

## State: Uttar Pradesh

### Agriculture Contingency Plan for District: Meerut

1.0 District Agriculture profile				
1.1	<b>Agro-Climatic/Ecological Zone</b>			
	Agro Ecological Sub Region (ICAR)	Northern Plain (And Central Highlands) Including Aravallis, Hot Semi-Arid Eco-Region (4.1)		
	Agro-Climatic Zone (Planning Commission)	Upper Gangetic Plain Region (V)		
	Agro Climatic Zone (NARP)	Western Plain Zone (UP-3)		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Muzaffarnagar, Meerut, Baghpat, Ghaziabad, G.B. Nagar and Bulandshahar.		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		28 <sup>0</sup> 98'	77 <sup>0</sup> 07'	218 Mt
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	ZRS, Modipuram, Meerut, S.V.Patel University of Agriculture & Technology, Meerut - 250110		
	Mention the KVK located in the district with address	Swami Kalyan Dev Krishi Vigyan Kendra, Hastinapur of S.V.P.U.A. & T, Meerut.		
Name and address of the nearest Agro met Field Unit (AMFU, IMD) for agro-advisories in the Zone	College of Agricultural sciences, S.V.Patel University of Agriculture & Technology, Meerut - 250110			

1.2	Rainfall	Normal RF(mm)	Normal Rainy days (number)	Normal Onset ( specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep)	598	46	3 <sup>rd</sup> week of July	2 <sup>nd</sup> week of September
	NE / Post Monsoon (Oct-Dec)	31	12	3 <sup>rd</sup> week of December	-
	Winter (Jan- March)	66	14	-	-
	Summer (Apr-May)	24	07	-	-

	Annual	719	79	-	-
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<b>1.3</b>	Land use pattern of the district (latest statistics)	Geographical area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area ('000 ha)	273.005	198.941	21.314	39.336	0.376	2.596	2.012	2.859	2.997	2.574

<b>1.4</b>	<b>Major Soils</b>	<b>Area ('000 ha)</b>	<b>Percent (%) of total</b>
	Very deep Loam soils	69.6	35%
	Very deep Sandy Loam soils	55.7	28%
	Very deep Sandy soils	67.6	34%
	Very deep Silty Loam soils	5.9	3%

<b>1.5</b>	<b>Agricultural land use</b>	<b>Area ('000 ha)</b>	<b>Cropping intensity %</b>
	Net sown area	198.941	152.67%
	Area sown more than once	104.783	
	Gross cropped area	303.724	

<b>1.6</b>	<b>Irrigation</b>	<b>Area ('000 ha)</b>		
	Net irrigated area	191.827		
	Gross irrigated area	303.706		
	Rainfed area	7.114		
	<b>Sources of Irrigation</b>	<b>Number</b>	<b>Area ('000 ha)</b>	<b>Percentage of total irrigated area</b>
	Canals	-	35.608	18.56%
	Tanks		0.141	0.073%

Open wells		0	-
Bore wells		155.949	81.3%
Lift irrigation schemes		-	
Micro-irrigation		-	
Other sources (Sewage water/ drains)		0.129	0.067%
Total Irrigated Area		191.827	
Pump sets			
No. of Tractors			
<b>Groundwater availability and use* (Data source: State/Central Ground water Department /Board)</b>	No. of blocks/ Tehsils Block-12	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
Over exploited	0	-	Not reported
Critical	1 (Kharkhauda)	8.357	do
Semi- critical	3	-	do
Safe	8	-	do
Wastewater availability and use	Daurala, Meerut	-	do
Ground water quality	Good		

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

### 1.7 Area under major field crops & horticulture (as per latest figures of 2008-09)

1.7	Major field crops cultivated	Area (*000 ha)							
		<i>Kharif</i>			<i>Rabi</i>			Summer	Grand total
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
Rice	17.629	-	17.629	-	-	-	-	17.629	
Maize	0.329	-	0.329	-	-	-	-	0.339	
Sugarcane	-	-	-	8.365	-	8.365	121.258	129.623	
Wheat	-	-	-	87.795	-	87.795	-	87.795	

Pulses	-	0.253	0.253	0.30	0.446	0.746	0.245	1.244
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	<b>Horticulture crops - Fruits</b>	<b>Area ('000 ha)</b>		
		<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>
	Mango	18	12	6
	Guava	3.5	3.050	0.450
	Other Fruits Crops	3.232	2.262	0.969
	<b>Horticulture crops - Vegetables</b>	<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>
	Potato	8.768	8.768	-
	Other Vegetable Crops	32.815	32.815	-
	<b>Medicinal and Aromatic crops</b>	<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>
	Flowers	0.850	0.850	-
	<b>Plantation crops</b>	<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>
	Popular	0.456	0.456	-
	<b>Fodder crops</b>	<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>
	Sorghum	16.538	11.325	5.213
	Berseem /oat	1.321	1.321	-

<b>Total fodder crop area</b>	17.859	12.646	5.213
<b>Grazing land</b>	0.123	-	0.123
<b>Sericulture etc</b>	Nil	-	-

<b>1.8</b>	<b>Livestock</b>	<b>Male ('000)</b>	<b>Female ('000)</b>	<b>Total ('000)</b>	
	Non descriptive Cattle (local low yielding)	15.126	65.0796	80.205	
	Improved cattle	10.084	43.386	53.470	
	Crossbred cattle	25.210	108.466	133.676	
	Non descriptive Buffaloes (local low yielding)	146.560	610.177	756.737	
	Descript Buffaloes	62.811	261.504	324.316	
	Goat	16.801	32.243	49.044	
	Sheep Indio + Exotic	3.067+0.098	3.643+0.173	6.981	
	Camel, Pig, Yak etc.	--	--	1115.090	
	Commercial dairy farms (Number)				
<b>1.9</b>	<b>Poultry</b>	<b>No. of farms</b>	<b>Total No. of birds ('000)</b>		
	Commercial		14.806		
	Backyard		16.300		
<b>1.10</b>	<b>Fisheries (Data source: Chief Planning Officer)</b>				
	<b>A. Capture</b>				
	i) Marine (Data Source: Fisheries Department)	<b>No. of fishermen</b>	<b>Boats</b>		<b>Nets</b>
Mechanized			Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)
	Nil	-	-	-	-
ii) Inland (Data Source: Fisheries)		<b>No. Farmer owned ponds</b>	<b>No. of Reservoirs</b>	<b>No. of village tanks</b>	

Department)	06	-	818
<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)	-	-	215
ii) <b>Fresh water</b> (Village tanks)(Data Source: Fisheries department)	797.60	-	-

**1.11 Production and Productivity of major crops (Average of last 5 years: 2008-09 )**

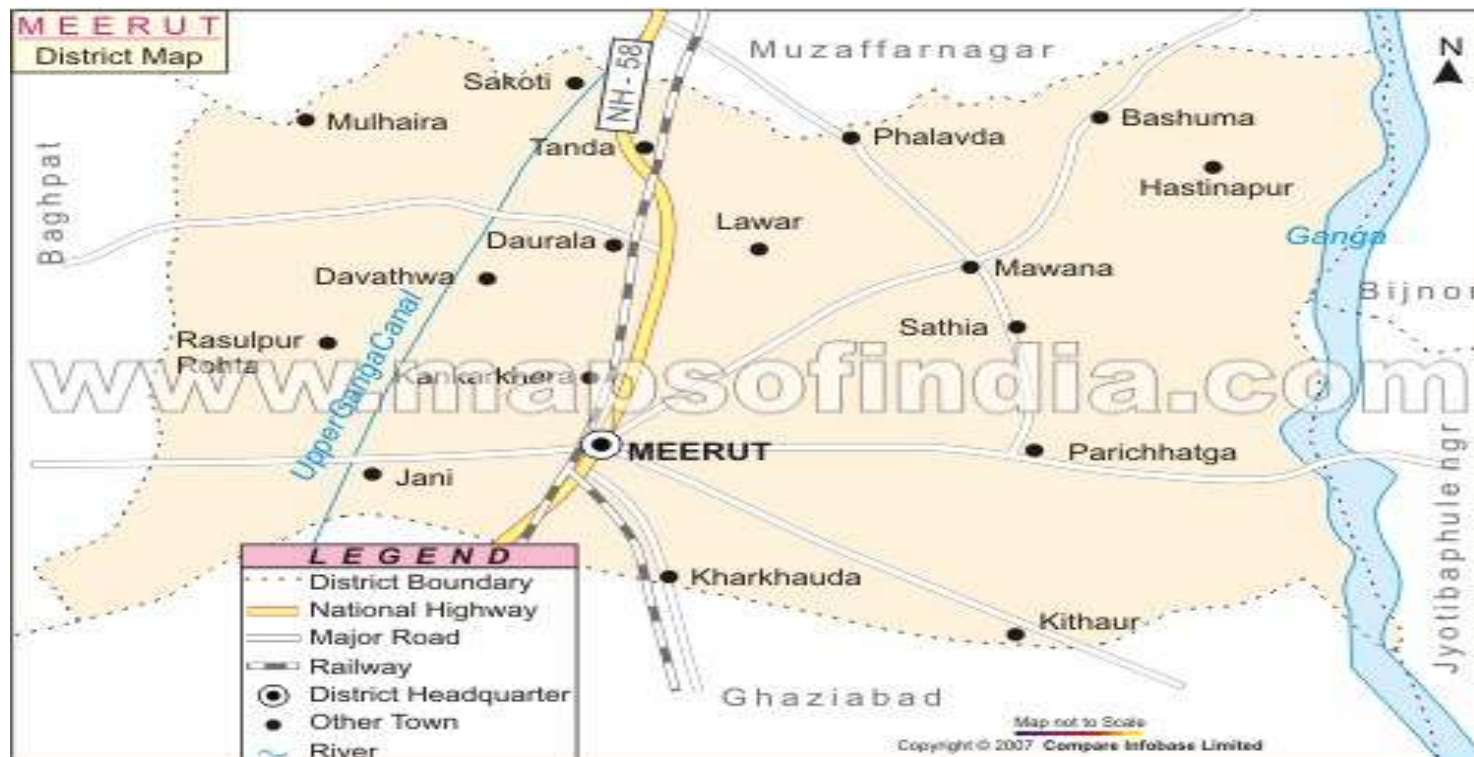
1.11	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder ('000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
<b>Major Field crops (Crops identified based on total acreage)</b>										
	Rice	45.113	2559	-	-	-	-	45.113	2559	54.14
	Maize	0.645	1903	-	-	-	-	0.645	1903	0.015
	Pulses	0.120	442	0.234	872	0.118	6.28	0.472	679	0.216
	Wheat	-	-	314.833	3586	-	-	-	3870	
	Sugarcane	-	-	533.69	63800	-	-	533.69	63800	122.7
	Mustard	-	-	4.105	1105	-	-	4.105	1105	-
<b>Major Horticultural crops (Crops identified based on total acreage)</b>										
	All Fruits	-	-	-	-	-	-	220.150	106.19	
	All Vegetables	-	-	-	-	-	-	613.449	186.94	
	Potato	-	-	-	-	-	-	206.311	235.3	
	Flowers	-	-	-	-	-	-	0.900	105.88	

1.12	Sowing window for 5 major field crops	Rice	Wheat	Sugarcane	Pulses	Potato
	Kharif- Rainfed	-	-	-	July – August	-
	Kharif-Irrigated	June – July	-	March – May	May – June	-
	Rabi- Rainfed	-	-	-	October – November	-
	Rabi-Irrigated	-	November – December	October – November	November – December	October – November

1.13	What is the major contingency the district is prone to? (Tick mark)	Regular	Occasional	None
	Drought			√
	Cyclone			√
	Hail storm		√	
	Heat wave		√	
	Cold wave	√		
	Frost			√
	Sea water intrusion			√
	Sheath blight & Hopper in rice		√	
	Fog	√		

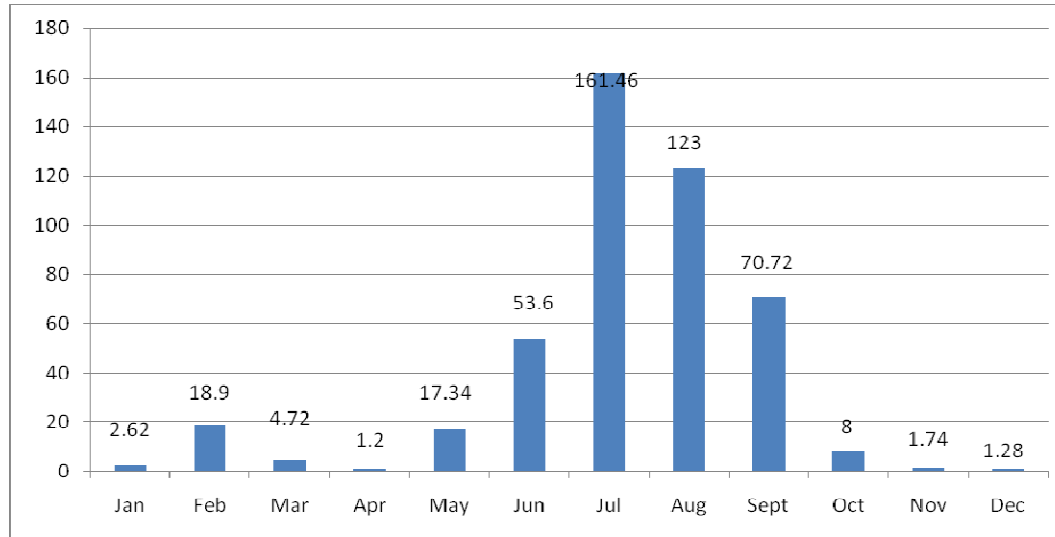
1.14	Include Digital maps of the district for	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure II	Enclosed: Yes
		Soil map as Annexure III	Enclosed: Yes

**Annexure I**

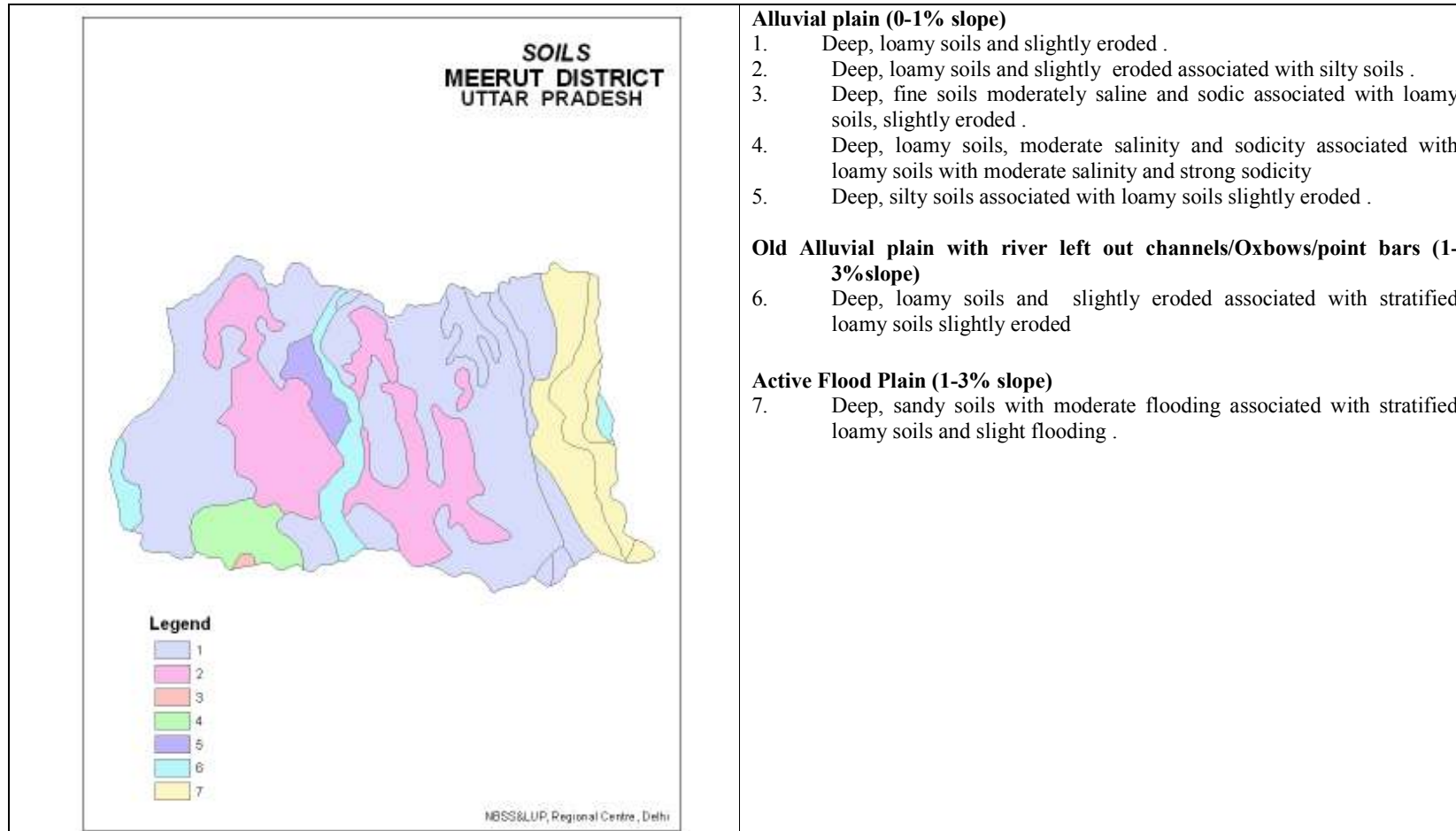




## Annexure II



### Annexure III



## 2.0 Strategies for weather related contingencies

### 2.1 Drought

#### 2.1.1 Rainfed situation (Rainfed area is negligible, so there is no need of contingencies)

Condition	Major Farming situation <sup>a</sup>	Normal Crop / Cropping system <sup>b</sup>	Suggested Contingency measures		
			Change in crop / cropping system <sup>c</sup> including variety	Agronomic measures <sup>d</sup>	Remarks on Implementation <sup>e</sup>
Early season drought (delayed onset)					
Delay by 2 weeks			Not applicable		
Delay by 4 weeks			Not applicable		
Delay by 6 weeks			Not applicable		
Delay by 8 weeks			Not applicable		

Condition	Major Farming situation <sup>a</sup>	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 stand etc.			Not applicable		
At vegetative stage			Not applicable		
At flowering/ fruiting stage			Not applicable		
Terminal drought			Not applicable		

#### 2.1.2 Drought- Irrigated situation

Condition			Suggested Contingency measures

	<b>Major Farming situation</b>	<b>Normal Crop/cropping system</b>	<b>Change in crop/cropping system</b>	<b>Agronomic measures</b>	<b>Remarks on Implementation</b>
Delayed release of water in canals due to low rainfall	Upland sandy loam soils	Rice (Basmati)-Wheat	Replace rice with maize or aerobic rice  Use short duration varieties of Rice: PS 4, 5, PB 1, PRH 10 Maize: Kanchan, Sweta, Navin, Surya	Light irrigation with tube well water, Follow alternate wetting and drying schedule of irrigation in rice, Alternate Furrow irrigation, Mulching in sugarcane / maize	Seed through KSSC and NFSM, Adequate supply of electricity/diesel should be ensured by the Govt. agencies.
		Sorghum (Fodder)/Maize-Potato/ Wheat	Bajra/Greengram/ Blackgram - Potato/ Wheat  Bajra: Wcc-75,Raj-171,Pusa-23,Pusa-322		
		Sugarcane +cucurbits –Ratoon-Wheat	No change		
	Lowland clay loam soils	Rice-wheat	Basmati rice –Wheat  Use short duration varieties of Rice: PS 4, 5, PB 1, PRH 10	Light irrigation with tube well water, Follow alternate wetting and drying schedule of irrigation in rice, Alternate Furrow irrigation, Mulching in sugarcane	
		Sorghum Fodder-Wheat	Bajra-Wheat Bajra: Wcc-75,Raj-171,Pusa-23,Pusa-322		
		Sugarcane-Ratoon-Wheat	No change		

<b>Condition</b>	<b>Major Farming situation<sup>f</sup></b>	<b>Normal Crop/cropping system<sup>g</sup></b>	<b>Change in crop/cropping system<sup>h</sup></b>	<b>Suggested Contingency measures</b>	
				<b>Agronomic measures<sup>i</sup></b>	<b>Remarks on Implementation<sup>j</sup></b>
Limited release of water in canals due to low rainfall	Upland sandy loam soils	Rice (Basmati)-Wheat	No change	Follow alternate wetting and drying schedule of irrigation in rice, Alternate Furrow irrigation,	Adequate supply of electricity/diesel should be ensured by the Govt. agencies.
		Sorghum (Fodder)/Maize-Potato/ Wheat	No change		
		Sugarcane +cucurbits –	No change		

Condition	Suggested Contingency measures				
	Major Farming situation <sup>f</sup>	Normal Crop/cropping system <sup>g</sup>	Change in crop/cropping system <sup>h</sup>	Agronomic measures <sup>i</sup>	Remarks on Implementation <sup>j</sup>
		Ratoon-Wheat		Mulching in sugarcane/ maize	
Lowland clay loam soils		Rice-wheat	No change	Follow alternate wetting and drying schedule of irrigation in rice, Alternate Furrow irrigation, Mulching in sugarcane/ maize	Supply of inter cultural implements through RKV, Adequate supply of electricity/diesel should be ensured by the Govt. agencies.
		Sorghum Fodder-Wheat	No change		
		Sugarcane-Ratoon-Wheat	No change required		

Condition	Suggested Contingency measures				
	Major Farming situation <sup>f</sup>	Normal Crop/cropping system <sup>g</sup>	Change in crop/cropping system <sup>h</sup>	Agronomic measures <sup>i</sup>	Remarks on Implementation <sup>j</sup>
Non release of water in canals under delayed onset of monsoon in catchment	Upland tube well irrigated canal sandy loam soil	Basmati rice	Maize/Arabic Rice	Limited irrigation, Alternate furrow irrigation, Drip irrigation, Mulching	Seed through KSSC and NFSM, Supply of inter cultural implements through RKVY
		Sorghum/Maize	Sorghum /Bajra /Pigeonpea/Blackgram		
		Sugarcane +cucurbits	Sugarcane		
	Lowland tube well irrigated canal clay loam soil	Rice	Bajra/ Blackgram/Greengram	Limited irrigation, Alternatefurrow irrigation, Drip irrigation, Mulching	Seed through KSSC and NFSM, Harvesting and threshing implements through RKVY
		Sorghum Fodder	Bajra/Sorghum Fodder		
		Sugarcane + cucurbits	Sugarcane		
Condition	Suggested Contingency measures				
Major Farming situation <sup>f</sup>	Normal Crop/cropping system <sup>g</sup>	Change in crop/cropping system <sup>h</sup>	Agronomic measures <sup>i</sup>	Remarks on Implementation <sup>j</sup>	
Lack of inflows into tanks due to insufficient /delayed onset of monsoon			Not Applicable		

Condition	Suggested Contingency measures				
	Major Farming situation <sup>f</sup>	Normal Crop/cropping system <sup>g</sup>	Change in crop/cropping system <sup>h</sup>	Agronomic measures <sup>i</sup>	Remarks on Implementation <sup>j</sup>
Insufficient groundwater recharge due to low rainfall	Upland tube well irrigated canal sandy loam soil	Basmati rice	Maize/Aerobic Rice /Vegetable (cucurbits)/Blackgram	Limited irrigation, Alternatefurrow irrigation, Drip irrigation, Mulching	Seed through KSSC and NFSM, Harvesting and threshing implements through RKVY
		Sorghum/Maize	Bajra /Pigeonpea/ Blackgram		
		Sugarcane +cucurbits	Sugarcane		
	Lowland tube well irrigated canal clay loam soil	Rice	Bajra/Greengram/ Blackgram	Limited irrigation, Alternatefurrow irrigation, Drip irrigation, Mulching	Seed through KSSC and NFSM, Micro/drip/sprinkler irrigation under govt. schemes, Supply of inter cultural implements through RKVY
		Sorghum Fodder	Bajra Fodder		
		Sugarcane + cucurbits	Sugarcane		

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

Condition	Suggested contingency measure			
	Vegetative stage <sup>k</sup>	Flowering stage <sup>l</sup>	Crop maturity stage <sup>m</sup>	Post harvest <sup>n</sup>
<b>Continuous high rainfall in a short span leading to water logging</b>				
Maize + Blackgram / Greengram /cucurbits	Provide drainage	Provide drainage	Drain out excess water, Harvesting at physiological maturity stage	Shift to safer place & dispose of produce as early as possible
Sugarcane	Provide drainage		Drain out excess water and harvest the lodged crop as early as possible	Supply to sugar mills /crusher as early as possible or shift to safer place and cover the cane with trash materials
Blackgram or Greengram	Provide drainage	Provide drainage	Drain out excess water Harvesting at physiological maturity stage.	Safe storage against storage pest and disease
<b>Horticulture</b>				
Okra	Provide drainage	Provide drainage	Picking of vegetables at physiological maturity stage	Shift to safer place & dispose

				of produce as early as possible
Cucurbits	Provide drainage	Provide drainage	Drain out excess water & Harvesting at physiological maturity stage and picking of cucurbits crop.	Shift to safer place & dispose of produce as early as possible
Brinjal	Provide drainage	Provide drainage	Picking at physiological maturity stage	Shift to safer place & dispose of produce as early as possible
Tomato	Provide drainage	Provide drainage	Picking at physiological maturity stage	Shift to safer place & dispose of produce as early as possible
Mango	-	-	Spray of 2% urea + Carbendazim 0.02% solution	-
Guava	-	-	Spray of 2% urea + Carbendazim 0.02% solution	-
<b>Heavy rainfall with high speed winds in a short span<sup>2</sup></b>				
Sugarcane	Earthing up, Tying		Drain out excess water and harvest the lodged crop as early as possible	Supply to sugar mills /crusher as early as possible or shift to safer place and cover the cane with trash materials
Maize/Sorghum	Provide drainage	Provide drainage, Use Wind breaks	Drain out excess water & Harvesting at physiological maturity stage	Shift to safer place & dispose of produce as early as possible
Blackgram/ Greengram	Provide drainage	Provide drainage, Use Wind breaks	Drain out excess water & Harvesting at physiological maturity stage	Shift to safer place & dispose of produce as early as possible
Rice (basmati)	Provide drainage	Provide drainage	Drain out excess water & Harvesting at physiological maturity stage	Shift to safer place & dispose of produce as early as possible
Pigeonpea	Provide drainage	Provide drainage	Drain out excess water &	Shift to safer place & dispose

	Sowing on raised bed		Harvesting at physiological maturity stage	of produce as early as possible
<b>Horticulture</b>				
Okra	Provide drainage, Sowing on raised bed	Provide drainage	Drain out excess water, Harvesting at physiological maturity stage	Shift to safer place & dispose of produce as early as possible
Brinjal	Provide drainage, Sowing on raised bed	Provide drainage	Drain out excess water, Harvesting at physiological maturity stage	Shift to safer place & dispose of produce as early as possible
Tomato	Provide drainage Sowing on raised bed Stacking	Provide drainage, Use Wind breaks, Stacking	Drain out excess water, Harvesting at physiological maturity stage Stacking	Shift to safer place & dispose of produce as early as possible
Cauliflower	Provide drainage, Sowing on raised bed	Provide drainage	Drain out excess water, Harvesting at physiological maturity stage	Shift to safer place & dispose of produce as early as possible
Cucurbits	Provide drainage, Sowing on raised bed	Provide drainage	Drain out excess water , Harvesting at physiological maturity stage	Shift to safer place & dispose of produce as early as possible
Mango	Use of wind breaks	Use of NAA spray	Use of NAA spray	-
Guava	Use of wind breaks	Use of NAA spray	Use of NAA spray	
<b>Outbreak of pests and diseases due to unseasonal rains</b>				
Rice (basmati)	Need based plant protection IPDM for Rice/pluses	Need based plant protection IPDM for Rice/pluses	Avoid use of pesticide at maturity stage	Shift to safer place & dispose of produce as early as possible
Sugarcane				
Sorghum fodder				



Blackgram/ Greengram				
Pigeonpea				
<b>Horticulture</b>				
Okra	Need based plant protection IPDM for Rice/pluses	Need based plant protection IPDM for Rice/pluses	Avoid use of pesticide at maturity stage	Shift to safer place & dispose of produce as early as possible
Brinjal				
Tomato				
Cucurbits				
Cauliflower				

### 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 (basmati)	<ul style="list-style-type: none"> <li>• Re sowing of nursery</li> <li>• Direct sowing of rice</li> <li>• Sowing of nursery on raised bed</li> </ul>	<ul style="list-style-type: none"> <li>• Provide drainage</li> </ul>	<ul style="list-style-type: none"> <li>• Provide drainage</li> </ul>	Shift to safer place & dispose of produce as early as possible
Sugarcane	<ul style="list-style-type: none"> <li>• Direct sowing</li> </ul>	<ul style="list-style-type: none"> <li>• Provide drainage</li> </ul>	<ul style="list-style-type: none"> <li>• Provide drainage</li> </ul>	Shift to safer place & dispose of produce as early as possible
Sorghum fodder	<ul style="list-style-type: none"> <li>• Direct sowing</li> </ul>	<ul style="list-style-type: none"> <li>• Provide drainage</li> </ul>	<ul style="list-style-type: none"> <li>• Provide drainage</li> </ul>	Shift to safer place & dispose of produce as early as possible
Blackgram/ Greengram	<ul style="list-style-type: none"> <li>• Direct sowing</li> </ul>	<ul style="list-style-type: none"> <li>• Provide drainage</li> </ul>	<ul style="list-style-type: none"> <li>• Provide drainage</li> </ul>	Shift to safer place & dispose of produce as early as possible
Pigeonpea	<ul style="list-style-type: none"> <li>• Direct sowing</li> </ul>	<ul style="list-style-type: none"> <li>• Provide drainage</li> </ul>	<ul style="list-style-type: none"> <li>• Provide drainage</li> </ul>	Shift to safer place & dispose of

				produce as early as possible
<b>Horticulture</b>				
Okra	<ul style="list-style-type: none"> <li>• Re sowing of nursery</li> <li>• Sowing of nursery on raised bed</li> <li>• Re transplanting</li> </ul>	• Provide drainage	• Provide drainage	Shift to safer place & dispose of produce as early as possible
Brinjal	<ul style="list-style-type: none"> <li>• Re sowing of nursery</li> <li>• Sowing of nursery on raised bed</li> <li>• Re transplanting</li> </ul>	• Provide drainage	• Provide drainage	Shift to safer place & dispose of produce as early as possible
Tomato	<ul style="list-style-type: none"> <li>• Re sowing of nursery</li> <li>• Sowing of nursery on raised bed</li> <li>• Re transplanting</li> </ul>	• Provide drainage	• Provide drainage	Shift to safer place & dispose of produce as early as possible
<b>Continuous submergence for more than 2 days</b>				
<b>Rice</b>	<ul style="list-style-type: none"> <li>• Re sowing of nursery</li> <li>• Direct sowing of rice</li> <li>• Sowing of nursery on raised bed</li> </ul>	• Provide drainage	• Provide drainage	Shift to safer place & dispose of produce as early as possible
<b>Horticulture</b>				
Okra	<ul style="list-style-type: none"> <li>• Re sowing of nursery</li> <li>• Sowing of nursery on raised bed</li> <li>• Re transplanting</li> </ul>	• Provide drainage	• Provide drainage	Shift to safer place & dispose of produce as early as possible
Brinjal	<ul style="list-style-type: none"> <li>• Re sowing of nursery</li> <li>• Sowing of nursery on raised bed</li> <li>• Re transplanting</li> </ul>	• Provide drainage	• Provide drainage	Shift to safer place & dispose of produce as early as possible
Tomato	<ul style="list-style-type: none"> <li>• Re sowing of nursery</li> <li>• Sowing of nursery on raised bed</li> <li>• Re transplanting</li> </ul>	• Provide drainage	• Provide drainage	Shift to safer place & dispose of produce as early as possible
Mango	<ul style="list-style-type: none"> <li>• Re sowing of nursery</li> <li>• Sowing of nursery on raised bed</li> <li>• Re transplanting</li> </ul>	• Provide drainage	• Provide drainage	Shift to safer place & dispose of produce as early as possible

Sea water intrusion <sup>3</sup>	Not Applicable
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#### 2.4 Extreme events: Heat wave / Cold wave/Frost/ Hailstorm /Cyclone/Fog

Extreme event type	Suggested contingency measure <sup>f</sup>			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
<b>Heat Wave</b>				
Rice (basmati)	<ul style="list-style-type: none"> <li>• Re sowing of nursery</li> <li>• Light and frequent irrigation during night</li> </ul>	<ul style="list-style-type: none"> <li>• Irrigation interval should be decreased</li> </ul>	<ul style="list-style-type: none"> <li>• Irrigation interval should be decreased</li> </ul>	Light and frequent irrigation
Sugarcane	<ul style="list-style-type: none"> <li>• Mulching</li> </ul>	<ul style="list-style-type: none"> <li>• Irrigation interval should be decreased</li> </ul>	<ul style="list-style-type: none"> <li>• Irrigation interval should be decreased</li> </ul>	Light and frequent irrigation
Sorghum fodder	<ul style="list-style-type: none"> <li>• Re sowing</li> </ul>	<ul style="list-style-type: none"> <li>• Irrigation interval should be decreased</li> </ul>	<ul style="list-style-type: none"> <li>• Irrigation interval should be decreased</li> </ul>	Make silage
Blackgram /Greengram	<ul style="list-style-type: none"> <li>• Re sowing</li> <li>• Mulching</li> </ul>	<ul style="list-style-type: none"> <li>• Light irrigation for survival</li> </ul>	<ul style="list-style-type: none"> <li>• Light irrigation for survival</li> </ul>	<ul style="list-style-type: none"> <li>• Pod picking</li> </ul>
Pigeonpea	<ul style="list-style-type: none"> <li>• Re sowing</li> <li>• Mulching</li> </ul>	<ul style="list-style-type: none"> <li>• Light irrigation for survival</li> </ul>	<ul style="list-style-type: none"> <li>• Light irrigation for survival</li> </ul>	<ul style="list-style-type: none"> <li>• Pod picking</li> </ul>
<b>Horticulture</b>				
Okra	<ul style="list-style-type: none"> <li>• Re sowing of nursery</li> <li>• Re transplanting</li> <li>• Mulching</li> <li>• Light watering during night</li> </ul>	<ul style="list-style-type: none"> <li>• Light irrigation for survival</li> </ul>	<ul style="list-style-type: none"> <li>• Light irrigation for survival</li> </ul>	<ul style="list-style-type: none"> <li>• Harvesting of fruits</li> </ul>
Brinjal	<ul style="list-style-type: none"> <li>• Re sowing of nursery</li> <li>• Re transplanting</li> <li>• Mulching</li> <li>• Light watering during night</li> </ul>	<ul style="list-style-type: none"> <li>• Light irrigation for survival</li> </ul>	<ul style="list-style-type: none"> <li>• Light irrigation for survival</li> </ul>	<ul style="list-style-type: none"> <li>• Harvesting of fruits</li> </ul>
Tomato	<ul style="list-style-type: none"> <li>• Re sowing of nursery</li> </ul>	<ul style="list-style-type: none"> <li>• Light irrigation for</li> </ul>	<ul style="list-style-type: none"> <li>• Light irrigation for survival</li> </ul>	<ul style="list-style-type: none"> <li>• Harvesting of</li> </ul>

	<ul style="list-style-type: none"> <li>• Re transplanting</li> <li>• Mulching of nursery beds</li> <li>• Light irrigation during night</li> </ul>	survival		fruits
Mango	<ul style="list-style-type: none"> <li>• Spray of water</li> </ul>	<ul style="list-style-type: none"> <li>• Spray of water</li> </ul>	<ul style="list-style-type: none"> <li>• Spray of water</li> </ul>	<ul style="list-style-type: none"> <li>• -</li> </ul>
Guava	<ul style="list-style-type: none"> <li>• Spray of water</li> </ul>	<ul style="list-style-type: none"> <li>• Spray of water</li> </ul>	<ul style="list-style-type: none"> <li>• Spray of water</li> </ul>	<ul style="list-style-type: none"> <li>• -</li> </ul>
<b>Cold wave<sup>q</sup></b>				
Wheat	Light irrigation	Light irrigation	Light irrigation	Light irrigation
Sugarcane		<ul style="list-style-type: none"> <li>• Light irrigation for survival</li> </ul>	--	<ul style="list-style-type: none"> <li>• Harvesting of cane</li> </ul>
<b>Horticulture</b>				
Tomato		<ul style="list-style-type: none"> <li>• Light Sprinkler irrigation</li> </ul>	<ul style="list-style-type: none"> <li>• Light Sprinkler irrigation</li> </ul>	<ul style="list-style-type: none"> <li>• Harvesting of fruits</li> </ul>
Pea		<ul style="list-style-type: none"> <li>• Light Sprinkler irrigation</li> </ul>	<ul style="list-style-type: none"> <li>• Light Sprinkler irrigation</li> </ul>	<ul style="list-style-type: none"> <li>• Harvesting of fruits</li> </ul>
<b>Potato</b>		<ul style="list-style-type: none"> <li>• Light Sprinkler irrigation</li> </ul>	--	<ul style="list-style-type: none"> <li>• Harvesting</li> </ul>
<b>Frost</b>				
Sugarcane	<ul style="list-style-type: none"> <li>• Light irrigation</li> </ul>	<ul style="list-style-type: none"> <li>• Light irrigation</li> </ul>	<ul style="list-style-type: none"> <li>• Light irrigation</li> </ul>	<ul style="list-style-type: none"> <li>• Harvesting of cane</li> </ul>
Pigeonpea	<ul style="list-style-type: none"> <li>• Smoke at night</li> </ul>	<ul style="list-style-type: none"> <li>• Light irrigation</li> <li>• Smoke at night</li> </ul>	<ul style="list-style-type: none"> <li>• Light irrigation</li> <li>• Smoke at night</li> </ul>	Smoke at night
<b>Horticulture</b>				
Potato	<ul style="list-style-type: none"> <li>•Light irrigation for survival</li> <li>•Smoke at night</li> </ul>	<ul style="list-style-type: none"> <li>•Light irrigation for survival</li> <li>•Smoke at night</li> </ul>	<ul style="list-style-type: none"> <li>•Light irrigation for survival</li> <li>•Smoke at night</li> </ul>	<ul style="list-style-type: none"> <li>• Harvesting</li> </ul>
Tomato	<ul style="list-style-type: none"> <li>•Light irrigation for survival</li> <li>•Smoke at night</li> </ul>	<ul style="list-style-type: none"> <li>•Light irrigation for survival</li> <li>•Smoke at night</li> </ul>	<ul style="list-style-type: none"> <li>•Light irrigation for survival</li> <li>•Smoke at night</li> </ul>	<ul style="list-style-type: none"> <li>• De halming</li> </ul>
Pea	<ul style="list-style-type: none"> <li>•Light irrigation for survival</li> </ul>	<ul style="list-style-type: none"> <li>•Light irrigation for survival</li> </ul>	<ul style="list-style-type: none"> <li>•Light irrigation for survival</li> </ul>	<ul style="list-style-type: none"> <li>• Harvesting</li> </ul>

	•Smoke at night	•Smoke at night	•Smoke at night	
Mango	• Irrigation &Smoking during night	•Irrigation &Smoking during night	•Irrigation &Smoking during night	--
Guava	•Irrigation &Smoking during night	•Irrigation &Smoking during night	•Irrigation &Smoking during night	Harvesting
<b>Hailstorm</b>				
<b>All the crops</b>	Re sowing	Re sowing of Catch crop	Harvest for fodder	Pre Harvesting
<b>Horticulture</b>				
All the Vegetable crops	Re sowing	Re sowing of Catch crop	Harvest for fodder	Pre Harvesting
All the Fruit crops	Use anti hail net Spray of fungicide with 2% urea solution	Use anti hail net Spray of fungicide with 2% urea solution	Use anti hail net Spray of fungicide with 2% urea solution	Harvest the damaged fruits Spray of fungicide with 2% urea solution
<b>Fog</b>	Not applicable			

## 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>• Fodder crop Insurance</li> <li>• Making of feed blocks</li> <li>• Encourage farmers to allocate some lands for cultivating perennial fodder (Napier grass, Subabul), specially on bunds and wasteland</li> <li>• Establishing fodder banks, encouraging fodder crops in irrigated area</li> <li>• Making silage or hay of excess fodder.</li> <li>• Statistics regarding feed/fodder availability and requirement should be updated by the concerned deptt.</li> <li>• Seed production and development of drought resistant crops and their varieties of fodder crops.</li> <li>• Encourage farmers to adopt sprinkler irrigation system.</li> <li>• Training to the farmers and extension functionaries for production and long term storage of feed and fodder.</li> </ul>	<ul style="list-style-type: none"> <li>• Utilizing fodder from perennial trees/shrubs/fodder bank reserves for small ruminant.</li> <li>• Utilizing stored fodder as silage, hay, feed blocks &amp; mixture etc.</li> <li>• Migration of herd /flock to other places.</li> <li>• Establishment of communication and linkage with other state agencies.</li> </ul>	<ul style="list-style-type: none"> <li>• Availing crop insurance</li> <li>• Cultivation of fast growing green fodder crops.</li> <li>• Development of drought resistance fodder.</li> <li>• Increase the no. of Fodder Banks for future use.</li> </ul>
Drinking water	<ul style="list-style-type: none"> <li>• Preserving water in the pond/tank for drinking purpose.</li> <li>• Excavation of bore well/creation of tanks or ponds.</li> <li>• De-silting of village ponds on regular basis and adopt water harvesting techniques through water shed approach.</li> <li>• Filling of the ponds with canal/tube well water during lean period.</li> </ul>	<ul style="list-style-type: none"> <li>• Using preserved water in the tanks for drinking</li> <li>• Available ground water should be used for drinking on priority basis.</li> </ul>	<ul style="list-style-type: none"> <li>• Recharge of well/ Tanks etc.</li> </ul>
Health and disease management	<ul style="list-style-type: none"> <li>• Farmers should be encouraged to avail Livestock insurance</li> </ul>	<ul style="list-style-type: none"> <li>• Conduction mass animal health camp and treating the effected animals.</li> </ul>	<ul style="list-style-type: none"> <li>• Availing insurance benefits.</li> <li>• Followed standard Livestock</li> </ul>

	<ul style="list-style-type: none"> <li>• Training to livestock owners regarding natural calamities.</li> <li>• Veterinary preparedness with medicines and vaccines.</li> <li>• Vaccination</li> </ul>	<ul style="list-style-type: none"> <li>• Mass campaigning through different media regarding possible outbreak of diseases and their management.</li> </ul>	<p>management practices.</p> <ul style="list-style-type: none"> <li>• Proper health care &amp; treatment.</li> </ul>
<b>Floods</b>			
Feed and fodder availability	<ul style="list-style-type: none"> <li>• Fodder crop Insurance</li> <li>• Making of feed blocks</li> <li>• Encourage farmers to allocate some lands for cultivating perennial fodder (Napier grass, Subabul), specially on bunds and wasteland</li> <li>• Establishing fodder banks, encouraging fodder crops.</li> <li>• Making silage or hay of excess fodder and that should be stored on up land.</li> <li>• Statistics regarding feed/fodder availability and requirement should be updated by the concerned deptt.</li> <li>• Seed production and development of crops and their varieties ( ) of fodder crops for water logged conditions.</li> <li>• Training to the farmers and extension functionaries for production and long term storage of feed and fodder.</li> </ul>	<ul style="list-style-type: none"> <li>• Utilizing fodder from perennial tress/shrubs/fodder bank reserves.</li> <li>• Use of feed mixture/block hay etc</li> <li>• Migration of flock /herds</li> <li>• Establishment of communication and linkage with other state agencies</li> </ul>	<ul style="list-style-type: none"> <li>• Availing crop insurance</li> <li>• Cultivation of fast growing green fodder crops</li> </ul>
Drinking water	<ul style="list-style-type: none"> <li>• Making suitable provision for safe drinking surface water including excavation of bore well/hand pump (India mark—II) at community level.</li> <li>• Make farmers aware not to use contaminated/ flood water for drinking purpose.</li> </ul>	<ul style="list-style-type: none"> <li>• Contaminated flood water should not be used for drinking.</li> </ul>	<ul style="list-style-type: none"> <li>• Open sources of drinking water (tank/well) should be further treated with potassium permanganate.</li> </ul>

and Health disease management	<ul style="list-style-type: none"> <li>• Live stock Insurance</li> <li>• Training to livestock owners regarding natural calamities.</li> <li>• Veterinary preparedness with medicines and vaccines.</li> <li>• Vaccination</li> </ul>	<ul style="list-style-type: none"> <li>• Conduction mass animal health camp and treating the effected animals.</li> <li>• Training to livestock owners regarding natural calamities.</li> <li>• Establishment of Co-ordination with other Agencies.</li> <li>• Use of mass media to spread expat advice</li> </ul>	<ul style="list-style-type: none"> <li>• Culling sick animals</li> <li>• Availing insurance benefits.</li> <li>• Culling unproductive livestock</li> <li>• Proper disposal of corpse of dead bodies to prevent the spread of contagious diseases.</li> </ul>
<b>Cyclone</b>	Not Applicable		
<b>Heat wave and cold wave</b>			
Shelter/environment management	<ul style="list-style-type: none"> <li>• Avoid use of GI sheet for roofing in the animal shed</li> <li>• Create adequate sources for additional supply of water to protect the animals from heat waves.</li> <li>• Establishment of modern shelter sheds.</li> <li>• As far as possible grow shade trees such as Neem, Pilkhan, Karanj etc near the animal sheds.</li> <li>• Make provision for adequate no. of fans/coolers /heaters according to the situation, if possible</li> </ul>	<ul style="list-style-type: none"> <li>• Provide the thatches/ tarpaulins in the animal sheds to protect against direct entry of hot/ cold waves</li> <li>• Provide proper bedding to prevent from cold and proper ventilation to prevent from heat.</li> <li>• Provide drinking water to animal frequently during heat wave</li> <li>• Watch the forecast of weather department.</li> <li>• As for as possible the animal should be allowed to allow in pounds/ canals/ river or give bath once or twice in a day during heat waves</li> </ul>	<ul style="list-style-type: none"> <li>• Repair and maintenance of additional facilities</li> </ul>



Health and disease management	<ul style="list-style-type: none"> <li>• Insure the animals</li> <li>• Training to livestock owners/ para-vets regarding preventive measure against extreme weather conditions</li> <li>• Veterinary preparedness with medicines and vaccines etc.</li> <li>• Vaccination against FMD &amp; Cold</li> </ul>	<ul style="list-style-type: none"> <li>• Organize village level animal health camps</li> <li>• Consult veterinary officer immediately if any adverse symptoms are noticed</li> <li>• Use of ITKs for food supplements</li> </ul>	<ul style="list-style-type: none"> <li>• Proper after care of animals.</li> <li>• Availing insurance benefits.</li> <li>• Proper disposal of corpse of dead bodies to prevent the spread of contagious diseases.</li> </ul>
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<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>• Making and storage of feed concentrates</li> <li>• Awareness regarding traditional feed banks.</li> <li>• Feed requirement data should be generated</li> <li>• Prepare the feed requirement data base of poultry farm.</li> <li>• Store the feed ingredients</li> </ul>	<ul style="list-style-type: none"> <li>• Use of feed concentrates/ mixture/blocks etc</li> <li>• Establishment of communication with other state agencies.</li> <li>• Use of locally available feed recourses.</li> <li>• Import the feed recourse form other states.</li> </ul>	<ul style="list-style-type: none"> <li>• Availing insurance</li> <li>• Increase the no. of feed banks for future use</li> </ul>	

Drinking water	<ul style="list-style-type: none"> <li>• Making extra facility for drinking water.</li> <li>• Repair &amp; maintenance of water resources</li> </ul>	<ul style="list-style-type: none"> <li>• Frequent supply of drinking water</li> </ul>		
Health and disease management	<ul style="list-style-type: none"> <li>• Veterinary preparedness with medicines and vaccines.</li> <li>• Vaccination</li> <li>• Training to poultry Growers regarding natural calamities.</li> </ul>	<ul style="list-style-type: none"> <li>• Treatment of affected poultry birds</li> </ul>	<ul style="list-style-type: none"> <li>• Culling of flock</li> <li>• Availing insurance benefits</li> <li>• Proper disposal of corpse of dead bodies to prevent the spread of contagious diseases</li> </ul>	
<b>Floods</b>				
Shortage of feed ingredients	<ul style="list-style-type: none"> <li>• Sufficient quantity of feed ingredients should be stored</li> </ul>	<ul style="list-style-type: none"> <li>• Use of stored feed in balanced form</li> <li>• Prevent the feed from moisture.</li> </ul>	<ul style="list-style-type: none"> <li>• Cleaning of feed store &amp; repair if any.</li> <li>• Moist feed should be dried &amp; treated as per requirement</li> </ul>	
Drinking water	<ul style="list-style-type: none"> <li>• Make provision of ground water for drinking</li> </ul>	<ul style="list-style-type: none"> <li>• Use only Ground water obtained from India Mrka II or Tubewell</li> </ul>	<ul style="list-style-type: none"> <li>• Repair, maintenance and cleaning of water recourse</li> <li>• Sanitation of open Wells</li> </ul>	
Health and disease management	<ul style="list-style-type: none"> <li>• Veterinary preparedness with medicines and vaccines</li> <li>• Vaccination</li> </ul>	<ul style="list-style-type: none"> <li>• Migration of flock if required</li> <li>• Treatment</li> </ul>	<ul style="list-style-type: none"> <li>• Availing insurance benefits.</li> <li>• Culling of unproductive flock</li> </ul>	

Cyclone	Not Applicable			
Shortage of feed ingredients	<ul style="list-style-type: none"> <li>Storage and making of feed concentrates</li> <li>Proper feed requirement data base</li> </ul>	<ul style="list-style-type: none"> <li>Establishment of communication with other state agencies</li> <li>Use of stored feed ingredient</li> <li>Import of feed from other areas</li> </ul>	<ul style="list-style-type: none"> <li>Repair and maintenance of feed store</li> </ul>	
Drinking water	<ul style="list-style-type: none"> <li>Make provision of ground water for drinking</li> </ul>	<ul style="list-style-type: none"> <li>Use only Ground water obtained from India Mrka II or Tubewell</li> </ul>	<ul style="list-style-type: none"> <li>Repair and maintenance of water recourse</li> </ul>	
Health and disease management	<ul style="list-style-type: none"> <li>Training to poultry growers regarding natural calamities.</li> <li>Veterinary preparedness with medicines and vaccines.</li> </ul>	<ul style="list-style-type: none"> <li>Treatment of injured poultry birds.</li> </ul>	<ul style="list-style-type: none"> <li>Culling of flock</li> <li>Availing insurance benefits.</li> <li>Proper disposal of corpse of dead bodies to prevent the pared of contagious diseases.</li> </ul>	
<b>Heat wave and cold wave</b>				
Shelter/environment management	<ul style="list-style-type: none"> <li>Making sufficient provision of shelter to protect live stock from heat and cold waves</li> <li>Establishment of alternate resource for water supply.</li> <li>Modern shelter sheds.</li> </ul>	<ul style="list-style-type: none"> <li>Keep the birds in appropriate shelter</li> <li>Provide proper bedding to prevent from cold and proper ventilated to prevent from heat</li> <li>Provide drinking water to birds frequently.</li> <li>Adopted proper management practices.</li> <li>Watch the fore cast of weather department.</li> </ul>	<ul style="list-style-type: none"> <li>Making of modern shelter sheds</li> <li>Increase the plantation of trees</li> </ul>	
Health and disease management	<ul style="list-style-type: none"> <li>Insurance</li> <li>Veterinary preparedness with</li> </ul>	<ul style="list-style-type: none"> <li>Provide proper treatment as per requirement</li> </ul>	<ul style="list-style-type: none"> <li>Availing insurance benefits</li> <li>Culling of unproductive</li> </ul>	

	medicines and vaccines <ul style="list-style-type: none"> <li>• Training to poultry growers regarding natural calamities</li> </ul>	<ul style="list-style-type: none"> <li>• Treatment of injured poultry</li> </ul>	flock <ul style="list-style-type: none"> <li>• Proper disposal of corpse of dead bodies to prevent the spread of contagious diseases</li> </ul>	
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<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>			
Marine	–	–	–
Inland			
(i) Shallow water depth due to insufficient rains/inflow	<ul style="list-style-type: none"> <li>• Adopt appropriate measures to reduce water seepage or infiltration</li> </ul>	<ul style="list-style-type: none"> <li>• Harvest the crop partially</li> </ul>	<ul style="list-style-type: none"> <li>• Re stock</li> </ul>
(ii) Changes in water quality	<ul style="list-style-type: none"> <li>• Regular observation to check the water quality and remove the pollutants if any.</li> </ul>	<ul style="list-style-type: none"> <li>• Add oxy-flow to improve oxygen</li> <li>• Churning of pond water</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain appropriate level of water if possible</li> <li>• Check the water quality and remove the pollutants if any.</li> </ul>
<b>B. Aquaculture</b>			
(i) Shallow water in ponds due to insufficient rains/inflow	<ul style="list-style-type: none"> <li>• Adopt appropriate measures to reduce water seepage or infiltration from ponds</li> <li>• Avoid any kinds of water pollution and maintain water pH</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure the Oxygen availability into ponds for the survival of fish</li> <li>• Avoid any kind of water pollution</li> <li>• Add oxy-flow to improve oxygen into ponds.</li> <li>• Churning of pond water</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain appropriate level of water in ponds</li> <li>• Check the water quality and remove the pollutants if any.</li> </ul>

(ii) Impact of salt load build up in ponds / change in water quality	<ul style="list-style-type: none"> <li>• Add some fresh water from other source like cannel etc</li> </ul>	<ul style="list-style-type: none"> <li>• Add oxy-flow to improve oxygen into ponds.</li> <li>• Churning of pond water</li> <li>• Add fresh water into pond for life saving and to reduce salt load</li> </ul>	<ul style="list-style-type: none"> <li>• Add fresh water into pond for life saving and to reduce salt load</li> <li>• Maintain appropriate level of water in ponds</li> <li>• Check the water quality and remove the pollutants if any.</li> </ul>
<b>2) Floods</b>			
<b>A. Capture</b>			
Marine	--	--	--
Inland			
(i) No. of boats / nets/damaged	<ul style="list-style-type: none"> <li>• Boats, nets etc should be taken out from water bodies</li> </ul>	<ul style="list-style-type: none"> <li>• Close supervision of flood condition</li> </ul>	<ul style="list-style-type: none"> <li>• Damaged boat or nets should be repaired</li> </ul>
(ii) No. of houses damaged	--	--	<ul style="list-style-type: none"> <li>• Repair the damaged house.</li> </ul>
(iii) Loss of stock	--	--	<ul style="list-style-type: none"> <li>• Sanitation and proper disposal of corpse</li> </ul>
(iv) Changes in water quality	<ul style="list-style-type: none"> <li>• Increase the height of bunds.</li> </ul>	--	--
(v) Health and diseases	--	<ul style="list-style-type: none"> <li>• Treatment if possible</li> </ul>	--
<b>B. Aquaculture</b>			
(i) Inundation with flood water	<ul style="list-style-type: none"> <li>• Repair the bunds to prevent the inflow of water</li> <li>• If inflow water is not polluted then place the net at inlet and outlet</li> <li>• Raise the height of bunds</li> <li>• Plan a proper drainage system at farm</li> <li>• Plantation of soil binding plants at bund</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid inflow of flood water from outside.</li> <li>• If inflow water is not polluted that can be permitted to flow through net placed at inlet and outlet of pond.</li> <li>• Fencing of net required in case of overflow to avoid the migration of fish</li> </ul>	<ul style="list-style-type: none"> <li>• Repair the damaged bunds</li> <li>• Check water quality</li> <li>• Change the water if it is polluted</li> </ul>

(ii) Water contamination and changes in water quality	<ul style="list-style-type: none"> <li>• Limeing @300 kg/ha</li> </ul>	<ul style="list-style-type: none"> <li>• Stop inflow of contaminated water</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain appropriate level of water in ponds</li> <li>• Check the water quality and remove the pollutants if any.</li> </ul>
(iii) Health and diseases	<ul style="list-style-type: none"> <li>• Limeing @300 kg/ha</li> <li>• Vaccination</li> </ul>	<ul style="list-style-type: none"> <li>• Diagnostic measures and provide appropriate medicines</li> </ul>	<ul style="list-style-type: none"> <li>• Limeing and medication as per requirement</li> <li>• Use Cifex to control ulcerative syndromes</li> </ul>
(iv) Loss of stock and inputs (feed, chemicals etc)	<ul style="list-style-type: none"> <li>• Marketable stock should be sold</li> </ul>	<ul style="list-style-type: none"> <li>• Immediately remove the dead fishes from ponds and do sanitation</li> </ul>	<ul style="list-style-type: none"> <li>• After sanitation add new stock</li> </ul>
(v) Infrastructure damage (pumps, aerators, huts etc)	<ul style="list-style-type: none"> <li>• Dommageable infrastructures should be secured</li> </ul>	<ul style="list-style-type: none"> <li>• Do not supplié Electric in flood éd area</li> </ul>	<ul style="list-style-type: none"> <li>• Repaire and service the damage infrastructure</li> </ul>
<b>3. Cyclone / Tsunami</b>	Not applicable		
<b>4. Heat wave and cold wave</b>			
<b>A. Capture</b>			
Marine	--	--	--
Inland			
<b>B. Aquaculture</b>			
(i) Changes in pond environment (water quality)	<ul style="list-style-type: none"> <li>• Maintain appropriate level of water in ponds <i>ie.</i> 1.75m in 2m deep ponds</li> <li>• Check the water quality and remove the pollutants if any</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain appropriate level of water in ponds <i>ie.</i> 1.75m in 2m deep ponds</li> <li>• Check the water quality and remove the pollutants if any</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain appropriate level of water in ponds <i>ie.</i> 1.75m in 2m deep ponds</li> <li>• Check the water quality and remove the pollutants if any</li> </ul>
i) Health and Disease management	<ul style="list-style-type: none"> <li>• Limeing@300kg/ha</li> </ul>	<ul style="list-style-type: none"> <li>• Medication as per requirement</li> </ul>	<ul style="list-style-type: none"> <li>• Remove the dead fishes from ponds and add new stocks to compensate the production</li> </ul>

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