

State: TAMILNADU

Agriculture Contingency Plan District: THOOTHUKODI

1.0 District Agriculture profile

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1.1	Agro-Climatic/Ecological Zone			
	Agro Ecological Region / Sub Region (ICAR)	Eastern Ghat (T.N. Uplands) semi-arid ecosubregion (8.3)		
	Agro-Climatic Region (Planning Commission)	East Coast Plains and Hills Region (XI)		
	Agro Climatic Zone (NARP)	Southern Zone		
	List all the districts or part thereof falling under the NARP Zone	Tuticorin		
	Geographic coordinates of district	Latitude	Longitude	Altitude
		8.48°09.29" N	78.08°42.5" E	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Agricultural Research Station, Kovilpatti		
	Mention the KVK located in the district	SCAD- Krishi Vigyan Kendra, Vagaikulam		
1.2	Rainfall	Average (mm)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	33	-	-
	NE Monsoon(Oct-Dec):	445	1 st week of October	2 nd Week of December
	Winter (Jan- March)	81	-	-
	Summer (Apr-May)	68	-	-
	Annual	626	-	-

1.3	Land use pattern of the district (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 (%)
	Area (000' ha)	470.7	11.0 (2.34%)	76.3 (16.22%)	5.1 (1.09%)	53.9 (11.46%)	39.4 (8.38%)	19.8 (4.22%)	14.3 (3.05 %)	74.9 (15.91%)

1.4	Major Soils	Area (000' ha)	Percent (%) of total
	Deep black soils	209.6	45.7
	Very deep black soils	88.7	19.3
	Moderately deep black soils	35.2	7.7
	Moderately deep red soils	30.3	6.6
	Deep red soils	26.9	5.7

1.5	Agricultural land use		Cropping Intensity
	Net sown area	169.7	104.0
	Area sown more than once	6.9	
	Gross cropped area	176.6	

1.6	Irrigation	Area ('000 ha)	Percent (%)		
	Net irrigated area	40.1	23.70		
	Gross irrigated area	46.8	25.44		
	Rainfed area	129.6	76.30		
	Sources of Irrigation	Number	Area ('000 ha)	Percent (%)	
	Canals	4 canals	11.8	28.4	
	Tanks	634 tanks	10.1	24.3	
	Open wells	22791			
	Bore wells	99	1.1	2.7	
	Lift irrigation				
	Other sources		-		
	Total		23.4	55.7	
	Pumpsets	684			
	Micro-irrigation	1.047 (1047ha)			
	Groundwater availability and use	No. of Blocks	% area	Quality of water	
	Over exploited	7	69	Salinity level: 28 % good, 32% moderate and 25% poor Residual Sodium Carbonate: 96% good and 4% moderate Sodium Adsorption Ratio:93 % good and 7% moderate	
	Critical	1	11		
Semi- critical	4	20			
Safe	-	-			
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.

*If break-up data (irrigated, rainfed) is not available, give total area

1.7	Crops	Area (000'ha)*					
		<i>Kharif</i>		<i>Rabi</i>		Summer	Total
	Major Field Crops cultivated	<i>Irrigated</i>	<i>Rainfed</i>	<i>Irrigated</i>	<i>Rainfed</i>		
1	Paddy	6.0	-	8.6	-	3.3	18.0
2	Blackgram	-	1.3	0.06	34.1	-	35.5
3	Green gram	0.01	-	0.08	30.4	-	30.5
4	Pearl millet	-	-	0.1	11.0	-	11.1
5	Maize	-	0.04	1.1	6.2	-	7.4
6	Sorghum	-	-	0.1	7.4	-	7.5
	Horticulture crops - Fruits	Total area		Irrigated		Rainfed	
1	Banana	10.2		10.2		-	
	Horticultural crops - Vegetables	Total area		Irrigated		Rainfed	
1	Chillies	15.2		2.5		12.7	
2	Coriander	4.7		-		4.7	
3	Onion	1.0		0.1		0.9	
4	Drumstick	1.6		1.5		0.5	

Medicinal and Aromatic crops		Total area	Irrigated	Rainfed
1	Medicinal and Aromatic crops	-	-	-
Plantation crops		Total area	Irrigated	Rainfed
1	Coconut	6.3	6374.6	10.1
2	Palmarah	3.2	2.5	3279.8
Fodder crops		Total area	Irrigated	Rainfed
1	Fodder sorghum	8.0	0.06	8.0
Total fodder crop area		8.0	0.08	8.0
Grazing land		-	-	-
Sericulture etc		-	-	-
Others (Specify)		-	-	-

1.8	Livestock (17th Livestock Census)	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)	59.3	242.5	301.8
	Crossbred cattle	131.4	525.6	657.1
	Non descriptive Buffaloes (local low yielding)			319.1
	Graded Buffaloes			
	Goat			318.3
	Sheep			540.7
	Others (Pig, dog etc.)			6.9
	Commercial dairy farms (Number)			
1.9	Poultry (17th Livestock Census)	No. of farms	Total No. of birds ('000)	
	Commercial		44.1	
	Backyard		360.6	
1.10	Fisheries (Data source: Chief Planning Officer)			
	A. Capture			

i) Marine (Data Source: Fisheries Department)	No. of fishermen	Boats		Nets		Storage facilities (Ice plants etc.)
		Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
	69558	345	4287	345	--	19
ii) Inland (Data Source: Fisheries Department)	No. Farmer owned ponds		No. of Reservoirs		No. of village tanks	
	Nil		Nil		1	
B. Culture						
	Water Spread Area (ha)		Yield (t/ha)		Production ('000 tons)	
i) Brackish water (Data Source: MPEDA/ Fisheries Department)	400		---			
ii) Fresh water (Data Source: Fisheries Department)	11926		---		1920 kg	
Others						

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)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production (t)	Productivity (kg/ha)
1	Paddy	-	4127	-	4147	-	2802	73192	3692
2	Black gram	-	-	-	-	-	-	12768	533
3	Green gram	-	-	-	-	-	-	11595	522
4	Pearl millet	-	-	-	-	-	-	29988	3749
5	Maize	-	-	-	-	-	-	22498	3749
Others		-	-	--	-	-	-	-	-

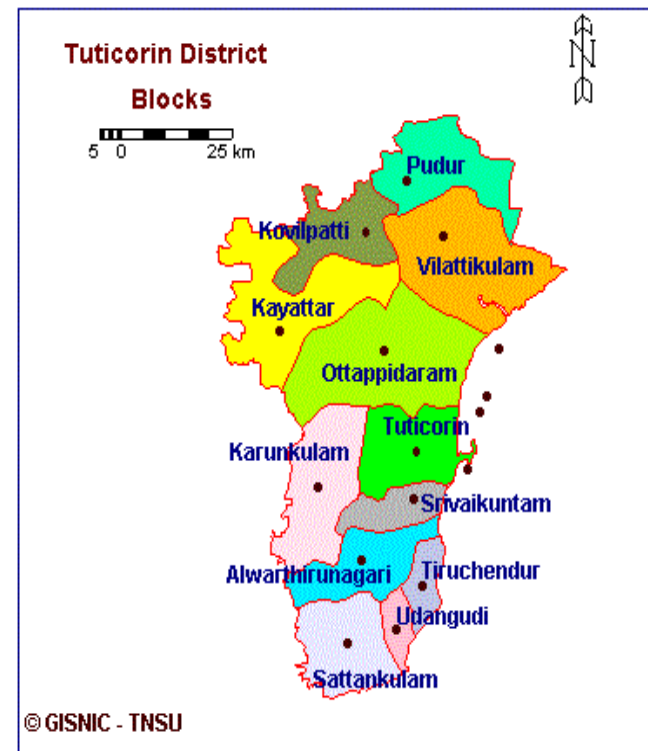
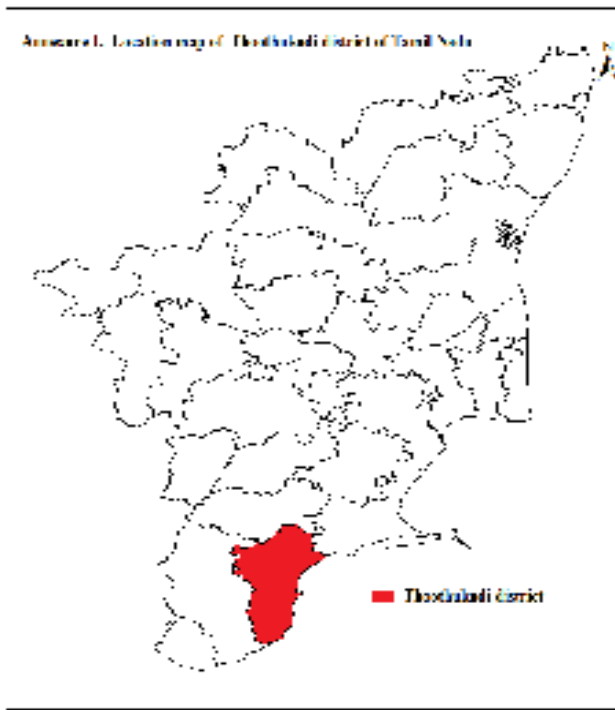
	Major Horticultural crops								
1	Chillies							5074	488
2	Coriander							1194	231
3	Banana							618720	65835
4	Coconut							472 (Lakh t)	7946 (Nuts/ha)

1.12	Sowing window for 5 major crops (start and end of sowing period)	Crop 1 (specify): Paddy	Crop 2: Blackgram	Crop 3: Green gram	Crop 4: Pearl millet	Crop 5: Maize
	Kharif- Rainfed	-	-	-	-	-
	Kharif-Irrigated	1 st week of June to 1 st week of July	-	-	-	-
	Rabi- Rainfed	-	4 th week of October to 2 nd week of November	4 th week of October to 2 nd week of November	4 th week of October to 2 nd week of November	4 th week of October to 2 nd week of November
	Rabi-Irrigated	4 th week of October to 3 rd week of November	-	-	-	4 th week of October to 2 nd week of November

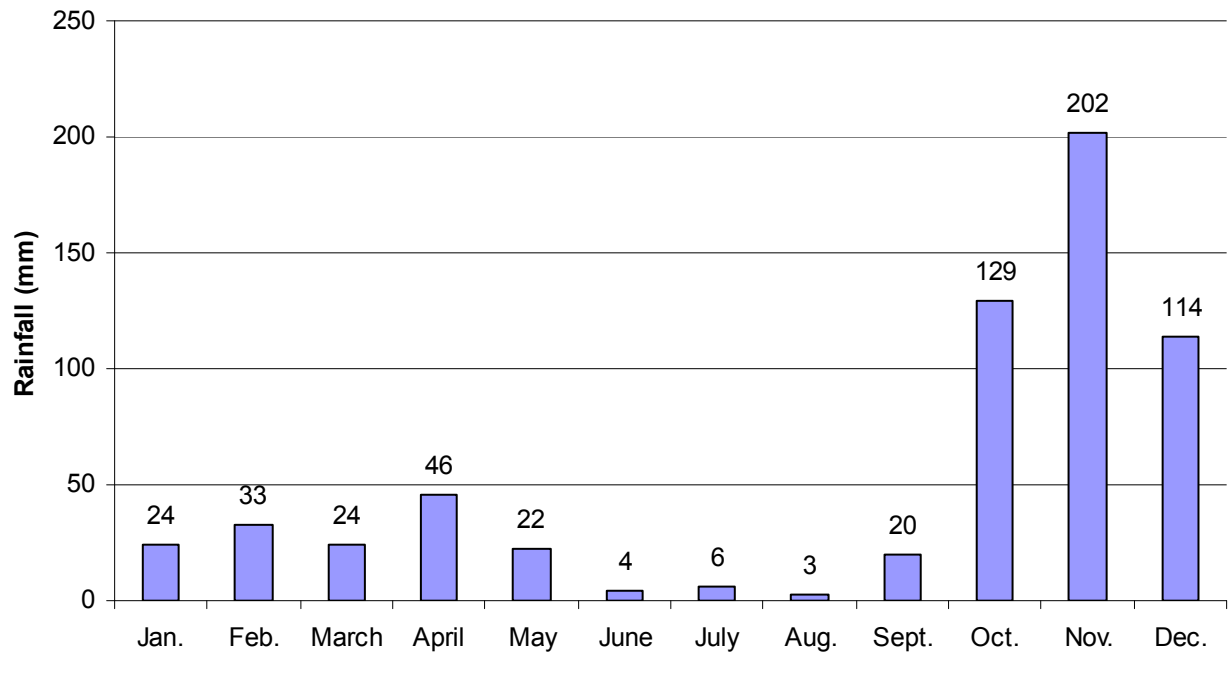
1.13	What is the major contingency the district is prone to? (Tick mark and mention years if known during the last 10 year period)	Regular	Occasional	None
	Drought	-	√	-
	Flood	-	√	-
	Cyclone	-	-	√
	Hail storm	-	-	√
	Heat wave	-	-	√
	Cold wave	-	-	√
	Frost	-	-	√
	Sea water inundation	-	-	√
	Pests and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

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

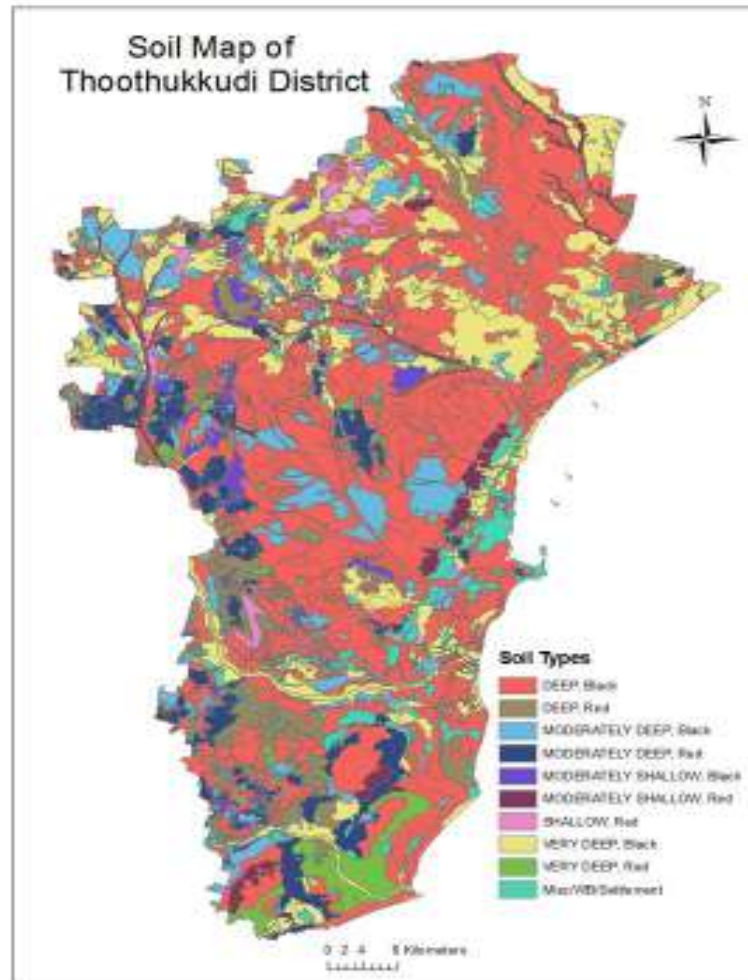
Annexure 1. Location map of Thoothukudi district and the blocks



Annexure 2. Mean annual rainfall of Thoothukudi district of Tamil Nadu



Annexure 3. Soil Map of Thoothukkudi district



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	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)	Deep and very deep black soils	Black gram Green gram (VBN 4, Co 6) Pearlmillet Maize Chilles Sorghum Cotton	No change No Change	Mechanical sowing with tractor drawn seed drill as the sowing window is narrow Seed hardening-(18 hrs. soaking in water followed by 24 hrs. shade drying Broad bed furrows	Department of Agriculture
		Deep Redsoil Sorghum + Cow pea			
Delay by 4 weeks (November 2 nd week)	Deep and very deep black soils	Black gram Green gram Maize Chilles Sorghum Cotton	Sunflower (Co 4 and private hybrids) Pearl millet (CO 7, CO (Cu) 9, X 7, ICMV 221) Finger millet Minor millets (Fox tail millet, Little millet) Coriander (PKM1) Bengal gram	Mechanical sowing with tractor drawn seed drill as the sowing window is narrow Soil test based integrated nutrient management Seed hardening-(18 hrs. soaking in water followed by 24 hrs. shade drying	
		Deep Red soil Sorghum + Cow pea	Sunflower (Co 4 and private hybrids) Pearl millet (CO 7, CO (Cu) 9, X 7, ICMV 221)	Broad bed furrows 10% excess seed rate	

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
				Compartmental bund Thinning and crop residue mulching Foliar Nutrition (Urea: 1-2%, KCl: 2%, KNO ₃ : 2%)	
Delay by 6 weeks (November 4 th week week)	Deep and very deep black soils Red Soil	Black gram Green gram Maize Chilles Sorghum Cotton Sorghum + Cow pea	Medicinal senna (KKM1) Fodder Sorghum (Co 27, K11) Horse gram Mixed crop of Senna + Coriander + Bengal gram Medicinal senna (KKM1) Fodder Sorghum (Co 27, K11) Horse gram	Seed hardening-(18 hrs. soaking in water followed by 24 hrs. shade drying Inter-cultivation Broad bed furrow 10% excess seed rate Thinning and crop residue mulching	Department of Agriculture
Delay by 8 weeks (December 2 nd week)	Deep and very deep black soils Red soil	Black gram Green gram Maize Chilles Sorghum Cotton Sorghum + Cow pea	Mixed crop of Medicinal Senna+Coriander+Bengal gram Medicinal senna (KKM1) Periwinkle Horse gram Medicinal senna (KKM1) Periwinkle Horse gram	Seed hardening-(18 hrs. soaking in water followed by 24 hrs. shade drying Inter-cultivation Broad bed furrow 10% excess seed rate crop residue mulching	Department of Agriculture

Condition			Suggested Contingency measures		
Early season drought (Normal onset, followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil management	Remarks on Implementation
	Deep and very deep black soils	Blackgram Greengram Pearlmillet Maize Chillies Sorghum Cotton	Re sowing/gap filling Supplemental irrigation (farm ponds) using micro irrigation system Thinning to retain one seedling at 30 cm Crop residue mulching	Application of Organic manure 12.5 t/ha Soil test based integrated nutrient management Broad bed furrows Thinning Dust (soil) mulching	Department of Agriculture
	Red soil	Sorghum + Cow pea	Re sowing/gap filling Supplemental irrigation (farm ponds) using micro irrigation system Thinning to retain one seedling at 30 cm Crop residue mulching	Application of Organic manure 12.5 t/ha Soil test based integrated nutrient management Compartmental bund Thinning Dust (soil) mulching	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil management	Remarks on Implementation
At vegetative stage	Deep and very deep black soils	Blackgram Greengram Pearlmillet Maize Chillies Sorghum Cotton	Life saving irrigation using microirrigation system 1% Kcl spray 3% Kaoline spray 0.1ppm Brasinosteriod spray 100ppm Salicylic acid Water spray	Application of Organic manure 12.5 t/ha Soil test based integrated nutrient management Broad bed furrows Thinning Dust (soil) mulching	Department of Agriculture
	Red Soil	Sorghum + Cow pea	Life saving irrigation using microirrigation system 1% Kcl spray 3% Kaoline spray 0.1ppm Brasinosteriod spray 100ppm Salicylic acid Water spray	Application of Organic manure 12.5 t/ha Soil test based integrated nutrient management Compartmental bund Thinning Dust (soil) mulching	
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil management	Remarks on Implementation
At reproductive stage	Deep and very deep black soils	Blackgram Greengram Pearlmillet Maize Chillies Sorghum Cotton	Life saving irrigation (From constructed farm ponds) Weeding and Weed mulching 1% Kcl spray 3 %Kaoline spray 0.1ppm Brasinosteriod spray 100ppm Salicylic acid Water spray	---	Department of Agriculture
	Red Soil	Sorghum + Cow pea	---do---		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil management	Remarks on Implementation
Terminal drought	Deep and very deep black soils	Blackgram Greengram Pearlmillet Maize Chillies Sorghum Cotton	Harvest at physiological maturity stage Water spray	===	Department of Agriculture
	Red soil	Sorghum + Cow pea	----do----		

2.1.2 Irrigated situation

Condition	Major Farming situation	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	Low land tank/tube well /canal irrigated black soil	Paddy (ASD 16, 17, 18 and ADT 42,43 and CO 47)	SRI method of rice cultivation Maize	Limited irrigation with mulching	Department of Agriculture
		Banana (Vayal Vazhai, Poovan, Grand Naine)	Banana (Leaf purpose) Chillies (K 1, PKM 1)	Drip irrigation with mulching	
Non release of water in canals under delayed onset of monsoon in catchment		Paddy (ASD 16, 17, 18 and ADT 42,43 and CO 47)	Short duration Pulses	2% DAP spray for pulses	Department of Agriculture
		Banana (Vayal Vazhai, Poovan, Grand Naine)		Application of Organic manure 12.5 t/ha	

Condition	Major Farming situation	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	Low land tank/ tube well canal irrigated black soil	Paddy (ASD 16, 17, 18 and ADT 42,43 and CO 47)	Rainfed maize and Short duration Pulses	2% DAP spray for pulses Conservation Furrow Thinning Soil test based integrated nutrient management Application of Organic manure 12.5 t/ha	Department of Agriculture
		Banana (Vayal Vazhai, Poovan, Grand Naine)	=		
Insufficient groundwater recharge due to low rainfall	Irrigated black soil (Tube and open well)	Paddy (ASD 16, 17, 18 and ADT 42,43 and CO 47)	Maize, pulses,vegetables (Chilli, tomato and Brinjal)	Limited irrigation	
		Banana (Vayal Vazhai, Poovan, Grand Naine)	=	Alternate Furrow irrigation Drip irrigation	

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

Condition	Suggested contingency measure			
	Vegetative stage ^k	Flowering stage ^l	Crop maturity stage ^m	Post harvest ⁿ
Continuous high rainfall in a short span leading to water logging				
Paddy	Provide Drainage			Mechanical drying and Shift to safer place against storage pest and disease
Black gram		-do-		do
Green gram		do		do
Maize		-do-		do
Sorghum		-Do-		do
Horticulture				
Banana		-Do-		Cold storage

Chilli	-Do-			Mechanical drying and Safe storage against storage pest and disease
Heavy rainfall with high speed winds in a short span²				
Banana	Drainage erection of wind breaks and shelter belts	Drainage, erection of supporting poles wind breaks and shelter belts	Drainage, erection of supporting poles wind breaks and shelter belts	Cold storage
Chillies	Drainage and erection of wind breaks and live fences	Drainage and erection of wind breaks and live fences	Drainage and erection of wind breaks and live fences	Mechanical drying and cold storage
Outbreak of pests and diseases due to unseasonal rains				
Paddy	Integrated Pest and Disease Management for, paddy, pluses, maize and sorghum	Integrated Pest and Disease Management for, paddy, pluses, maize and sorghum	-	Safe storage against storage pest and diseases
Black gram				
Green gram				
Maize				
Sorghum				
Horticulture				
Banana	- Integrated Pest and Disease Management	Integrated Pest and Disease Management		Cold storage
Chillies	Integrated Pest and Disease Management	Integrated Pest and Disease		-do-

2.3 Floods

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation¹				
Paddy		-		Harvest and mechanical drying
Pulses		-do-		-do-
Horticulture				
Banana		Provide Drainage		
Chillies		Provide Drainage		
Continuous submergence for more than 2 days²				
Paddy		-		Harvest and mechanical drying
Pulses		Provide Drainage		Harvest and mechanical drying
Horticulture				
Chillies		Provide Drainage		Cold storage

Banana	Provide Drainage	Cold storage
Sea water inundation ³	NA	

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

Extreme event type	Suggested contingency measure ^r			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave ^p				
Cold wave ^q				
Frost				
Horticulture				
Hailstorm				
Cyclone				
Horticulture				
Banana	Drainage, erection of wind breaks and shelter belts	Drainage, erection of upporting poles wind breaks and shelter belts and Propping	Drainage, erection of supporting poles wind breaks and shelter belts and Propping	Cold storage

2.5 Contingent strategies for Livestock, Poultry & Fisheries:

	Suggested contingency measures		
	Before the event	During the event	After the event
Drought			
Feed and Fodder availability	<p>Sowing of cereals (Sorghum) and leguminous crops (Lucerne, Horsegram, Cowpea) during North-East monsoon under dry land system for fodder production.</p> <p>Fodder production with Sorghum – stylo- Sorghum on rotation basis.</p> <p>As the district is moderately prone to draught, all the available crop residues especially paddy straw, sorghum /Bajra/maize stover should be stored properly in the farm of hay at individual farmer level.</p> <p>Training to farmers on silage, Azolla cultivation</p> <p>Create awareness on establishment of pasture with drought resistant fodder Varieties like Guinea grass, stylo, kolukkattai grass, Acacia trees, etc.</p> <p>Creation of tree fodder models with Subabul, Glyricidia, Agathi, etc for tree fodder production during summer.</p> <p>Encouraging farmers to cultivate short-term fodder crops like sunhemp.</p> <p>Chopping of fodder should be made as mandatory in every village through supply and establishment of good quality crop cutters.</p> <p>Creation of permanent fodder, feed and fodder seed banks in all drought prone</p>	<p>Harvest and use all the failed crop (Paddy, Sorghum, Maize, Bajra, Green gram, Blackgram, Horse Gram etc.) material as fodder.</p> <p>Harvest all the top fodder available (Subabul, Glyricidia, Agathi, Prosopis etc) and feed the LS during drought In severe drought don't allow for grazing and try to stall fed the animals</p> <p>Silage / hay, UMMB and mineral mixture should be supplied on subsidy to the farmers having high productive livestock</p> <p>Transport dry fodder bales from the fodder grid at DLF, Hosur to the drought affected villages</p> <p>All the hay should be enriched with 2% Urea molasses solution or 1% common salt solution and fed to LS</p> <p>Herd should be split and supplementation should be given only to the highly productive and breeding animals during severe drought</p> <p>Provision of emergency grazing/feeding (Cow-calf camps or other special arrangements to protect high productive & breeding stock) during severe drought</p> <p>Encourage mixing available kitchen waste with dry fodder while feeding to the milch animals</p> <p>Arrangements should be made for mobilization of small ruminants across the districts where no drought exists</p> <p>Unproductive livestock should to be culled during severe drought</p> <p>Create transportation and marketing facilities for the culled and unproductive animals (10000-20000 animals)</p>	<p>Flushing the stock to recoup</p> <p>Replenish the feed and fodder banks</p> <p>Supply of quality seeds of COFS 29, Stylo and fodder slips of Co3, Co4, guinea grass well before monsoon to the farmers and encourage to grow by input subsidy</p>

	<p>villages</p> <p>Capacity building and preparedness of the stakeholders and official staff for the unexpected events</p>	<p>Subsidized loans (5-10 crores) should be provided to the livestock keepers</p>	
Cyclone	<p>Harvest all the possible wetted grain (Rice/ sorghum /Bajra/maize /blackgram etc) and use as animal feed.</p> <p>As the district is chronically prone for cyclone, arrange for storing minimum required quantity of hay (25-50 kg) and concentrates (10-25 kg) per animal in farmer's / LS keepers house/ shed for feeding during cyclone.</p> <p>Stock of anti-diarrheal drugs and electrolytes should be made available for emergency transport</p> <p>Don't allow the animals for grazing in case of early forewarning (EFW) of cyclone</p> <p>Incase of EFW of severe cyclone, shift the animals to safer places.</p>	<p>Treatment of the sick, injured and affected animals through arrangement of mobile emergency veterinary hospitals / rescue animal health workers.</p> <p>Diarrhea out break may happen. Health camps should be organized</p> <p>In severe cases un-tether or let loose the animals</p> <p>Arrange transportation of highly productive animals to safer place</p> <p>Spraying of fly repellants in animal sheds</p>	<p>Repair of animal shed</p> <p>Deworm the animals through mass camps</p> <p>Vaccinate against possible disease out breaks like HS, BQ, FMD and PPR</p> <p>Proper dispose of the dead animals / carcasses by burning / deep burying (4-8 feet) with lime powder (1kg for small ruminants and 5kg for large ruminants) in pit</p> <p>Bleach / chlorinate (0.1%) drinking water or water resources</p> <p>Collect drowned crop material, dry it and store for future use</p> <p>Sowing of short duration fodder crops in unsown and water logged areas when crops are damaged and no chance to replant</p> <p>Application of urea (20-25kg/ha) in the inundated areas and CPR's to enhance the bio mass production.</p>

<p>Floods</p>	<p>In case of early forewarning (EFW), harvest all the crops that can be useful as fodder in future (store properly)</p> <p>Don't allow the animals for grazing if severe floods are forewarned</p> <p>Keep stock of bleaching powder and lime</p> <p>Carry out Butax spray for control of external parasites</p> <p>Identify the Clinical staff and trained paravets and indent for their services as per schedules</p> <p>Identify the volunteers who can serve in need of emergency</p> <p>Arrangement for transportation of animals from low lying area to safer places and also for rescue animal health workers to get involve in rescue operations</p> <p>Capacity building and preparedness of the stakeholders and official staff for the unexpected events</p>	<p>Transportation of animals to elevated areas</p> <p>Proper hygiene and sanitation of the animal shed</p> <p>In severe storms, un-tether or let loose the animals</p> <p>Avoid soaked and mould infected feeds / fodders to livestock</p> <p>Emergency outlet establishment for required medicines or feed in each village</p> <p>Spraying of fly repellants in animal sheds</p>	<p>Repair of animal shed</p> <p>Bring back the animals to the shed</p> <p>Cleaning and disinfection of the shed</p> <p>Bleach (0.1%) drinking water / water sources</p> <p>Deworming with broad spectrum dewormers</p> <p>Proper disposal of the dead animals / carcasses by burning / deep burying (4-8 feet) with lime powder (1kg for small ruminants and 5kg for large ruminants) in pit</p> <p>Drying the harvested crop material and proper storage for use as fodder.</p>
<p>Heat & Cold wave</p>	<p><i>NA</i></p>		
<p>Health and Disease management</p>	<p>Procure and stock emergency medicines and vaccines for important endemic diseases of the area</p> <p>All the stock must be immunized for endemic diseases of the area</p> <p>Anthrax</p> <p>Vaccination against Anthrax during October,</p>	<p>Carryout deworming to all animals entering into relief camps</p> <p>Identification and quarantine of sick animals</p> <p>Constitution of Rapid Action Veterinary Force</p> <p>Performing ring vaccination (8 km radius) in case of any outbreak</p>	<p>Keep close surveillance on disease outbreak.</p> <p>Undertake the vaccination depending on need</p> <p>Keep the animal houses clean and spray disinfectants Farmers should be advised to breed their milch animals during</p>

	<p>December and January in Thoothukudi, Srivaikundam blocks</p> <p>Foot and Mouth Disease</p> <p>Vaccination against FMD during September and October in Ettayapuram and Thoothukudi blocks</p> <p>Blue Tongue</p> <p>Vaccination against Blue tongue disease during October and November in Kovilpatti, Vilathikulam, Ottapidaram, Karunkulam, Srivaikundam, Pudur and Ettayapuram blocks.</p> <p>PPR</p> <p>Vaccination against PPR disease during October and November in Ottapidaram block</p> <p>Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district</p> <p>Adequate refreshment training on draught /flood/cyclone management to be given to VAS, Jr.VAS, LI with regard to health & management measures.</p> <p>Procure and stock multivitamins & area specific mineral mixture</p>	<p>Restricting movement of livestock in case of any epidemic</p> <p>Rescue of sick and injured animals and their treatment</p> <p>Organize with community, daily lifting of dung from relief camps</p>	<p>July-September so that the peak milk production does not coincide with mid summer</p>
Insurance	<p>Encouraging insurance of livestock</p>	<p>Listing out the details of the dead animals</p>	<p>Submission for insurance claim and availing insurance benefit</p> <p>Purchase of new productive animals</p>
Drinking water	<p>Identification of water resources</p> <p>Desilting of ponds</p> <p>Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals)</p> <p>Construction of drinking water tanks in</p>	<p>Restrict wallowing of animals in water bodies/resources</p>	<p>Bleach (0.1%) drinking water / water sources</p> <p>Provide clean drinking water</p>

	herding places/village junctions/relief camp locations Community drinking water trough can be arranged in shandies /community grazing areas		
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Vaccination schedule in small ruminants (Sheep & Goat)

Disease	Season
Foot and mouth disease (FMD)	Preferably in winter / autumn
PPR	All seasons, preferably in June-July
Black quarter (BQ)	May / June
Enterotoxaemia (ET)	May
Haemorrhagic septicaemia (HS)	March / June
Sheep pox (SP)	December / march

Vaccination programme for cattle and buffalo:

Disease	Age and season at vaccination
Anthrax	In endemic areas only, Feb to May
HS	May to June
BQ	May to June
FMD	November to December

2.5.2

Poultry

	Suggested contingency measures		
Drought	Before the event ^a	During the event	After the event
Shortage of feed ingredients	Storing of house hold grain like maize, broken rice, bajra etc, Culling of weak birds	Supplementation only for productive birds with house hold grain Supplementation of shell grit (calcium) for laying birds	Supplementation to all
Drinking water	Rain water harvesting	Sanitation of drinking water	Give sufficient water as per the bird's requirement
Health and disease management	Culling of sick birds. Deworming and vaccination against RD and IBD	Mixing of Vit. A,D,E, K and B-complex including vit C in drinking water	Hygienic and sanitation of poultry house Disposal of dead birds by burning / burying with lime powder in pit
Floods			
Shortage of feed ingredients	In case of EFW, shift the birds to safer place Storing of house hold grain like maize, broken rice, bajra etc, Culling of weak birds	Use stored feed as supplement Don't allow for scavenging	Routine practices are followed
Drinking water	Provide clean drinking water	Sanitation of drinking water	Sanitation of drinking water
Health and disease management	In case of EFW, add antibiotic powder in drinking water to prevent any disease outbreak	Sanitation of poultry house Treatment of affected birds Prevent water logging surrounding the sheds Assure supply of electricity Sprinkle lime powder to prevent	Disposal of dead birds by burning / burying with lime powder in pit Disposal of poultry manure to prevent protozoal problem

		ammonia accumulation due to dampness	Supplementation of coccidiostats in feed Vaccination against RD
Cyclone			
Shortage of feed ingredients	In case of EFW, shift the birds to safer place Storing of house hold grain like maize, broken rice, bajra etc, Culling of weak birds	Use stored feed as supplement Don't allow for scavenging Protect from thunder storms	Routine practices are followed
Drinking water		Use water sanitizers or offer cool drinking water	
Health and disease management	In case of EFW, add antibiotic powder in drinking water to prevent any disease outbreak	Sanitation of poultry house Treatment of affected birds Prevent water logging surrounding the sheds Assure supply of electricity Sprinkle lime powder (5-10g per square feet) to prevent ammonia accumulation due to dampness	Disposal of dead birds by burning / deep burying with lime powder in pit Disposal of poultry manure to prevent protozoal problem Supplementation of coccidiostats in feed Vaccination against Ranikhet Disease (0.5ml S/c)
Heat wave and cold wave	<i>NA</i>		

^a based on forewarning wherever available

2.5.3

Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event ^a	During the event	After the event
1) Drought			
A. Capture			
Marine	Repairing and overhauling the ice plants and freezing plants	Keeping the fish preservation plants in good condition.	Training the fishermen in hygienic handling of fishes.
Inland			
(i) Shallow water depth due to insufficient rains/inflow	---	---	---
(ii) Changes in water quality	---	---	---
(iii) Any other	---	---	---
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	Desilting and ploughing the aquaculture ponds.	Keeping the ponds dry for rectifying disease problem.	Making the ponds ready for stocking and start aquaculture practice.
(ii) Impact of salt load build up in ponds / change in water quality	Assessment of water hardness and salinity check.	Assessing the environmental parameters for algal check.	Liming the culture system for stocking of fish seeds.
(iii) Any other	---	---	---
2) Floods			
A. Capture			
Marine	Repairing the crafts and gears.	Keep the crafts and gears in safe condition.	Training the fishermen in hygienic handling of fishes, fish preservation and processing.
Inland			
(i) Average compensation paid due to loss of human life	---	---	---
(ii) No. of boats / nets/damaged	---	---	---
(iii) No. of houses damaged			

(iv) Loss of stock	---	---	---
(v) Changes in water quality	---	---	---
(vi) Health and diseases	---	---	---
B. Aquaculture			
(i) Inundation with flood water	Harvesting the farms.	Keeping the ponds without stocking	Making the ponds ready for stocking
(ii) Water continuation and changes in water quality	Water quality check	Water quality check.	Assessing the water quality for seed stocking.
(iii) Health and diseases	Checking the microbial load.	Checking the microbial load.	Water treatment for control of microbes.
(iv) Loss of stock and inputs (feed, chemicals etc)	Fish pond sampling and estimate the loss.	Safety of feeds and chemicals used for aquaculture.	Usage of feeds and chemicals for starting culture practice.
(v) Infrastructure damage (pumps, aerators, huts etc)	Safeguarding the pumps, aerators and pump house.	Safeguarding the pumps, aerators and pump house.	Repairing the pumps and aerators for use in aquaculture.
(vi) Any other	---	---	---
3. Cyclone / Tsunami			
A. Capture			
Marine			
(i) Average compensation paid due to loss of fishermen lives	Safety of fishermen and fishing accessories.	Safety of fishermen and fishing accessories.	Estimating the loss of lives for compensation.
(ii) Avg. no. of boats / nets/damaged	Safety of boats and nets.	Keeping the boats and nets in safe condition.	Assessing the damages to boats and nets.
(iii) Avg. no. of houses damaged	Safety of houses	Safety of houses	Estimating the loss for damaged houses.
Inland			
B. Aquaculture	---	---	---
(i) Overflow / flooding of ponds	---	---	---
(ii) Changes in water quality (fresh water / brackish water ratio)	---	---	---

(iii) Health and diseases	---	---	---
(iv) Loss of stock and inputs (feed, chemicals etc)	Training of fish farmers for safety of farm accessories	Safety of feeds, chemicals <i>etc.</i>	Estimate the losses.
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)	Alertness for safety of infrastructure.	Safety of infrastructure.	Renovation and reconstruction of infrastructure.
(vi) Any other	---	---	---
4. Heat wave and cold wave			
A. Capture			
Marine	Studying the temperature of water and assessing mass mortality of fishes.	Studying the environmental characters and removing the dead fishes.	Assessing the fish catches and provide compensation for fishermen.
Inland	---	---	---
B. Aquaculture			
(i) Changes in pond environment (water quality)	Studying the water temperature periodically.	Studying the water temperature periodically.	Take measures for control rise/fall of water temperature.
(ii) Health and Disease management	Monitoring the disease problem in cultured fishes.	Control mortality of fishes by providing disease treatment.	Remove infected animals and provide disinfection and treatment.
(iii) Any other			

^a based on forewarning wherever available