State: TAMIL NADU

Agriculture Contingency Plan for District: SALEM

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Region / Sub Region (ICAR)	Eastern Ghats And TamilNadu Uplands And Dry Region (8.3)		
	Agro-Climatic Region (Planning Commission)	Southern Plateau and Hills Region (X)		
	Agro Climatic Zone (NARP)	North Western Zone (TN-2)		
	List all the districts or part thereof falling under the NARP Zone	Salem district, Dharmapuri district excluding hilly areas, Namakkal district excluding Thiruchengodu and Perambalur taluka.		
	Geographic coordinates of district	**Latitude**	**Longitude**	**Altitude**
		11° 38'36.86"N	78°09'26.35" E	309m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Tapioca and Castor Research Station, Yethapur-636117		
	Mention the KVK located in the district	ICAR-KVK, Santhiyur, Salem Dt.-636004		
1.2	**Rainfall**	**Average (mm)**	**Normal Onset**	**Normal Cessation**
	SW monsoon (June-Sep):	493	June 1st week	October 1st week
	NE Monsoon (Oct-Dec):	301	October 2nd week	December 1st week
	Winter (Jan- Feb)	28		
	Summer (Mar-May)	161		
	Annual	983		

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)	520.5	125.7	59.1	4.2	5.1	3.2	38.9	55.4	24.8

1. 4	**Major Soils**	**Area ('000 ha)**	**Percent (%) of total**
	1. Shallow red soils	98.8	19.0
	2. Moderately shallow red soils	94.3	18.1
	3. Very deep black soils	62.3	12.0
	4. Moderately deep red soils	46.0	8.9
	5. Deep black soils	43.1	8.3
1.5	**Agricultural land use**	**Area ('000 ha)**	**Cropping intensity %**
	Net sown area	205.1	109.7
	Area sown more than once	19.9	
	Gross cropped area	224.9	

1.6	**Irrigation**	**Area ('000 ha)**		
	Net irrigated area	98.8		
	Gross irrigated area	111.6		
	Rainfed area	106.3		
	Sources of Irrigation	**Number**	**Area ('000 ha)**	**% area**
	Canals		4.0	4.1
	Tanks	546	1.4	1.4
	Open wells	1,07,723	121.3	88.8
	Bore wells	9,872	9.3	9.4

	Lift irrigation schemes	-	-	-
	Other sources (Kanmai)	1,566	-	-
	Total	-	137.8	16.8
	Pumpsets	1,17,535	0.4	
	Micro-irrigation			
	Groundwater availability and use	**No. of blocks**	**% area**	**Quality of water**
	Over exploited	14	70	Salinity level: 27 % good, 51% moderate and 22% poor Residual Sodium Carbonate: 72% good, 15% moderate and 13% poor Sodium Adsorption Ratio:95 % good and 5% moderate
	Critical	2	10	
	Semi- critical	3	15	
	Safe	1	5	
	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	9.0	18.4	11.7	18.9	5.3	63.3
	2	Maize	15.6	9.3	13.4	3.5	-	41.7
	3	Paddy	9.4	0.2	22.9	0.09	-	32.6
	4	Groundnut	1.3	17.9	5.1	0.1	-	24.4
	5	Sugarcane	6.7	0	7.8	0	-	14.4
	6	Cotton	4.9	6.1	1.1	6.1	-	12.9
		Horticulture crops - Fruits	**Total area ('000 ha)**					
	1	Tapioca	11.5					
	2	Mango	8.9					
	3	Turmeric	5.2					
		Horticultural crops - Vegetables	**Total area ('000 ha)**					
	1	Tomato	4.2					
	2.	Chillies	1.2					
	2.	Brinjal	1.1					

		Plantation crops	Total area ('000 ha)
	1	Coffee	6.9
	2	Arecanut	1.4

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)	49.3	74.2	123.6
	Crossbred cattle	64.9	375.6	440.6
	Non descriptive Buffaloes (local low yielding)			146.5
	Graded Buffaloes			
	Goat			360.3
	Sheep(cross bred)			355.0
	Sheep (indigenous)			
	Others (Pig, Horse, etc.)			14.1
	Commercial dairy farms (Number)			More than 200 farms
1.9	**Poultry**	**No. of farms**	**Total No. of birds (number)**	
	Commercial	-	15,85,850	
	Backyard	-	10,88,229	

1.10 Fisheries

	A. Capture						
	i. Marine (Data Source: Fisheries Department)	No. of fishermen	Boats		Nets		Storage facilities (Ice plants etc.,)
		19673	Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
			2	1229	12307	683 (Cast nets) Drag Net : 185 Other Nets: 63	
	ii. Inland (Data Source:	No. Farmers owned ponds		No. of Reservoirs		No. of village tanks	

	Fisheries Department)	20		
	B.Culture			
		Water Spread Area (ha)	Yield (t/ha0	Production (*000 tons)
	i. Brackish water (Data Source: MPEDA/Fisheries Department)			
	ii. Fresh water(Data Source: Fisheries Department)			

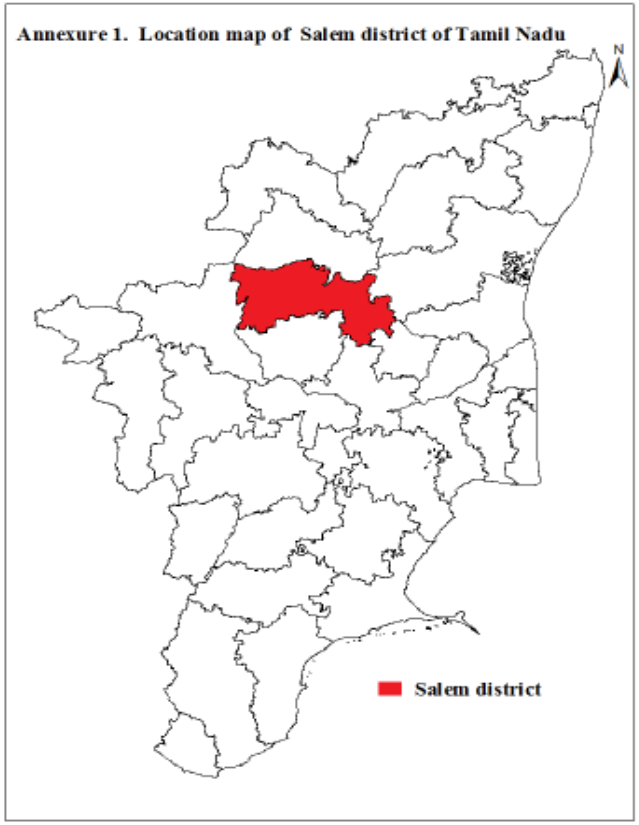
1.11	**Production and Productivity of major crops** (Average of last 3 years: 2006, 07, 08)	**Kharif**		**Rabi**		**Summer**		**Total**	
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)
1	Sorghum	25.6	675	19.9	798	-	-	45.5	735
2	Maize	45.8	1750	80.9	3025	-	-	126.7	2055
3	Paddy	45.1	6865	106.1	6450	-	-	151.2	6686
4	Groundnut	26.6	1350	14.0	2251	-	-	40.6	1850
5	Sugarcane	-	-	-	-	-	-	1413.2	90,500
Others	Cotton	12.6	2120	27.3	3970	-	-	39.9	2960
	Major Horticultural crops							Production ('000 t)	Productivity (kg/ha)
1	Tapioca							775.5	3880
2	Banana							63.9	53,584
3	Turmeric							13.4	4537
4	Mango							9.1	5100

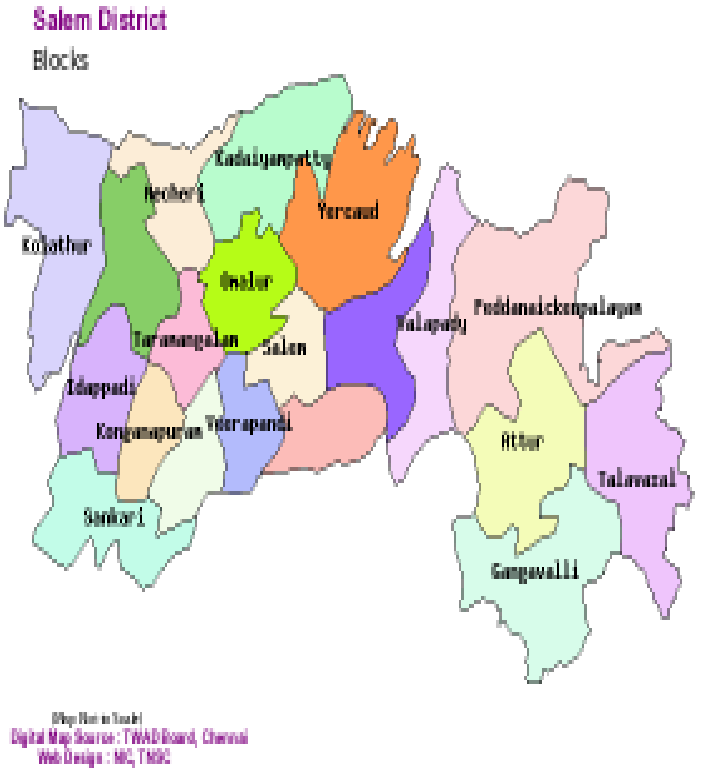
1.12	**Sowing window for 5 major crops (start and end of sowing period)**	**Sorghum**	**Maize**	**Paddy**	**Groundnut**	**Sugarcane**
	Kharif - Rainfed	June 1st week – September 4th week	-	August 1st week	April 4th week - May 3rd week	-
	Kharif -Irrigated	April 3rd week – June 4th week	July 1st week –September 2nd week	May 3rd week - June 4th week	-	April
	Rabi - Rainfed	January	January	-	-	-
	Rabi - Irrigated	-	-	-	December 3rd week – Januar 3rd week	-

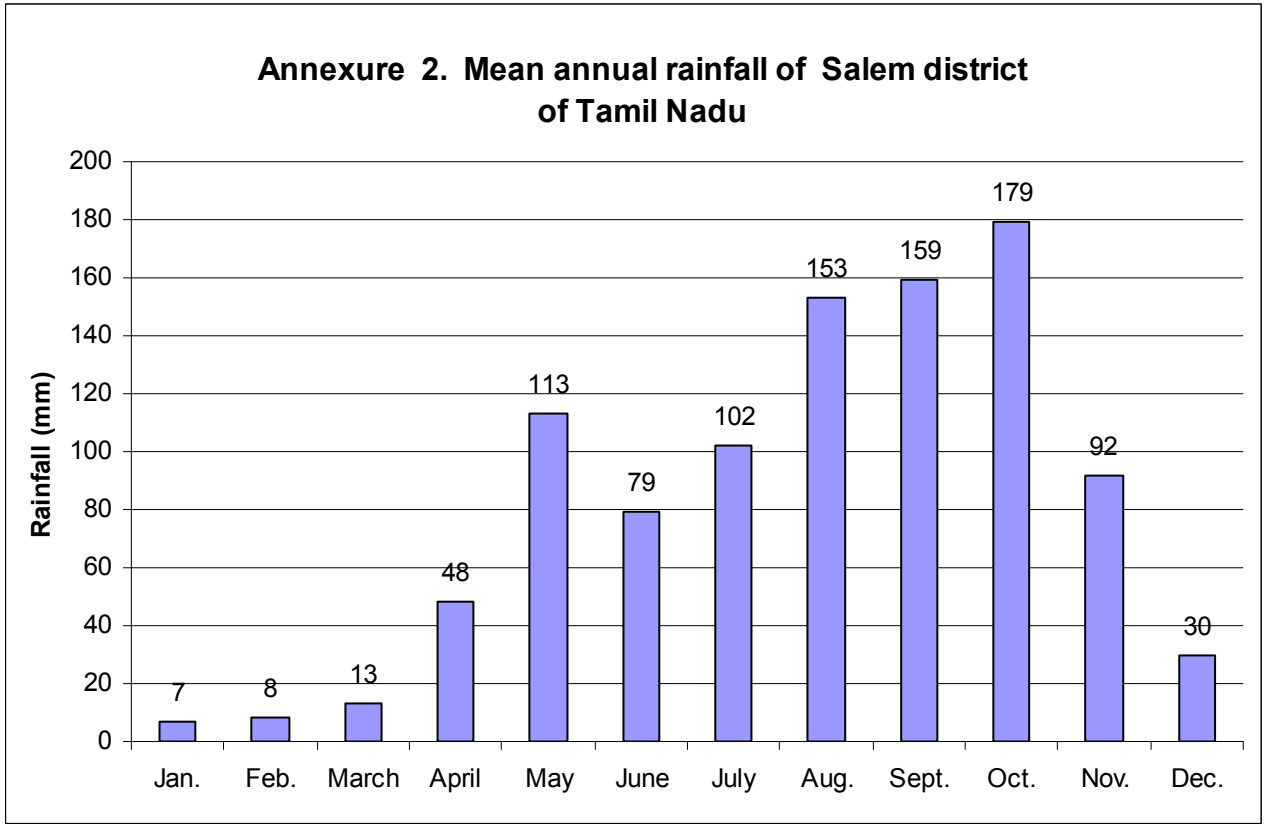
1.13	**What is the major contingency the district is prone to? (Tick mark and mention years if known during the last 10 year period)**	Regular	Occasional	None
	Drought		✓	✓
	Flood			✓
	High intense storms			✓
	Cyclone			✓
	Hail storm			
	Heat wave			✓
	Cold wave			✓
	Frost			✓
	Sea water inundation			✓
	Pests and diseases (specify) Paddy: BPH Tapioca: Mealybug	✓		

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

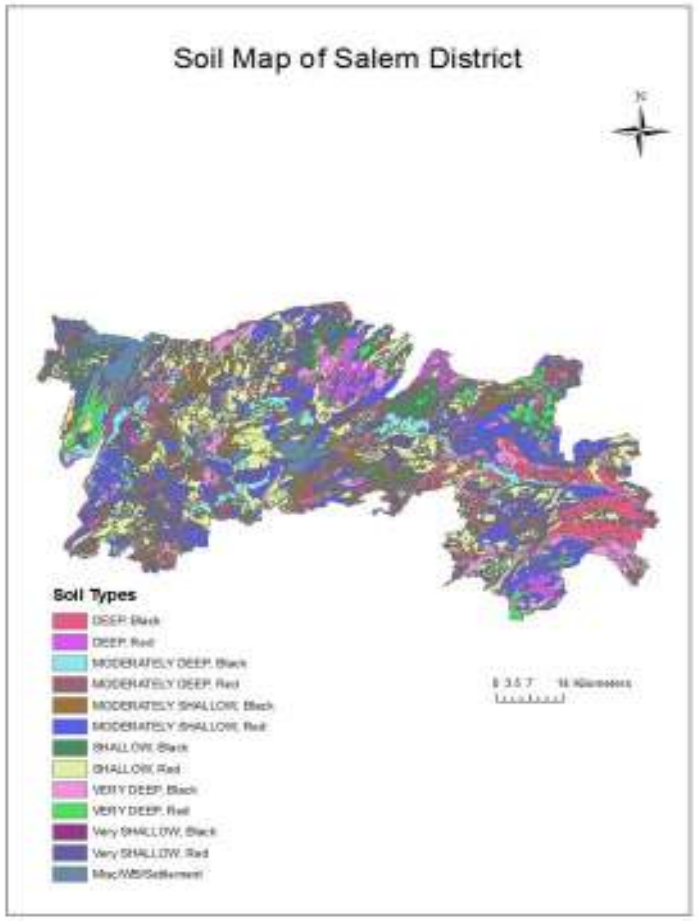
Annexure 1. Location map of Salem district and the blocks






Annexure 2. Mean annual rainfall of Salem district of Tamil Nadu
Rainfall (mm)
200
180
160
140
120
100
80
60
40
20
0
7
8
13
48
113
79
102
153
159
179
92
30
Jan.
Feb.
March
April
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.

Annexure 3. Soil map of Salem district of Tamil Nadu



2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks (June 3rd week)	Shallow red soils	• Groundnut + Red gram + Castor • Sorghum / maize / ragi / Pearl millet • Groundnut + castor • Rainfed tomato	No change	1. Mulching - (In-situ moisture conservation) 2. 0.5% KH_2PO_4 for seed treatment in sorghum for drought tolerant 3. Intercultivation	1. Seed drills under RKVY 2. Supply of seeds through NFSM 3. Awareness creation about seed treatments for drought tolerance
Rabi season (Oct. 4th week)		• Tapioca • Sorghum + pulses • Horse gram			
Kharif season (June 3rd week)	Black soil	• Maize - Red gram • Cotton			
Rabi season (Oct. 4th week)		• Maize			

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 4 weeks *Kharif* season (July 1st week)	Shallow red soils	• Groundnut + Red gram + Castor • Sorghum / maize / ragi / pearl millet • Groundnut + castor • Rainfed tomato	Spreading groundnut (TMV 2, TMV 7, VRI 2) / Sunflower (CO 4, Morden) / Castor (TMV 5, TMV 6) / Red gram (SA1, VBN2) / Cowpea (Paiyur 1, CO(CP)7)/ Sorghum (CO 26) / Cumbu (CO 7, CO(Cu)9, ICMV 221)	1. Mulching - (In-situ moisture conservation) 2. Conservation furrow 3. Drought tolerant varieties are selected 4. Intercultivation 5. 0.5 % Kcl foliar spray for drought tolerant 6. 0.5% KH_2PO_4 for seed treatment in sorghum for drought tolerant	1. Seed drills under RKVY 2. Supply of seeds through NFSM 3. Awareness creation about seed treatments for drought tolerance 4. Farmers has to take up water conservation measures and mulching
Rabi season (Nov. 2nd week)		• Tapioca • Sorghum + pulses • Horse gram	Horse gram (CO 1, Paiyur 1&2) / Black gram (T 9, VBN 1, VBN 2, VBN 3) / Sorghum (CO 26, CO (S) 28, BSR 1, Paiyur 1 & 2)		
Kharif season (July 1st week)	Black soil	• Maize - Red gram • Cotton	Fodder sorghum (CO 27, COFS 29) / Maize (CO 1, COH (M) 4) + Green gram (CO 6, Paiyur 1) / Pearl millet (CO 7, ICMV 221) / Sorghum (CO 26, CO (S) 28, BSR 1, Paiyur 1 & 2)		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Rabi season (Nov. 2nd week)		• Maize	Fodder sorghum (CO 27, COFS 29) / Horse gram (CO 1, Paiyur 1 & 2)		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 6 weeks *Kharif* season (July 3rd week)	Shallow red soils	• Groundnut + Red gram + Castor • Sorghum / maize / ragi / pearl millet • Groundnut + castor • Rainfed tomato	Fodder Sorghum (CO 27, COFS 29) / Minor millets Castor (TMV 5, TMV 6) + pulses	1. Mulching - (In-situ moisture conservation) 2. Conservation furrow 3. Drought tolerant varieties are selected 4. Intercultivation 5. 0.5 % KCl foliar spray for drought tolerant 6. 0.5% KH_2PO_4 for seed treatment in sorghum for drought tolerant	1. Seed drills under RKVY 2. Supply of seeds through NFSM 3. Awareness creation about seed treatments for drought tolerance 4. Farmers has to take up water conservation measures and mulching
Rabi season (Nov. 4th week)		• Tapioca • Sorghum + pulses • Horse gram			
Kharif season (July 3rd week)	Black soil	• Maize - Red gram • Cotton	Fodder Sorghum (CO 27, COFS 29) / Minor millets		
Rabi season (Nov. 4th week)		• Maize	Pulses		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8 weeks (Specify month) *Kharif* season (Aug. 1st week) *Rabi season* (Dec. 2nd week)	Shallow red soils	Not applicable			
Kharif season (Aug. 1st week) *Rabi season* (Dec. 2nd week)	Black soils				

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**	**Crop/cropping system**	**Crop management**	**Soil management**	**Remarks on Implementation**
	Shallow red soils	• Groundnut + Redgram + Castor – Ragi • Ragi – Groundnut	1. Thinning and gap filling the existing crop 2. Mulching 3. Supplementary irrigation 4. Water spray	1. Dust mulching 2. Conservation furrow 3. Basal application of FYM or Vermicompost to improve the soil physical properties. 4. Intercultivation	1. Supply of seeds through NFSM 2. IEC materials on early season drought may be issued to the farming community
	Black soils	• Cotton Maize - Pulses	Gap filling / resowing if necessary	Intercultivation	

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell)	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil management**	**Remarks on Implementation**
At vegetative stage	Shallow red soils Black soils	• Groundnut + Redgram + Castor – Ragi • Ragi – Groundnut • Cotton • Maize - Pulses	1. Supplementary irrigation through rain gun, siphon irrigation 2. Water spraying 3. Spraying of drought tolerance chemicals/ growth regulators	1. Intercultivation 2. Conservation furrow 3. Split fertilizer application after receipt of rains	1. Supply of intercultural implements through RKVY 2. Supply of seeds through NFSM

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell)	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil management**	**Remarks on Implementation**
At reproductive stage	Shallow red soils	Not applicable			
	Black soils				

Condition			**Suggested Contingency measures**		
Terminal drought	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
	Shallow red soil	Not applicable			
	Black soil				

2.1.2 Irrigated situation:

Condition			Suggested Contingency measures		
	Major Farming situation	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delayed/ limited release of water in canals due to low rainfall	1. Canal irrigated Red soils 2. Canal irrigated Black soils 3. Borewell irrigated Red soils 4. Borewell irrigated Black soils 5. Tankfed areas	• Rice - Rice • Sugarcane • Rice – Cotton / Gingelly / Groundnut • Turmeric - fallow	Green manure / Pulses - Rice Millets / Pulses - Rice Gingelly / Maize / Sorghum	1. Alternate wetting and drying 2. Adopting moisture conservation practices 3. Selecting suitable short duration varieties	1. Supply of seeds through NFSM

Condition			Suggested Contingency measures		
	Major Farming situation	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Non release of water in canals under delayed onset of monsoon in catchment	1. Canal irrigated Red soils 2. Canal irrigated Black soils 3. Tankfed areas	• Rice - Rice • Sugarcane • Rice – Cotton / Gingelly / Groundnut • Turmeric - fallow	Gingelly / Sorghum / Maize Fodder sorghum / Pearl millet / Pulses	1. Mulching 2. Adopting moisture conservation practices 3. Selecting suitable short duration varieties	1. Awareness creation through mass media 2.State Department of Agriculture and Agriculture Engineering

Condition			Suggested Contingency measures		
	Major Farming situation	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Lack of inflows into tanks due to insufficient delayed onset of monsoon	1. Tankfed Red soils 2. Tankfed black soils	Rice	Gingelly / Sorghum / Maize Fodder sorghum / Pearl millet / Pulses	1. Mulching 2. Adopting moisture conservation practices	1.Package of practices of new crops may be given to the farmers

Condition			Suggested Contingency measures		
	Major Farming situation	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Insufficient groundwater recharge due to low rainfall	Borewell irrigated red soils and black soils	Groundnut / Gingelly / Sunflower	Sorghum / Pearl millet / Fodder sorghum	1. Mulching 2. Water harvesting and Recycling	1.Package of practices of new crops may be given to the farmers

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

Condition	Suggested contingency measure			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**
Groundnut	Provision of Drainage	Drain excess water Spraying of growth regulators to avoid / minimize flower shedding	Weather based advisory to be followed for harvesting	➢ Mechanical drying ➢ Threshing on 5th day after harvest of groundnut crop
Outbreak of pests and diseases due to unseasonal rains				
Groundnut	-	Timely plant protection measures are to be taken against ELS and root rot.	-	-
Horticulture				

2.3 Floods: NA

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

2.5 Contingent strategies for Livestock, Poultry & Fisheries:

2.5.1 Livestock

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Drought			
Feed and fodder availability	1. Dry fodder production, hay making and creation of fodder banks at village levels based on the livestock population 2. Ensiling and enrichment of fodder grasses and sugarcane tops 3. Creation of fodder models for draught with Guinea grass, stylo, desmanthus, kolukkattai grass etc. 4. Conservation of green and dry fodder through chaffing 4. Creation of tree fodder models with Subabul, Glyricidia, Agathi, Prosopis etc. 5. Fodder production with Sorghum – Stylo- Sorghum on rotation basis	1. Chaffing of green and dry fodder to conserve fodder. 2. Use of unconventional and locally available cheap feed ingredients forfeeding livestock. 3. Enrichment of dry fodder with urea Salt and molasses. 4. Continuous supplementation of Minerals to prevent infertility. 5. Use of foggers and sprinklers on the sheds, sprinkling of water on the body to reduce the heat load. 6. Advising the farmers to feed Concentrates during cooler parts of the day. 7. Advising farmers not to graze during hotter parts of the day 8. Snail control measures in the Water bodies.	1.Mineral supplementation for heifers and cows. 2. Use of salt licks for goats calves etc. 3. Feeding ad libitum gree fodder including legumes.
Drinking water	1. Creation of drinking water facilities in the veterinary institutions and common grazing areas in the villages (community water tanks)	1. Water treatment with Sanitizers	
Health and disease management	1. Sheep pox vaccination in endemic areas 2. Deworming of all livestock	1. Treatment and control of diseases in the event of outbreak or disease manifestation.	1. Nutritional supplementation 2. Breeding management

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<td>3. FMD vaccination for all livestock
4. Control of ectoparasites
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<tr><td>2</td><td>Sheep & Goat</td><td>Goat pox vaccine ,anthrax vaccine as per endemic</td></tr>
<tr><td>3</td><td>Pig</td><td>FMD,
Swine fever & anthrax vaccine a per endemic</td></tr>
<tr><td>4</td><td>Dogs</td><td>Rabies vaccine</td></tr>
<tr><td>5</td><td>Poultry</td><td>Mareks disease vaccine RDV,FPV,IBRV&IBDV</td></tr>
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<td>2. Nutritional supplementation
3. Summer management of livestock</td>
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	3	pig	FMD, Swine fever & anthrax vaccine as per endemic		
	4	dogs	Rabies vaccine		
	5	poultry	Mareks disease vaccine RDV,FPV,IBRV&IBDV		
Cyclone	NA				
Feed and fodder availability					
Drinking water					
Health and disease management					
Heat wave and cold wave	NA				
Shelter/environment management					
Health and disease management					

2.5.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	**During the event**	**After the event**	
Drought				
Shortage of feed ingredients	1. Procurement and storage of feed ingredients	1. Nutritional supplementation of poultry	1. Nutritional supplementation of poultry	--
Drinking water	1. Arrangements for ample potable drinking water to meet to the ensuing draught situation	1. Supply of cool potable water to poultry 2. Water sanitation		--
Health and disease management	1. Vaccination against Ranikhet disease 2. Deworming of poultry 3. Provision of foggers and sprinklers to reduce heat load 4. Supplementation of vitamins and minerals	1. Prevention and control of Coccidiosis in poultry 2. Summer management of poultry- use of foggers and sprinklers 3. Continuous supply of cool potable water 4. Supplementation of vitamins and minerals 5. Feeding during cooler parts of the day 6. Mixing water in the concentrate mash and feeding	1. Nutritional supplementation of poultry	--
Floods	NA			
Shortage of feed ingredients				
Drinking water				
Health and disease management				

Cyclone	NA			
Shortage of feed ingredients				
Drinking water				
Health and disease management				
Heat wave and cold wave	NA			
Shelter/environment management				
Health and disease management				

2.5.3 Fisheries – Not Applicable