

**State: BIHAR**  
**Agriculture Contingency Plan for District: SAMASTIPUR**

<b>1.0 District Agriculture profile</b>			
1.1	Agro-Climatic/Ecological Zone		
	Agro Ecological Sub Region (ICAR)	Eastern Plain, Hot Subhumid (moist) Eco-Region (13.1)	
	Agro-Climatic Zone (Planning Commission)	MIDDLE GANGETIC PLAIN REGION (IV)S	
	Agro Climatic Zone (NARP)	NORTH WEST ALLUVIAL PLAIN ZONE (BI-1)	
	List all the districts falling under the NARP Zone	Zone – 1 (Saran, Siwan, Gopalganj, Muzaffarpur, E. Champaran, W. Champaran, Sitamarhi, Sheohar, Vaishali, Darbhanga , Madhubani, Samastipur	
	Geographic coordinates of district headquarters	Latitude	Longitude
		25 <sup>0</sup> 46' N	86 <sup>0</sup> 10' E
	Altitude	53.0 m	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	R.A.U., Pusa	
	Mention the KVK located in the district with address	KVK, Biraoli, Dist.- Samastipur (Bihar) Pin - 848113	
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Rajendra Agricultural University, Pusa, Samastipur (Bihar)	

1.2	Rainfall (Zone-I) (data base 1971-2001)	Normal RF(mm)	Normal Rainy days (number)	Normal Onset ( specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep)	1107	45	2 <sup>nd</sup> week of June	2 <sup>nd</sup> week of October
	NE Monsoon(Oct-Dec)/ Post Monsoon	19.3	03		
	Winter (Jan- March)	29.6	03	-	-
	Summer (Apr-May)	78.2	04	-	-
	Annual	1234	55	-	-

1.3	Land use pattern of the district	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)	262.390	184.061	0.00	62.138	0.069	3.930	8.201	0.00	2.831	1.16

1.4	Major Soils	Area (*000 ha)	Percent (%) of total
	1. Very deep, Calcareous fine loamy	Not available	Not available

2. Very deep, Calcareous fine silty	
3. Very deep, Coarse loamy	
4. Very deep, Very fine cracking	
Others	

<b>1.5</b>	<b>Agricultural land use</b>	Area ('000 ha)	Cropping intensity %
	Net sown area	184.061	137%
	Area sown more than once	67.98	
	Gross cropped area	252.041	

<b>1.6</b>	<b>Irrigation</b>	Area ('000 ha)		
	Net irrigated area	66.080		
	Gross irrigated area	112.387		
	Rainfed area	117.981		
	<b>Sources of Irrigation</b>	Number	Area ('000 ha)	% Area
	Canals	0	-	
	Tanks	24	0.08	0.07%
	Open wells & Bore wells	6418	26.35	24.36%
	Lift irrigation schemes	19	0.014	
	Micro-irrigation	0	-	
	Other sources (please specify)	137	1.267	1.13%
	Total Irrigated Area		112.387	
	Pump sets			
	No. of Tractors			
	<b>Groundwater availability and use* (Data source: State/Central Ground water Department /Board)</b>	No. of blocks/ Tehsils	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited	-	-	-
	Critical	-	-	-
Semi- critical	-	-	-	
Safe	-	-	-	
Wastewater availability and use	-	-	-	
Ground water quality				

\*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%

### 1.7 Area under major field crops & horticulture (2008-09)

<b>1.7</b>	<b>Major field crops</b>	<b>Area ('000 ha)</b>
------------	--------------------------	-----------------------

cultivated	Kharif			Rabi			Summer	Grand total
	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
Rice	68.800		68.800		-		-	68.800
Wheat	-		-	58.910	-	58.910	-	58.910
Maize	-		13.99	-	-	24.9	5.06	43.95
Greengram	--		-	-	-	-	10.279	10.28
Lentil	-		-	-	-	-	1.637	1.64
<b>Horticulture crops - Fruits</b>	<b>Area ('000 ha)</b>							
	<b>Total</b>		<b>Irrigated</b>			<b>Rainfed</b>		
Mango	10.436		-			-		
Guava	0.606		-			-		
Banana	2.008		-			-		
Lemon	0.749		-			-		
Litchi	1.198		-			-		
<b>Horticulture crops- Vegetables</b>	<b>Total</b>		<b>Irrigated</b>			<b>Rainfed</b>		
Potato	11.763		-			-		
Tomato	1.254		-			-		
Brinjal	2.199		-			-		
Onion	1.184		-			-		
Cabbage	1.768		-			-		
Cauliflower	2.881		-			-		
<b>Medicinal and Aromatic crops</b>	<b>Total ( '000 ha)</b>		<b>Irrigated ( '000 ha)</b>			<b>Rainfed ( '000 ha)</b>		
Lemon grass	0.030		0.017			0.013		
Java citronella	0.040		0.022			0.018		
Palm Rosa	0.025		0.018			0.007		
Mentha	0.0500		0.352			0.148		
Sarpgandha	0.030		0.023			0.007		
Mulethi	0.040		0.014			0.026		
<b>Plantation crops</b>	<b>Total</b>		<b>Irrigated</b>			<b>Rainfed</b>		
<b>Fodder crops</b>	<b>Total ('000 ha)</b>		<b>Irrigated('000 ha)</b>			<b>Rainfed('000 ha)</b>		
<b>Total fodder crop area</b>								
<b>Grazing land</b>								
<b>Sericulture etc</b>								
<b>Others (specify)</b>								

1.8	Livestock	Male ('000)	Female ('000)	Total ('000) (lakh)
	Non descriptive Cattle (local low yielding)	60.853	157.738	218.591
	Improved cattle			

	Crossbred cattle	29.791	136.240	166031
	Non descriptive Buffaloes (local low yielding)			
	Descript Buffaloes	19.118	205.557	224.675
	Goat	70.880	216.566	287.446
	Sheep	1.628	4.356	5.984
	Others (Camel, Pig, Yak etc.)			
	Commercial dairy farms (Number)			
1.9	<b>Poultry</b>	<b>No. of farms</b>	<b>Total No. of birds ('000)</b>	
	Commercial		40.022	
	Backyard		95.493	

1.10	<b>Fisheries</b> (Data source: Chief Planning Officer)						
	<b>A. Capture</b>						
	i) <b>Marine</b> (Data Source: Fisheries Department) Bihar is a land locked state and only inland fisheries resources are available	<b>No. of fishermen</b>	<b>Boats</b>		<b>Nets</b>		<b>Storage facilities (Ice plants etc.)</b>
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
	ii) <b>Inland</b> (Data Source: Fisheries Department)	<b>No. Farmer owned ponds</b>		<b>No. of Reservoirs</b>		<b>No. of village tanks</b>	
		157		NA		607	
	<b>B. Culture</b>						
				<b>Water Spread Area (ha)</b>	<b>Yield (t/ha)</b>	<b>Production ('000 tons)</b>	
	i) <b>Brackish water</b> (Data Source: MPEDA/ Fisheries Department)						
ii) <b>Fresh water</b> (Data Source: Fisheries Department)			1386.13	3.2t/ha	284.468		
<b>Others</b>							

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

**Major Field crops (Crops to be identified based on total acreage)**

1.11	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder ('000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
	Rice	251.276	3652	-	-	-	-	251.276	3652	-
	Wheat	-	-	188.007	3205	-	-	188.007	3205	-
	Maize	55.976	4000	149.822	6000	16.725	3300	222.523	4433	-
	Greengram	-	-	-	-	5.139	500	5.139	500	-

	Lentil	-		1.392	850	-		1.392	850	
--	--------	---	--	-------	-----	---	--	-------	-----	--

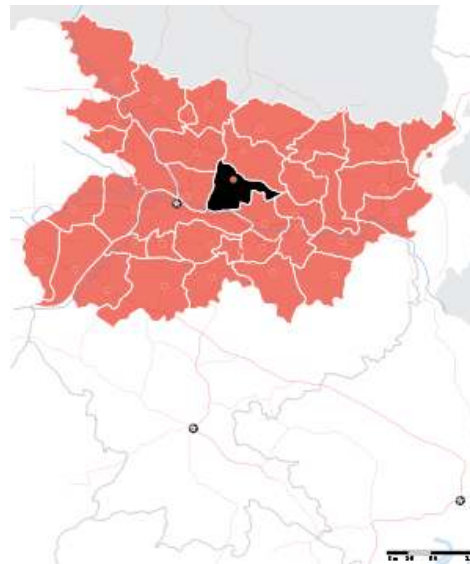
	Mango	-	-	-	-	615.350	6000	615.350	6000	-
	Banana	580.100	31000	-	-			850.100	31000	--
	Guava	-	-	61.500	10000		-	61.500	10000	-
	Litchi	-	-	-	-	72.730	10000	72.730	10000	-
	Cauliflower	-	-	447.840	16000	-	-	447.840	16000	-
	Potato			240.000	2000	-	-	240.000	2000	-
	Brinjal	399.200	20000			-	-	399.200	20000	-
	Tomato			193.620	10000	-	-	193.620	10000	-
	Lemon	66.160	9000	-	-	-	-	66.160	9000	-
	Other	125.070	11000	-	-	-	-	125.070	11000	-

1.12	Sowing window for 5 major crops (start and end of sowing period)	Rice	Wheat	Maize	Potato	Brinjal
	Kharif rainfed 1. Upland	1 <sup>st</sup> week of July to 2 <sup>nd</sup> week of July		3 <sup>rd</sup> week of May to 2 <sup>nd</sup> week of June (kharif)	October to November	June to August
	2. Midland	2 <sup>nd</sup> week of June to 3 <sup>rd</sup> week of June		November (Rabi)		
	3. Lowland	3 <sup>rd</sup> week of May to 1 <sup>st</sup> week of June		March (Summer)		
	Kharif irrigated 1. Upland	1 <sup>st</sup> week of July to 2 <sup>nd</sup> week of July				June to August
	2. Midland	2 <sup>nd</sup> week of June to 3 <sup>rd</sup> week of June				
	3. Lowland	3 <sup>rd</sup> week of May to 1 <sup>st</sup> week of June				
	Rabi rainfed 1. Un irrigated		3 <sup>rd</sup> week of November to 4 <sup>th</sup> week of November	Summer: 2 <sup>nd</sup> week of February to 3 <sup>rd</sup> week of April	-	
	2. Timely sown		3 <sup>rd</sup> week of November to 1 <sup>st</sup> week of December	November	October to November	
	3. Late sown		2 <sup>nd</sup> week of December to 4 <sup>th</sup> week of December			
	Rabi irrigated	Boro rice (November to May)	3 <sup>rd</sup> week of November to 4 <sup>th</sup>	2 <sup>nd</sup> week of October to 3 <sup>rd</sup> week of November	October to November	

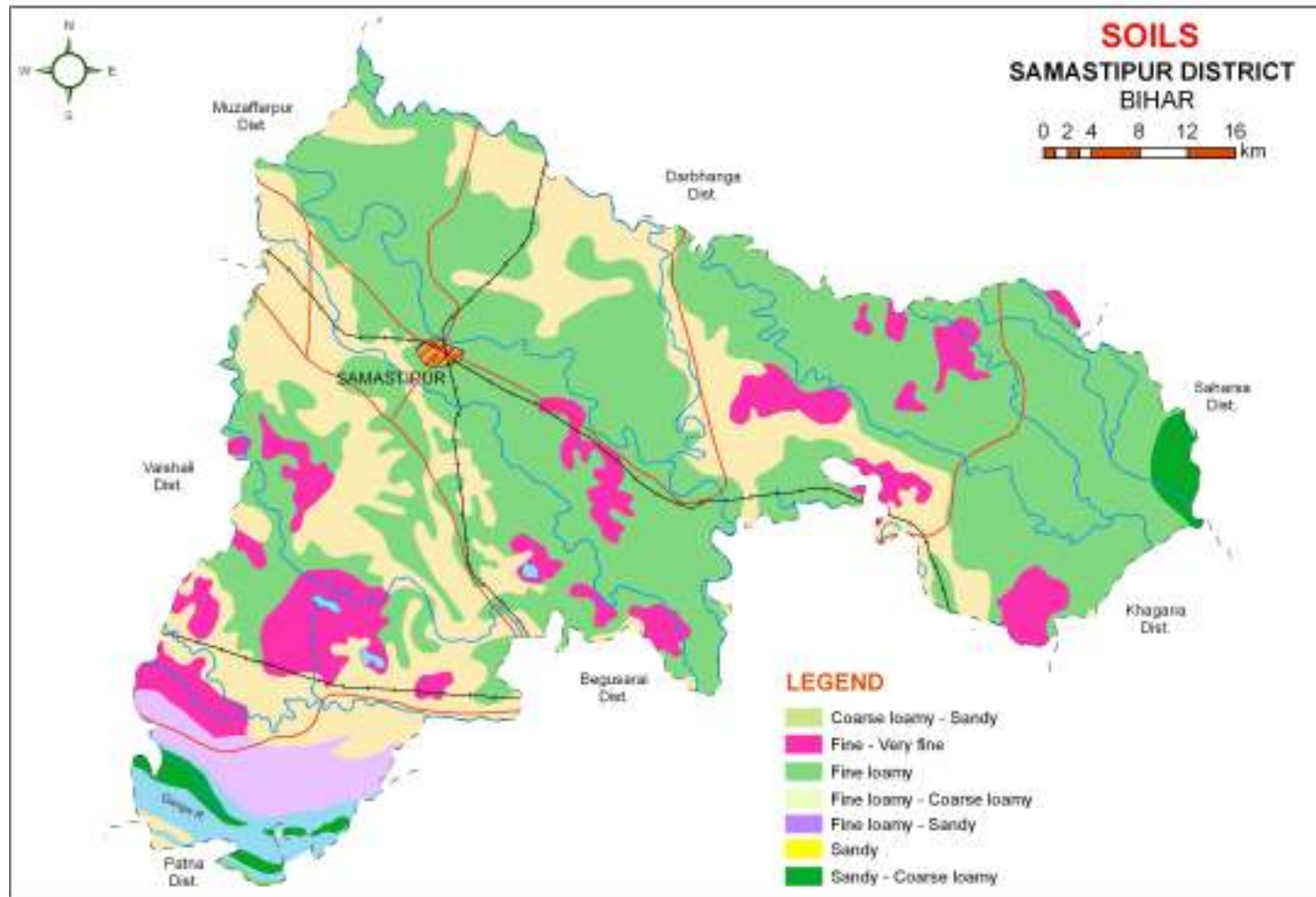
			week of November		
<b>1.13</b>	<b>What is the major contingency the district is prone to? (Tick mark)</b>	<b>Regular</b>	<b>Occasional</b>	<b>None</b>	
	Drought		✓		
	Flood	✓			
	Cyclone				
	Hail storm				
	Heat wave		✓		
	Cold wave		✓		
	Frost		✓		
	Sea water intrusion				
	Pests and disease outbreak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

<b>1.14</b>	<b>Include Digital maps of the district for</b>	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: No
		Soil map as Annexure 3	Enclosed: Yes

**ANNEXURE-I**



ANNEXURE-III



## 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		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)  Delay by 2 weeks 4 <sup>th</sup> week of June	Very deep, calcareous fine silty soil, loamy surface texture	Rice-Wheat Vegetable-Wheat Vegetable-Vegetable Rice-Rabi maize Maize-Wheat Maize-Rabi maize	No change  <b>Rice-</b> Prabhat, Richharia, Dhanlaxmi, Turanta <b>Wheat-</b> HD-2733, PBW-343, HP-1731, HD-2824 <b>Maize -</b> Shaktiman-1,2,3,4, Suwan, Ganga-11, Deoki, Pusa early hybrid Makka-3 <b>Rabi Maize-</b> Saktiman-1,2,3,4, Laxmi, Deoki, Rajendra Hybrid -1,2	<ul style="list-style-type: none"> <li>• Normal package of Practices</li> <li>• Direct seeding of Rice can also practiced</li> <li>• Life saving irrigation</li> </ul>	Seeds from RAU, Pusa, NSC, TDC, BRBN etc.
	2. Medium land	Rice-Wheat	Rice-Wheat  Medium duration Rice  <b>Rice -</b> Rajendra Bhagawati, Rajendra Suwasni, Rajshree, Prabhat <b>Wheat-</b> HD-2733, PBW-343, HP-1731	<ul style="list-style-type: none"> <li>• Normal package of Practices</li> <li>• Direct seeding of rice can be practiced</li> <li>• Life saving irrigation</li> </ul>	Seeds from RAU, Pusa, NSC, TDC , BRBN etc..
	3. Low land	Rice-Wheat	Rice – Wheat  Medium to long duration  <b>Rice -</b> Rajshree, Santosh , Sita Rajendra, Suwasini, Rajendra Sweta <b>Wheat-</b> HD-2733, PBW-343, HP-1731	<ul style="list-style-type: none"> <li>• Normal package of Practices</li> <li>• Direct seeding of rice can be practiced</li> <li>• Life saving irrigation</li> </ul>	Seeds from RAU, Pusa, NSC, TDC , BRBN etc..



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  2 <sup>nd</sup> week of July	Very deep, calcareous fine silty soil, loamy surface texture	Rice-Wheat Vegetable-Wheat Vegetable-Vegetable Rice-Rabi maize Maize-Wheat Maize-Rabi maize	Rice(short duration) – Wheat Vegetable-Wheat Pigeonpea+Blackgram - Maize + Sponge goBlackgram- Wheat Sesame/ Blackgram - Wheat  <b>Rice-</b> Prabhat, Richharia, Dhanlaxmi, Turanta, <b>Wheat-</b> HD-2733, PBW-343, HP-1731, HD-2824 <b>Maize -</b> Shaktiman-1,2,3,4, Suwan, Ganga-11, Deoki, Pusa early hybrid Makka-3 <b>Pigeonpea –</b> Bahar, Pusa-9 Narendra Pigeonpea-I <b>Blackgram-</b> T-9, Navin, Pant Blackgram-30 , Pant Blackgram-19 <b>Sesame –</b> Krishna, Pragati	<ul style="list-style-type: none"> <li>Direct seedling of rice can also be made.</li> <li>Life saving irrigation</li> <li>Old age seedling of 30-35 days early rice can also be used along with balance dose of NPK</li> </ul>	Seeds from RAU, Pusa, NSC, TDC, BRBN etc.
	2. Mid land	Rice-Wheat	Mid duration rice Rice up to 125-130 days. <b>Rice-</b> Rajendra Bhagawati, Rajendra Suwasni , Saroj, Rajendra Kasturi, Santosh <b>Wheat-</b> HD-2733, PBW-343, HP-1731, HD-2824	<ul style="list-style-type: none"> <li>Moisture conservation measures</li> <li>Full basal dose of NPK</li> <li>Application of potash with adjuvant</li> </ul>	Seeds from RAU, Pusa, NSC, TDC, BRBN etc.
	3. Low land	Rice-Wheat	Mid duration rice Rice up to 125-130 days. <b>Rice-</b> Rajshree, Sakuntala,	<ul style="list-style-type: none"> <li>Enhanced dose of nitrogen with full basal dose of NPK at transplanting</li> <li>Old age seedling of 35 -40</li> </ul>	Seeds from RAU, Pusa, NSC, TDC, BRBN etc.

			Satyam, Kishori Rajendra Sweta Rajendra Mashuri <b>Wheat-</b> HD-2733, PBW-343, HP-1731, HD-2824	days may be used <ul style="list-style-type: none"> <li>• Three seedling per hill having closer spacing should be transplanted</li> <li>• Moisture conservation through mulching</li> <li>• Interculturing</li> <li>• Dapog seedling should be used</li> </ul>	
--	--	--	--	--	--

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 6 weeks 4 <sup>th</sup> week of July	Very deep, calcareous fine silty soil, loamy surface texture	Rice-Wheat Vegetable-Vegetable  Maize-Wheat  Vegetable-Wheat	Early Rice – Wheat Pigeonpea –Greengram Blackgram/ Horsegram-Wheat  <b>Rice-</b> Prabhat, Dhanlaxmi, Richharia <b>Blackgram-</b> T-9, Navin, Pant Blackgram-30 , Pant Blackgram-19 <b>Pigeonpea-</b> Bhar, Pusa-9 <b>Horsegram:</b> DB-7, BR-5, BR-10, Coimbatore-1  <b>Wheat-</b> HD-2733, PBW-343, HP-1731 <b>Greengram:</b> Samrat, Pusa Vishal,	<ul style="list-style-type: none"> <li>• Direct seeding Rice</li> <li>• Dapog seedling can be used</li> <li>• Spray of Potassic fertilizer with adjuvant at vegetative stage</li> <li>• Zero tillage for Rice &amp; wheat to makeup the time</li> <li>• Protective spray of pesticides with adjuvant against BLB &amp; BLAST &amp; Helmintho sporium leaf spot.</li> </ul>	Seeds from RAU, Pusa, NSC, TDC , BRBN etc.

			SML 668, PDM-44, T-44		
	Midland	Rice-Wheat	<p>Rice (short duration)–Wheat Rice- Blackgram Rice- Horsegram</p> <p><b>Rice-</b> Prabhat, Dhanlaxmi, Richharia <b>Wheat-</b> HD-2733, PBW-343, HP-1731, HD-2824 <b>Blackgram-</b> T-9, Navin, Pant Blackgram-30 , Pant Blackgram-19 <b>Horsegram-</b> DB-7, BR-5, BR-10, Coimbatore-1</p>	<ul style="list-style-type: none"> <li>• Enhanced basal dose of NPK to boost the early vegetative growth</li> <li>• Application of potassic fertilizer with adjuvant at vegetative stage to boost the growth</li> <li>• Protective spray of pesticides with adjuvant against BLB &amp; BLAST and Helmintho sporium leaf spot</li> <li>• Dapog seedling should be used</li> <li>• Zero tillage for Rice &amp; wheat to make up the time</li> <li>• Direct seeding of Rice can also be done</li> </ul>	Seeds from RAU, Pusa, NSC, TDC, BRBN etc.
	Low land	Rice-wheat	<p>Rice (short duration) –Wheat Rice- Vegetable Rice- Pulses Rice- Mustard</p> <p><b>Rice-</b> Prabhat, Dhanlaxmi, Richharia <b>Wheat -</b> HD-2733, PBW-343, HP-1731, HD-2824 <b>Mustard-</b> 66-197-3, Rajendra Sarson-I</p>	<ul style="list-style-type: none"> <li>• Dapog Nursery raised rice seedling should be used</li> <li>• Zero tillage for Rice and wheat to make up the time</li> <li>• Direct seeding of Rice</li> <li>• Application of Potassic fertilizer with adjuvant at vegetative stage</li> <li>• Protective spray of pesticides against BLB, BLAST and Helmintho sporium etc.</li> <li>• Enhanced basal dose of NPK</li> <li>• Transplanting of 35-40 days old seedling</li> </ul>	Seeds from RAU, Pusa, NSC, TDC , BRBN etc

<b>Condition</b>			<b>Suggested Contingency measures</b>
------------------	--	--	---------------------------------------

Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
<p>Delay by 8 weeks</p> <p>2<sup>nd</sup> week of August</p>	<p>Very deep, calcareous fine silty soil, loamy surface texture</p>	<p>Rice- Wheat Rice-Pulses Rice-Oilseed Rice-Vegetables Rice-Potato</p>	<p>Blackgram/Horsegram - Rabi maize Blackgram/Horsegram -Sep. Pigeonpea Blackgram/Horsegram -Late wheat Blackgram/Horsegram -vegetables Blackgram/Horsegram -Lentil Blackgram/Horsegram -Potato Blackgram/Horsegram -Rai</p> <p><b>Blackgram-</b> T-9, Navin, Pant Urd-30 , Pant Urd-19 <b>Rabi Maize-</b> Saktiman-1,2,3,4, Laxmi, Deoki, Rajendra Hybrid -1,2 <b>Late Wheat</b> – HUW-234, , PBW-14, HP-1744, HD-2643 <b>Mustard-</b> 66-197-3, Rajendra Sarson-I <b>Potato</b> – PJ376, Rajendra Aloo-1, 2,3, Kufri Jyoti <b>Pigeonpea</b> – Sharad, Pusa-9</p> <p><b>Lentil-</b> PL-406, Malika, Arun</p> <p><b>Horsegram-</b> DB-7, BR-5, BR-10, Coimbatore-1 <b>Rai-</b> Varuna Kranti, Pusa Bold, Rajendra Rai Pichheti</p>	<ul style="list-style-type: none"> <li>• Enhanced basal dose of NPK to boost the early vegetative growth.</li> <li>• Moisture conservation</li> <li>• Interculturing</li> <li>• Protective spray of pesticides</li> </ul>	
	<p>Mid land</p>	<p>Rice–Wheat Rice–Oilseed Rice–Vegetable Rice–Potato Rice–Lentil Rice- Chickpea</p>	<p>Rice(Short duration)-Wheat Blackgram- Late wheat Blackgram-Vegetable Blackgram- Lentil Tulsi-Lentil Tulsi- Chickpea</p> <p><b>Rice-</b> Prabhat, Dhanlaxmi, Richharia</p> <p><b>Wheat-</b> HD-2733, PBW-343, HP-1731, HD-2824</p> <p><b>Lentil-</b> PL-406, Malika,</p>		

			<p>Arun  <b>Linseed-</b> Shubra, Garima, Sweta  <b>Blackgram-</b> T-9, Navin, Pant Urd-30 , Pant Urd-19  <b>Tusli</b> – Cimsomaya  <b>Chickpea-</b> Pusa-236, KPG-39 (Uday) ,</p>		
	Low land	<p>Rice–Wheat  Rice–Oilseed  Rice–Vegetable  Rice–Potato  Rice–Lentil  Rice–Gram</p>	<p>Rice(Short duration)-Wheat/Lentil/  Chickpea/Vegetables  Blackgram- Late wheat  Blackgram-Vegetable  Blackgram- Lentil</p> <p><b>Rice-</b> Prabhat, Dhanlaxmi, Richharia  <b>Wheat-</b> HD-2733, PBW-343, HP-1731, HD-2824</p> <p><b>Lentil-</b> PL-406, Malika, Arun  <b>Blackgram-</b> T-9, Navin, Pant Urd-30 , Pant Urd-19  <b>Chickpea-</b> Pusa-236, KPG-39 (Uday) ,</p>		
		Sugarcane (Feb. and Oct. Planting)	<p>No change</p> <p><b>Sugarcane</b> – BO 141, BO 147, BO 136, BO91</p>	<ul style="list-style-type: none"> <li>▪ Weeding</li> <li>▪ Inter culturing</li> <li>▪ irrigation</li> <li>▪ Fertilizer, Pesticides application, propping etc.</li> </ul>	Seeds from RAU, Pusa,

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measues	Remarks on Implementation
<p>Early season drought (Normal onset)</p> <p>Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.</p> <p>1<sup>st</sup> week of July</p>	<p>Very deep, calcareous fine loamy, loamy surface texture</p>	<p>Rice-Wheat  Vegetable-Wheat  Vegetable-Vegetable  Rice-Rabi maize  Maize-Wheat  Maize-Rabi maize</p> <p><b>Rice-</b>Prabhat, Dhanlaxmi, Richharia, Turanta,  <b>Wheat-</b> HD-2733, PBW-343,</p>	<ul style="list-style-type: none"> <li>• Life saving irrigation</li> <li>• Gap filling if needed</li> <li>• Protective spray of pesticides with adjuvant against Pests and diseases</li> </ul>	<ul style="list-style-type: none"> <li>• Interculturing</li> <li>• Mulching through weeds for moisture conservation</li> <li>• Application potassic fertilizer with adjuvant</li> </ul>	<p>Seeds from RAU, Pusa, NSC, TDC , BRBN etc</p>

		HP-1731, HD-2824 <b>Maize</b> - Shaktiman-1,2,3,4, Suwan Ganga-11, Deoki, Pusa early hybrid Makka-3 <b>Rabi Maize-</b> Saktiman-1,2,3,4, Laxmi, Deoki, Rajendra Hybrid -1,2			
	Medium land	Rice-wheat <b>Rice-</b> Rajendra Bhagawati, Rajendra Suwasni Saroj, Rajendra Kasturi, Santosh <b>Wheat-</b> HD-2733, PBW-343, HP-1731, HD-2824	<ul style="list-style-type: none"> <li>• Life saving irrigation</li> <li>• Gap filling if needed</li> <li>• Protective spray of pesticides with adjuvant against Pests and diseases</li> </ul>	<ul style="list-style-type: none"> <li>• Interculturing</li> <li>• Mulching through weeds for moisture conservation</li> <li>• Application potassic fertilizer with adjuvant</li> </ul>	Seeds from RAU, Pusa, NSC, TDC , BRBN etc
	Low land	Rice-Wheat <b>Rice-</b> Rajshree, Sakuntala, Satyam, Kishori Rajendra Sweta Rajendra Mashuri <b>Wheat-</b> HD-2733, PBW-343, HP-1731, HD-2824 <b>Greengram</b> - SML-6-68, Pusa Vishal, Samarat			

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measues	Remarks on Implementation <sup>e</sup>
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)					
At vegetative stage	Very deep, calcareous fine loamy, loamy surface texture	Rice-Wheat Vegetable-Wheat Vegetable-Vegetable Rice-Rabi maize Maize-Wheat		<ul style="list-style-type: none"> <li>• Interculturing</li> <li>• Mulching through weeds for moisture conservation</li> <li>• Spray potassic fertilizer with</li> </ul>	Seeds from RAU, Pusa, NSC, TDC , BRBN etc

		<p>Maize-Rabi maize</p> <p><b>Rice</b>-Prabhat, Dhanlaxmi, Richharia, Turanta,</p> <p><b>Wheat</b>- HD-2733, PBW-343, HP-1731, HD-2824</p> <p><b>Maize</b> - Shaktiman-1,2,3,4, Suwan Ganga-11, Deoki, Pusa early hybrid Makka-3</p> <p><b>Rabi Maize</b>- Saktiman-1,2,3,4, Laxmi, Deoki, Rajendra Hybrid -1,2</p>		adjuvant at vegetative stage	
	Mid land	<p>Rice-wheat</p> <p><b>Rice</b>- Rajendra Bhagawati, Rajendra Suwasini Saroj, Rajendra kasturi, Santosh</p> <p><b>Wheat</b>- HD-2733, PBW-343, HP-1731, HD-2824</p>			
	Low land	<p>Rice-Wheat</p> <p><b>Rice</b>- - Rajshree, Sakuntala, Satyam, Kishori Rajendra Sweta Rajendra Mashuri</p> <p><b>Wheat</b>- HD-2733, PBW-343, HP-1731, HD-2824 Green Gram- SML-6-68, Pusa Vishal, Samarat</p>			

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measues	Remarks on Implementation
Mid season drought (long dry spell)					
At flowering/ fruiting stage	Up land	Rice-Wheat Vegetable-Wheat Vegetable-Vegetable	<ul style="list-style-type: none"> <li>• IPM practices</li> <li>• Spray of pesticides with spreader</li> </ul>	<ul style="list-style-type: none"> <li>• Interculturing</li> <li>• Mulching through weeds</li> <li>• Life saving irrigation</li> </ul>	Seeds from RAU, Pusa, NSC, TDC ,

		<p>Rice-Rabi maize Maize-Wheat Maize-Rabi maize Pigeonpea-</p> <p><b>Rice</b>-Prabhat, Dhanlaxmi, Richharia, Turanta, <b>Wheat</b>- HD-2733, PBW-343, HP-1731, HD-2824 <b>Maize</b> - Shaktiman-1,2,3,4, Suwan Ganga-11, Deoki, Pusa early hybrid Makka-3</p> <p><b>Rabi Maize</b>- Saktiman- 1,2,3,4, Laxmi, Deoki, Rajendra Hybrid -1,2 <b>Pigeonpea</b> – Bahar, Pusa-9, Narendra Pigeonpea-I</p>		<ul style="list-style-type: none"> <li>• Application of potassic fertilizer with adjuvant</li> </ul>	BRBN etc
	Medium land	<p>Rice-Wheat Maize-Wheat Red Gram-Greengram</p> <p><b>Rice</b>- Rajendra Bhagawati, Rajendra Suwasni, Saroj, Rajendra Kasturi, Santosh <b>Maize</b> - Shaktiman-1,2,3,4, Suwan, Ganga-11, Deoki, Pusa early hybrid Makka-3</p> <p><b>Wheat</b>- HD-2733, PBW-343, HP-1731, HD-2824</p> <p><b>Pigeonpea</b>- Bahar, Narendra ,</p>	<ul style="list-style-type: none"> <li>• IPM practices</li> <li>• Clipping of maize leaves</li> <li>• Spray of pesticides with spreader</li> </ul>		



		Pigeonpea-1, Sharad <b>Greengram</b> – Samrat, Pusa Vishal, SML 668,			
	Low land	Rice-wheat  <b>Rice</b> - Rajshree, Sakuntala, Satyam, Kishori, Rajendra Sweta Rajendra Mashuri <b>Wheat</b> - HD-2733, PBW-343, HP-1731, HD-2824	<ul style="list-style-type: none"> <li>• IPM practice</li> <li>• Spray of pesticides with spreader</li> </ul>		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Rabi Crop planning	Remarks on Implementation
<b>Terminal drought</b> (Early withdrawal of monsoon)					
	Up land	Rice-Wheat Vegetable-Wheat Vegetable-Vegetable Rice-Rabi maize Maize-Wheat Maize-Rabi maize Pigeonpea-  <b>Rice</b> -Prabhat, Dhanlaxmi, Richharia, Turanta, <b>Wheat</b> - HD-2733, PBW-343, HP-1731, HD-2824 <b>Maize</b> - Shaktiman-1,2,3,4, Suwan Ganga-11, Deoki, Pusa early hybrid Makka-3 <b>Rabi Maize</b> - Saktiman-1,2,3,4, Laxmi, Deoki, Rajendra Hybrid -1,2	<ul style="list-style-type: none"> <li>• Application of potassic fertilizer with adjuvant</li> <li>• IPM practices</li> <li>• Life saving irrigation</li> <li>• Mulching</li> </ul>	<ul style="list-style-type: none"> <li>• Open the furrow during evening and leave it open overnight and plank in the next morning before sunrise for growing of early rabi crops like wheat, Rabi Maize/Pulses /Oilseeds/ Vegetables</li> <li>• Stored water to be used at critical stage of growth</li> <li>• To clean irrigation channel for preventing loss of moisture through seepage</li> </ul>	Seeds from RAU, Pusa, NSC, TDC , BRBN etc

		<b>Pigeonpea</b> – Bahar, Pusa-9, Narendra, Arhar-I			
	Medium land	Rice-wheat  <b>Rice-</b> Rajendra Bhagawati, Rajendra Suwasini Saroj, Rajendra Kasturi, Santosh  <b>Wheat-</b> HD-2733, PBW-343, HP-1731, HD-2824			
	Low land	Rice-wheat <b>Rice-</b> Rajshree, Sakuntala, Satyam, Kishori Rajendra Sweta Rajendra Mashuri <b>Wheat-</b> HD-2733, PBW-343, HP-1731, HD-2824			

### 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		Not applicable			

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in canals due to low rainfall	1) Farming situation:	Not applicable			

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		Not applicable			

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	1.Upland	Rice-Wheat Vegetable-Wheat Vegetable-Vegetable Rice-Rabi maize Maize-Wheat Maize-Rabi maize Pigeonpea-	Short duration rice –Wheat Pigeonpea- Blackgram/Sesame/Horsegram-Wheat  <b>Rice-</b> Prabhat, Dhanlaxmi, Richharia, Turanta, <b>Pigeonpea</b> – Bahar, Pusa-9 Narendra Pigeonpea-I <b>Sesame-</b> Krishna, Pragati <b>Blackgram-</b> T-9, Navin, Pant Urd-30 , Pant Urd-19 <b>Wheat-</b> HD-2733, PBW-343, HP-1731, HD-2824 <b>Horsegram-</b> DB-7, BR-5, BR-10, Coimbatore-1	<ul style="list-style-type: none"> <li>• Dapog nursery for rice</li> <li>• Direct seeding of rice</li> <li>• Life saving irrigation</li> <li>• Application of potassic fertilizer with adjuvant</li> <li>• Mulching</li> <li>• Application of organic manure and vermicompost</li> </ul>	Seeds from RAU, Pusa, NSC, TDC , BRBN etc
	Medium Land	Rice-Wheat Rice - Mustard Rice - Pulses Rice - Rabi maize	Medium duration rice- Wheat Rice-Rabi maize Sesame –Wheat <b>Rice</b> - Rajendra Bhagawati, Rajendra Suwasini Saroj, Rajendra Kasturi, Santosh <b>Wheat-</b> HD-2733, PBW-343, HP-1731, HD-2824  <b>Pigeonpea</b> – Bahar, Pusa-9 Narendra, Arhar-I		

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
			Sesame- Krishna, Pragati		
	Low land	Rice-Wheat Rice- Mustard Rice- Pulses	Rice-Wheat Rice - Lentil Rice - Mustard Rice- Linseed  <b>Rice-</b> Rajshree, Sakuntala, Satyam, Kishori Rajendra Sweta Rajendra Mashuri <b>Mustard-</b> 66-197-3, Rajendra Sarson-I <b>Lentil-</b> PL-406, Malika, Arun <b>Linseed-</b> Shubra, Garima, Sweta <b>Wheat-</b> HD-2733, PBW-343, HP-1731, HD-2824		

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	<b>Very deep, calcareous fine loamy, loamy surface texture</b>	Rice-Wheat Vegetable-Wheat Vegetable-Vegetable Rice-Rabi maize Maize-Wheat Maize-Rabi maize Pigeonpea-	Sesame-Wheat Black gram - Wheat Pigeonpea-Greengram  <b>Sesame</b> – Krishna, Pragati <b>Wheat-</b> HD-2733, PBW-343, HP-1731, HD-2824 <b>Pigeonpea</b> – Bahar, Pusa-9 Narendra Arhara-I <b>Greengram</b> – Samrat, Pusa Vishal, SML 668, T-44	<ul style="list-style-type: none"> <li>Life saving irrigation</li> <li>Spray of potassic fertilizer with adjuvant</li> <li>Use of organic manure and vermicompost</li> </ul>	Seeds from RAU, Pusa, NSC, TDC , BRBN etc

			<b>Blackgram-</b> T-9, Navin, Pant Moong-30 , Pant Moong-19		
	Mid land	Rice –Wheat Rice- Pulse Rice- Oilseed Maize-Rabi maize Rice-Rabi maize	<ul style="list-style-type: none"> <li>• Rice –Wheat</li> <li>• Pigeonpea-</li> <li>• Greengram -Wheat</li> <li>• Coarse cereal-Wheat</li> </ul> <p><b>Rice</b> - Rajendra Bhagawati, Rajendra Suwasini Saroj, Rajendra Kasturi, Santosh</p> <p><b>Wheat-</b> HD-2733, PBW-343, HP-1731, HD-2824</p> <p><b>Maize</b> - Shaktiman-1,2,3,4, Suwan, Ganga-11, Deoki, Pusa early hybrid Maka-3</p> <p><b>Greengram</b> – Samrat, Pusa Vishal, SML 668, PDM-44, T-44</p> <p><b>Pigeonpea</b> – Bahar, Pusa-9 Narendra Arhar-I</p>	<ul style="list-style-type: none"> <li>• Zero tillage for wheat and rice</li> <li>• Clipping of maize leaves</li> <li>• Direct sowing of rice</li> <li>• Life saving irrigation</li> <li>• Mulching for moisture conservation</li> <li>• Application of potassic fertilizer wit adjuvant</li> </ul>	Seeds from RAU, Pusa, NSC, TDC , BRBN etc
	Low land	Rice –Wheat Rice- Pulses	<ul style="list-style-type: none"> <li>• Rice-Wheat</li> <li>• Rice-Lentil/Chickpea</li> </ul> <p><b>Rice-</b> Rajshree, Sakuntala, Satyam, Kishori Rajendra Sweta Rajendra Mashuri</p> <p><b>Wheat-</b> HD-2733, PBW-343, HP-1731, HD-2824</p> <p><b>Chickpea-</b> Pusa-236, KPG-39 (Uday) Pusa-372, SG-2</p> <p><b>Lentil-</b> PL-406, Malika, Arun</p>		

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

Condition	Suggested contingency measure
-----------	-------------------------------

<b>Continuous high rainfall in a short span leading to water logging</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>• Drainage management</li> <li>• Gap filling, if required</li> <li>• Resowing through drum seeder</li> <li>• Re transplanting through Dapog nursery if needed</li> </ul>	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Subsequent crop like Toria may be taken if present crop is substantially damaged/affected</li> </ul>	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Harvest at physiological maturity</li> </ul>	<ul style="list-style-type: none"> <li>• Proper drying</li> <li>• Safer storage and Transportation</li> </ul>
Maize	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Gap filling, if needed</li> <li>• Resowing, if sequentially affected</li> <li>• Sowing of R&amp;F should be adopted</li> </ul>	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Alternative Rabi maize or other rabi crop if substantially damaged</li> </ul>	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Harvest at physiological maturity</li> </ul>	<ul style="list-style-type: none"> <li>• Proper drying</li> <li>• Safer storage and Transportation</li> </ul>
Pigeon pea	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Gap filling if needed</li> <li>• September sowing of Pigeonpea if Kharif Pigeonpea is completely affected</li> <li>• Sowing of R&amp;F should be adopted</li> </ul>	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Spray of pesticides</li> </ul>		<ul style="list-style-type: none"> <li>• Proper drying</li> <li>• Safer storage and Transportation</li> </ul>
Vegetable	<ul style="list-style-type: none"> <li>• Resowing , if required</li> <li>• Replanting</li> </ul>	<ul style="list-style-type: none"> <li>• Drainage management</li> </ul>	<ul style="list-style-type: none"> <li>• Drainage management</li> </ul>	Storage at safer place
<b>Horticulture</b>				
Mango	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Gap filling</li> <li>• Replanting if completely damaged</li> </ul>	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Spray of pesticides</li> </ul>	<ul style="list-style-type: none"> <li>• Drenching with copper fungicides</li> <li>• Drainage management</li> </ul>	
Litchi	<ul style="list-style-type: none"> <li>❖ Drainage management</li> <li>❖ Replanting</li> <li>❖ Gap filling</li> </ul>	<ul style="list-style-type: none"> <li>❖ Pesticides spray</li> <li>❖ Drainage management</li> </ul>	<ul style="list-style-type: none"> <li>❖ Drainage management</li> <li>❖ Harvest at proper time</li> </ul>	
Banana	<ul style="list-style-type: none"> <li>• Replanting if completely damaged</li> <li>• Gap filling</li> <li>• Drainage management</li> </ul>	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Spray of pesticides</li> </ul>	<ul style="list-style-type: none"> <li>• Drenching with copper fungicides</li> <li>• Drainage management</li> </ul>	
Guava	<ul style="list-style-type: none"> <li>❖ Drainage management</li> <li>❖ Replanting</li> <li>❖ Gap filling</li> </ul>	<ul style="list-style-type: none"> <li>❖ Pesticides spray</li> <li>❖ Drainage management</li> </ul>	<ul style="list-style-type: none"> <li>❖ Drainage management</li> <li>❖ Harvest at proper time</li> </ul>	
<b>Heavy rainfall with high speed winds in a short span<sup>2</sup></b>	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Gap filling</li> <li>• Replanting if completely damaged</li> </ul>	<ul style="list-style-type: none"> <li>• Drainage management</li> </ul>	<ul style="list-style-type: none"> <li>• Drainage management</li> </ul>	
Rice	<ul style="list-style-type: none"> <li>❖ Drainage management</li> <li>❖ Gap filling</li> <li>❖ Replanting with Dapog seedling</li> <li>❖ Kharuhan (double transplanting)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Pesticides spray</li> <li>❖ Drainage management</li> <li>❖ Alternative crop if completely failed</li> </ul>	<ul style="list-style-type: none"> <li>❖ Drainage management</li> <li>❖ Harvest at proper time</li> </ul>	<ul style="list-style-type: none"> <li>❖ Proper drying</li> <li>❖ Safer storage and Transportation</li> </ul>
Maize	<ul style="list-style-type: none"> <li>❖ Drainage management</li> <li>❖ Gap filling</li> <li>❖ Replanting</li> </ul>	<ul style="list-style-type: none"> <li>❖ Pesticides spray</li> <li>❖ Drainage management</li> <li>❖ Alternative crop if</li> </ul>	<ul style="list-style-type: none"> <li>❖ Drainage management</li> <li>❖ Harvest at proper time</li> </ul>	<ul style="list-style-type: none"> <li>❖ Proper drying</li> <li>❖ Safer storage and Transportation</li> </ul>

	❖ Earthing up	completely failed		
Pegeonpea	❖ Drainage management ❖ Gap filling ❖ Resowing	❖ Pesticides spray ❖ Drainage management ❖ Alternative crop if completely failed	❖ Drainage management ❖ Harvest at proper time	❖ Proper drying ❖ Safer storage and Transportation
vegetable	▪ Drainage management ▪ Gap filling	• Drainage management	• Drainage management • Drenching with copper fungicide	
<b>Horticulture</b>				
Mango	❖ Drainage management ❖ Replanting or Gap filling as the case may be	❖ Pesticides spray ❖ Drainage management	❖ Drainage management ❖ Harvest at proper time	
Litchi	❖ Drainage management ❖ Replanting or Gap filling as the case may be	❖ Drainage management ❖ Pesticides spray	❖ Drainage management ❖ Harvest at proper time	
Banana	❖ Drainage management ❖ Replanting or Gap filling as the case may be	❖ Drainage management ❖ Pesticides spray	❖ Drainage management • Harvest at proper time	
Guava	❖ Drainage management ❖ Replanting or Gap filling as the case may be	❖ Drainage management ❖ Pesticides spray	Drainage management Harvest at proper time	
<b>Outbreak of pests and diseases due to unseasonal rains</b>				
Rice	❖ Seedling treatment with carbendazin + Imidachloropid ❖ Spray of pesticides with adjuvant	❖ Spray of specific pesticides with adjuvant	❖ Spray of specific pesticides with adjuvant ❖ Harvest at physiological maturity	❖ Proper dying ❖ Storage at safe place and transportation
Maize	❖ Application of granular insecticides viz. Thimet 10g., Carbofuran 3g. in whorl of maize	❖ Spray of specific pesticides with adjuvant	❖ Spray of specific pesticides with adjuvant ❖ Harvest at physiological maturity	❖ Proper dying ❖ Storage at safe place and transportation
Pigeon pea	Use of fungicide and insecticide	❖ Spray of specific pesticides with adjuvant	❖ Spray of specific pesticides with adjuvant ❖ Harvest at physiological maturity	❖ Proper dying • Storage at safe place and transportation
Vegetable	• Drainage management • Spraying of insecticide & fungicide	• Spray of specific pesticides with adjuvant • Drainage management	• Spray of specific pesticides with adjuvant • Drainage management	Safe storage & transportation
<b>Horticulture</b>				

Mango	Use of fungicide and insecticide	❖ Spray of specific pesticides with adjuvant	❖ Spray of specific pesticides with adjuvant ❖ Harvest at proper time	
Litchi	Use of fungicide and insecticide	❖ Spray of specific pesticides with adjuvant	❖ Spray of specific pesticides with adjuvant • Harvest at proper time	
Banana	Use of fungicide and insecticide	❖ Spray of specific pesticides with adjuvant	• Spray of specific pesticides with adjuvant • Harvest at proper time	
Guava	Use of fungicide and insecticide	❖ Spray of specific pesticides with adjuvant	❖ Spray of specific pesticides with adjuvant ❖ Harvest at proper time	

### 2.3 Floods

Condition	Suggested contingency measure <sup>o</sup>			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
<b>Transient water logging/ partial inundation<sup>1</sup></b>				
Rice  For such situation var. like Swarna-Sub-I & local var. of Desaria Barogar etc. should be taken	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Resowing, if completely damaged</li> <li>• Use of pesticides</li> </ul>	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Gap filling</li> <li>• Transplanting using 40-45 days old seedling</li> <li>• Double transplanting through Kharuan</li> <li>• Use of pesticides</li> </ul>	Lentil as Paira crop	<ul style="list-style-type: none"> <li>• Proper drying</li> <li>• Safer storage</li> <li>• Transportation</li> </ul>
Maize	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Replanting , if substantially damaged</li> <li>• Use of pesticides</li> </ul>	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Resowing if completely damaged</li> <li>• Toria if standing crop damaged</li> <li>• Use of pesticides</li> </ul>	Lentil if standing crop damaged	<ul style="list-style-type: none"> <li>• Proper drying</li> <li>• Safer storage</li> <li>• Transportation</li> </ul>
Pigeon pea	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Resowing, if substantially damaged</li> <li>• Use of pesticides</li> </ul>	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Rabi Maize if standing crop damaged</li> <li>• Use of pesticides</li> </ul>	Spring maize Var. Suwan if crop is substantially damaged	<ul style="list-style-type: none"> <li>• Proper drying</li> <li>• Safer storage</li> <li>• Transportation</li> </ul>
<b>Horticulture</b>				
Mango	• Drainage management	❖ Drainage management	❖ Drainage management	



	<ul style="list-style-type: none"> <li>• Gap filling</li> <li>• Replanting, if substantially damaged</li> </ul>	❖ Drenching with copper fungicide	<ul style="list-style-type: none"> <li>❖ Drenching with copper fungicide</li> <li>❖ Harvest at proper time</li> </ul>	
Litchi	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Gap filling</li> <li>• Replanting, if substantially damaged</li> </ul>	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Drenching with copper fungicide</li> </ul>	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Drenching with copper fungicide</li> <li>• Harvest at proper time</li> </ul>	
Banana	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Gap filling</li> <li>• Replanting, if substantially damaged</li> </ul>	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Drenching with copper fungicide</li> </ul>	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Drenching with copper fungicide</li> <li>• Harvest at proper time</li> </ul>	
Guava	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Gap filling</li> <li>• Replanting, if substantially damaged</li> </ul>	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Drenching with copper fungicide</li> </ul>	<ul style="list-style-type: none"> <li>• Drainage management</li> <li>• Drenching with copper fungicide</li> <li>• Harvest at proper time</li> </ul>	
<b>Continuous submergence for more than 2 days</b>				
:Rice (for such situation Swarna Sub-1 should be grown)	Re-sowing, if damaged after receding of floods	Re-sowing, gap filling	Toria/late wheat, if substantial damaged	Storage at safe place
Maize	Re-sowing, if damaged after receding of floods	Re-sowing, gap filling	Toria/late wheat, if substantial damaged	Storage at safe place
<b>Horticulture</b>				
Mango	<ul style="list-style-type: none"> <li>❖ Drainage management</li> <li>❖ Use of fungicide with the use of nitrogenous fertilizer and manure</li> <li>❖ Replanting if damaged</li> </ul>	<ul style="list-style-type: none"> <li>❖ Drainage management</li> <li>❖ Use of fungicide with the use of nitrogenous fertilizer and manure</li> <li>❖ Replanting</li> </ul>	<ul style="list-style-type: none"> <li>❖ Drainage management</li> <li>❖ Use of fungicide with the use of nitrogenous fertilizer and manure</li> </ul>	
Litchi	<ul style="list-style-type: none"> <li>❖ Drainage management</li> <li>❖ Use of fungicide with the use of nitrogenous fertilizer and manure</li> <li>❖ Replanting if damaged</li> </ul>	<ul style="list-style-type: none"> <li>❖ Drainage management</li> <li>❖ Use of fungicide with the use of nitrogenous fertilizer and manure</li> <li>❖ Replanting</li> </ul>	<ul style="list-style-type: none"> <li>❖ Drainage management</li> <li>❖ Use of fungicide with the use of nitrogenous fertilizer and manure</li> </ul>	

Guava	<ul style="list-style-type: none"> <li>❖ Drainage management</li> <li>❖ Use of fungicide with the use of nitrogenous fertilizer and manure</li> <li>❖ Replanting</li> </ul>	<ul style="list-style-type: none"> <li>❖ Drainage management</li> <li>❖ Use of fungicide with the use of nitrogenous fertilizer and manure</li> <li>❖ Replanting</li> </ul>	<ul style="list-style-type: none"> <li>❖ Drainage management</li> <li>• Use of fungicide with the use of nitrogenous fertilizer and manure</li> </ul>	
<b>Sea water intrusion</b>	Not applicable			

#### 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
<b>Heat Wave</b>				
Rice		Life saving irrigation Spray of potassic fertilizer with adjuvant	Life saving irrigation Spray of potassic fertilizer with adjuvant	-
Maize	Life saving irrigation	Life saving irrigation	Life saving irrigation	-
Pigeonpea	Life saving irrigation	Life saving irrigation	Life saving irrigation	-
Wheat	Life saving irrigation	Life saving irrigation	Life saving irrigation	-
<b>Horticulture</b>				
Mango	Life saving irrigation	Life saving irrigation	Life saving irrigation	-
Litchi	Life saving irrigation	Life saving irrigation	Life saving irrigation	-
Papaya	Life saving irrigation	Life saving irrigation	Life saving irrigation	-
<b>Cold wave</b>				
Wheat	-	Irrigation, inter culturing, mulching by weeds	-	-
Maize	-	Irrigation, inter culturing, mulching by weeds	-	-
Mustard	-	Irrigation, inter culturing, mulching by weeds	-	-
Potato	-	Irrigation, inter culturing, mulching by weeds	-	-
Pulses	-	Irrigation, inter	-	-

		culturing, mulching by weeds		
<b>Horticulture</b>				
bhendi	-	Irrigation, inter culturing, mulching by weeds	-	-
Brinjal	-	Irrigation, inter culturing, mulching by weeds	-	-
Chili	-	Irrigation, inter culturing, mulching by weeds	-	-
tomato	-	Irrigation, inter culturing, mulching by weeds	-	-
Lauki	-	Irrigation, inter culturing, mulching by weeds	-	-
<b>Frost</b>				
Wheat	-	Irrigation, inter culturing, mulching by weeds	-	-
Chick pea	-	Irrigation inter culturing, mulching by weeds	-	-
Pigeonpea	-	Irrigation inter culturing, mulching by weeds	-	-
Lentil	-	Irrigation inter culturing, mulching by weeds	-	-
<b>Horticulture</b>	-			
Bhendi	Treat the seeds in 0.2% soln of Dithane M-45	Irrigation, inter culturing, mulching by weeds	-	-
Brinjal	-	Irrigation interculturing, mulching by weeds	-	-
Chilli	-	Irrigation interculturing, mulching by weeds	-	-
Tomato & Potato	Treat the seeds in 0.2%	Earth up to 15cm ht.	Spray Dithane M-45/	Harvest in dry

	soln of Dithane M-45	Irrigation interculturing, mulching by weeds	Mancozeb @ 2.5 gm/lit of water in 3 <sup>rd</sup> week of December at 10 days interval 3 times	weather
Cyclone	-	-	-	-

## 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	<ol style="list-style-type: none"> <li>1. Advance planning for cultivation of fodder tree</li> <li>2. Storage of Improved Quality Fodder</li> <li>3. Conservation &amp; Storage of <ul style="list-style-type: none"> <li>• Feed &amp; Fodder</li> <li>• Hay &amp; Silage: — Preserve the fodder in the form of hay from Berseem &amp; other grasses as well as silage from <ol style="list-style-type: none"> <li>(a) Maize- harvesting at well developed cob.</li> <li>(b) Jowar - at flowering stage.</li> <li>(c) Oat</li> <li>(d) Hybrid Napier – 40-45 day old.</li> <li>(e) Water hycianth mixing with Rice straw in ratio of 4:1 with 70 kg molasses /ton of clean water hycianth.</li> <li>(f) Potato leaves mixing with wheat straw in ratio of 7:1 and should be supplemented with 3% molasses.</li> </ol> </li> </ul> </li> </ol> <p>Hay: –</p> <ul style="list-style-type: none"> <li>• Berseem/Lucerne and other grasses.</li> <li>• Bales of hay and other dry fodder should be stored in dry places at a height of last</li> </ul>	<ol style="list-style-type: none"> <li>1. Feeding of Complete Feed Block</li> <li>2. Feeding of Urea-Molasses-Mineral-Block &amp; Fodder</li> <li>3. Feeding of stored Hay/Silage/Improved Quality Fodder</li> <li>4. Feeding of Tree leaves some of which are as follows: <ol style="list-style-type: none"> <li>1. Bamboo leaves</li> <li>2. Neem</li> <li>3. Bargad</li> <li>4. Peepal</li> <li>5. Seesam</li> <li>6. Subabul</li> </ol> </li> </ol> <p>Use of unconventional feed stuff:</p> <ol style="list-style-type: none"> <li>(i) Aquatic Plants – water hycianth</li> <li>(i) Lotus</li> <li>(ii) Aquatic weeds</li> </ol>	<p>Production of forage crops</p> <ol style="list-style-type: none"> <li>1. Balanced feeding of Animal supported with little higher concentrate mixture</li> <li>2. Cultivation of fodder Rabi maize if water stagnated upto Nov/ December</li> <li>3. Jowar/Cowpea</li> <li>4. Maize in September</li> </ol>

	<p>flood level and covered with asbestos sheet or polythene sheet.</p> <p>2. Development &amp; storage of: –  (a) Complete Feed Block (CFB)  (b) Urea-Molasses-Mineral-Block (U.M.M.B)</p> <p>3. Development of Fodder Bank</p>		
Drinking water			
Health and disease management	<p>Veterinary Preparedness with Medicines, Vaccines and provision for mobile ambulatory van.</p> <ul style="list-style-type: none"> <li>Vaccination</li> </ul> <p>During flood stress becomes an incriminating factor for the precipitation of diseases in livestock and poultry.</p> <p>So, necessary vaccination of livestock and poultry should be done against economically important contagious disease.</p> <p>This will be helpful not only to check epidemic in animals, but also to reduce the probability of zoonoses in human beings.</p> <p>Care should be taken for mass vaccination of livestock and poultry with a view to covering 80% of livestock population in order to achieve herd immunity.</p> <p>Mass vaccination should be conducted by a team of Department staff with proper maintenance of detailed Inoculation Register.</p> <p>Pro-active steps should be taken to receive and stock the required doses of vaccines against different diseases for their use in face of Flood.</p>	<p>Animal safety, Health camp and Treatment</p> <p>Important Suggestions for animal and Poultry safety</p> <p>During flood, all efforts should be made to rescue most of the livestock and poultry as carefully as possible.</p> <p>The people should be made conscious through announcement with the help of mikes or other means of communication, so that they may escape with their livestock and poultry to safe area.</p> <p>The fisherman or the people who knows swimming should be deputed for the rescue of drowning and floating animals and birds.</p> <p>During flood do not leave halter or headstalls on animals.</p> <p>Do not tie animals together when releasing.</p> <p>Report the location, identification and disposition of livestock and poultry to authorities handling the disaster.</p> <p>Health camp and treatment</p> <p>Water borne diseases are one of the most common phenomena during the flood Diarrhoeal diseases outbreaks can Report the location, identification and disposition of livestock and poultry to authorities handling the disaster.</p>	<p>Sanitation, deworming, treatment, health camps Culling of Sick animals and disposal of carcass</p> <p>Maintenance of Sanitation:  Adequate attention is to be paid to disinfect the premises of temporary sheds with the help of bleaching powder, phenol, carbolic acid etc. In no case the carcass/ cadaver should come in contact with healthy animals rehabilitated in sheds. Arrangements should be made accordingly.</p> <p>De-worming after the flood:  Immediately after flood, the animals like cattle, buffalo. Sheep, goat, pig, dog and poultry need to be de-wormed with suitable broad spectrum anthelmintics. This will enable the animals to regain proper health.</p> <p>In water logged area, sucks can be introduced as biological control measures against snails to protect livestock from parasitic disease.</p>

		<p>Health camp and treatment</p> <p>Water borne diseases are one of the most common phenomena during the flood</p> <p>Diarrhoeal diseases outbreaks can occur after drinking contaminated water.</p> <p>Diseases that can occur during flood should be given special attention and accordingly medicines should be available in the health camp for the following mentioned diseases.</p> <p>Salmonella spp. Escherichia coli Giardiasis Amoebiasis Rotavirus Leptospirosis Scabies Black leg Malignant Edema Foot rot Anthrax Botulism Tetanus Red water Black disease Entertoxemia Liver fluke Amphistomiasis Brooders pneumonia</p> <p>Treatment of Non infectious</p> <p>Arrangement should be made for the treatment of drowning and traumatic injuries, aspiration pneumonia, lameness and other surgical cases in the health camp.</p> <p>Disinfection of livestock premises and</p>	<p>Treatment of sick animals: The</p> <p>Disposal of Carcass: the disposal of dead animals and birds are to be done by Animal Husbandry Department. Accordingly, necessary arrangement should be made for prompt and easy disposal of carcasses during the Flood and Post-Flood period.</p> <p>Carcasses of animals affected by the disease are the chief source of soil infection. They harbour the germs in large numbers and liberate them from both artificial and natural body openings into the surrounding soil.</p> <p>Methods of Carcass disposal to be adopted</p> <p>Burial</p> <p>Burning</p> <p>Composting</p> <p>Vulturing</p> <p>s. Health Camp after the flood:</p> <p>Protection of livestock from out breaking and communicable diseases be made. Health camps are to be organised in Flood affected areas to restore the normal breeding capability</p>
--	--	---	--

		Poultry shed Disinfection of livestock premises and the temporary sheds should be done with the help of bleaching powder, phenol, carbolic acid etc	of breedable population as well as to restore the normal health of livestock and poultry.
<b>Floods</b>			
<b>Cyclone</b>			
<b>Heat wave and cold wave</b>	Adequate and suitable measures for safety of animal lifes		
Shelter/environment management			
Health and disease management			

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

### 2.5.2 Poultry etc.

	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>				
<b>Floods</b>				
Shortage of feed ingredients				
Drinking water				
Health and disease management	Vaccines to be used for different animals and Poultry  Cattle and Buffalo Hemorrhagic Septicemia Vaccine Black Quarter Vaccine FMD Vaccine Anthrax Vaccine as per endemicity.			

	<p style="text-align: center;">Sheep and Goat</p> <p>Hemorrhagic Septicemia Vaccine  PPR Vaccine  FMD Vaccine  Goat pox Vaccine  Enterotoxemia Vaccine  Anthrax Vaccine as per endemicity</p> <p style="text-align: center;">Pigs</p> <p>Hemorrhagic Septicemia Vaccine  PPR Vaccine  FMD Vaccine  Goat pox Vaccine  Enterotoxemia Vaccine  Anthrax Vaccine as per endemicity.</p> <p style="text-align: center;">Dogs</p> <p>Rabies Vaccine</p> <p style="text-align: center;">Poultry</p> <p>Mareks disease vaccine  RDV (F<sub>1</sub> &amp; R<sub>2</sub>B),  FPV,  IBRV &amp;  IBDV  ( Annexure-1)</p> <ul style="list-style-type: none"> <li>• Medicines</li> </ul> <p>All Districts should be earmarked for flood.</p> <p>An inventory of required medicines to treat the affected livestock in case of eventualities should be made.</p> <p>The Govt. should take steps to procure sufficient quantity of essential life saving medicines.</p> <p>List of life saving Medicines  Corticosteroids  Nikethamide  Antibloat  Adrenaline  Antihistaminic  Antidotes for common poisoning  Antisnake venom  Broad spectrum antibiotics  Anti-inflammatory</p>			
--	--	--	--	--



	<p>Antipyretic and Analgesics Fluids and Electrolytes</p> <ul style="list-style-type: none"> <li>• Mobile Veterinary Clinics</li> </ul> <p>Mobile Veterinary Clinics should be kept ready at Veterinary Hospital or Veterinary Camps so that immediate treatment of injured and affected animals may be done.</p> <p>For this MVC must have adequate drugs like antibiotic, analgesic, dewormer, ointment, antsnake venom and emergency health care facilities along with trained personnel.</p> <p>A good no. of mobile clinic teams should be planned consisting dedicated and experienced technical workers with allotment of area of operation.</p> <p>The teams should be kept in readiness having required stock of medicines and equipment to work in any adverse situation.</p> <p>A telephone directory should be maintained at the District level by collecting the telephone nos. of Vets, Para-Vets, NGOs / youth clubs / societies, volunteers etc. to collect feedback and plan the activities during the emergency.</p> <p>An emergency kit for poultry should be made ready well in advance. The Poultry kit should have Cage, mask, mash, pellet feed trough, waterers, detergents, poultry vaccines, Veterinary drugs, workers protection uniform etc.</p>			
<b>Cyclone</b>				
<b>Heat wave and cold wave</b>				

<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>			
A. Capture			
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	(i) Thinning of population (ii) Arrangement of water supply from external resource	(i) Partial harvesting (ii) Addition of water (iii) Stocking of air breathing fishes	(i) Maintenances of remaining stock till favorable condition achieved (ii) If not feasible, total harvesting or transfer of fishes may be done. (iii) Preparation of the pond for next crop.
(ii) Impact of salt load build up in ponds / change in water quality	(i) Regular monitoring of water quality parameter. (ii) Arrangement of aeration (iii) Addition of water from external resource	(i) Arrangement of aeration. (ii) Addition of water a. Monitoring of water quality b. Reduction of manuring according to water level.	
<b>2) Floods</b>			
A. Capture			
B. Aquaculture			
(i) Inundation with flood water	(i) Elevation/ Renovation of pond dyke. (ii) Sale of Table/marketable size fishes (iii) construction of earthen nursery ponds in upland areas	Collection of naturally bred seeds (Spawn /fry /fingerling) from flooded water  Stocking in nursery ponds for rearing	-Retain the water in pond immediately after flood through repairing of damaged dyke etc.  -Netting of pond  -Removal of unwanted, predatory/weed fishes  -Sell of large size fishes
(ii) Water contamination and changes in water quality	Arrangement of regular water quality monitoring		
(iii) Health and diseases	Use lime/ potassium permanganate (b) Arrangement of CIFAX and medicines & chemical stock		-Sampling of fishes and water for disease analysis  - Liming, use of drugs/ medicine if required

			in consultancy of fisheries experts
(iv) Loss of stock and inputs (feed, chemicals etc)	Raising the height of dyke by fencing with net and bamboo poles to prevent loss of stock	Arrangement of advance size fingerling/ yearlings for stocking	Stocking of large size fingerlings carp Fertilization of pond and regular feeding of fish Harvesting and sale of fish
(v) Infrastructure damage (pumps, aerators, huts etc)	Repairing/ arrangement of alternate safe place to keep pumps aerators etc.	A regular water on the flood and infrastructure facilities.	Re establishment of the infra structural facility.
(vi) Any other			
<b>3. Cyclone / Tsunami</b>			
A. Capture			
B. Aquaculture			
<b>4. Heat wave and cold wave</b>			
A. Capture			
B. Aquaculture			

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