

**State: Assam**  
**Agriculture Contingency Plan for District: Udalguri**

**1.0 District Agriculture profile – Udalguri, Assam**

<b>1.1</b>	<b>Agro-Climatic/Ecological Zone</b>				
	Agro Ecological Sub Region (ICAR)	Assam and Bengal Plain, Hot sub humid to humid (Inclusion of Perhumid) Eco Region 15.4			
	Agro-Climatic Zone (Planning Commission)	Eastern Himalayan Region			
	Agro Climatic Zone (NARP)	North Bank Plain Zone			
	List all the districts falling under the NARP Zone*	Udalguri, Darrang, Sonitpur, Lakhimpur, Dhemaji			
	<b>Geographic coordinates of district headquarters</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Altitude</b>	
		26°46' & 26°77' north latitude	90°08' & 95°15' east longitude	345' above the mean sea level (MSL)	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRTTS	RARS, North Lakhimpur, Assam Agricultural University, District: Lakhimpur			
Mention the KVK located in the district with full address	KVK, Udalguri, AAU, Lalpool, District – Udalguri, BTAD, Assam, PIN: 784 514				
Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	AMFU, Sonitpur, BN College of Agriculture, AAU, Biswanath Chariali, Assam				

<b>1.2</b>	<b>Rainfall</b>	<b>Normal RF (mm)</b>	<b>Normal Rainy days (number)</b>	<b>Normal Onset ( specify week and month)</b>	<b>Normal Cessation (specify week &amp; month)</b>
	SW monsoon (June-Sep):	1273	55	1st week of June to last week of September.	Last week of Sept.
	Post Monsoon/ NE Monsoon (Oct-Dec):	121.9	2	1st week of Oct. to 2nd week of Nov.	Last week of Nov.
	Winter (Jan- March)	88.0			-
	Summer (April-May)	488.8	21	1st week of April to last week of May.	-
	Annual	1971.7			

1.3	Land use pattern of the district (latest statistics)	Geographical Area ('000 ha)	Cultivable area ('000 ha)	Forest area ('000 ha)	Land under non-agricultural use ('000 ha)	Permanent Pastures ('000 ha)	Cultivable wasteland ('000 ha)	Land under Misc. tree crops and groves ('000 ha)	Barren and uncultivable land ('000 ha)	Current Fallows ('000 ha)	Other fallows ('000 ha)	Land put for non agricultural use
	Area ('000 ha)	201.20	91.68	21.9	44.18	6.62	7.29	10.77	14.21	0.051	0.081	31.11

1.4	<b>Major Soils</b>	<b>Area ('000ha)</b>	<b>Percent (%) of total</b>
	1. Sandy loam	40.56	44.26
	2. Clay loam	45.49	49.65
	3. Silty clay loam	1.23	1.34
	Other (specify)	4.35	4.74
1.5	<b>Agricultural land use</b>		<b>Cropping intensity</b>
	Net sown area	110.20	<b>151 %</b>
	Area sown more than once	56.33	
	Net irrigated area	3.19	
	Gross cropped area	166.53	

1.6	<b>Irrigation</b>	<b>Area ('000 ha)</b>	<b>Percent (%)</b>	
	Net cultivated area	91.68	-	
	Net irrigated area	24.36	-	
	Gross cultivated area	-	-	
	Gross irrigated area	19.03	-	
	Rainfed area	140.28	-	
	<b>Sources of Irrigation</b>	Number	Area ('000 ha)	% area
	Canals	57 nos.	-	-
	Tanks	NA	-	-
	Open wells	-	-	-
	Bore wells	-	-	-
	Lift irrigation	-	-	-
	Other sources	-	-	-
	Pump sets	-	-	-

	Micro-irrigation	-	-	-
	<b>Groundwater availability and use</b>	-	-	-
	Over exploited	-	-	-
	Critical	-	-	-
	Semi-critical	-	-	-
	Safe	-	-	-
	Wastewater availability and use	-	-	-

**1.7 Area under major field crops & horticulture (as per latest figures) (Specify year 2014-15)**

1.7a	Major field crops cultivated	Area ('000 ha)							Summer	Grand total
		<i>Kharif</i>			<i>Rabi</i>					
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total			
1	Paddy	-	25.64	-	-	63.21	-	5.80	94.65	
2	Wheat	-	-	-	-	1.06	-	-	1.06	
3	Maize	-	0.51	-	-	-	-	-	0.51	
5	Linseed	-	-	-	-	0.34	-	-	0.34	
6	Rapeseed/mustard	-	-	-	-	7.03	-	-	7.03	
7.	Black gram	-	1.93	-	-	-	-	-	1.93	
8.	Green gram	-	NA	-	-	-	-	NA	NA	
10.	Lentil	-	0.74	-	-	-	-	-	0.74	
<b>1.7b</b>	<b>Horticulture crops – Fruits</b>	<b>Total</b>			<b>Irrigated</b>			<b>Rainfed ('000 ha)</b>		
1	<b>Areca nut</b>	-								
2	Banana	0.61			-			0.61		
3	<b>Coconut</b>	0.650			-			0.650		
4	Lemon	-			-			-		
5.	Pineapple	.100			-			.100		
6.	Orange	0.74			-			0.74		
<b>1.7c</b>	<b>Horticulture crops - Vegetables</b>	<b>Total area ('000 ha)</b>			<b>Irrigated area ('000 ha)</b>			<b>Rainfed area ('000 ha)</b>		
1	<i>Kharif</i> vegetables	0.735			-			0.735		
2	<i>Rabi</i> vegetables	0.937			-			0.937		
2	Chilli	0.452			-			0.452		
6	Onion	-			-			-		
7	Garlic	0.350			-			0.350		
<b>1.7d</b>	<b>Medicinal and Aromatic crops</b>	<b>Total area ('000 ha)</b>			<b>Irrigated area ('000 ha)</b>			<b>Rainfed area ('000 ha)</b>		
1	Medicinal and Aromatic crops	NA			-			-		
Others	-	-			-			-		

<b>1.7e</b>	<b>Plantation crops</b>	<b>Total area ('000 ha)</b>	<b>Irrigated area ('000 ha)</b>	<b>Rainfed area ('000 ha)</b>
1	Turmeric	0.601	-	0.601
2	Ginger	0.753	-	0.753
3	Coriander	0.210	-	0.210
<b>1.7f</b>	<b>Fodder crops</b>	<b>Total area ('000 ha)</b>	<b>Irrigated area ('000 ha)</b>	<b>Rainfed area ('000 ha)</b>
<b>1.7g</b>	<b>Grazing land</b>	-	-	-
<b>1.7h</b>	<b>Sericulture etc</b>	-	-	-
<b>1.7i</b>	<b>Others (specify)</b>	-	-	-

Source: District Statistical Handbook, 2014-15

<b>1.8</b>	<b>Livestock (in number)</b>	<b>Male ('000)</b>	<b>Female ('000)</b>	<b>Total ('000)</b>
	Non descriptive Cattle (local low yielding)	152.811	199.019	351.830
	Crossbred cattle	1.358	4.846	6.204
	Non descriptive Buffaloes (local low yielding)	0.972	0.752	1.724
	Graded Buffaloes	-	-	-
	Goat	72.471	111.893	184.364
	Sheep	3.007	3.837	6.844
	Others (Camel, Pig, Yak etc.)	-	-	-
	(i) Pig	39.583	28.668	68.251
	(ii) Mithun	-	-	-
	Commercial dairy farms (Number)	-	-	18
<b>1.9</b>	<b>Poultry</b>	<b>No. of farms</b>	<b>Total No. of birds ('000)</b>	
	Commercial + Backyard	30	725.856	
	Duck	-	141.590	

<b>1.10</b>	<b>Fisheries (Data source: Chief Planning Officer of district)</b>							
	<b>A. Capture</b>							
	<b>i) Marine (Data Source: Fisheries Department)</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		
	<b>Not applicable</b>							
<b>ii) Inland (Data Source: Fisheries Department)</b>	<b>No. Farmer owned ponds</b>		<b>No. of Reservoirs</b>		<b>No. of village tanks</b>		<b>No of ponds&amp; tanks</b>	
	1800 ha		8		110 ha		107	
<b>B. Culture</b>								
			<b>Water Spread Area (ha)</b>	<b>Yield (t/ha)</b>	<b>Production ('000 tons)</b>			
<b>i) Brackish water (Data Source: MPEDA/ Fisheries Department)</b>			-	-	-			
<b>ii) Fresh water (Data Source: Fisheries Department)</b>			-	-	-			

**1.11 Production and Productivity of major crops (Average of last 5 years: 2008 to 2014 – Source DAO office, Udalguri, Assam)**

<b>1.11</b>	<b>Name of crop</b>	<b>Kharif</b>		<b>Rabi</b>		<b>Summer</b>		<b>Total</b>		<b>Crop residue as fodder ('000 tons)</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>										
Crop 1	Rice	3.3	3500	834.40	1324	315.15	3483.86	1318.14	1377	-
Crop 2	Toria	-	-	1.6	-	-	-	-	359	-
Crop 3	Jute	-	-	-	-	3	3200	3	3200	-
Crop 4	Blackgram	-	-	-	-	2.5	800	2.5	800	-
Crop 5	Wheat	-	-	2.6	2400	-	-	-	2400	-
Others	Sugarcane	-	-	-	-	52	52800	-	52800	-
<b>Major Horticultural crops (Crops to be identified based on total acreage)</b>										
Crop 1	Banana	27	27000	-	-	-	-	27	27000	-
Crop 2	Papaya	27	30000	-	-	-	-	27	30000	-
Crop 3	Assam lemon	5	40000	-	-	-	-	5	40000	-
Crop 4	Pineapple	18750 nos.	18000	-	-	-	-	18750 nos.	18000	-

Crop 5	Coconut	18	18750 nos.	-	-	-	-	18	18750 nos.	-
Crop 6	Arecanut	29	29370	-	-	-	-	29	29370	-
Crop 7	<i>Kharif</i> vegetables	30	30000	-	-	-	-	30	30000	-
Crop 8	<i>Rabi</i> vegetables	35	28000	-	-	-	-	35	28000	-

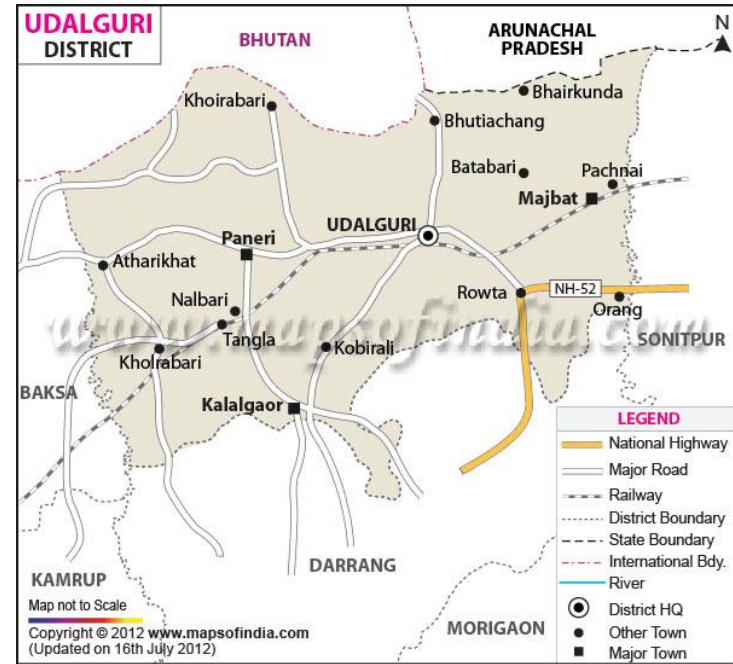
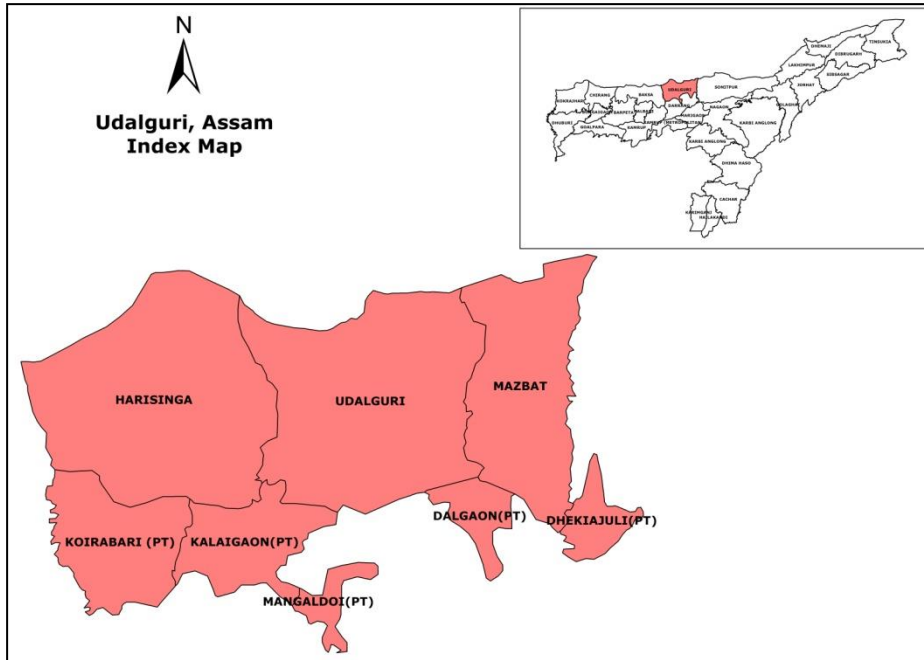
1.12	<b>Sowing window for 5 major crops (start and end of sowing period)</b>	1: Rice	2: Toria	3: Jute	4: Blackgram	5: Wheat
	<i>Kharif</i> -Rainfed	June-July		March-May	Mid Aug-Mid Sept	-
	<i>Kharif</i> -Irrigated	-	-	-	-	-
	<i>Rabi</i> -Rainfed	-	Oct - Nov.	-	-	5 <sup>th</sup> Nov-15 <sup>th</sup> Dec
	<i>Rabi</i> -Irrigated	Nov-Dec	-	-	-	-

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

**6 out of 10 years = Regular**

1.14	<b>Include Digital maps of the district for</b>	Location map of district within State as Annexure I	Enclosed: <b>Yes</b>
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Location map of district within State as Annexure I



## 2.0 Strategies for weather related contingencies

### 2.1 Drought

#### A. Drought - Pre-Monsoon (Last week of March to First week of April)

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)					
Delayed by 2 weeks ( 2 <sup>nd</sup> to 3 <sup>rd</sup> week of April)	1)Farming situation: Rainfed upland	<b>Cropping system 1:</b> Summer vegetables /Summer Pulse (Greengram/Blackgram)/Summer,Oilseed (Sesamum), Maize	No Change Growing high yielding varieties <b>Greengram</b> -SGC-16, Sonai (SG 21-5) T 44,K 851, Pratap  <b>Blackgram</b> - Sonkush (SB 23-5) Pant U 19, T-9, KU-301 etc  <b>Sesamum</b> -Kaliabor local, SG 25-1,AST-1 Maize- NMH 803,Ganga 5,Hi- starch, Diara NLD etc	Allow recommended package of practices for different crops i) Weeding at critical stages of growth. ii) Addition of sufficient organic matter in the soil at the time of land preparation	Use of mulch for moisture conservation.  Development of water harvesting structure for irrigation at critical stages of crop growth for higher yield.  Use of STWs for irrigation of the crop.

#### Normal onset of Pre-monsoon

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Early season drought (Normal onset )					
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop	2)Farming situation: Rainfed Medium land/ Medium	<b>Cropping system 1:</b> Rice( Early	No Change Use HYV of short duration rice Luit, Kolong,Kapilee,Dishang, Dikhow ,IR	1.Weeding at critical stages of growth 2 Irrigation as per requirement	Schemes for line department/RKVY/ ATMA Use of weather



stand etc.	lowland	ahu and ,normal ahu) monocropping	36,Culture 1 etc	3. Proper plant protection measures as and when required 6.Foliar application of 1% MOP	advisory service
		<b>Cropping system 2:</b> Boro Rice	No Change Grow high yielding varieties like – <b>Rice-</b> Joymoti, Swarnabh, Kanaklata, Dinanath	1.Weeding at critical stages of growth 2 Irrigation as per requirement 3. Proper plant protection measures as and when required 6.Foliar application of 1% MOP	-

### 2.1.1 Rainfed situation

Condition			Suggested Contingency measures		
Early season drought (delayed onset of monsoon)	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Delay by 2 weeks (Specify month)* June 3 <sup>rd</sup> week	Rainfed upland	<b>Cropping system 1</b> Summer vegetables/Sumer pulse(Blackgram) -Toria/ Potato/ <i>Rabi</i> vegetables like chilli/pea/cole crops	<b>No Change</b> Grow high yielding varieties like - <b>Blackgram-</b> Pant U 19, T-9, KU-301 etc, <b>Toria-</b> TS-36, TS-38, TS-67, TS-46 <b>Potato-</b> Kufri Chandramukhi, Kufri Jyoti, Kufri Megha, Kufri Pukhraj <b>Garden pea</b> – Azad, Arkel	Follow recommended package of practices for different crops i) Weeding at critical stages of crop growth. ii) Addition of sufficient organic matter/compost/Vermicompost in the soil at the time of land preparation iii) INM including use of biofertilizers like Azotobacter, PSB iv) Seed Treatment of pulses with Rhizobium culture	Provision for supply of seeds/inputs through RKVY and other Central/State schemes

		<p><b><u>Cropping system 2</u></b> Rice - <i>Rabi</i> crops like Toria/Potato/<i>rabi</i> vegetables</p>	<p><b>No change</b> Grow short duration rice varieties like Luit, Kapilee, Dishang, Inglongkiri, selected local cultivars. <b>Toria</b> varieties TS-36, TS-38, TS-67, TS-46 and <b>Potato</b> varieties like Kufri Chandramukhi, Kufri Jyoti, Kufri Megha, Kufri Pukhraj</p>	<p>Follow recommended package of practices for different crops-</p> <p>i) Weeding at critical stages of growth.</p> <p>ii) Addition of sufficient organic matter/compost/Vermicompost in the soil at the time of land preparation</p> <p>iii) Use INM practices including use of biofertilizers like Azotobacter, PSB</p>	
	<p>2) <b>Farming situation:</b> Rainfed Medium land/ Medium lowland</p>	<p><b><u>Cropping system 1:</u></b> Sali Rice (Winter rice) monocropping</p>	<p>Sali Rice (Winter rice) - Toria/Potato/ Garden pea <b>Rice-</b> Ranjit, Bahadur, Maniram, Piolee, Kushal etc <b>Blackgram-</b> Pant U 19, T-9, KU-301 etc, <b>Toria-</b> TS-36, TS-38, TS-67, TS-46 <b>Potato-</b>Kufri Chandramukhi, Kufri Jyoti, Kufri Megha, Kufri Pukhraj <b>Garden pea</b> – Azad, Arkel</p>	<p>-Recommended package of practices for normal crop –</p> <ol style="list-style-type: none"> <li>1. Addition of sufficient organic matter/compost/Vermicompost in the soil</li> <li>2. Use INM practices in rice including use of Azospirillum and PSB as seedling treatment or recommended doses of fertilizers.</li> <li>3. Weeding at critical stages of growth</li> <li>4. Proper plant protection measures as and when required</li> </ol>	<p>Provision for supply of seeds/inputs through RKVY and various other Central/State schemes</p>

		<p><b><u>Cropping system 2</u></b> Rice - <i>Rabi</i> crops like Toria/Potato/<i>rabi</i> vegetables</p>	<p><b>No change</b> Grow HYV of rice varieties like Satya, Basundhara, Ranjit, Bahadur, Swarna, Mahsuri, Maniram <b>Toria</b> varieties TS-36, TS-38, TS-67, TS-46 and <b>Potato</b> varieties like Kufri Chandramukhi, Kufri Jyoti, Kufri Megha, Kufri Pukhraj <b>Garden pea</b> – Azad, Arkel</p>	<p>Follow recommended package of practices for different crops-</p> <p>i) Weeding at critical stages of growth.</p> <p>ii) Addition of sufficient organic matter/compost/Vermicompost in the soil at the time of land preparation</p> <p>iii) Use INM practices including use of biofertilizers like Azotobacter, PSB or recommended doses of fertilizers.</p>	
		<p><b><u>Cropping system 3</u></b> Jute - Toria / <i>Rabi</i> vegetables</p>	<p>No Change</p> <p>Grow high yielding varieties like <b>Jute</b> – Sonali, Reshma, Shyamali, Navin, Bahagi etc <b>Toria</b> varieties TS-36, TS-38, TS-67, TS-46.</p>	<p>Follow recommended package of practices for different crops-</p> <p>i) Weeding at critical stages of growth.</p> <p>Addition of sufficient organic matter/compost/Vermicompost in the soil at the time of land preparation</p> <p>iii) Use INM practices including use of biofertilizers like Azotobacter, PSB</p>	<p>Provision for supply of seeds/inputs through RKVY and various Central/State schemes</p>

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 4 weeks (Specify month) July 1st week	Rainfed upland	<b><u>Cropping system 1</u></b> Summer vegetables/Sumer pulse(Blackgram) -Torla/Potato/ <i>Rabi</i> vegetables like chilli/pea/Cole crops	<b>No Change</b> Grow high yielding varieties like <b>Blackgram</b> - Pant U 19, T-9, KU-301 etc, <b>Torla</b> - TS-36, TS-38, TS-67, TS-46 <b>Potato</b> -Kufri Chandramukhi, Kufri Jyoti, Kufri Megha, Kufri Pukhraj  <b>Vegetable pea</b> – Azad, Arkel	i) Life saving supplemental irrigation ii) Thinning in Torla to maintain optimum plant population ii) Weeding at critical stages of growth. iii) Supplemental irrigation in the nursery bed of <i>Rabi</i> vegetables iv) Addition of sufficient organic matter/compost /Vermicompost in the soil at the time of land preparation v) Use of mulching in Potato. Vi) Soil moisture conservation practices should be followed including water harvesting in farm ponds vii) Use of Agro-Meteorological advisories/weather forecast data	Crop insurance through Fasal bhima yojana  Provision for water harvesting structures under PMKSY
		<b><u>Cropping system 2</u></b> Rice - <i>Rabi</i> crops like Torla/Potato/ <i>rabi</i> vegetables	<b>No change</b> Grow short duration rice varieties like Luit, Kapilee, Dishang, Inghongkiri, selected local cultivars. <b>Torla</b> varieties TS-36, TS-38, TS-67, TS-46 and <b>Potato</b> varieties like Kufri Chandramukhi, Kufri Jyoti, Kufri Megha, Kufri Pukhraj		

	<p><b>Rainfed medium land/medium low land</b></p>	<p><b><u>Cropping system 1:</u></b> Sali Rice (Winter rice) monocropping</p>	<p>Sali Rice (Winter rice) - Toria/Potato <b>Rice-</b> Ranjit, Bahadur, Maniram, Piolee, Kushal etc <b>Blackgram-</b> Pant U 19, T-9, KU-301 etc, <b>Toria-</b> TS-36, TS-38, TS-67, TS-46 <b>Potato-</b>Kufri Chandramukhi, Kufri Jyoti, Kufri Megha, Kufri Pukhraj</p>	<p>Growing of medium duration rice varieties such as Satyaranjan, Basundhara, TTB 404 (Shraboni), Swarna etc (transplanting up to 1<sup>st</sup> week August). - Short duration rice varieties such as Luit, Kolong, Dishang etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 15x15 cm spacing with 4-6 seedlings/hill. -Rice varieties that can be grown as late Sali up to last part of August are Manohar Sali, Andrew Sali, Salpona, Prafulla and Gitesh up to 60 days old sowing with Closer spacing of (15 cm x 15 cm) and 6-8 seedlings/hill is recommended Tender seedlings should be transplanted  iii) Community nursery for traditional as well as HYV of late planted varieties of paddy  iv) Identification and evaluation of suitable varieties specific to prevailing situation</p>	<p>Crop insurance through Fasal bhima yojana  Provision for water harvesting structures under PMKSY</p>
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				<p>v) Demonstration programme in real field situation for farmers' motivation</p> <p>vi) Use of Agro-Meteorological advisories/weather forecast data</p>	
		<p><b><u>Cropping system 2</u></b> Rice - <i>Rabi</i> crops like Toria/Potato/<i>rabi</i> vegetables</p>	No change	<p>-Growing of medium duration rice varieties like Satyaranjan, Basundhara, TTB 404, Jaya etc (transplanting up to 1<sup>st</sup> week of August).</p> <p>- Short duration rice varieties such as Luit, Kapilee, Dishang etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 15x15 cm</p> <p>--Grow late Sali rice varieties up to last part of August like Manohar Sali, Salpona, Prafulla, Gitesh up to 60 days old seedlings. About 60 kg seed/ha is</p>	<p>Crop insurance through Fasal bhima yojana</p> <p>Provision for water harvesting structures under PMKSY</p>

		<b>Cropping system 3</b> Jute - Toria / <i>Rabi</i> vegetables		<p>required with closer spacing of (15 cm x 15 cm) and 6-8 seedlings/hill.</p> <p>Grow Short duration <i>rabi</i> vegetables -beans, garden pea, leafy vegetables</p> <p>Tender seedlings should be transplanted</p> <p>iii) Community nursery for traditional as well as HYV of late planted varieties of paddy</p> <p>iv) Identification and evaluation of suitable varieties specific to prevailing situation</p> <p>v) Demonstration programme in real field situation for farmers' motivation</p>	
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Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agonomic measures	Remarks on Implementation
Early season drought (delayed onset)  Delay by 6 weeks (Specify month) <b>July 3<sup>rd</sup> week</b>	Rainfed upland	<b>Cropping system 1</b> Summer vegetables/Sumer pulse (Blackgram) -Toria/ Potato/ <i>Rabi</i> vegetables like chilli/pea/cole crops	Summer vegetables/ Sumer pulse(Blackgram) -Toria/ Potato/ <i>Rabi</i> vegetables like chilli/pea/cole crops	i) Life saving supplemental irrigation ii) Weeding at critical stages of growth. iii) Thinning in Toria to	Crop insurance through Fasal bhima yojana  Seeds/inputs supply

		<p><b><u>Cropping system 2</u></b></p> <p>Rice - <i>Rabi</i> crops like Toria/Potato/<i>rabi</i> vegetables</p>	<p>Rice - <i>Rabi</i> crops like Toria/Potato/<i>rabi</i> vegetables</p>	<p>maintain optimum population</p> <p>iii) Supplemental irrigation in the nursery bed of <i>Rabi</i> vegetables</p> <p>. Soil moisture conservation practices are to be followed.</p> <p>3. Use of Agro-Meteorological advisories/weather forecast data</p>	<p>through RKVY</p> <p>Provision for water harvesting structures under PMKSY</p>
Rainfed medium / low land	<p><b><u>Cropping system 1:</u></b> Sali Rice (Winter rice) monocropping</p>	<p>Sali Rice (Winter rice) - Toria/Potato</p> <p><b>Rice-</b> Ranjit, Bahadur, Maniram, Piolee, Kushal etc</p> <p><b>Blackgram-</b> Pant U 19, T-9, KU-301 etc,</p> <p><b>Toria-</b> TS-36, TS-38, TS-67, TS-46</p> <p><b>Potato-</b>Kufri Chandramukhi, Kufri Jyoti, Kufri Megha, Kufri Pukhraj</p>	<p>Sali Rice (Winter rice) - Toria/Potato</p>	<p>Short duration rice varieties such as Luit, Kolong, Dishang etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 15 x15 cm spacing.</p> <p>--Rice varieties that can be grown as late Sali up to last part of August are Manohar Sali, Andrew Sali, Salpona, Prafulla and Gitesh etc. and traditional photo-period sensitive coarse grain</p>	<p>Crop insurance through Fasal bhima yojana</p> <p>Seeds/inputs supply through RKVY</p> <p>Provision for water harvesting structures under PMKSY</p>
	<p><b><u>Cropping system 2</u></b></p> <p>Rice - <i>Rabi</i> crops like Toria/Potato/<i>rabi</i> vegetables</p>	<p>Relay cropping of rice with lathyrus, field pea, lentil, linseed and niger</p>			



		<b>Cropping system 3</b> Jute - Toria / Rabi vegetables	Jute - Toria / Rabi pulses	<p>varieties with up to 60 days old seedlings. About 62 kg seed/ha is required with closer spacing (15 cm x 15 cm) and 6-8 seedlings/hill.</p> <p>In potato - use varieties like Kufri Jyoti and Kufri Megha.</p> <p>Soil moisture conservation practices are to be followed.</p> <p>Tender seedlings should be transplanted</p> <p>Use of Agro-Meteorological advisories/weather forecast data</p> <p>Use of mulches</p>	
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Condition	Major Farming situation <sup>a</sup>	Normal Crop/cropping system <sup>b</sup>	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought(delayed onset)					
Delay by 8 weeks (Specify month)	-	-	-	-	-

Condition			Suggested Contingency measures		
Early season drought (Normal onset)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures <sup>d</sup>	Remarks on Implementation
Normal onset followed by 15-20 days dry spell on standing crop.	1) Farming situation: upland	<p><b>Cropping system 1</b> Summer vegetables/Sumer pulse(Blackgram) -Torja/Potato/<i>Rabi</i> vegetables like chilli/pea/cole crops</p> <p><b>Cropping system 2</b> Rice - <i>Rabi</i> crops like Torja/Potato/<i>rabi</i> vegetables</p>	No Change	<p>-Life saving supplemental irrigation</p> <p>-Weeding at critical stages of growth.</p> <p>-Mulching</p> <p>-2% urea spray at branching in pulses</p> <p>Use Mulches</p> <p>Use of Agro-Meteorological advisories/weather forecast data</p>	<p>Crop insurance through Fasal bhima yojana</p> <p>Seeds/inputs supply through RKVY</p> <p>Provision for water harvesting structures under PMKSY</p>
	2) Farming situation: Medium land	<b>Cropping system 1:</b> Sali Rice (Winter rice) monocropping	<p>Sali Rice (Winter rice) - Torja/Potato</p> <p><b>Rice-</b> Ranjit, Bahadur, Maniram, Piolee, Kushal etc</p> <p><b>Blackgram-</b> Pant U 19, T-9, KU-301 etc,</p> <p><b>Torja-</b> TS-36, TS-38, TS-67, TS-46</p> <p><b>Potato-</b> Kufri Chandramukhi, Kufri Jyoti, Kufri Megha, Kufri Pukhraj</p>	<p>-Life saving supplemental irrigation if possible</p> <p>-Weeding at critical stages of growth.</p> <p>Use Mulches</p> <p>Use of Agro-Meteorological advisories/weather forecast data</p> <p>Use Mulches</p> <p>Use of Agro-Meteorological advisories/weather forecast data</p>	
		<b>Cropping system 2</b> Rice - <i>Rabi</i> crops like Torja/Potato/ <i>rabi</i> vegetables	No change	<p>-Supplemental irrigation through STW /farm pond in the nursery bed of rice.</p> <p>-The gap of 30 cm between two beds may be</p>	

				<p>converted into channel to supply water to keep the raised beds moist in the event of drought.</p> <p>-Application of sufficient quantity of FYM or compost in the nursery bed and main field.</p> <p>-Where germination is severely affected, re-sowing of rice seed may also be recommended. Varieties suitable for normal sowing should be selected.</p> <p>-Spraying of Mancozeb @ 2.5g/l or Edifenphos 2.0 ml/l or Carbendazim @ 1g/l against brown spot disease in rice.</p> <p>Use Mulches Use of Agro-Meteorological advisories/weather forecast data</p>	
		<p><b><u>Cropping system 3</u></b> Jute - Toria / <i>Rabi</i> vegetables</p>	No change	<p>PSB as soil application.</p> <p>Application of sufficient quantity of FYM or compost in the nursery bed and main field.</p> <p>Use Mulches Use of Agro-Meteorological advisories/weather forecast data</p>	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Mid season drought (long dry spell, consecutive 2 weeks rainless (< 2.5 mm))					
At vegetative stage	1) Farming situation: <b>upland</b>	<b><u>Cropping system 1</u></b> Summer vegetables/Sumer pulse(Blackgram) -Torla/Potato/ <i>Rabi</i> vegetables like chilli/pea/cole crops	No Change	-Life saving supplemental irrigation -Weeding at critical stages of growth. Application of post emergence herbicides (Imazethapyr, quazalofop-p-ethyl (60 g/ha)  - Thinning to maintain optimum plant population.  -Mulching in horticultural crops	Crop insurance through Fasal bhima yojana  Seeds/inputs supply through RKVY  Provision for water harvesting structures under PMKSY
		<b><u>Cropping system 2</u></b> Rice - <i>Rabi</i> crops like Torla/Potato/ <i>rabi</i> vegetables			
	2) Farming situation: <b>Medium land/ medium low land</b>	<b><u>Cropping system 1:</u></b> Sali Rice (Winter rice) monocropping	Sali Rice (Winter rice) - Torla/Potato <b>Rice-</b> Ranjit, Bahadur, Maniram, Piolee, Kushal etc <b>Blackgram-</b> Pant U 19, T-9, KU-301 etc, <b>Torla-</b> TS-36, TS-38, TS-67, TS-46 <b>Potato-</b> Kufri Chandramukhi, Kufri Jyoti, Kufri Megha, Kufri Pukhraj	- Life saving supplemental irrigation at critical stages of crop growth -Top dressing of additional quantities of MOP @ 37.5 kg/ha and incorporation is recommended in rice -Spraying of 2% KCl solution on leaves of rice if and when drought appears during afternoon (After 3 PM). -Top dressing of urea may be delayed upto heading stage of rice if drought prevails at tillering stage. -Spraying of Mancozeb @ 2.5g/l or Edifenphos 2 ml/l or Carbendazim @ 1g/l against brown spot disease in rice. -Weeding at critical stages of growth.	
		<b><u>Cropping system 2</u></b> Rice - <i>Rabi</i> crops like Torla/Potato/ <i>rabi</i> vegetables	No Change		
		<b><u>Cropping system 3</u></b> Jute - Torla / <i>Rabi</i> vegetables	No Change		

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures <sup>d</sup>	Remarks on Implementation
At flowering/fruiting stage	1. Upland	<b>Cropping system 1</b> Summer vegetables/Sumer pulse(Blackgram) -Torja/Potato/ <i>Rabi</i> vegetables like chilli/pea/cole crops	No change	-Life saving supplemental irrigation - Spraying of 1% KCl solution at flowering stage and 2% urea spray at pod initiation stage of pulses	Crop insurance through Fasal bhima yojana  Seeds/inputs supply through RKVY  Provision for water harvesting structures under PMKSY
		<b>Cropping system 2</b> Rice - <i>Rabi</i> crops like Torja/Potato/ <i>rabi</i> vegetables			
	2 Medium land/low land	<b>Cropping system 1:</b> Sali Rice (Winter rice) monocropping	Sali Rice (Winter rice) - Torja/Potato <b>Rice-</b> Ranjit, Bahadur, Maniram, Piolee, Kushal <b>Blackgram-</b> Pant U 19, T-9, KU-301 etc, <b>Torja-</b> TS-36, TS-38, TS-67, TS-46 <b>Potato-</b> Kufri Chandramukhi, Kufri Jyoti, Kufri Megha, Kufri Pukhraj	Top dressing of additional quantities of MOP @ 37.5 kg/ha and incorporation is recommended in rice before flowering. -Spraying of 2% KCL solution on leaves of rice if and when drought appear before flowering. -Top dressing of urea may be delayed up to heading stage of rice if drought prevails at the stages of top dressing	
		<b>Cropping system 2</b> Rice - <i>Rabi</i> crops like Torja/Potato/ <i>rabi</i> vegetables	No change	-Life saving supplemental irrigation at critical stages of crop growth.	
		<b>Cropping system 3</b> Jute - Torja / <i>Rabi</i> vegetables	No change		
Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	<i>Rabi</i> Crop planning	Remarks on Implementation

September-October	1) Farming situation: Upland	<b><u>Cropping system 1</u></b> Summer vegetables/Sumer pulse(Blackgram) -Torja/Potato/ <i>Rabi</i> vegetables like chilli/pea/cole crops	-Life saving supplemental irrigation  -Harvesting of <i>kharif</i> crops at physiological maturity stage.  -Spraying of 1% KCl solution at flowering stage and 2% urea spray at pod initiation stage of pulses	- <i>Rabi</i> cropping with Cole crops such as Cauliflower (mid season varieties). Growing of Tomato, Brinjal, pea, potato and Leafy vegetables like Spinach, Radish etc. with recommended varieties and package of practices.  --Growing of <i>rabi</i> field crops like Torja, Lentil in time with pre-sowing irrigation if required with recommended varieties and package of practices. - Zero tillage	Seeds/inputs supply through RKVY  Provision for water harvesting structures under PMKSY
		<b><u>Cropping system 2</u></b> Rice - <i>Rabi</i> crops like Torja/Potato/ <i>rabi</i> vegetables			
	2) Farming situation: Medium land	<b><u>Cropping system 1:</u></b> Sali Rice (Winter rice) monocropping	-Life saving supplemental irrigation - - Harvesting of <i>kharif</i> crops at physiological maturity stage.	- <i>Rabi</i> cropping with Cole crops such as Cauliflower (mid season varieties). -Growing of Tomato, Brinjal, pea, potato and Leafy vegetables like Spinach, Radish etc. with recommended varieties and package of practices. --Growing of <i>rabi</i> field crops like torja, lentil, wheat etc. in time with pre-sowing irrigation if required with recommended varieties and package of practices.	Seeds/inputs supply through RKVY  Provision for water harvesting structures under PMKSY
		<b><u>Cropping system 2</u></b> Rice - <i>Rabi</i> crops like Torja/Potato/ <i>rabi</i> vegetables			
		<b><u>Cropping system 3</u></b> Jute - Torja / <i>Rabi</i> vegetables			

### 2.1.2 . Drought - Irrigated situation-- Not applicable

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	1) Farming Situation	Cropping System: 1	Not applicable		
	2) Farming Situation	Cropping System: 1	Not applicable		
Limited release of water in canals due to low rainfall	1) Farming Situation	Cropping System: 1	Not applicable		
Non release of water in canals under delayed onset of monsoon in catchment	1) Farming Situation	Cropping System: 1	Not applicable		
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Upland / medium land		Not applicable		
Insufficient groundwater recharge due to low rainfall	Upland / medium land		Not applicable		
	Medium / low land		Not applicable		

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

Condition	Suggested Contingency Measures			
Continuous high rainfall in a short span leading to water logging	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Crop1 - Rice	<ul style="list-style-type: none"> <li>-Sow rice seed in raised nursery bed with 30cm gap between two beds which can be utilized to drain out excess water.</li> <li>- Excess rain water to be drained out through surface drainage channel to avoid submergence in the main field.</li> <li>-Light hoeing and weeding</li> </ul>	Excess rain water to be drained out through surface drainage wherever possible	<ul style="list-style-type: none"> <li>- Excess rain water to be drained out through surface drainage wherever possible</li> <li>-Crop to be harvested at physiological maturity stage.</li> </ul>	<ul style="list-style-type: none"> <li>-Proper drying of grains to maintain optimum moisture percentage (12-14%) for storage under shade, in bamboo fitted on poles or using mechanical driers.</li> </ul>

Crop2 - Toria	Excess rain water to be drained out through surface drainage channel to avoid submergence in the main field.	-	Excess rain water to be drained out through surface drainage	Proper drying of grains to maintain optimum moisture percentage (12-14%) for storage under shade, using mechanical driers.
Crop4 - Jute	- Drainage -If top dressing of N fertilizer is not possible, foliar spray of 3% urea (11.5 kgN/ha i.e. 30 g urea/l of water) at 40-45 days and 55-60 days after sowing.,	-	Excess rain water to be drained out through surface drainage	Proper drying of fibre under shade, bamboo poles or using mechanical driers
Crop5 - Black Gram	Excess rain water to be drained out through surface drainage channel to avoid water stagnation in the main field.	Excess rain water to be drained out through surface drainage	Excess rain water to be drained out through surface drainage	Proper drying of grains to maintain optimum moisture percentage (12-14%) for storage under shade, using mechanical driers. Treat seeds with fungicide for storage
<b>Horticulture</b>				
Crop1 - Chilli	-Drainage  - Plant protection to be taken	- Excess rain water to be drained out through surface drainage - Application of hormones, nutrient, sprays to prevent flower drop.	- Excess rain water to be drained out through surface drainage  -Plant protection measures against fruit rot  --Crop to be harvested at physiological maturity stage.	- sell the produce immediately.  Proper drying of grains to maintain optimum moisture percentage under shade, using mechanical driers.
Crop2 - Potato	- Excess rain water to be drained out through	-Proper plant protection measure	- Excess rain water to be drained out through surface	-proper drying of the



	surface drainage -Proper plant protection measure	against late blight	drainage -Harvesting of tuber	produce. -Dry under shade.
Crop-3 - Tomato	- Excess rain water to be drained out through surface drainage  -Proper plant protection measure against late blight  -Earthing up at 25 and 60 days after planting.	- Excess rain water to be drained out through surface drainage  -Proper plant protection measure against late blight	- Excess rain water to be drained out through surface drainage  -Harvesting of tuber	- Sell mature tomatoes immediately - dry under shade - grow under low cost plastic houses
Crop4 - Vegetables	- Excess rain water to be drained out through surface drainage			Shifting of the produce to dry place, cold storage
<b>Heavy rainfall with high speed winds in a short span<sup>2</sup></b>	<b>Not Applicable</b>			
<b>Outbreak of pests and diseases due to unseasonal rains</b>				
Crop1 - Rice	-Application of pesticides like chlorpyrifos 50 EC or Dimethoate @ 2 ml/lit against stem borer, leaf folder, case worm.  -Adoption IPM module. -Alternate flooding and drying against case worm.	Adoption IPM module - Rouging of infected plant , - Application of pesticides like Chlorpyrifos or Monocrotophos @ 2 ml/lit against stem borer -Spraying of pesticide should not coincide pollination time. -Application of carbendazim @ 1g/l against blast and sheath blight.	-	-Insect pest and disease infested seed/grains should be discarded
Crop3 Jute	- Jute hairy caterpillar, semi looper etc. are to be hand picked and destroyed by putting in kerosinazed water.	-	-	-Discard insect pest and disease infested

	<ul style="list-style-type: none"> <li>- Alternatively, apply Fenitrothion 50 EC @ 1ml/l(3 sprayings)</li> <li>-</li> <li>- In case of root rot, stem rot, seedling blight, apply carbendazim @ 1g/l of water. Application of potash should be increased up to 50 kg/ha</li> </ul>			plants to maintain the quality.
Crop4 Black gram	<ul style="list-style-type: none"> <li>- Against the vector of YMV (white fly) spray Dimethoate @ 2ml/l (2 - 3 spraying) to kill the vector</li> <li>- Against jassids, aphids, flee beetle, leaf folder, spray Malathion 50 EC @ 2 ml/l of water.</li> <li>- Against damping off, root rot and seedling blight, apply carbendazim @ 1g/l of water.</li> </ul>	<ul style="list-style-type: none"> <li>- Against pod borer and pod bug, spray Malathion 50 EC @ 2 ml/l of water.</li> </ul>		Insect pest and disease infested seed/grains should be discarded
<b>Horticulture</b>				
Crop1 Potato	<ul style="list-style-type: none"> <li>-Depending on the weather condition, Mancozeb @ 2.5 g/l should be sprayed as prophylactic measures against late blight.</li> <li>-Use of sticker is essential in the spray solution for spraying during rainy weather.</li> <li>-Drainage of excess water through surface channels</li> </ul>			-Discard disease and insect infested tubers.
Crop2 Tomato	<ul style="list-style-type: none"> <li>-Depending on the weather condition, Mancozeb @ 2.5 g/l should be sprayed as prophylactic measures against late blight.</li> <li>-Against late blight, 6 spraying with Mancozeb 2.5g/l of water at an interval of 12 days.</li> <li>-Use of sticker is essential in the spray solution for spraying during rainy weather.</li> <li>- Drainage of excess water through surface channels</li> </ul>			-Discard disease and insect infested fruits.

### 2.3 Floods

Condition	Suggested Contingency Measures <sup>0</sup>				
	Transient water logging/partial inundation	Seeding/ nursery stage	Vegetative stage	Reproductive stage	At harvest
Crop1 - Rice	<ul style="list-style-type: none"> <li>-Raised nursery bed with 30 cm gap in between two beds so that excess water can be removed.</li> </ul>		-	-	Harvesting at physiological maturity stage, storage under

				shade, in bamboo fitted on poles or using mechanical driers.
Crop2- <b>Jute</b>	-Drainage of flood water by surface channels	-Drainage of flood water -Foliar application of urea instead of top dressing is advocated	-	-Harvested plants should be made in bundles and to be kept in standing position for 2-4 days.
Crop3 - <b>Black gram</b>	Re-sowing if required	-	-	-Harvesting at physiological maturity stage. -Proper drying of produce under shade, or using mechanical driers.
Crop 4. <b>Toria</b>		Not applicable	Not applicable	Not applicable
<b>Horticulture</b>				
Crop1 Banana	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water, propping.	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water, propping.	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water, propping.	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water, propping.
Crop2 <i>Kharif</i> Vegetable	-Drainage of flood water -Hoeing in between lines for aeration in root zone after flood			-Harvesting of produce as early as possible
Crop3 Arecanut	Make trenches/furrows in between rows to facilitate drainage of excess water			-
Crop 4. Assam lemon	Making trenches in between ridges to drain out the excess water.			Shifting of the produce to dry place
Crop 5. Pineapple	Making trenches in between ridges to drain out the excess water.			Shifting of the produce to dry place
<b>Continuous submergence for more than 2 days<sup>2</sup></b>				
Crop1 Summer rice	-Not Applicable	-Not Applicable	Harvesting at physiological	- storage under shade, in

			maturity stage, storage under shade, in bamboo fitted on poles or using mechanical driers.	bamboo fitted on poles or using mechanical driers. - crop insurance
Crop2 Winter rice	<p>-If seedlings are damaged by flood water, re-sowing may be done with the following varieties-</p> <p>-If transplanting can be done by mid August, select varieties like Satyaranjan, Basundhara, IR -36, Jaya etc. Seedlings should be raised in non flood prone or high land area.</p> <p>- If transplanting is possible during last part of August, short duration varieties such as Luit, Kolong, Dishang etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 15x15 cm spacing with 4-5 seedlings/hill</p>		Harvesting at physiological maturity stage, storage under shade, in bamboo fitted on poles or using mechanical driers.	Harvesting at physiological maturity stage, storage under shade, in bamboo fitted on poles or using mechanical driers - crop insurance
<b>Sea water inundation</b>	<b>Not applicable</b>			

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

Extreme event type	Suggested contingency measure <sup>r</sup>			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
<b>Heat Wave<sup>p</sup></b>	NA			
Crop1				
<b>Horticulture</b>				
Crop1 (specify)				
<b>Cold wave<sup>q</sup></b>				
Crop1				
<b>Horticulture</b>				
Crop1 (specify)				
<b>Frost</b>				
Crop1				
<b>Horticulture</b>				

Crop1 (specify)				
<b>Hailstorm</b>				
Crop1				
<b>Horticulture</b>				
Crop1 (specify)				
<b>Cyclone</b>				

## 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	<ul style="list-style-type: none"> <li>Increasing cultivation of perennial fodder and feed reserves in district</li> <li>Establishment of fodder banks with inclusion of drought tolerant fodders</li> <li>Training and preparation of hay and silage</li> <li>Making facility for block feed and UMMB licks</li> <li>Raising drought tolerant perennial grasses, trees, shrubs &amp; bushes in field boundaries</li> <li>Quality up-gradation of inferior quality roughages like paddy straw, wheat straw etc. with urea treatment.</li> <li>Preventing the practice of burning paddy straw, maize stover and sugarcane tress.</li> <li>Encouraging production of Azolla for animal feed.</li> <li>Mass awareness on feeding the livestock with unconventional feeds and various byproducts.</li> </ul>	<ul style="list-style-type: none"> <li>Feeding fodders from perennial trees.</li> <li>Feeding already prepared silage, hay, UMMB lick</li> <li>Providing feed blocks, unconventional feeds and various byproducts.</li> <li>Providing urea treated straw.</li> <li>Use of harvested tree/top of fodder as feed for livestock animals.</li> <li>Feeding of grains damaged during processing, milling by products &amp; use of all failed field crops during the drought period as animal feed.</li> </ul>	<ul style="list-style-type: none"> <li>Culling of affected and unproductive animals.</li> <li>Fodder rejuvenation and cultivation of fodder crops (Oat, Maize etc.)</li> </ul>

	<ul style="list-style-type: none"> <li>• Mass awareness on utilization of crop byproducts like sugarcane tops and bagasse for animal feeding with method demonstration on urea treatment of straw.</li> </ul>		
Drinking water	<ul style="list-style-type: none"> <li>• Storing water in tanks for the hard period</li> <li>• On farm /Roof top water harvesting/</li> <li>• Identification of natural water resources and their use in a planned way.</li> </ul>	<ul style="list-style-type: none"> <li>• Offering stored water to the livestock.</li> <li>• Preventing wastage of water</li> <li>• Animals not to be exposed outside</li> </ul>	<ul style="list-style-type: none"> <li>• Culling of affected and unproductive animals.</li> </ul>
Health and disease management	<ul style="list-style-type: none"> <li>• Popularizing the concept of animal insurance and its implementation.</li> <li>• Creation of repositories to store a sizeable stock of veterinary medicines for emergencies</li> <li>• Prompt recognition of endemic animal diseases and timely vaccination against them.</li> <li>• Mass awareness programme on management of livestock during drought.</li> <li>• Regular de-worming of animals to minimize the parasitic burden and improve the productivity of farm livestock.</li> <li>• Constituting efficient team of workers to act as a Rapid Action Force during emergencies</li> <li>• Collaboration with local and district veterinary officials to handle endemic animal diseases.</li> </ul>	<ul style="list-style-type: none"> <li>• Immediate treatment of the sick animals.</li> <li>• Organizing mass animal health check up camps wherever necessary.</li> <li>• Providing anthelmintics and mineral mixtures to productive animals.</li> <li>• Segregation of suspicious and disease animals from the herd and their early treatment.</li> </ul>	<ul style="list-style-type: none"> <li>• Availing insurance</li> <li>• Culling of unproductive livestock to improve economic status of livestock owners.</li> <li>• Organizing need based animal health check up camps</li> <li>• Minimizing cases of anestrous and repeat breeding in productive animals by organizing mass animal fertility camps.</li> </ul>
<b>Floods</b>			
Feed and fodder availability	<ul style="list-style-type: none"> <li>• Increasing cultivation of perennial fodder and feed reserves in district</li> <li>• Establishment of community fodder banks with inclusion of flood tolerant fodder variety.</li> <li>• Encouraging preparation of hay making and silage preparation</li> <li>• Making facility for block feed and UMMB</li> </ul>	<ul style="list-style-type: none"> <li>• Making fodders available from community fodder banks</li> <li>• Feeding already prepared silage, hay, UMMB lick feed blocks, unconventional feeds and various byproducts.</li> <li>• Providing urea treated straw.</li> <li>• Use of harvested tree/top of fodder as</li> </ul>	<ul style="list-style-type: none"> <li>• Availing insurance</li> <li>• Culling of affected and unproductive animals.</li> <li>• Fodder rejuvenation</li> </ul>

	<ul style="list-style-type: none"> <li>licks</li> <li>Preventing the practice of burning paddy straw, maize stover and sugarcane tress and quality up gradation of inferior quality roughages like paddy straw, wheat straw etc. with urea treatment.</li> <li>Encouraging production of Azolla for animal feed.</li> <li>Mass awareness on feeding the livestock with unconventional feeds and various byproducts.</li> <li>Mass awareness on utilization of crop byproducts like sugarcane tops and bagasse for animal feeding with method demonstration of urea treatment of straw.</li> <li>Erection of raised platform for feed storage and animals</li> </ul>	<ul style="list-style-type: none"> <li>feed for livestock animals.</li> <li>Keep animals in safe place like raised plate form/upland</li> </ul>	
Drinking water	<ul style="list-style-type: none"> <li>Storing water in tanks</li> </ul>	<ul style="list-style-type: none"> <li>Offering stored water to the livestock.</li> </ul>	<ul style="list-style-type: none"> <li>Treating of drinking water.</li> </ul>
Health and disease management	<ul style="list-style-type: none"> <li>Popularizing the concept of animal insurance and its implementation</li> <li>Prompt recognition of endemic animal diseases and timely vaccination against them.</li> <li>Creation of repositories to store a sizeable stock of veterinary medicines for emergencies</li> <li>Mass awareness programme on management of livestock during floods.</li> <li>Regular de-worming of animals to minimize the parasitic burden and improve the productivity of farm livestock.</li> <li>Constituting trained team of workers to act as a Rapid Action Force during emergencies</li> <li>Involvement of the local veterinary officials</li> </ul>	<ul style="list-style-type: none"> <li>Immediate treatment of the sick animals.</li> <li>Conducting animal health camps during the period.</li> </ul>	<ul style="list-style-type: none"> <li>Availing insurance</li> <li>Organizing need based animal health check up camps and vaccination</li> <li>Culling of unproductive livestock to improve economic status of livestock owners.</li> <li>Minimizing cases of anestrous and repeat breeding in productive animals by organizing mass animal fertility camps.</li> </ul>

	to handle endemic animal diseases.		
<b>Cyclone</b>	NA	NA	NA
Feed and fodder availability	NA	NA	NA
Drinking water	NA	NA	NA
Health and disease management	NA	NA	NA
<b>Heat wave and cold wave</b>	NA	NA	NA
Shelter/environment management	NA	NA	NA
Health and disease management	NA	NA	NA
	NA	NA	NA

<sup>s</sup> based on forewarning wherever available



## 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 ingredients	<ul style="list-style-type: none"> <li>• Culling of unproductive poultry for efficient utilization of poultry feed.</li> <li>• Storage of household grains like broken rice, maize, pulses, oilseeds etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Offering stored feed and use of non conventional source of feed like broken grains, brewery wastes, etc.</li> <li>• Supplementation of shell grit/ calcium to the laying birds</li> <li>• Immediate marketing of the meat type birds</li> <li>• Arrangement of good quality poultry feed</li> </ul>	<ul style="list-style-type: none"> <li>• Culling unproductive birds.</li> <li>• Providing of good quality poultry feed to obtain optimum growth</li> </ul>	RKVY
Drinking water	<ul style="list-style-type: none"> <li>• Preserving water in tank</li> </ul>	<ul style="list-style-type: none"> <li>• Judicious use of stored water</li> </ul>	<ul style="list-style-type: none"> <li>• Developing drinking water storage facilities.</li> </ul>	
Health and disease management	<ul style="list-style-type: none"> <li>• Culling of weak and diseased birds.</li> <li>• Timely de-worming.</li> <li>• Vaccination against endemic diseases especially Ranikhet disease.</li> <li>• Arrangement of brooding facilities for young chicks</li> <li>• Construction of good quality poultry houses or farms to minimize disease incidences and to avoid predation by carnivores.</li> <li>• Proper waste disposal system in poultry farms possessing large flocks.</li> <li>• Provision for balanced feeding</li> </ul>	<ul style="list-style-type: none"> <li>• Immediate segregation of disease affected and suspicious birds from the flock.</li> <li>• Immediate treatment of the sick animals.</li> <li>• Conducting animal health camps during the period.</li> <li>• Maintenance of proper hygiene and sanitation in the commercial poultry farms.</li> <li>• Regular cleaning of poultry houses to minimize disease incidence.</li> <li>• Restricting trade of poultry, poultry meat and eggs during outbreak of a disease having potential to take an epidemic form.e.g. Bird flu.</li> <li>• Restriction against needless</li> </ul>	<ul style="list-style-type: none"> <li>• Culling of unproductive birds</li> <li>• Availing insurance wherever required</li> <li>• Maintenance of proper hygiene and sanitation in the poultry sheds.</li> <li>• Disposal of dead birds by burning or by deep burial with lime in pits of optimum sizes.</li> <li>• Timely vaccination of all the birds.</li> <li>• Timely marketing of meat type poultry and poultry eggs to minimize losses due to</li> </ul>	

	<ul style="list-style-type: none"> <li>of productive birds</li> <li>• Veterinary preparedness</li> <li>• Mass awareness programme on management of poultry during drought.</li> <li>• Popularizing poultry insurance and its implementation.</li> </ul>	<ul style="list-style-type: none"> <li>movement of individuals in the farm premises</li> </ul>	<ul style="list-style-type: none"> <li>mortality.</li> <li>• Mass awareness programme on management of poultry during drought.</li> </ul>	
<b>Floods</b>				
Shortage of feed ingredients	<ul style="list-style-type: none"> <li>• Procurement and storage of sufficient good quality feed ingredients in flood prone areas</li> </ul>	<ul style="list-style-type: none"> <li>• Supply feed ingredient to the affected poultries</li> </ul>	<ul style="list-style-type: none"> <li>• Culling unproductive birds.</li> <li>• Use of good quality poultry feed to obtain optimum growth</li> </ul>	
Drinking water	<ul style="list-style-type: none"> <li>• Preserving water in tank</li> </ul>	<ul style="list-style-type: none"> <li>• Arrangement of safe drinking/ medicated water from outside</li> </ul>	<ul style="list-style-type: none"> <li>• Treating drinking water</li> </ul>	
Shelter management	<ul style="list-style-type: none"> <li>• Popularizing poultry sheds on raised bamboo/ pucca structures to protect birds/sheds from flood water, occurrence of diseases and storage of feed</li> <li>• Identification of sites/areas not prone to inundation during floods for erecting poultry sheds and feeds storage units</li> </ul>	<ul style="list-style-type: none"> <li>• Shifting of birds and feed to raised sheds and storage units respectively</li> </ul>	<ul style="list-style-type: none"> <li>• Sterilization of vacant poultry sheds before bringing back the batch of birds</li> </ul>	<ul style="list-style-type: none"> <li>• Insure poultry units and avail gov. programs for the same</li> </ul>

Health and disease management	<ul style="list-style-type: none"> <li>• Vaccination against endemic diseases especially Ranikhet disease.</li> <li>• Stocking of emergency medicine for prevalent diseases</li> <li>• Mass awareness programme on management of poultry and zoonotic diseases.</li> </ul>	<ul style="list-style-type: none"> <li>• Conducting animal health camps during the period</li> <li>• Immediate segregation of disease affected and suspicious birds from the flock and treatment of the sick birds</li> <li>• Maintenance of proper hygiene and sanitation in the commercial poultry farms</li> <li>• Restricting trade of poultry meat and eggs during outbreak of a disease having potential to take an epidemic form.e.g. Bird flu.</li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance of proper hygiene and sanitation in the poultry sheds.</li> <li>• Disposal of dead birds by burning or by deep burial with lime in pits at proper depth</li> <li>• Timely marketing of meat type poultry and poultry eggs to minimize losses due to mortality</li> </ul>	
<b>Cyclone</b>	-	-	-	-
Shortage of feed ingredients	-	-	-	-
Drinking water	-	-	-	-
Health and disease management	-	-	-	-
<b>Heat wave and cold wave</b>	-	-	-	-
Shelter/environment management	-	-	-	-
Health and disease management	-	-	-	-

<sup>a</sup> based on forewarning wherever available

### 2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event <sup>a</sup>	During the event	After the event
<b>1) Drought</b>	-	-	-
<b>A. Capture</b>	NA	NA	NA
Marine	-	-	-
<b>Inland</b>	-	-	-
(i) Shallow water depth due to insufficient rains/inflow	-	-	-
(ii) Changes in water quality	-	-	-
(iii) Any other	-	-	-
<b>B. Aquaculture</b>	-	-	-
(i) Shallow water in ponds due to insufficient rains/inflow	<ul style="list-style-type: none"> <li>• Capturing some amount of fishes and keeping few to minimize quantity of fishes in the pond</li> <li>• Digging of ponds to increase depth</li> <li>• Follow measures like addition of cow dung etc. to stop/minimize downward percolation of water</li> <li>• Enquiring alternative water sources to add to the pond</li> <li>• For pond construction select soils with sufficient clay for retention of water.</li> <li>• Apply sufficient organic manure during preparation to minimize water loss through seepage.</li> <li>• Educating for Insurance and</li> </ul>	<ul style="list-style-type: none"> <li>• Digging of ponds/ middle of ponds to increase depth for saving life of the fishes</li> <li>• Minimizing quantity of fishes</li> <li>• Pump in water from other water source (nearby spring, stream, rivers etc) or ground water, if any.</li> <li>• Reduce food for minimum metabolism.</li> <li>• Restrict fertilizer for preventing algal bloom and minimum stress.</li> <li>• Dig deep trench in convenient part of the pond to save brood fishes.</li> <li>• Careful observation on daily</li> </ul>	<ul style="list-style-type: none"> <li>• Cleaning and digging of ponds to increase depth</li> <li>• Use of clay material in pond beds to minimize water loss through percolation</li> <li>• Extended seed production</li> <li>• Restock the pond.</li> <li>• Promoting area specific Integrated fish farming</li> <li>• Short duration culture of species that are fast growing in initial stage and can be marketed at small size (minor and medium carps).</li> <li>• Air breathing fish culture</li> <li>• Claim compensation with support of record and documents.</li> </ul>

	<p>apply</p> <ul style="list-style-type: none"> <li>Excavation of bore wells</li> <li>Reduce biomass and stocking density through partial harvesting.</li> <li>Sell out the fishes attaining marketable size to minimize loss.</li> <li>Stock fishes that can thrive low water depth, like air breathing fishes.</li> <li>Maintenance of proper record for claiming compensation, especially in schemes assisted by Govt. or financial institutes.</li> <li>Planning for rain water harvest.</li> </ul>	<p>basis.</p> <ul style="list-style-type: none"> <li>Scare away birds and other animals (attracted by shallow water to catch fish) – may be vector for diseases.</li> </ul>	
(ii) Impact of salt load build up in ponds / change in water quality	<ul style="list-style-type: none"> <li>Identify risks associated with the suspected outbreak of pathogens and be ready with suitable remedial measures</li> </ul>	-	<ul style="list-style-type: none"> <li>Partial water exchange to optimize salinity</li> </ul>
(iii) Any other	<ul style="list-style-type: none"> <li>Repairing/ arrangement of alternate safe place to keep pumps, aerators, etc</li> <li>Store the feeds in a proper place</li> </ul>	-	-
<b>2) Floods</b>	-	-	-
<b>A. Capture</b>	-	-	-
Marine	-	-	-
Inland	-	-	-
(i) No. of boats / nets/damaged	-	-	-
(ii) No.of houses damaged	-	-	-

(iii) Loss of stock	<ul style="list-style-type: none"> <li>• Thin out population</li> </ul>	<ul style="list-style-type: none"> <li>• Use FAD, feed attractant</li> </ul>	<ul style="list-style-type: none"> <li>• Use of disinfectant</li> </ul>
(iv) Changes in water quality			
(v) Health and diseases	<ul style="list-style-type: none"> <li>• Use of disinfectant</li> </ul>		
<b>B. Aquaculture</b>			
(i) Inundation with flood water	<ul style="list-style-type: none"> <li>• Dyke should be strongly constructed/ renovated above the expected flood level.</li> <li>• Insurance</li> <li>• Repairing, turving and compaction of peripheral embankments.</li> <li>• Growing horticultural crops on the embankment to prevent erosion.</li> <li>• Sufficient bamboo poles and nylon nets to be kept ready.</li> <li>• Construction of earthen nursery ponds in upland areas</li> <li>• ‘High stocking multiple harvesting’ can be taken up.</li> <li>• Sell out the fishes attaining marketable size to minimize loss.</li> <li>• Maintenance of proper record for claiming compensation, especially in schemes assisted by Govt. or financial institutes.</li> </ul>	<ul style="list-style-type: none"> <li>• Encircling the fishery with fish net to prevent the escaping of fishes</li> <li>• Surround the pond with nets supported by bamboo poles to prevent escape of fish.</li> <li>• Supply sufficient food to fishes to reduce tendency of escaping from the pond.</li> <li>• Fixing nets with appropriate size to reduce the loss of stock</li> <li>• Turbidity need to be controlled</li> <li>• Collection of naturally bred seeds (spawn/ fry/ fingerlings) from flooded water</li> </ul>	<ul style="list-style-type: none"> <li>• Dyke should be renovated strongly above the maximum flood level.</li> <li>• Sampling of fishes and water for disease analysis</li> <li>• Desilting</li> <li>• Restock the pond if original stock escapes.</li> <li>• Promotion of suitable Integrated fish farming</li> <li>• Short duration culture of species that are fast growing and can be marketed at small size.</li> <li>• Claim compensation with support of record and documents.</li> <li>• Removal of unwanted/ predatory fish from pond before stocking.</li> </ul>

(ii) Water contamination and changes in water quality	<ul style="list-style-type: none"> <li>• Dyke should be strongly constructed above the expected flood level.</li> <li>• Prevent entry of water from outside.</li> <li>• Precaution to prevent entry of pesticide/insecticide laden water from nearby agricultural land.</li> <li>• Apply lime regularly as per recommendation.</li> </ul>	<ul style="list-style-type: none"> <li>• Use disinfectant</li> <li>• Apply lime regularly as per recommendation.</li> </ul>	<ul style="list-style-type: none"> <li>• Use disinfectant, Remove all unwanted exotic fishes</li> <li>• Apply lime regularly as per recommendation.</li> <li>• Remove muck and debris, if entered with flood.</li> <li>• Apply preventive agents (eg. CIFAX) before on set of winter.</li> </ul>
(iii) Health and diseases	<ul style="list-style-type: none"> <li>• Provided vitamin, mineral with feed</li> <li>• Arrangement of medicines and chemical stocks</li> </ul>	<ul style="list-style-type: none"> <li>• Provided vitamin, mineral, protein with feed, use bactericide</li> </ul>	<ul style="list-style-type: none"> <li>• Use bactericide and disinfectant and feed with balance diets.</li> </ul>
(iv) Loss of stock and inputs (feed, chemicals etc)	<ul style="list-style-type: none"> <li>• Dyke should be strongly constructed above the maximum flood level.</li> </ul>	<ul style="list-style-type: none"> <li>• Catch the some amount of fishes to reduce the stock.</li> </ul>	<ul style="list-style-type: none"> <li>• Dyke should be strongly renovated and apply disinfectant and fish out the unwanted exotic fishes</li> </ul>
(v) Infrastructure damage (pumps, aerators, huts, etc)	NA	NA	NA
(vi) Any other	NA	NA	NA
<b>3. Cyclone / Tsunami</b>	NA	NA	NA
A. Capture	NA	NA	NA
Marine	NA	NA	NA
(i) Average compensation paid due to loss of fishermen lives	NA	NA	NA
(ii) Avg. no. of boats / nets/damaged	NA	NA	NA
(iii) Avg. no. of houses damaged	NA	NA	NA
Inland	NA	NA	NA
B. Aquaculture	NA	NA	NA

(i) Overflow / flooding of ponds	NA	NA	NA
(ii) Changes in water quality (fresh water / brackish water ratio)	NA	NA	NA
(iii) Health and diseases	NA	NA	NA
(iv) Loss of stock and inputs (feed, chemicals etc)	NA	NA	NA
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)	NA	NA	NA
(vi) Any other	NA	NA	NA
<b>4. Heat wave and cold wave</b>	NA	NA	NA
<b>A. Capture</b>	NA	NA	NA
Marine	NA	NA	NA
Inland	NA	NA	NA
<b>B. Aquaculture</b>	NA	NA	NA
(i) Changes in pond environment (water quality)	<ul style="list-style-type: none"> <li>• Reduction of biomass by partial harvest in the event of heat as the DO levels will be very low.</li> <li>• Apply lime regularly as per recommendation.</li> <li>• Apply preventive agents (eg. CIFAX) before onset of winter.</li> </ul>	<ul style="list-style-type: none"> <li>• Apply lime regularly as per recommendation.</li> <li>• Restrict application of fertilizer as per requirement.</li> <li>• Deep pool refuge based aquaculture to provide shelter and growth during summer and winter season</li> </ul>	<ul style="list-style-type: none"> <li>• Exchange water upto 2/3rd and take suggestion from expert</li> <li>• Apply lime regularly as per recommendation.</li> <li>•</li> </ul>
(ii) Health and Disease management	-	-	-
(iii) Any other	-	-	---

<sup>a</sup> based on forewarning wherever available