

**State: TAMILNADU**

**Agriculture Contingency Plan District: KARUR**

<b>1.0 District Agriculture profile</b>				
<b>1.1</b>	<b>Agro-Climatic/Ecological Zone</b>			
	Agro Ecological Region / Sub Region (ICAR)	Eastern Ghat (TN uplands) ecosubregion (8.3).		
	Agro-Climatic Region (Planning Commission)	Southern Plateau and Hills Region (X)		
	Agro Climatic Zone (NARP)	Western zone (TN-3)		
	List all the districts or part thereof falling under the NARP Zone	Periyar and Coimbatore districts, Thiruchengodu of Namakkal district Karur district and northern parts of Madurai district.		
	Geographic coordinates of district Hqs	Latitude	Longitude	Altitude
		10 <sup>0</sup> 32' N	77 <sup>0</sup> 45' E	122 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Maize Research Station, P.O: Vagarai, Dist:Dindigul		
Mention the KVK located in the district	Saraswathi KVK, Puzhuderu Village, Puzhuderu (Po), Thogamalai block, Karur District			
<b>1.2</b>	<b>Rainfall</b>	Average (mm)	Normal Onset ( specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	192	1 <sup>st</sup> week of June	1 <sup>st</sup> week of October
	NE Monsoon(Oct-Dec):	300	2 <sup>nd</sup> week of October	4 <sup>th</sup> week of December
	Winter (Jan- March)	26	-	-
	Summer (Apr-May)	115	-	-
	Annual	635	-	-

<b>1.3</b>	<b>Land use pattern of the district</b> (latest statistics)	Geographical area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows	
	<b>Area (000'ha)</b>	289.6	6.2	37.5	10.8	67.4	1.3	2.8	25.3	43.5	
<b>1.4</b>	<b>Major Soils</b>	<b>Area ('000 ha)</b>					<b>Percent (%) of total</b>				
	Deep black soils	80.0					27.6				
	Deep red soils	46.0					16.0				
	Shallow red soils	44.0					15.3				
	Shallow black soils	41.0					14.2				
	Moderately deep black soils	30.0					10.3				
	Moderately deep red soils	18.0					6.2				
<b>1.5</b>	<b>Agricultural land use</b>	<b>Area ('000 ha)</b>					<b>Cropping intensity %</b>				
	Net sown area	94.4					101.8				
	Area sown more than once	1.7									
	Gross cropped area	96.1									

<b>1.6</b>	<b>Irrigation</b>	<b>Area (000'ha)</b>	<b>Percent (%)</b>		
	Net irrigated area	48.1	51.7		
	Gross irrigated area	49.7	52.5		
	Rainfed area	46.3	38.4		
	<b>Sources of Irrigation</b>	<b>Number</b>	<b>Area (000'ha)</b>	<b>% area</b>	
	Canals	23	15.8	31.7	
	Tanks	266	0.1	0.1	
	Open wells	47230	31.2	62.4	
	Bore wells	192	4.8	9.6	
	Lift irrigation	6623	0.3	0.7	
	Other sources	-	-	-	
	Total	54334	52.7	103.5	
	Pumpsets	49282	43.3	86.6	
	Micro-irrigation	-	-	-	
	<b>Groundwater availability and use</b>	<b>No. of blocks</b>	<b>% area</b>	<b>Quality of water</b>	
	Over exploited	2	27.3	Data not available	
	Critical	0	0.0		
Semi- critical	5	50.1			
Safe	1	18.6			
Wastewater availability and use	Data not available	-			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%					

**Area under major field crops & horticulture etc.**

1.7 Major Field Crops cultivated		Area (000'ha)					
		Kharif		Rabi		Summer	Total
		Irrigated	Rainfed	Irrigated	Rainfed		
1	Sorghum	1.2	23.1	0.5	0.1	--	24.9
2	Paddy	-	-	14.9	-	--	14.9
3	Sunflower	3.8	0.1	3.9	-	--	7.8
4	Gingelly	0.1	7.0	0.2	0.2	--	7.4
5	Ground nut	2.2	1.8	2.1	0.1	--	6.2
6	Pulses	0.1	4.5	0.1	1.6	--	6.1
7	Sugarcane						6.0
<b>Horticulture crops - Fruits</b>		<b>Total area</b>		<b>Irrigated</b>		<b>Rainfed</b>	
1	Banana	5.0		5.0		-	
2	Tapioca	2.8		2.9		-	
3	Mango	0.6		0.5		0.1	
<b>Horticultural crops - Vegetables</b>		<b>Total area</b>		<b>Irrigated</b>		<b>Rainfed</b>	
1	Chillies	0.8		0.8		-	
<b>Horticultural crops -Flowers</b>		-		-			
1	Jasmine	0.1		0.1		-	
2	Kaanthal	0.3		0.2		0.1	
<b>Medicinal and Aromatic crops</b>		<b>Total area</b>		<b>Irrigated</b>		<b>Rainfed</b>	
1	Betal vine	0.2		0.2		-	
<b>Plantation crops</b>		<b>Total area</b>		<b>Irrigated</b>		<b>Rainfed</b>	
1	Coconut	5.2		5.2		-	
<b>Fodder crops</b>		<b>Total area</b>		<b>Irrigated</b>		<b>Rainfed</b>	
1	Sorghum	6.0		0.1		5.9	
	<b>Total fodder crop area</b>	6.1		0.2		5.9	
	<b>Grazing land</b>	10.8		-		-	
	<b>Sericulture etc</b>	0.3		-		-	
	<b>Others (non-food crops) Korai</b>	1.6		1.6		-	

<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)	10.2	26.2	36.4			
	Crossbred cattle	7.1	77.6	84.7			
	Non descriptive Buffaloes (local low yielding)	-	-	55.5			
	Graded Buffaloes	-	-				
	Goat			166.7			
	Sheep			302.4			
	Others (Pigs)			10.21			
	Others (Horses & Ponies)						
	Commercial dairy farms (Number)						
<b>1.9</b>	<b>Poultry</b>	<b>No. of farms</b>	<b>Total No. of birds (number)</b>				
	Commercial		498470				
	Backyard						
<b>1.10</b>	<b>Fisheries</b> (Data source: Chief Planning Officer)						
	<b>A. Capture</b>						
	<b>i) Marine</b> (Data Source: Fisheries Department)	<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)	
		1764					
	<b>ii) Inland</b> (Data Source: Fisheries Department)	<b>No. Farmer owned ponds</b>		<b>No. of Reservoirs</b>		<b>No. of village tanks</b>	
	<b>B. Culture</b>						
		<b>Water Spread Area (ha)</b>		<b>Yield (t/ha)</b>		<b>Production ('000 tons)</b>	
	<b>i) Brackish water</b> (Data Source: MPEDA/ Fisheries Department)						

	ii) <b>Fresh water</b> (Data Source: Fisheries Department)			
	<b>Others</b>			

1.11	Production and Productivity of major crops (Average of last 3 years: 2006, 07, 08)	Kharif		Rabi		Summer		Total	
		Production ('000 t)	Productivity (kg/ha)						
1	Paddy	-	-	45592	3068	0.0	0.0	45.592	3068
2	Sorghum	-	-	-	-	-	-	11.555	463
3	Sunflower	-	-	-	-	-	-	6.498	1257
4	Gingelly	-	-	-	-	-	-	1.922	265
5	Ground nut	-	-	-	-	-	-	13.846	2215
Others	Sugarcane	-	-	-	-	-	-	655.744	96
<b>Major Horticultural crops</b>									
1	Banana	-	-	-	-	-	-	194.376	41989
2	Mango	-	-	-	-	-	-	2.336	4166
3	Coconut	-	-	-	-	-	-	0.402	9599
4	Tapioca	-	-	-	-	-	-	102.904	41358
5	Chillies	-	-	-	-	-	-	0.359	521

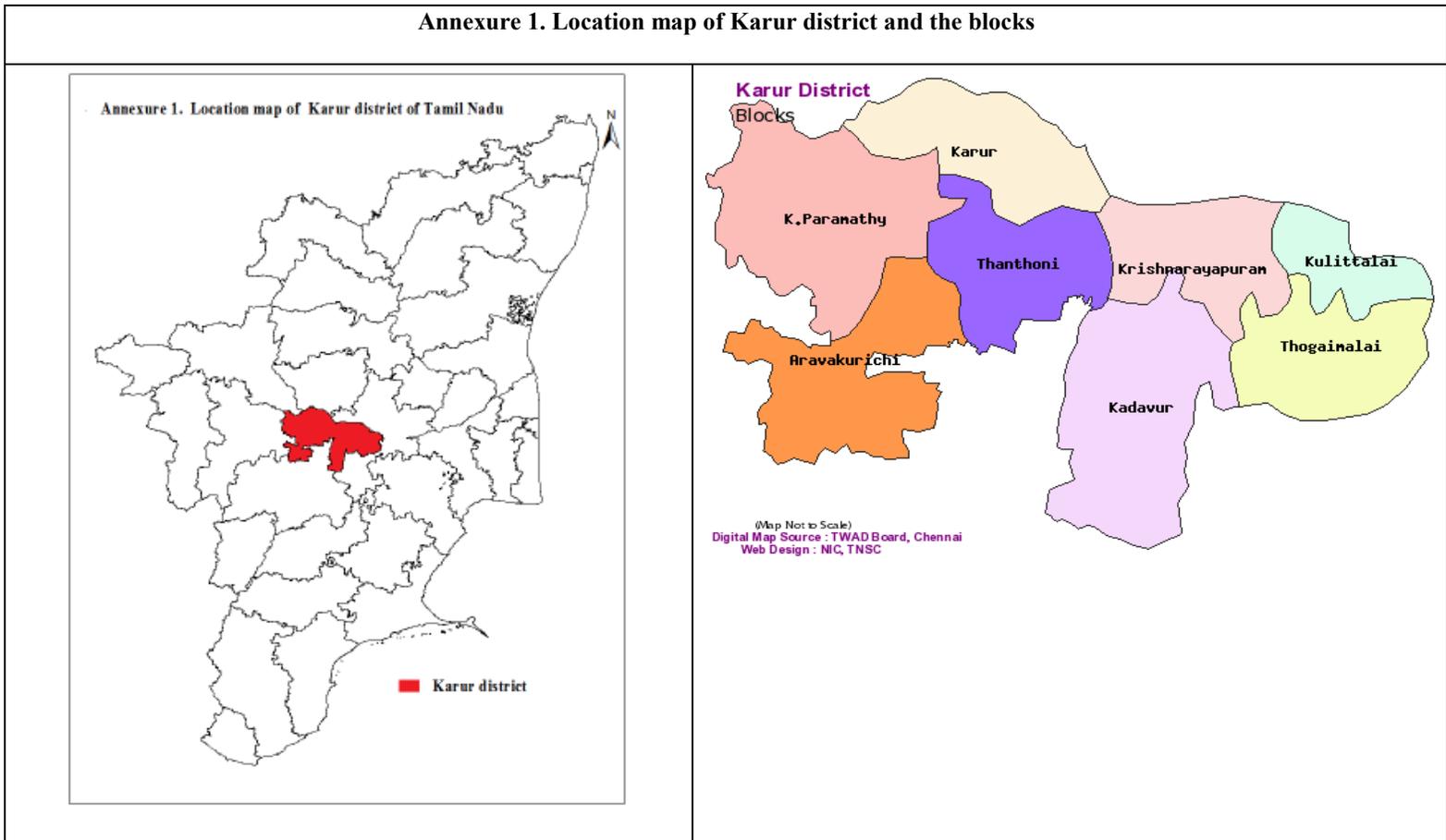
<b>1.12</b>	<b>Sowing window for 5 major crops (start and end of sowing period)</b>	Paddy	Sorghum	Groundnut	Sunflower	Sugarcane
	Kharif- Rainfed	-	1 <sup>st</sup> week June to 1 <sup>st</sup> week July	1 <sup>st</sup> week of July to 1 <sup>st</sup> week of August	2 <sup>nd</sup> week of June to 1 <sup>st</sup> week of July	-
	Kharif-Irrigated	2 <sup>nd</sup> week of June to 2 <sup>nd</sup> week of July	2 <sup>nd</sup> week of April to 1 <sup>st</sup> week of May	1 <sup>st</sup> week of December to 1 <sup>st</sup> week of Jan, 2 <sup>nd</sup> week of May-1 <sup>st</sup> week of June	1 <sup>st</sup> week of December to 1 <sup>st</sup> week of January 2 <sup>nd</sup> week of April to 1 <sup>st</sup> week of May	2 <sup>nd</sup> week of April to 1 <sup>st</sup> week of May, 1 <sup>st</sup> week of December to 1 <sup>st</sup> week of January
	Rabi- Rainfed	-	2 <sup>nd</sup> week of September to 1 <sup>st</sup> week of October	-	1 <sup>st</sup> week of October to 1 <sup>st</sup> week of November	-
	Rabi-Irrigated	2 <sup>nd</sup> week of August to 1 <sup>st</sup> week of September	1 <sup>st</sup> week of January to 1 <sup>st</sup> week of February	-	-	-

<b>1.13</b>	<b>What is the major contingency the district is prone to? (Tick mark and mention years if known during the last 10 year period)</b>	Regular	Occasional	None
	Drought	✓	-	-
	Flood	-	✓	-
	Cyclone	-	-	✓
	Hail storm	-	-	✓
	Heat wave	-	-	✓
	Cold wave	-	-	✓
	Frost	-	-	✓
	Sea water inundation	-	-	✓
	Pests and diseases (specify)	-	-	✓

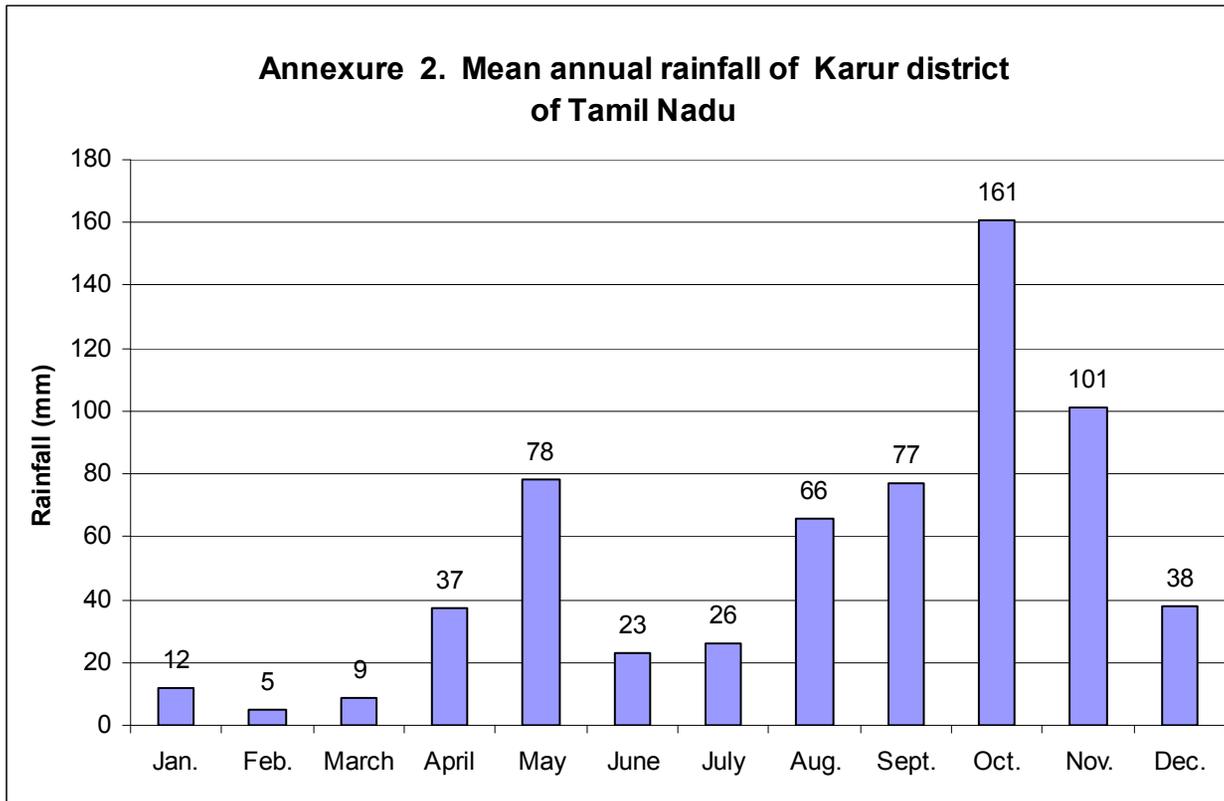
<b>1.14</b>	<b>Include Digital maps of the district for</b>	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes



**Annexure 1. Location map of Karur district and the blocks**

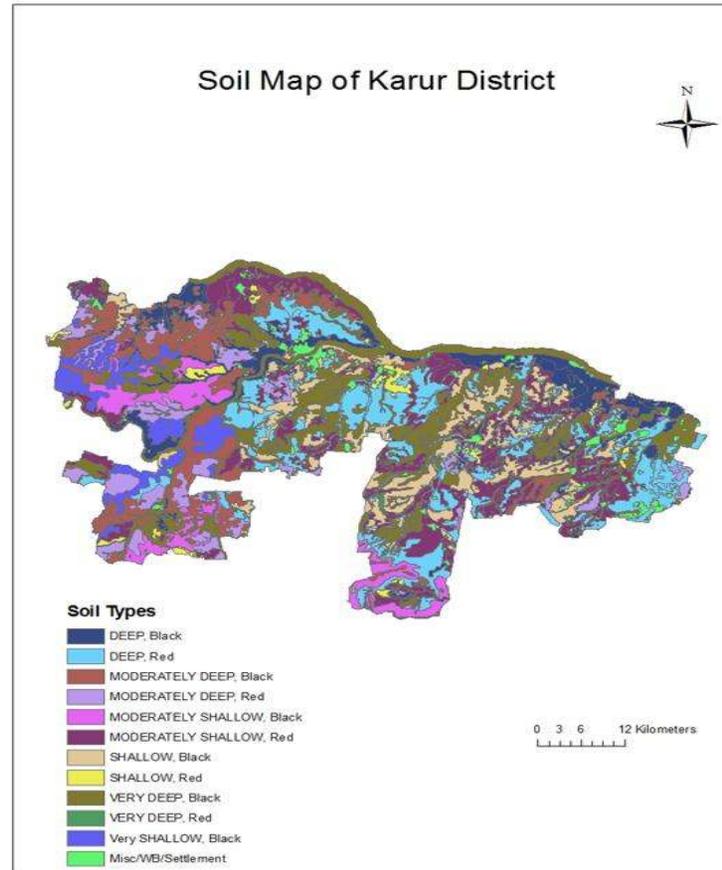


**Annexure 2. Mean annual rainfall of Karur district  
of Tamil Nadu**



### Annexure 3. Soil Map of Karur district in Tamil Nadu

Source: NBSSLUP



## 2.0 Strategies for weather related contingencies

### 2.1 Drought: Kharif season

#### 2.1.1 Rainfed situation

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 2 weeks June 3 <sup>rd</sup> week	Red soils	Groundnut + Pigeon pea (6 :1 ratio) Ground nut (sole crop)	No change	1. Mechanical sowing with tractor drawn seed drill as the sowing window is narrow	Hiring Seed drills from the Dept. of Agrl. Eng. Supply of seeds through ISOPOM project
Delay by 4 weeks July 1 <sup>st</sup> week		Groundnut + Pigeon pea (6 :1 ratio) Ground nut (sole crop)	No change	1. Deep tillage to conserve soil moisture 2. Mechanical sowing with tractor drawn seed drill 3. Application of composted coir pith @ 10 t ha <sup>-1</sup> to conserve soil moisture. 4. Seed hardening with 1 % KH <sub>2</sub> PO <sub>4</sub> (Soak the seeds in solution for 24 hours and decant the solution. Shade dry the seeds and sowing)	
Delay by 6 weeks (July 3 <sup>rd</sup> week)	Red soils	Groundnut + Pigeon pea (6 :1 ratio) Ground nut (sole crop)	Groundnut + Pigeon pea Red gram (Co(RG) 7) 12 :1 ratio Sorghum + Red gram (mixed) Sorghum: Co 26, Co (S) 28 Red gram: Co(RG) 7)	1. Mechanical sowing with tractor drawn seed drill 2. Adopt wider spacing of 45 x 10 cm. 3. Use of short duration cultivars like VRI 2, TMV 7. 4. Conservation of soil moisture through straw/black polythene mulching. 5. Spraying of B and K to increase drought tolerance.	Hiring Seed drills from the Dept. of Agrl. Eng. Supply of seeds through ISOPOM project

Delay by 8 weeks (Aug 1 <sup>st</sup> week)		Groundnut + Pigeon pea (6 :1 ratio)  Ground nut (sole crop)	Groundnut + Pigeon pea Inter cropping (VRI 2, TMV 7, ALR 3, TMV 10) Red gram (Co(RG) 7) 12 :1 ratio Sorghum + Red gram (mixed) Sorghum: Co 26, Co (S) 28 Red gram: Co(RG) 7)	<ol style="list-style-type: none"> <li>1. Select early maturing cultivars.</li> <li>2. Soak the seeds in 2% potassium dihydrogen phosphate for six hours and shade dry the seeds for 5 hours.</li> <li>3. Additional dose of 20 kg N under excessive rain during vegetative phase.</li> <li>4. Supplemental irrigation during pod filling stage</li> <li>5. Application of mulch to improve the soil moisture status.</li> <li>6. Sorghum crop will be grown for fodder purpose.</li> </ol>	
September 1 <sup>st</sup> week		Groundnut + Pigeon pea (6 :1 ratio)  Ground nut (sole crop) VRI 2, TMV 10	Sorghum as a sole crop for fodder (Co 26, Co (S) 28)  Horse gram as a sole crop (Co 1, Paiyur 1 and 2)	<ol style="list-style-type: none"> <li>1. Crops grown for fodder purpose with some soil moisture conservation practices.</li> <li>2. Sow the horse gram by broad casting</li> </ol>	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil management	Remarks on Implementation
<b>Early season drought</b> (Normal onset, followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.)	Red soils	Groundnut + Pigeon pea (12 :1 ratio) Sorghum + Red gram (mixed)	Reduce plant population by thinning and use biomass as mulch.	Resort to bed-furrow system and adopt alternate row irrigation. Apply stored water through micro irrigation practices (sprinkler).	Hiring inter cultural implements from the Dept. of Agrl. Eng.
			Re sowing in between the existing or relay cropping		
<b>Mid season drought</b> (long dry spell, > 2 consecutive weeks rainless (>2.5 mm) period) <b>At vegetative stage</b>		Groundnut + Pigeon pea (12 :1 ratio) Sorghum + Red gram (mixed)	Reduce the plant population to the extent of 25 to 40 per cent. Postponement of top dressing	Inter cultivation to control weeds and use of soil mulch.	Hiring inter cultural implements from the Dept. of Agrl. Eng.  Farm ponds through IWSM programme
			Spraying of 0.5 % KCl to mitigate water stress.  Spray kaoline @ 6 % will reduce the transpirational loss of water.	Efficient use of stored water for life saving irrigation (micro sprinkler or sprinkler)	

<b>Mid season drought</b> (long dry spell) <b>At reproductive stage</b>	Red soils	Groundnut + Pigeon pea (12 :1 ratio) Sorghum + Red gram (mixed)	Foliar spray of 2 % DAP plus 1 % KCl during flowering and pod formation stages  Spraying antitranspirant like kaoline  Harvest for fodder purpose	Life saving irrigation  Weeding and Weed mulching	Farm ponds through IWSM programme
<b>Terminal drought</b>		Groundnut + Pigeon pea (12 :1 ratio) Sorghum + Red gram (mixed)	Harvest Pigeonpea for vegetable purpose  Harvest groundnut at physiological maturity stage (or) harvest for fodder purpose	Life saving supplemental irrigation (or) Plan for Rabi crop  Sunflower, Horsegram (Sep-October month)	Groundnut harvester and decorticator implements through the Dept. of Agrl. Eng.

## 2.1 Drought: Rabi season

### 2.1.1 Rainfed situation

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 2 weeks Oct. 4 <sup>th</sup> week	Red soils	Groundnut + Pigeon pea (6: 1 ratio) Ground nut (sole crop)	No change in cropping system	Mechanical sowing with tractor drawn seed drill as the sowing window is narrow	Hiring Seed drills from the Dept. of Agrl. Eng. Supply of seeds through ISOPOM project
Delay by 4 weeks Nov. 2 <sup>nd</sup> week	Red soils	Groundnut + Pigeon pea (6: 1 ratio) Ground nut (sole crop)		Deep tillage to conserve soil moisture Mechanical sowing with tractor drawn seed drill Application of composted coir pith @ 10 t ha <sup>-1</sup> to conserve soil moisture. Seed hardening with 1 % KH <sub>2</sub> PO <sub>4</sub> (Soak the seeds in solution for 24 hours and decant the solution. Shade dry the seeds and sowing)	

Delay by 6 weeks Nov. 4 <sup>th</sup> week		Groundnut + Pigeon pea (6: 1 ratio)  Ground nut (sole crop)	Groundnut + Pigeon pea Inter cropping (VRI 2, TMV 7, ALR 3, TMV 10) Red gram (Co (RG) 7) 12: 1 ratio Sorghum + Red gram (mixed) Sorghum: Co 26, Co (S) 28 Red gram: Co (RG) 7)	Mechanical sowing with tractor drawn seed drill Adopt wider spacing of 45X10 cm. Use of short duration cultivars like VRI 2, TMV 7. Soak the seeds in 2% potassium dihydrogen phosphate for six hours and shades dry the seeds for 5 hours. Conservation of soil moisture through straw/black polythene mulching. Supplemental irrigation during pod filling stage Spraying of B and K to increase drought tolerance.	Hiring Seed drills from the Dept. of Agrl. Eng.  Supply of seeds through ISOPOM project
Delay by 8 weeks Dec. 2 <sup>nd</sup> week		Groundnut + Pigeon pea (6: 1 ratio)  Ground nut (sole crop)	Sorghum (sole crop) Sorghum: Co 26, Co (S) 28	Sorghum crop will be grown for fodder purpose.	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil management	Remarks on Implementation
Early season drought (Normal onset, followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.)	Red soils	Groundnut + Pigeon pea (12: 1 ratio) Sorghum + Red gram (mixed)	1. Reduce plant population by thinning and use biomass as mulch. 2. Re sowing in between the existing or relay cropping	1. Resort to bed-furrow system and adopt alternate row irrigation. 2. Apply stored water through micro irrigation practices (sprinkler).	Hiring inter cultural implements from the Dept. of Agrl. Eng.
Mid season drought (long dry spell, > 2 consecutive weeks rainless (>2.5 mm) period) At vegetative stage			1. Reduce the plant population to the extent of 25 to 40 per cent. 2. Postponement of top dressing 3. Spraying of 0.5 % KCl to mitigate water stress. 4. Spray kaoline @ 6 % will reduce the transpiration loss of water.	1. Inter cultivation to control weeds and use of soil mulch. 2. Efficient use of stored water for life saving irrigation (micro sprinkler or sprinkler)	Hiring inter cultural implements from the Dept. of Agrl. Eng.  Farm ponds through IWSM programme

Mid season drought (long dry spell) At reproductive stage			1. Foliar spray of 2 % DAP plus 1 % KCl during flowering and pod formation stages 2. Spraying antitranspirant like kaolin 3. Could be harvested for fodder purpose	1. Life saving irrigation 2. Weeding and Weed mulching	Farm ponds through IWSM programme
Terminal drought			1. Pigeon pea harvested for vegetable purpose 2. Harvest the groundnut crop at physiological maturity stage (or) Harvest it for fodder purpose	1. Life saving supplemental irrigation (or) Plan for Rabi crop Sunflower, Horse gram (Sep-October month)	Groundnut harvester and decorticator implements through the Dept. of Agrl. Eng.

### 2.1.2 Irrigated situation

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop /cropping system	Agronomic measures	Remarks on Implementation
Delayed/ limited release of water in canals due to low rainfall	Canal water irrigated low lands /Bore well water irrigated low lands with alluvial soils	Paddy Paddy – Pulses Paddy – Oil seeds Paddy - Banana	Paddy  Sunflower	Paddy 1. Direct seeding of sprouted seeds in line with recommended NPK 2. Use of cyclic submergence and drying to save water 3. Bunch planting (4-5 seedlings/hill) Deep planting. Sunflower 1. Drip irrigation 2. Urea and K spray @ 2.5 % at 15 days interval.	Supply of seeds through ISOPOM project  Hiring drum seeder from the Dept. of Agrl. Eng.  Supply of accessories for drip irrigation through precision farming
Non release of water in canals under delayed onset of monsoon in catchment	Canal water irrigated low lands with alluvial soils	Paddy	Raise paddy as rainfed crop then convert to low land crop after the water is released Sorghum, pulses, and gingelly are recommended as rainfed crops.	Crops are grown with available soil moisture	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop /cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Canal water irrigated low lands with alluvial soils	Paddy	Sorghum and gingelly are recommended as rainfed crops.	Crops are grown with available soil moisture	
Insufficient groundwater recharge due to low rainfall	Bore well water irrigated red and brown soils	Paddy	Sunflower  Sorghum as rainfed crop  Gingelly	1. Light life saving irrigation 2. Micro irrigation (Drip/sprinkler)system 3. Available water may be applied economically by following alternate skip furrow method. 4. Intercultural operations to break soil capillaries for checking surface moisture loss.	1. Supply of accessories for drip irrigation through precision farming

## 2.2 Unusual rains (untimely, unseasonal etc)

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Continuous high rainfall in a short span leading to water logging				
Ground nut + pigeon pea	1. Providing adequate Drainage 2. Apply plant protection measures against leaf minor, thrips and stem rot	1. Drainage 2. Spray of 40 ppm NAA for controlling excessive fall of flowers 3. Foliar spray of 0.5 % ZnSO <sub>4</sub> + 1.0 % urea	1. Providing adequate Drainage 2. Harvesting at physiological maturity stage 3. Harvest the pigeon pea for vegetable purpose	1. Reduce the moisture content of the produce to the desired level using mechanical drier
Sorghum + pigeon pea	1. Providing adequate Drainage	1. Providing adequate Drainage 2. Apply plant protection measures against downy mildew, stem rot etc.	1. Providing adequate Drainage 2. Harvesting at physiological maturity stage 3. Harvest the pigeon pea for vegetable purpose	1. Reduce the moisture content of the produce to the desired level using mechanical drier

Pulses	-do -	1. Drainage 2. Spray of 40 ppm NAA for controlling excessive fall of flowers 3. Foliar spray of 0.5 % ZnSO <sub>4</sub> + 1.0 % urea	1. Drain out 2. Harvest for vegetable purpose	1. Reduce the moisture content of the produce to the desired level using mechanical drier 2. Safe storage against storage pest and disease
Sunflower	1. Providing adequate Drainage 2. Apply plant protection measures against cut worms, hairy and tobacco caterpillar	1. Drainage 2. Spray of 40 ppm NAA for controlling excessive fall of flowers 3. Foliar spray of 0.5 % ZnSO <sub>4</sub> + 1.0 % urea 4. Plant protection against capitulum borer, downy mildew	1. Providing adequate drainage 2. Harvesting at physiological maturity stage	1. Reduce the moisture content of the produce to the desired level using mechanical drier
Paddy	Providing adequate drainage	1. Providing adequate Drainage 2. Apply 20 % of the recommended N as top dressing	1. Providing adequate drainage 2. Harvesting at physiological maturity stage	1. Reduce the moisture content of the produce to the desired level using mechanical drier
<b>Horticulture</b>				
Banana	Provide drainage Harvest at physiological maturity stage	Provide drainage Harvest at physiological maturity stage	1. Providing adequate drainage 2. Proper staking	Market immediately
Tapioca	- do -	-do -	1. Providing adequate drainage 2. Harvesting at physiological maturity stage	- do-
<b>Heavy rainfall with high speed winds in a short span</b>				
Paddy	Drainage	1. Drainage 2. Apply 20 % of the recommended N as top dressing	Drainage	1. Reduce the moisture content of the produce to the desired level using mechanical drier
<b>Horticulture</b>				
Banana	Drainage Protect the plants against lodging with bamboo sticks	Drainage Protect the plants against lodging with bamboo sticks	Drainage Protect the plant and bunch against lodging with bamboo sticks Use of Bunch cover	1. Market immediately

<b>Outbreak of pests and diseases due to unseasonal rains</b>				
Sorghum + pigeon pea	Need based plant protection IPDM for pluses	Need based plant protection IPDM for pluses in	Need based plant protection IPDM for pluses in	Safe storage against storage pest and diseases
Groundnut + pigeon pea				
Sunflower				
Pulses				
Paddy				
<b>Horticulture</b>				
Banana	Need based plant protection IPDM for pluses	Need based plant protection IPDM for pluses	Need based plant protection IPDM for pluses	Safe storage against storage pest and diseases
Tapioca				

### 2.3 Floods

<b>Condition</b>	<b>Suggested contingency measure</b>			
	<b>Seedling / nursery stage</b>	<b>Vegetative stage</b>	<b>Reproductive stage</b>	<b>At harvest</b>
<b>Transient water logging/ partial inundation</b>				
Paddy	Provide drainage Re - sowing	Provide drainage Re-transplanting in damaged fields Apply 20 % of recommended N as top dressing Foliar spray of 100 ppm salicylic acid	Provide drainage If the crop is lodged harvest it for straw purpose otherwise harvest at physiological maturity stage	Reduce the moisture content using mechanical drier
Ground nut + Red gram	-do-	-do -	Provide drainage Harvest at physiological maturity stage	
Sorghum+Red gram	-do-	Provide drainage Harvest at physiological maturity stage Apply 20 % of recommended N as top dressing	Provide drainage If the crop is lodged harvest it for straw purpose otherwise harvest at physiological maturity stage	
Sunflower	-do-	-do-	- do -	

Pulses	Drainage Re-planting in damaged fields	Provide drainage Harvest at physiological maturity stage Apply 20 % of recommended N as top dressing Foliar spray of 100 ppm salicylic acid	Provide drainage Harvest at physiological maturity stage	
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<b>Horticulture</b>				
Banana	Provide drainage strengthening of field bunds Re-planting	Provide drainage Apply 20 % of recommended N as top dressing	Provide drainage	Market immediately after harvest
Tapioca	Drainage Strengthening of field bunds Re-planting	Drainage Apply 20 % of recommended N as top dressing	Provide drainage Harvest at physiological maturity stage	Market immediately after harvest
<b>Continuous submergence for more than 2 days</b>				
Paddy	Provide drainage Re-planting/sowing Raising community nursery	Provide drainage Apply 20 % of recommended N as top dressing	Provide drainage Harvest at physiological maturity stage	Drainage Reduce moisture content using mechanical drier
Groundnut + Red gram				
Sorghum + Red gram				
Sunflower				
Pulses				
<b>Horticulture</b>	Provide drainage	Provide drainage Apply 20 % of recommended N as top dressing	-do-	Provide drainage
Banana				
Tapioca				

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

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave	- Not applicable -			
Cold wave				
Frost				
Hailstorm	- Not applicable			
Cyclone				

## 2.5 Contingent strategies for Livestock, Poultry & Fisheries

### 2.5.1 Livestock

	Suggested contingency measures		
	Before the event	During the event	After the event
<b>Drought</b>			
Feed and fodder availability	<ol style="list-style-type: none"> <li>1. Sowing of cereals (Sorghum) and leguminous crops during North-East monsoon under dry land system for dry fodder production.</li> <li>2. Harvesting of fodder crops and Hay making during the months of January and February for use in summer months/drought season.</li> <li>3. Ensiling and enrichment of surplus green grasses and sugarcane tops.</li> <li>4. Create awareness on establishment of pasture with drought resistant fodder Varieties like Guinea grass, stylo, kolukkattai grass, Acacia trees, etc.</li> <li>5. Creation of tree fodder models with Subabul, Glyricidia, Agathi, etc for tree fodder production during summer.</li> <li>6. Encouraging farmers to cultivate short-term fodder crops like sunhemp.</li> <li>7. Keeping sufficient stock of mineral mixture.</li> </ol>	<ol style="list-style-type: none"> <li>1. Chaffing of green and dry fodder to avoid wastage.</li> <li>2. Use of unconventional and locally available cheap feed ingredients for feeding of livestock.</li> <li>3. Enrichment of dry fodder with urea, Salt and molasses.</li> <li>4. Continuous supplementation of Minerals to prevent infertility.</li> <li>5. Advising the farmers to feed Balanced ration during summer months.</li> <li>6. Feeding of chaffed and salt sprinkled crop residues.</li> <li>7. Supplementation of tree fodder</li> </ol>	<ol style="list-style-type: none"> <li>1. Motivate the farmers to produce adequate quantity of improved fodder varieties like Co-4, Co FS-29, Fodder maize, fodder cowpea, etc. in under irrigation system</li> <li>2. Adequate Mineral supplementation to livestock.</li> <li>3. Storing crop residues after sprinkling 2% sodium chloride solution.</li> <li>4. Motivation of farmers to cultivate 20% of their dry land with fodder varieties before the onset of monsoon.</li> <li>5. Farmers should be advised to breed their cows during</li> </ol>

	<p>8. Popularization of the use of chaff cutters to avoid green fodder wastage.</p> <p>9. Educate the farmers about the proper method of hay making in order to avoid spoilage.</p> <p>10. Conservation of crop residues for summer feeding.</p>	<p>with the available grass fodder.</p> <p>8. Feeding livestock with locally available cheaper brewery waste.</p> <p>9. Using of ensiled grasses and sugarcane tops during the drought period.</p> <p>10. Culling/disposal of unproductive animals To conserve feed and fodder.</p> <p>11. Promote Azola cultivation for protein supplementation.</p>	<p>July-August-September so that the peak milk production does not coincide with peak summer.</p>
Drinking water	<p>1. Adopt various water conservation methods at village level to improve the ground water level for adequate water supply.</p> <p>2. Establishment of community watering holes at common grazing areas.</p> <p>3. To avoid water scarcity during the drought season, digging of bore wells may be done in dry areas.</p>	<p>1. Adequate supply of drinking water.</p> <p>2. Filling of community water tank on daily basis.</p>	<p>Water shed management practices shall be promoted to conserve the rain water.</p>
Health and disease management	<p>Cattle:-</p> <ul style="list-style-type: none"> <li>❖ FMD vaccination (Entire district)</li> <li>❖ Anthrax vaccination in endemic areas of the district (Aravakurichi and Krishnarayapuram blocks)</li> </ul> <p>Sheep &amp; Goat:-</p> <ul style="list-style-type: none"> <li>❖ FMD vaccination (Entire district)</li> <li>❖ Anthrax vaccination in endemic areas of the district (Aravakurichi and Krishnarayapuram blocks)</li> <li>❖ PPR vaccination.</li> </ul> <p>Other measures:-</p> <ol style="list-style-type: none"> <li>1. Deworming of all livestock.</li> <li>2. Control of ectoparasites.</li> <li>3. Improvement of other sanitary measures.</li> <li>4. Awareness creation campaigns can be arranged.</li> <li>5. The Animal husbandry department may be informed to store sufficient quantities of required vaccines corresponding to the animal population of the district.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reporting the outbreak to local veterinarian. <ol style="list-style-type: none"> <li>a. Reporting to the local veterinarian in case of sudden death in livestock.</li> <li>b. Proper disposal of the carcasses only after post-mortem examination by the local veterinarian.</li> </ol> </li> <li>2. Reporting to the district ADIU and VUTRC for disease confirmation.</li> <li>3. Entering the data and information in the electronic media at the NIC Centre at the district Collectorate.</li> <li>4. Preparation of disease investigation report and sending collected specimens to CRL and CUL.</li> <li>5. Isolation and treatment of affected animals.</li> <li>6. Deployment of vaccination squad for performing ring vaccination.</li> <li>7. Preventing movement of livestock in the</li> </ol>	<ol style="list-style-type: none"> <li>1. Keeping vigil on the disease outbreak.</li> </ol>

		<p>affected area.</p> <p>8. Sending regular reports to the Directorate of Animal Husbandry.</p> <p>9. Adequate Nutritional supplementation during the drought period</p>	
<b>Floods</b>			
Feed and fodder availability	Establish proper fodder storage facilities to avoid wastage of fodder through wetting during the rainy season.	. Supplementation of concentrates during the rains along with dry fodder.	Cultivation of fodder crops. 2. Feeding unchaffed crop residues to the young pasture grazing cows.
Drinking water	-	Care should be taken to provide clean and potable water to livestock.	Keeping vigil on the disease outbreak.
Health and disease management	<p>Cattle:-</p> <ul style="list-style-type: none"> <li>❖ FMD vaccination (Entire district)</li> <li>❖ Anthrax vaccination in endemic areas of the district (Aravakurichi and Krishnarayapuram blocks)</li> </ul> <p>Sheep &amp; Goat:-</p> <ul style="list-style-type: none"> <li>❖ FMD vaccination (Entire district)</li> <li>❖ Anthrax vaccination in endemic areas of the district (Aravakurichi and Krishnarayapuram blocks)</li> <li>❖ PPR vaccination.</li> </ul> <p>Other measures:-</p> <ol style="list-style-type: none"> <li>1. Deworming of all livestock.</li> <li>2. The Animal husbandry department may be informed to store sufficient quantities of required vaccines corresponding to the animal population of the district.</li> <li>3. Take steps to avoid stagnation of water in low lying areas and livestock sheds for pest control.</li> </ol>	<p>. Reporting the outbreak to local veterinarian.</p> <p>a. Reporting to the local veterinarian in case of sudden death in livestock.</p> <p>b. Proper disposal of the carcasses only after post-mortem examination by the local veterinarian.</p> <p>2. Reporting to the district ADIU and VUTRC for disease confirmation.</p> <p>3. Entering the data and information in the electronic media at the NIC Centre at the district Collectorate.</p> <p>4. Preparation of disease investigation report and sending collected specimens to CRL and CUL.</p> <p>5. Isolation and treatment of affected animals.</p> <p>6. Deployment of vaccination squad for performing ring vaccination (8 k.m. radius).</p> <p>7. Preventing movement of livestock in the affected area.</p> <p>8. Animal should be housed in better</p>	

		protected shelters.	
<b>Cyclone</b>	NA		
<b>Heat wave and cold wave</b>	NA		

## 2.5.2 Poultry

Condition	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	Procurement of good quality feed ingredients and proper storage	Adequate feeding of poultry with balanced ration.	Nutritional supplementation along with regular adequate feeding.	-
Drinking water	Arrangements shall be made for availability of ample potable drinking water during the drought season.	1. Supply of cool potable water to poultry. 2. Providing anti-stress B-Complex and C Vitamins in drinking water.	-	-
Health and disease management	1. Assessment of RD titre and vaccination against RD and IBD. 2. Deworming of poultry. 3. Provision of foggers and sprinklers to reduce heat load. 4. Supplementation of vitamins and minerals. 5. Proper planning and disposal of batch between September to January to avoid mortality	1. Feeding during early mornings and in the evenings. 2. Increasing the height of deep litter. 3. Reducing the number of birds per shed. 4. Provision of ceiling fan @ one per 1000 sq.ft. 5. Prevention and control of Coccidiosis in poultry. 6. Summer management of poultry- use of foggers and sprinklers 7. Continuous supply of cool potable water.	1. Nutritional supplementation of poultry. 2. Preparation of road map for increasing the feed ingredients production. 3. Ensuring enough stock of ingredients in the future. Disease Outbreak: 1. No poultry should be introduced in the area for	Regular updating of farmers about the weather reports, available by linkage with the local meteorological survey centre of the district.  Linked to the regular vaccination programmes of the Department of Animal Husbandry.

	<p>during the summer.</p> <p>6. Provision of cooler environment in the farm premises by tree plantation.</p>	<p>8. Supplementation of vitamins and minerals.</p> <p>9. Feeding during cooler time of the day.</p> <p>10. Feeding of balanced ration.</p> <p>11. Avoiding vaccination and debeaking during summer.</p> <p>12. Storing the feed only for short duration to avoid loss of vitamins.</p> <p>13. Avoiding having stock of layers between 21 to 36 weeks of age.</p> <p>Disease Outbreak:</p> <p>1. Reporting the outbreak to the local veterinarian.</p> <p>2. Preparing FIR and intimation to the DAH, RJDAH and ADAH.</p> <p>3. Data entry in the NIC Centre of the Collectorate and transmitting to the State Head Quarters.</p> <p>4. Deployment of disease investigation teams, collection of samples, dispatch to CRL and CUL.</p> <p>5. Vaccination of birds.</p> <p>6. Isolation and treatment affected stock.</p> <p>7. Proper disposal of dead birds.</p> <p>8. Regular reporting to the DAH.</p>	<p>next 3 months.</p> <p>2. Compensation for forceful culling.</p> <p>3. Sending the disease outbreak annual and completion report.</p>	
<b>Floods</b>				
Shortage of feed ingredients	1. Forecasting the forthcoming cyclone and informing the farmers to store the required feed materials as stock to meet out the event.	1. Providing Vitamin C and B-Complex in water.	1. Providing Vitamin C and B-Complex in water.	
Drinking water	1. Forecasting the forthcoming cyclone and informing the farmers to keep their water sources clean and make sure the availability of warm potable water to the birds.	1. Providing Vitamin C and B-Complex in water.	1. Providing Vitamin C and B-Complex in water.	

Health and disease management	<ol style="list-style-type: none"> <li>1. Vaccination against Ranikhet disease and IBD</li> <li>2. Deworming of poultry</li> <li>3. Supplementation of vitamins and minerals.</li> </ol>	<p>Disease Outbreak:</p> <ol style="list-style-type: none"> <li>1. Reporting the outbreak to the local veterinarian.</li> <li>2. Preparing FIR and intimation to the DAH, RJDAH and ADAH.</li> <li>3. Data entry in the NIC Centre of the Collectorate and transmitting to the State Head Quarters.</li> <li>4. Deployment of disease investigation teams, collection of samples, dispatch to CRL and CUL.</li> <li>5. Vaccination of birds.</li> <li>6. Isolation and treatment affected stock.</li> <li>7. Proper disposal of dead birds.</li> <li>8. Regular reporting to the DAH.</li> </ol>	<p>Disease Outbreak:</p> <ol style="list-style-type: none"> <li>1. No poultry should be introduced in the area for next 3 months.</li> <li>2. Compensation for forceful culling.</li> <li>3. Sending the disease outbreak annual and completion report.</li> </ol>	<p>TANUVAS Agro Meteorological Advisory Centre, Namakkal.</p> <p>Linked to the regular vaccination programmes of the Department of Animal Husbandry.</p>
Cyclone	NA			
Heat wave and cold wave	NA			