State: TAMIL NADU

Agriculture Contingency Plan for District: ERODE

1.0 District Agriculture profile

1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Region / Sub Region (ICAR)	Eastern Ghats And Tamil Nadu Uplands D, (8.2, 8.3)		
	Agro-Climatic Region (Planning Commission)	Southern plateau and hilly region (X)		
	Agro Climatic Zone (NARP)	North-Western Zone (TN-2), Western Zone (TN-3)		
	List all the districts or part thereof falling under the NARP Zone	Erode, Thirupur, Coimbatore, Dindugal, Madurai, Trichy , Salem district		
	Geographic coordinates of district	Latitude	Longitude	Altitude
		11^0 20' N	77^0.43 E	-
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	ARS, Bhavanisagar 638 451,Erode District		
	Mention the KVK located in the district	MYRADA (Mysore Resettlement and Development Agency) KVK, Gobichettipalayam		
1.2	**Rainfall**	Average (mm)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	270	1st Week of June	4th week of September
	NE Monsoon(Oct-Dec):	319	1st week of October	4th Week of December
	Winter (Jan- Feb)	44	-	-
	Summer (Apr-May)	139	-	-
	Annual	772	-	-

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)	816.2	228.7	81.8	0.2	1.7	1.3	7.0	102.7	102.6

1. 4	**Major Soils (Dominant)**	Area ('000 ha)	Percent (%) of total
	Red clayey soils	142.0	17
	Lateritic soils	114.2	14
	Alluvial soils	145.2	17
	Other soil types	414.8	52
1.5	**Agricultural land use**	Area ('000 ha)	Cropping intensity %
	Net sown area	294.7	105.4
	Area sown more than once	16.0	
	Gross cropped area	310.7	

1.6	**Irrigation**	**Area ('000 ha)**	**Percent (%)**	
	Net irrigated area	166.1	60	
	Gross irrigated area	181.8	62	
	Rainfed area	128.6	40	
	Sources of Irrigation	**Number**	**Area ('000 ha)**	**% area**
	Canals	13	88.0	50.7
	Tanks	21	0.3	0.2

	Open wells	121358	66.3	5.2
	Bore wells	9905	16.5	9.5
	Lift irrigation	-	1.4	
	Other sources	-	2.2	1.3
	Total	-	173.3	66.5
	Pumpsets	-	-	
	Micro-irrigation	-	-	

Groundwater availability and use	**No. of blocks**	**% area**	**Quality of water**
Over exploited	3	27.8	Salinity level: 85% good , 12% moderate and 3% poor Residual Sodium Carbonate: 100% good Sodium Adsorption Ratio: 100 % good
Critical	3	38.2	
Semi- critical	5	23.0	
Safe	3	10.9	
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	**Major Field Crops cultivated**	**Area ('000 ha)**					
		Kharif		***Rabi***		**Summer**	**Total**
		Irrigated	***Rainfed***	***Irrigated***	***Rainfed***		
	Sugarcane	41.9	-	-	-	-	41.9
	Paddy	9.9	-	27.0	0.08	1.3	38.3
	Groundnut	3.6	23.1	4.4	0.2	-	31.4
	Maize	7.0	7.0	6.4	-	-	20.4
	Sesame	5.5	1.9	4.5	-	-	12.1
	Horticulture crops - Fruits	**Total area ('000 ha)**		**Irrigated**		**Rainfed**	
	Banana	10.4		10.4		-	

	Mango	0.9	0.9	0.05
	Horticultural crops - Vegetables	**Total area**	**Irrigated**	**Rainfed**
	Onion	3.4	3.4	-
	Chillies	1.1	1.1	-

	Medicinal and Aromatic crops	**Total area**		
	Kanvazhi kizhangu(*Gloriosa superba*)	0.9		
	Spices and Condiments			
	Turmeric	7.8		
	Plantation crops	**Total area**		
	Coconut	19.4		
	Fodder crops	**Total area**		
	Fodder Sorghum	59.5		
	Total fodder crop area	59.5		
	Grazing land	0.18		
	Sericulture etc	1.05		

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Non descriptive Cattle (local low yielding)	49.0	80.8	129.9
	Crossbred cattle	78.4	341.1	419.5
	Non descriptive Buffaloes (local low yielding)			242.4
	Graded Buffaloes			
	Goat			533.0
	Sheep			584.3
	Others (Camel, Pig, Yak etc.)			7.3
	Commercial dairy farms (Number)			
1.9	**Poultry**	**No. of farms**	**Total No. of birds (number)**	

	Commercial	87 – Layer farms 132 – Broiler farms	36,81,898 – Layer 34,45,416 – Broiler
	Backyard	---	3,16,151 – Desi Birds 6,28,151 – Improved Birds

1.10 Fisheries (Data source: Chief Planning Officer)

A. Capture

i) Marine (Data Source: Fisheries Department)	**No. of fishermen**	**Boats**		**Nets**		**Storagefacilities (Ice plants etc.)**
		Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
	-	-	-	-	-	-

ii) Inland (Data Source: Fisheries Department)	**No. Farmer owned ponds**	**No. of Reservoirs**	**No. of village tanks**
	40.7 Ha. (Source: Fish Farmers Development Agency)	**7**	847

B. Culture

	Water Spread Area (ha)	**Yield (t/ha)**	**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 (tonnes)	Productivity (kg/ha)	Production (tonnes)	Productivity (kg/ha)	Production (tonnes)	Productivity (kg/ha)	Production (tonnes)	Productivity (kg/ha)
	1.Sugarcane	-						5662523	132000
	2.Paddy	48087	4631	112207	4168	3936	3619	164230	4139

	3.Groundnut	27564	1112			20384	2820	47948	1966
	4.Maize	-						93571	5548
	5.Sesame	1829	831			6847	763	8676	797

Major Horticultural crops			
Banana	-	61452	576623
Mango	-	5424	5498
Onion	-	23282	8393
Chillies	-	1036	1048
Kanvazhi kizhangu(Glory lily)	-		
Katrazhai(Aloe)	-		
Turmeric	-	61845	7213
Coconut	-	2579 *	13407 **

* in Lac nuts ** nuts / ha

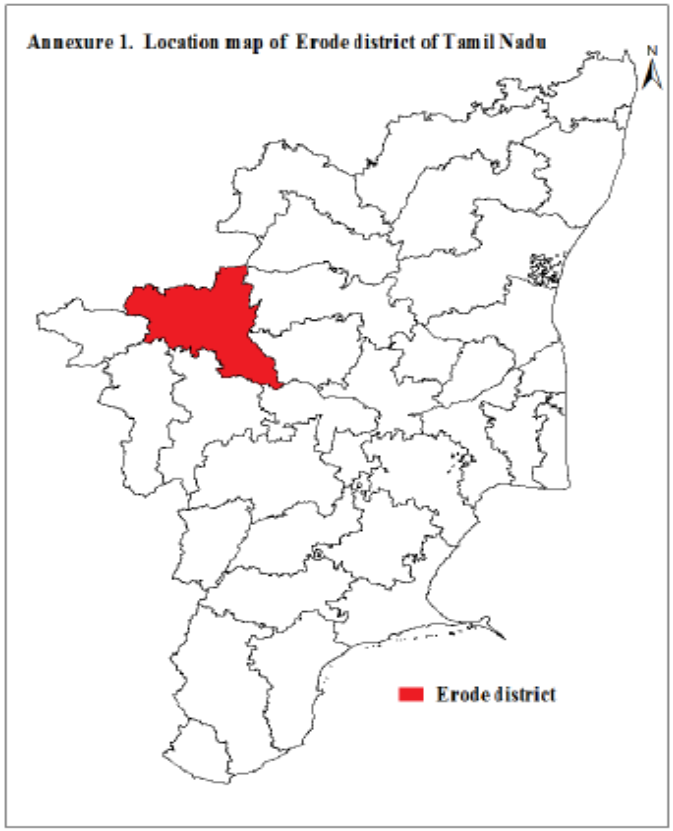
1.12	**Sowing window for 5 major crops (start and end of sowing period)**	Sugarcane	Paddy	Ground nut	Maize	Gingelly
	Kharif- Rainfed	-	-	1st week of June to 4th week of June	1st week of July - ,2nd week of August.	-
	Kharif-Irrigated	1st week of June to 4th week of September	1st week of June to 1st week of July and 3rd week of August to 1st week of September	-	1st week of July - ,2nd week of August and 3rd week of September to 2nd week of October	-
	Rabi- Rainfed	-	-	-	-	-
	Rabi-Irrigated	1st week of October to 4th week of December	1st week of October to 1st week of November	-		-
	Summer Irrigated	1st week of January to 4th week of May	1st week of January to 4th week of January	1st week of December to 1st week of January	2nd week of January to 2nd week of February	2nd week of February to 2nd week of

						March

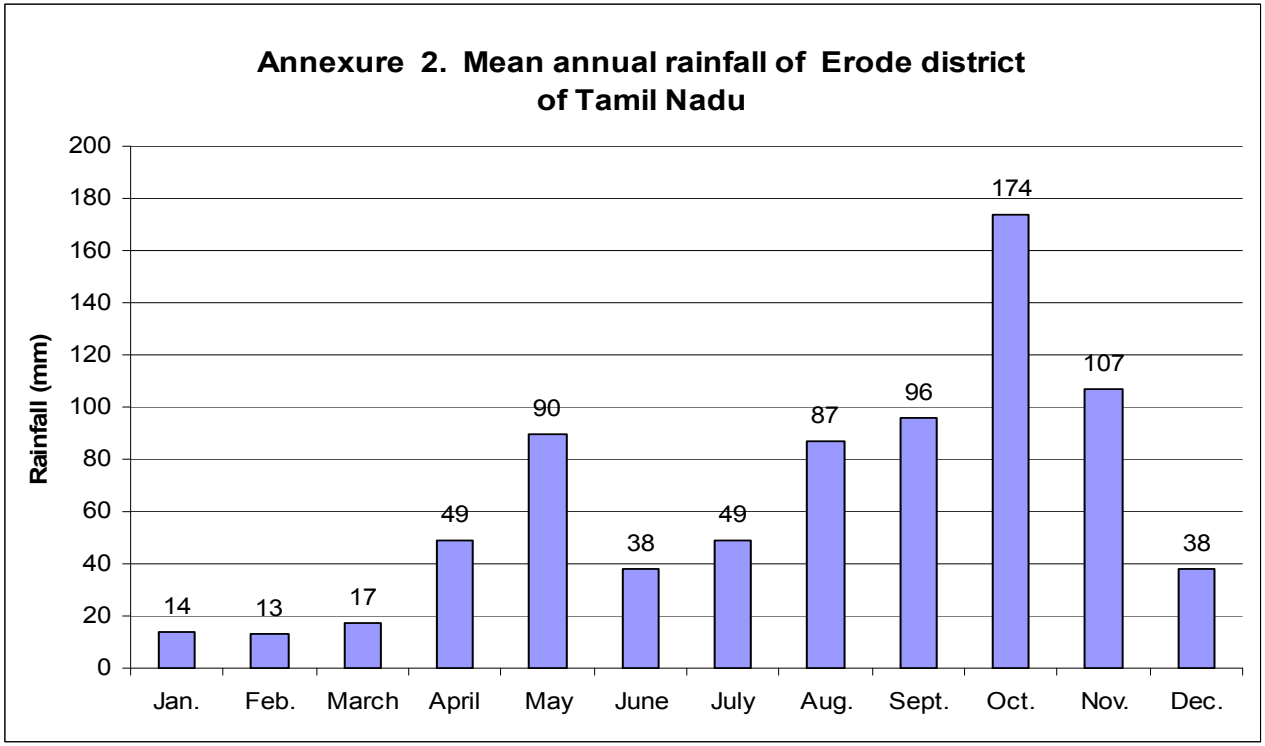
1.13	**What is the major contingency the district is prone to? (Tick mark and mention years if known during the last 10 year period)**	Regular	Occasional	None
	Drought	-	√	-
	Flood	-	-	√
	High intense storms	-	-	√
	Cyclone	-	-	√
	Hail storm	-	-	√
	Heat wave	-	-	√
	Cold wave	-	-	√
	Frost	-	-	√
	Sea water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

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

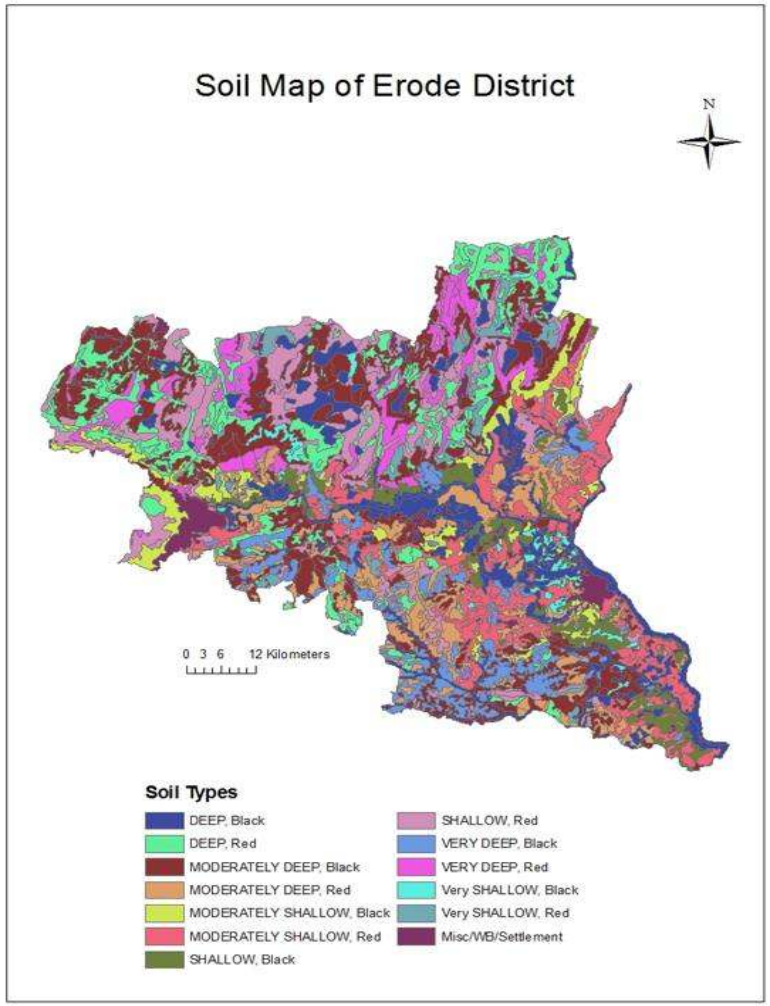
Annexure 1. Location map of Erode district and the blocks



Annexure 2. Mean annual rainfall of Erode district



Annexure 3. Soil map of Erode district of Tamil Nadu



Source: NBSS & LUP

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**
Delay by 2 weeks June 3rd week	Red soils	Groundnut + Pulses (Black gram/ Green gram/ Cowpea)	No change	No change
		Groundnut + Pulses (Red gram)+Castor	No change	No change
Delay by 4 weeks	Red soils	As above	As above	Seed hardening with 1 percent Potassium dihydrogen phosphate. Mechanical sowing with tractor drawn seed drills may also be used.
Delay by 6 weeks July 3 rd week	Red Soils	Groundnut + Pulses (Black gram/ Green gram/ Cowpea)	Sorghum+ Pulses (Black gram/ Green gram/ Cowpea	-do-
		Groundnut + Pulses (Red gram)+Castor	Sorghum+ Pulses (Black gram/ Green gram/ Cowpea	
Delay by 8 weeks August 1st week	Red Soils	Groundnut + Pulses (Black gram/ Green gram/ Cowpea/ Redgram + Castor)	Fodder Sorghum + Pulses (Black gram/ Green gram/ Cowpea)	-do-
		Groundnut + Pulses (Black gram/ Green gram/ Cowpea/ Redgram + Castor)	Horse gram	Mechanical sowing with tractor drawn seed drills may also be used.

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**
	Red Soils	Groundnut +Blackgram/ Greengram/ Cowpea intercropping system	Seed hardening with 1 percent Potassium dihydrogen phosphate.	Soil test based fertilizer application is recommended after resumption of rains.

Mid season drought (long dry spell)	Major Farming situation	Crop/cropping system	Crop management	Soil management
At vegetative stage	Red Soils	Groundnut +Blackgram/ Greengram/ Cowpea intercropping system	Stimulates groundnut crop for profuse and synchronous flowering	Mulching with available farm wastes is advised

Condition			Suggested Contingency measures	
Mid season drought (long dry spell)	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil management**
At reproductive stage	Red Soils	Groundnut +Blackgram/ Greengram/ Cowpea intercropping system	Supplemental irrigation with harvested rain water from farm ponds, if possible. Spraying of 0.5 to 1 per cent potassium chloride (KCl)	_

Condition			Suggested Contingency measures	
Terminal drought	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Rabi Crop planning**

Condition			Suggested Contingency measures	
Terminal drought	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Rabi Crop planning**
	Red Soils	Groundnut +Blackgram/ Greengram/ Cowpea intercropping system	Supplemental irrigation with harvested rain water from farm ponds, if possible. Spraying of 0.5 to 1 per cent potassium chloride (KCl)	No rabi crop in rainfed alfisols.

2.1.2 Irrigated situation

Condition			Suggested Contingency measures	
	Major Farming situation	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**
Delayed/ limited release of water in canals due to low rainfall	1. Canal irrigated red soils and laterite soils 2. Canal irrigated black soils 3. Well irrigated red and laterite soils 4. Well irrigated black soils	Paddy – Groundnut	No change	Irrigation at critical stages of crop growth viz. sowing, flowering, peg formation and maturity in the case of Groundnut; and adopting System of Rice Intensification (SRI method) with 2.5 cm depth of irrigation at critical stages like Tillering, Panicle initiation, flowering and maturity
		Sugarcane	No change	Drip irrigation
		Turmeric	No change	-do-
		Banana	No change	-do-

Condition			Suggested Contingency measures	
	Major Farming situation	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**
		1.Paddy – Paddy	Groundnut / Sesame - Paddy	Irrigation at critical stages of crop growth viz. Sowing, Flowering, Peg formation and maturity in the case of Groundnut; Sowing, Flowering and maturity in the case of Sesame and adopting System of Rice Intensification (SRI method) with 2.5 cm depth of irrigation at critical stages like Tillering, Panicle initiation, flowering and maturity

Condition			Suggested Contingency measures	
	Major Farming situation	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**
Non release of water in canals under delayed onset of monsoon in catchment	Tail end area with red /laterite/block soils	Groundnut and Maize	Sorghum + Pulses (Cowpea / Green gram / Blackgram intercropping is recommended in case of limited water availability in the wells.	Irrigation at critical stages of crop growth namely sowing, 4to 5 leaf stage, flowering and milking stage Drip irrigation

Condition			Suggested Contingency measures	
	Major Farming situation	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Red / laterite/block soils	Sorghum + Pulses (Cowpea / Green gram / Blackgram)	No change	Seed hardening with 1 percent Potassium dihydrogen phosphate. Drip irrigation

Condition			Suggested Contingency measures	
	Major Farming situation	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**
Insufficient groundwater recharge due to low rainfall	Red / laterite/block soils	Fodder Sorghum	No change	Seed hardening with 1 percent Potassium dihydrogen phosphate. Drip irrigation

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	Providing drainage facility Spray of growth retardant of 500 ppm cycocel for arresting apical dominance and thereby promoting growth of laterals	Drain excess water	Providing drainage	Stripping of Groundnut at the earliest. Mechanical drier may be used for drying the produce
Paddy	Providing drainage facility	-do-	-do-	-do-
Sorghum	-Do-			
Maize				
Horse gram				

2.3 Floods: Not applicable

2.4 Extreme events: Not applicable

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	1. Development of green fodders such as CO4, Guinea grass, Kolukattaigrass, Sorghum, cow pea, Desmanthus, and tree fodders etc.. 2. Straw & Hay making. 3. Sorghum stover preservation. 4. Creation of fodder banks at village levels based on the livestock population. 5. Silage making with available green fodder such as CO3 and Sugarcane tops. 6. Creation of fodder models for draught with Guinea grass, stylo, desmanthus, kolukkattai grass etc. 7. Conservation of green and dry fodder through chaffing. 8. Creation of tree fodder models with Subabul, Glyricidia, Agathi, Prosopis etc. 9. Fodder production with Sorghum – stylo-Sorghum on rotation basis 10. Storage of available feed ingredients in a proper manner without fungal contamination.	1. Chaffing of green and dry fodder to conserve fodder. 2. Use unconventional feedstuffs and locally available low cost feed ingredients to reduce the cost of feed. 3. Use of tree leaves are good proteinecious feed for livestock. 4. Uses of mineral mixture in the livestock feed prevent the nutritional deficiency diseases and infertility cases. 5. Enrichment of dry fodder with urea. 6. Use of silage in livestock feed. 7. Use Hay, Straw and Stover in livestock feed. 8. Concentrate feed prepared with available grains, oil cakes and rice bran. 9. Before Sun rise and after Sun set allow the animal for grazing.	1. Development of green fodders and tree fodders. 2. Use of Mineral mixture or Salt lick in the livestock feed.
Drinking water	1. Make Bore Well. 2. Construct common water drough in the grazing areas of village.	1. Give plenty of chilled drinking water. 2. Use of Green fodder or Silage reduces the intake of water in livestock because it contains 60-90% of water. 3. Addition of Vitamin C or lemon in drinking water prevents heat stress.	1. Give plenty of drinking water.
Health and disease management	1. Vaccinate the cattle for Foot and Mouth Disease. 2. Vaccinate the sheep against sheep pox, Blue tongue, entero toxemia etc. 3. Vaccinating the goat against PPR.	1. Keep the animals in good aeration with shadow place. 2. Provide plenty of chilled drinking water.	1. Keep the animals in good aeration with shadowy place. 2. Give plenty of chilled drinking water.

	4. Deworming the livestock 4. Control of ectoparasites.	3. Use of foggers and sprinklers on the sheds, sprinkling of water on the body to reduce the heat load. 4. Advising farmers not to graze during hotter parts of the day. 5. Nutritional supplementation. 6. Control of ectoparasites prevent the livestock from Anaplasmosis, Theileriosis and Babesiosis disease. 7. Snail control measures in the water bodies.	
Floods			
Feed and fodder availability	1. Sowing the fodder crops such as fodder sorghum, fodder maize, fodder cumbu, sorghum and Desmanthus. 2. Straw & Hay making. 3. Sorghum stover preservation. 4. Silage making with available green fodder such as CO3 and Sugarcane tops. 5. Storage of available feed ingredients in a proper manner without fungal contamination.	1. Uses of mineral mixture in the livestock feed prevent the nutritional deficiency diseases and infertility cases. 2. Use of silage in livestock feed. 3. Use Hay, Straw and Stover in livestock feed. 4. Concentrate feed prepared with available grains, oil cakes and rice bran. 5. Storage of available feed ingredients properly without fungal contamination.	1. Proper storage of feed ingredients, concentrate feed and dry fodders in to avoid fungal contamination. 2. Store the available green fodders in the form of hay and silage.
Drinking water	1. Construct the rain water storage tank. 2. Construct the wall around the well prevent the germs and dust mixed with well water during rainfall.	1. Use of bore well water is better than well water. 2. Well water and canal water will be used after chlorination and disinfection.	1. Use of bore well water is better than well water. 2. Well water and canal water will be used after chlorination and disinfection.
Health and disease management	1. Vaccinate the Cattle against Foot and Mouth Disease. 2. Vaccinate the Sheep against Blue Tongue Disease. 3. Vaccinate the Goat against Enterotoxaemia and PPR. 4. Deworming the livestock's.	1. Keep the animals in good aeration with shadowy place. 2. Provide clean water and feed. 3. Control of ectoparasites prevent the livestock's from Anaplasmosis, Theileriosis and Babesiosis disease. 4. Prevent the entry of rain water in the livestock shed.	1. Deworming the livestock's. 2. Provide clean water and feed. 3. Control of ectoparasites prevent the livestock's from Anaplasmosis, Theileriosis and Babesiosis disease.
Cyclone			

Feed and fodder availability	1. Sowing the fodder crops such as fodder sorghum, fodder maize, fodder cumbu, sorghum and Desmanthus. 2. Straw & Hay making. 3. Sorghum stover preservation. 4. Silage making with available green fodder such as CO3 and Sugarcane tops. 5. Storage of available feed ingredients in a proper manner without fungal contamination.	1. Use of silage in livestock feed. 2. Use Hay, Straw and Stover in livestock feed. 3. Concentrate feed prepared with available grains, oil cakes and rice bran. 4. Storage of available feed ingredients in a proper manner without fungal contamination.	1. Dry the feed ingredients, concentrate feed and dry fodders in sunlight to avoid fungal contamination. 2. Store the available green fodders in the form of hay and silage.
Drinking water	1. Construct the rain water storage tank. 2. Construct the wall around the well prevent the germs and dust mixed with well water during rainfall.	1. Use of bore well water is better than well water. 2. Well water and canal water will be used after chlorination and disinfection.	1. Use of bore well water is better than well water. 2. Well water and canal water will be used after chlorination and disinfection.
Health and disease management	1. Vaccinate the Cattle against Foot and Mouth Disease. 2. Vaccinate the Sheep against Blue Tongue Disease. 3. Vaccinate the Goat against Enterotoxaemia and PPR. 4. Deworming the livestock's.	1. Keep the animals in good aeration with shadowy place. 2. Provide clean water and feed. 3. Control of ectoparasites prevent the livestock's from Anaplasmosis, Theileriosis and Babesiosis disease.	1. Deworming the livestock's. 2. Provide clean water and feed. 3. Control of ectoparasites prevent the livestock's from Anaplasmosis, Theileriosis and Babesiosis disease.
Heat wave and cold wave	NA		

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	Store the available feed ingredients required for the preparation of poultry feed.	• Use unconventional feedstuffs to reduce the cost of feed.	• Nutritional supplementation.	
Drinking water	• Arrangement for ample	• Supply of cool potable water to poultry.	• Use bore well water .	

	potable drinking water to meet the ensuing drought situation.	• Water sanitation.		
Health and disease management	• Vaccination against Ranikhet disease • Deworming of poultry • Provision of foggers and sprinklers to reduce heat load • Supplementation of vitamins and minerals	• Effective fly control programme. • Prevention and control of Coccidiosis in poultry • Summer management of poultry- use of foggers and sprinklers • Continuous supply of cool potable water • Supplementation of vitamins and minerals • Feeding during cooler parts of the day • Mixing water in the concentrate mash and feeding	• Nutritional supplementation of poultry. • Vaccination against Ranikhet disease	
Floods				
Shortage of feed ingredients	• Store the unconventional feedstuffs without fungal contamination.	Use available feed ingredients with unconventional feedstuffs for poultry feed preparation.	• Use unconventional feedstuffs.	
Drinking water	• Construct the borewell.	• Use of bore well water is better than well water. • Well water and canal water will be used after chlorination and sanitation. • Automatic drinkers used	• Use of bore well water is better than well water. • Well water and canal water will be used after chlorination and sanitation.	
Health and disease management	• Vaccinate the birds against Ranikhet and Infectious Bursal Disease regularly. • Deworming the birds.	• Keep the birds in good aeration with shadowy place. • Provide clean water and feed. • Control of ectoparasites.	• Deworming the birds. • Provide clean water and feed. • Control of ectoparasites.	
Cyclone				
Shortage of feed ingredients	• Store the unconventional feedstuffs without fungal contamination.	• Use available feed ingredients with unconventional feedstuffs for poultry feed preparation.	• Use unconventional feedstuffs.	

Drinking water	• Construct the borewell.	• Use of bore well water is better than well water. • Well water and canal water will be used after chlorination and sanitation.	• Use of bore well water is better than well water. • Well water and canal water will be used after chlorination and sanitation.	
Health and disease management	• Vaccinate the birds against Ranikhet and Infectious Bursal Disease regularly. • Deworming the birds.	• Keep the birds in good aeration with shadowy place. • Provide clean water and feed. • Control of flies & ectoparasites.	• Deworming the birds. • Provide clean water and feed. • Control of ectoparasites.	
Heat wave and cold wave				
Shelter/environment management	• Tree Plantation around the poultry Shed. • Spray Bleaching powder and disinfect around the poultry farm.	• During heat wave fogger used to control the heat stress in poultry.	• 1% butox will be sprayed in the poultry shed during sunlight time to prevent the ectoparasites.	
Health and disease management	• Vaccinate the birds. • Construct the wall around the well prevent the germs and dust mixed with well water during rainfall. • Deworming the animals.	• Vitamin C Supplementation. • Prevent the entry of other birds and outsiders.	• Vaccinate the birds. • Deworm the birds.	

[a] based on forewarning wherever available

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
1) Drought			
A. Capture			
Marine	-		

Inland	-		
(i) Shallow water depth due to insufficient rains/inflow	• Harvesting large individuals • Increased Stocking-density in smaller/confined areas	• Harvesting large individuals • Disposable of unwanted excess stock • Stocking of desirable/special individuals in brood stock ponds	• Proper management of the local environment
(ii) Changes in water quality	Negligible changes in water quality	Negligible changes in water quality	Negligible changes in water quality
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	• Harvesting of the stock	• Harvesting of the stock • Transferring of smaller fishes to artificial ponds (if available) for tiding over the drought	• Steps to improve the quality of stocked fishes, via feed management water quality management
(ii) Impact of salt load build up in ponds / change in water quality	• Harvesting of the stock	• Harvesting of the stock • Transferring of smaller fishes to artificial ponds (if available) for tiding over the drought with water from other source (less hardness)	• Steps to improve the quality of stocked fishes, via feed management water quality management
2) Floods			
A. Capture	-	-	-
Marine	-	-	-
Inland	• Proper fencing to prevent escaping of fishes • Increasing bund height and improve bund strength • Improve land drainage to allow easy and quick flow of flood waters	• In extreme conditions, controlled draining of flooded ponds • Thinning of stock by harvesting of larger individuals	• Repair damaged bundhs • Collect and preserve existing stock
(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	• Negligible changes	• Flood water can bring parasites, and increased turbidity – repair/correct drainage to improve quick drainage of flood waters	• Turbid waters may be flushed off with fresh borewell/well water
(vi) Health and diseases	- -		

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B. Aquaculture			
(i) Inundation with flood water	• Proper fencing to prevent escaping of fishes • Increasing bundh height and improve bundh strength • Improve land drainage to allow easy and quick flow of flood waters	• In extreme conditions, controlled draining of flooded ponds • Thinning of stock by harvesting of larger individuals	• Repair damaged bundhs • Collect and preserve existing stock
(ii) Water continuation and changes in water quality	• Negligible changes	• Water can become turbid due to flood waters, reduce stock to prevent mortality	• Flushing of pond water with bore- well water to improve water quality
(iii) Health and diseases	-		
(iv) Loss of stock and inputs (feed, chemicals etc)	• Negligible changes	• Harvesting of stock • Shift reserve of brood stock to ponds at elevated levels	• Selling remaining stock and inundated equipment immediately to minimize losses
(v) Infrastructure damage (pumps, aerators, huts etc)	• Dismantling of pumps, aerators and other equipment and shifting to safer zones	• Salvaging of inundated pumps, aerators and other equipment and shifting to safer zones	• Selling remaining stock and inundated equipment immediately to minimize losses
3. Cyclone / Tsunami	-NA-		
4. Heat wave and cold wave	- NA-		