Jute – Rice	<ul style="list-style-type: none"> <li>• Gap filling with improved variety in the row if population is less than 75% of optimum</li> <li>• Weeding</li> </ul>	<ul style="list-style-type: none"> <li>• Postpone top dressing with N</li> <li>• Apply foliar spray with 2% Urea</li> <li>• Supplemental irrigation</li> </ul>
		Rice – Toria	Gap filling with the seedlings @ 2-3 per hill from community nurseries / split the tillers from surviving hills	-do-
	Deep to very deep sandy loam soils	Jute – Rice	<ul style="list-style-type: none"> <li>• Gap filling with improved variety in the row if population is less than 75% of optimum</li> <li>• Weeding</li> </ul>	-do-
		Rice – Toria	Gap filling with the seedlings @ 2-3 per hill from	-do-
Coarse sandy	Rice – Toria	Gap filling with the seedlings @ 2-3 per hill from	-do-	

	soils in uplands		community nurseries / split the tillers from surviving hills	
		Jute - Rice	<ul style="list-style-type: none"> <li>• Gap filling with improved variety in the row if population is less than 75% of optimum</li> <li>• Weeding</li> </ul>	-do-

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	
			Crop management	Soil nutrient & moisture conservation measures
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)  At vegetative stage	Deep to very deep fine loamy to clayey soils	Jute – Rice	<ul style="list-style-type: none"> <li>• Gap filling with improved variety in the row if population is less than 75% of optimum</li> <li>• Weeding</li> </ul>	<ul style="list-style-type: none"> <li>• Postpone top dressing with N</li> <li>• Apply foliar spray with 2% Urea</li> <li>• Supplemental irrigation</li> </ul>
	Deep to very deep sandy loam soils	Rice – Toria	<ul style="list-style-type: none"> <li>• Gap filling with the seedlings @ 2-3 per hill from community nurseries / split the tillers from surviving hills</li> <li>• Protection against leaf folder with chlorpyrifos 2ml/l</li> </ul>	-do-
		Jute – Rice	<ul style="list-style-type: none"> <li>• Gap filling with improved variety in the row if population is less than 75% of optimum</li> <li>• Weeding</li> </ul>	-do-
	Coarse sandy soils in uplands	Rice – Toria	<ul style="list-style-type: none"> <li>• Gap filling with the seedlings @ 2-3per hill from community nurseries / split the tillers from surviving hills</li> <li>• Protection against leaf folder with chlorpyrifos 2ml/l</li> </ul>	-do-
		Jute - Rice	<ul style="list-style-type: none"> <li>• Gap filling with improved variety in the row if population is less than 75% of optimum</li> <li>• Weeding</li> </ul>	-do-

Condition	Major farming situation	Normal Crop/cropping system	Suggested contingency measures	
			Crop management	Soil nutrient & moisture conservation measures
Mid season drought (long dry spell)	Deep to very deep fine loamy to clayey soils	Jute – Rice	<ul style="list-style-type: none"> <li>• Timely weeding</li> <li>• Plan for rabi rice if damage is very severe</li> </ul>	<ul style="list-style-type: none"> <li>• Supplemental irrigation with farm pond water / other sources</li> <li>• Top dressing of 30-50 kg N/ha after relief</li> </ul>

At flowering/ fruiting stage				of dry spell
	Deep to very deep sandy loam soils	Rice – Toria	-do-	-do-
		Jute – Rice	<ul style="list-style-type: none"> <li>• Timely weeding</li> <li>• Plan for rabi rice if damage is very severe</li> </ul>	-do-
Coarse sandy soils in uplands	Rice – Toria	-do-	-do-	

Condition			Suggested contingency measures	
<b>Terminal drought (Early withdrawal of monsoon)</b>	<b>Major farming situation</b>	<b>Normal Crop/cropping system</b>	<b>Crop management</b>	<b>Rabi crop planning</b>
	Deep to very deep fine loamy to clayey soils	Jute – Rice	Supplemental irrigation with farm pond water / other sources	Land preparation for rabi rice
	Deep to very deep sandy loam soils	Rice – Toria	-do-	Rabi planning for Toria
		Jute – Rice	-do-	Land preparation for rabi rice
	Coarse sandy soils in uplands	Rice – Toria	-do-	Rabi planning for Toria

### 2.1.2 Drought - Irrigated situation

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall	NA				

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	NA				

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	NA				

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	NA				

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Soil nutrient & moisture conservation measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	Shallow tube well irrigated Deep to very deep fine loamy to clayey soils	Rice – Rice- Potato/ Mustard/Wheat/Late Vegetable	Rice- Potato-/ Mustard/Late Vegetable	<ul style="list-style-type: none"> <li>• Adopt SRI method for rice cultivation</li> <li>• Adopt alternate furrow irrigation for potato / mustard / Vegetable</li> <li>• Timely inter culture</li> </ul>	Machine for Zero tillage under NFSM

	Shallow tube well irrigated Deep to very deep sandy loam soils	Rice- early potato/ Mustard/ Wheat/Vegetable	Rice-Wheat/Mustard	<ul style="list-style-type: none"> <li>• Adopt SRI method for rice cultivation</li> <li>• Adopt alternate furrow irrigation for potato / mustard / Vegetable</li> <li>• Timely inter culture</li> <li>• Zero tillage for wheat</li> </ul>
		Rice-early potato/ vegetable- Maize/potato	No Change	<ul style="list-style-type: none"> <li>• Adopt SRI method for rice cultivation</li> <li>• Adopt alternate furrow irrigation for potato / mustard / Vegetable</li> <li>• Timely interculture</li> </ul>
	Shallow tube well irrigated Coarse sandy soils in uplands	Rice-early potato/ vegetable- Maize/potato	No Change	<ul style="list-style-type: none"> <li>• Adopt SRI method for rice cultivation</li> <li>• Adopt alternate furrow irrigation for potato / mustard / Vegetable</li> <li>• Timely interculture</li> </ul>
		Pine apple	No Change	<ul style="list-style-type: none"> <li>• Mulching in between rows</li> <li>• Supplemental irrigation by alternate furrow</li> <li>• Earthing up to provide good anchorage</li> </ul>

## 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>• Gap filling with seedlings if population is less than 75%</li> <li>• Postpone topdressing N fertilizers till water recedes</li> </ul>	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Top dressing of N (20-30 kg/ha) after draining excess water</li> </ul>	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Spray 2% brine solution to prevent premature germination in field</li> </ul>	<ul style="list-style-type: none"> <li>• Shift produce to safer place</li> <li>• Maintain optimum moisture of the grain followed by bagging and marketing</li> </ul>
Potato	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Postpone topdressing N fertilizers till water recedes</li> <li>• Earthing up to provide support for the plants</li> </ul>	Drain excess water	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Spray mancozeb @3g/l to control fungal diseases</li> </ul>	-
Jute	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Gap filling with improved</li> </ul>	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Top dressing of N (20-30</li> </ul>	Drain excess water	-



	<p>seed if population is less than 75%</p> <ul style="list-style-type: none"> <li>• Intercultivation at optimum soil moisture condition to loosen and aerate the soil and to control weeds</li> </ul>	kg/ha) after water recedes		
Wheat	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Gap filling with improved seed if population is less than 75%</li> <li>• Intercultivation at optimum soil moisture condition to loosen and aerate the soil and to control weeds</li> </ul>	Drain excess water	Allow the crop to dry completely before harvesting	<ul style="list-style-type: none"> <li>• Transfer the produce to safe place</li> <li>• Dry the grain to proper moisture content before bagging and storage</li> </ul>
Maize	-do-	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Top dressing of N (20-30 kg/ha) after water recedes</li> </ul>	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Top dressing of N (20-30 kg/ha) after water recedes</li> </ul>	-
<b>Horticulture</b>				
Vegetables	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Spray Mancozeb (2 g/ l of water) and Copper oxychloride (4 g/ l of water) alternately as fungicide against the damping off disease.</li> <li>• Spray Dimethoate 30 EC (2ml per litre of water) and Dicofol 1805 EC (3ml per litre of water) against the insect pest attack.</li> </ul>	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Spray Mancozeb (2 g/ l of water) and Copper oxychloride (4 gm per litre of water) alternately as fungicide against the damping off disease.</li> <li>• Spray Dimethoate 30 EC (2ml per litre of water) and Dicofol 1805 EC (3ml per litre of water) against the insect pest attack.</li> </ul>	Drain excess water	Earliest arrangement should be done to dry out and sale out the post harvest product
Pine Apple	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Earthing up to provide support to plants</li> </ul>	Drain excess water	Immediate harvesting & kept under shade with airy place	Transfer the produce to safe place
<b>Condition-Heavy rainfall with high speed winds in a short span</b>				
Rice	Drain excess water	Drain excess water	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Spray 2% brine solution to</li> </ul>	Shift produced to safer place

			prevent premature germination in field	
Potato	-do-	-do-	Drain excess water	-do-
Jute	-do-	-do-	-do-	-do-
Wheat	-do-	-do-	-do-	-do-
<b>Horticulture</b>				
Vegetables	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Spray Mancozeb (2 gm per litre of water) and Copper oxychloride (4 gm per litre of water) alternately as fungicide against the damping off disease.</li> <li>• Spray Dimethoate 30 EC (2ml per litre of water) and Dicofol 1805 EC (3ml per litre of water) against the insect pest attack.</li> </ul>	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Spray Mancozeb (2 gm per litre of water) and Copper oxychloride (4 gm per litre of water) alternately as fungicide against the damping off disease.</li> <li>• Spray Dimethoate 30 EC (2ml per litre of water) and Dicofol 1805 EC (3ml per litre of water) against the insect pest attack.</li> </ul>	Drain excess water.	Earliest arrangement should be done to dry out and sale out the post harvest product
Pine Apple	<ul style="list-style-type: none"> <li>• Drain excess water</li> <li>• Earthing up to provide support for plants</li> </ul>	Drain the excess water.	Immediate harvesting & keep under shade with airy place	Transfer the produce to safe place
<b>Condition-Outbreak of pests and diseases due to unseasonal rains</b>				
Potato	-	Spray metalaxyl + mancozeb mixture @ 1.5 g/l twice at 10 days interval to protect against late blight disease	Spray metalaxyl + mancozeb mixture @ 1.5 g/l twice at 10 days interval to protect against late blight disease	<ul style="list-style-type: none"> <li>• Dehauling of affected parts and destroy</li> <li>• Severely infested produce is unfit for seed purpose</li> </ul>
Rice	Protection against leaf blast with Tricyclazole 1ml/l	Protect against bacterial leaf blight with Hexaconazole 1ml/l	<ul style="list-style-type: none"> <li>• Protect against bacterial leaf blight with Hexaconazole 1ml/l</li> <li>• Spray Carbendazim 0.1% to prevent seed discolouration / grain spot</li> </ul>	
Jute	-	-	-	-
Wheat	-	-	-	--

## 2.3 Flood

Condition - Transient water logging/ partial inundation				
Crop	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Aman Rice	<ul style="list-style-type: none"> <li>Drain the excess water after recession of flood</li> <li>Preserve extra amount of seed for raising second seedbed</li> <li>Raise seed nursery in upland condition</li> <li>Grow the variety like IET 5656 and NC 490 which can withstand submergence to some extent and suitable for late transplanting</li> </ul>	<ul style="list-style-type: none"> <li>Drain the excess water after recession of flood</li> <li>Double transplanting with aged seedling maybe done from upland to medium and low land</li> <li>May go for alternate crop like black gram or green gram</li> </ul>	<p>Plan for alternate crops like Kalai, Mustard, Wheat, Lentil, Potato, Gram, Maize and Boro paddy</p> <p>For early flood, supply of seed/fertilizer minikit as follows: Paddy seed@5 kg/kit, Urea @10 kg/kit Kalai @ 4 kg/kit</p> <p>For late flood: Boro paddy @6 kg/kit Mustard @ 1kh/kit Wheat @15kg/kit Potato@15 kg/kit Lentil @ 2kh/kit Gram @ 4 kg/kit</p>	Early harvest
Sea water intrusion	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			
Cold wave	NA			
Frost	NA			
Hailstorm				
Boro Rice	Preserve extra amount of seed for raising second seedbed	Gap filling in early vegetative stage	-	-
Jute	If the field is completely affected by hail storm plough down the field and go for any late variety of	-	-	-

	jute(Baishakhi, JRO-66), use the unaffected plants as leafy vegetable			
Wheat	-	-	Harvest the crop quickly	-
Maize	-	Gap filling	-	-
<b>Horticulture</b>				
Pine apple	-	-	Spray of fungicide incase of rotting	Harvest quickly and sale out
<b>Cyclone</b>	NA			

## 2.5. Contingent strategies for Livestock, Poultry & Fisheries

### 2.5.1 Livestock

	Suggested contingency measures		
	Before the event	During the event	After the event
<b>Drought</b>			
Feed and fodder availability	Preserve the surplus food and fodder through hay and silage making	Provide hay, silage and urea straw treated feed to dairy animals	Grow drought tolerant variety in barren land to meet crisis
Drinking water	Store hygienic drinking water and make silage of fodder to retain water	Provide fresh water and green fodder as silage to reduce the water intake	Supply adequate fresh water to avoid heat strokes
Health and disease management	Vaccination of dairy animals against infectious diseases	Keep animal in cool place to avoid heat stress and strokes	Give antistress drug and preventive medicinal supplement to dairy animals
<b>Floods</b>			
Feed and fodder availability	Store the feed and fodder in upland through silage	Avoid damp and moldy feed and fodder to dairy animals	Dry the stored damp feed and fodder before feeding the dairy animals
Drinking water	Store hygienic drinking water and make silage of fodder to retain water	Provide hygienic and chlorinated water to dairy animals	Supply chlorinated fresh water to avoid diahorea and dysentery of dairy animals
Health and disease management	Vaccination of dairy animals against infectious diseases	Keep the animals in upland areas to avoid drowning	Provide preventive anti diahorea vitamin supplement
<b>Cyclone</b>	-		
<b>Heat wave and cold wave</b>	-		

### 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	Preserve the surplus feed	Provide the low cost CF	-	-

	ingredient of concentrate feed	with locally available resources		
Drinking water	Store plenty of fresh water	Supply stored fresh and chlorinated water	-	-
Health and disease management	Vaccination of poultry against infectious diseases	Keep birds in cool and shady place to avoid heat stroke and stress	Provide anti stress drug and medicinal supplement	-
<b>Floods</b>				-
Shortage of feed ingredients	-do-	-do-	-do-	-
Drinking water	-do-	-do-	-do-	-
Health and disease management	-do-	-do-	-do-	-
<b>Cyclone</b>				-
Shortage of feed ingredients	-do-	-do-	-do-	-
Drinking water	-do-	-do-	-do-	-
Health and disease management	-do-	-do-	-do-	-
<b>Heat wave and cold wave</b>				-
Shelter/environment management	-do-	-do-	-do-	-
Health and disease management	-do-	-do-	-do-	-

### 2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event	During the event	After the event
<b>1) Drought</b>			
<b>B. Aquaculture</b>			
(i) Shallow water in ponds due to insufficient rains/inflow	Reduce stocking density and harvesting fish	Apply KMnO4	Supply water from other ponds and available water resources
<b>2) Floods</b>			
<b>B. Aquaculture</b>			
(i) Inundation with flood water	Harvesting fish to reduce stocking density and pen erected	Netting and keeping in cage	Application of lime
(ii) Water contamination and changes in water quality	Application of lime@ 200 kg/ha water body	Netting and keeping in cage	Application of lime@ 200 kg/ha water body
(iii) Health and diseases	Application of CIFAX @ 1lit/ha-m of water	-	Application of CIFAX @ 1lit/ha-m of water
(iv) Loss of stock and inputs (feed, chemicals etc)	Feed and chemicals should be stocked in room with care	-	Purchase low cost input

(v) Infrastructure damage (pumps, aerators, huts etc)	Keep in concrete house or protected area	-	Repair infrastructure
(vi) Any other	-	-	-
<b>3. Cyclone / Tsunami</b>			
<b>B. Aquaculture</b>			
(i) Overflow / flooding of ponds	Harvesting or reducing stocking density, dyke may be constructed	-	Application of lime
(ii) Changes in water quality (fresh water / brackish water ratio)	-	-	
(iii) Health and diseases	Application of CIFAX or lime		Application of CIFAX or lime
<b>4. Heat wave and cold wave</b>		-	
<b>B. Aquaculture</b>	-	-	
(i) Changes in pond environment (water quality)	Application of lime, stop manuring	-	Application of lime, harvesting fish
(ii) Health and Disease management	Provide shade	Provide shade	Application of CIFAX or lime
(iii) Any other	-		