State: TAMIL NADU

Agriculture Contingency Plan District: PERAMBALUR

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)	East Coast Plains And Hills Region, Southern Plateau And Hills Region (XI, X)		
	Agro Climatic Zone (NARP)	North Western Zone, Cauvery Delta Zone (TN-2, TN-4)		
	List all the districts or part thereof falling under the NARP Zone	Dharmapuri, Salem, Namakkal districts		
	Geographic coordinates of district	Latitude	Longitude	Altitude
		11^0 14'00.59"N	78^0 52'59.85"E	133.3m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Cotton Research Station, Veppanthattai -621116		
	Mention the KVK located in the district	Hans Roever Krishi Vigyan Kendra, Valikandapuram, Perambalur District-621115		
1.2	**Rainfall**	Average (mm)	Normal Onset	Normal Cessation
	SW monsoon (June-Sep):	270	1st week of June	1st week of October
	NE Monsoon(Oct-Dec):	466	2nd week of October	4th week of December
	Winter (Jan-Feb)	26		
	Summer (Mar-May)	99		
	Annual	861		

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)	369.1	17.0	59.7	1.4	9.0	22.1	11.3	19.7	18.3

1. 4	**Major Soils**	**Area ('000 ha)**	**Percent (%) of total**
	Deep Black	637.4	38.9
	Deep Red	49.4	3.02
	Moderately deep black	75.5	4.3
	Moderately deep red	64.7	3.7
	Moderately shallow red	149.7	8.6
	Shallow Red	215.3	12.3
	Very Deep Black	357.8	20.4
	Very Shallow Black	37.1	2.1
	Very Shallow Red	48.8	2.8
1.5	**Agricultural land use**	Area ('000ha)	Cropping intensity %
	Net sown area	213.0	104.9
	Area sown more than once	10.5	
	Gross cropped area	223.5	

1.6	**Irrigation**	Area (‘000 ha)		
	Net irrigated area	67.5		
	Gross irrigated area	74.1		
	Rainfed area	145.5		
	Sources of Irrigation	Number	Area (‘000 ha)	% area
	Canals	-	9.5	15.1
	Tanks	189	6.0	9.4
	Open wells	34428	22.5	-
	Bore wells	6	17.9	28.4
	Lift irrigation schemes	-	-	-
	Other sources Tape wells, Filter ponds	3477	0.083	0.1
	Total	-	57.4	100.0
	Pumpsets	-	-	-
	Micro-irrigation			-
	Groundwater availability and use	No. of blocks	% area	Quality of water
	Over exploited	4	100	Data not available
	Critical	-	-	
	Semi- critical	-	-	
	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.

1.7	S.No.	Major Field Crops cultivated	Area ('000 ha)					
			Kharif		*Rabi*		Summer	Total
			Irrigated	*Rainfed*	*Irrigated*	*Rainfed*		
	1	Maize	0.3	38.2	-	0.4	-	38.9
	2	Cotton	-	23.8	-	0.4	-	24.2
	3	Paddy	12.4	-	-	-	-	12.4
	4	Groundnut	0.4	1.3	0.7	-	-	2.4
	5	Sunflower	0.1	0.1	0.2	-	-	0.4
		Others	-	-	-	-	-	-
		Horticulture crops - Fruits	**Total area**					
	1	Banana	0.2					
	2	Mango	0.2					
		Horticultural crops - Vegetables	**Total area**					
	1	Onion (Small)	7.5					
	2	Tapioca	0.9					
		Medicinal and Aromatic crops	**Total area**					
	1	Medicinal and Aromatic crops	-					
		Plantation crops/Spices	**Total area**					
	1	Coriander	0.1					
	2	Chillies	0.1					
	3	Turmeric	0.6					
		Fodder crops	**Total area**					
		Total fodder crop area	-					
		Grazing land	-					
		Sericulture etc	-					

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Non descriptive Cattle (local low yielding)	9.5	8.7	18.2
	Crossbred cattle	36.1	72.5	108.6
	Non descriptive Buffaloes (local low yielding)	2.2	2.7	5.0
	Graded Buffaloes			
	Goat			155.7
	Sheep			58.4
	Others (Camel, Pig, Yak etc.)			2.0
	Commercial dairy farms (Number)			110

1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**
	Commercial	-	311.5
	Backyard		

1.10	**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)	
		2048		252		Total 1831	
	ii. Inland (Data Source: Fisheries Department)	**No. Farmers owned ponds**		**No. of Reservoirs**		**No. of village tanks**	
		10		3 (38 ha)		30	
	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)	15 ha		

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	Maize							88.247	2112
2	Cotton							12.501	903
3	Paddy							53.245	5470
4	Sugarcane							0.764	126
5	Groundnut							5.236	1352
Others									
Major Horticultural crops								Production (' 000t)	Productivity (t/ha)
1	Onion							60.622	8.04
2	Tapioca							39.079	41.93
3	Turmeric							3.410	5.75
4	Chillies							0.796	1.69
5	Coriander							0.164	0.32

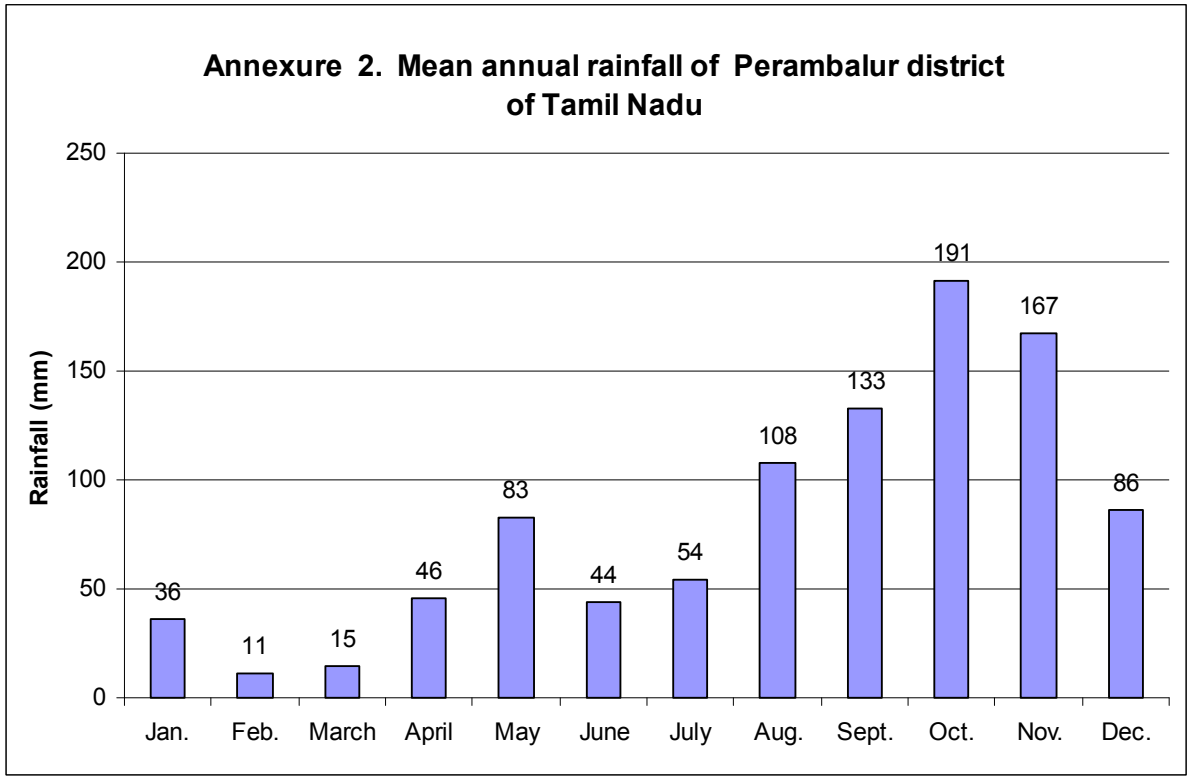
1.12	**Sowing window for 5 major crops (start and end of sowing period)**	**Maize**	**Cotton**	**Paddy**	**Sugarcane**	**Groundnut**
	Kharif- Rainfed	2nd week of September – 2nd week of October	2nd week of August - 2nd week of October	-	-	-

	Kharif-Irrigated	-	-	2nd week of June - 2nd week of July	-	-
	Rabi- Rainfed	-	-	-	2nd week of December - 2nd week of January	-
	Rabi-Irrigated	-	-	2nd week of September - 2nd week of October	-	2nd week of December - January

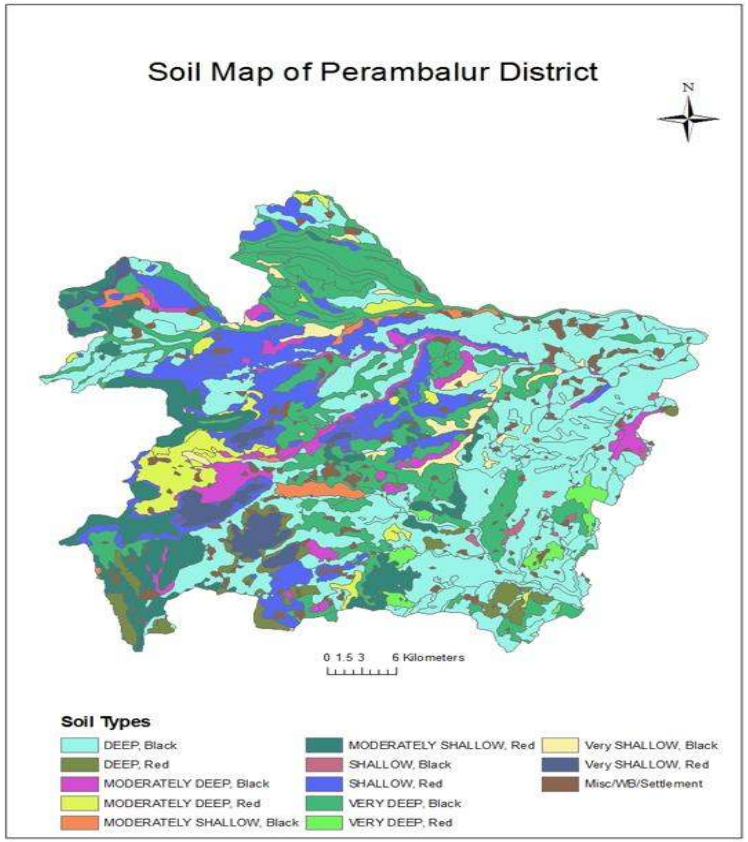
1.13	**What is the major contingency the district is prone to? (Tick mark and mention years if known during the last 10 year period)**	Regular	Occasional	None
			✓	
	Drought			✓
	Flood			✓
	High intense storms			✓
	Cyclone			✓
	Hail storm			
	Heat wave			✓
	Cold wave			✓
	Frost			✓
	Sea water inundation			✓
	Pests and diseases Cotton: Sucking pest, Bacterial blight, Alternaria blight, Grey Mildew, Para wilt Maize: Shoot borer	✓		

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

Annexure 1. Location map of Perambalur district and the blocks


Annexure 2. Mean annual rainfall of Perambalur district of Tamil Nadu
Rainfall (mm)
250
200
150
100
50
0
36
11
15
46
83
44
54
108
133
191
167
86
Jan.
Feb.
March
April
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.

Annexure 3. Soil map of Perambalur 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**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delayed by 2 weeks June 3rd week	Black soil	Cotton (Sowing continued upto september)	No change	Tractor drawn seed drill sowing	State department of Agriculture and Department of Agricultural Engineering
Delayed by 4 weeks July 1st week		Cotton	Maize + Pulses/ Redgram (Long duration)/ Groundnut	Wider spacing Broad Bed Furrow System, Mulching	
Delayed by 6 weeks July 3rd week		Cotton	Redgram (Short duration) + Onion/ sorghum	Seed hardening and Seed treatment, Intercultivation with chisel ploughing and Composted coir pith application	
Delayed by 8 weeks August 1st week		Maize	Fodder sorghum/ Coriander	Sowing in ridges and furrows	

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**
	Black soil	Cotton	Seed treatment with 2% $CaCl_2$ (or) 2% KCl	Chisel ploughing with composted coir pith application once in 3 years -Enriched FYM application -Sowing of crops on ridges and furrows	State department of Agriculture and Department of Agricultural Engineering
		Maize	Seed treatment with 2% KCl	-chisel ploughing with composted coir pith application once in 3 years -Enriched FYM application -Sowing of crops on ridges and furrows Soil test based INM	
		Groundnut + Redgram	Seed hardening with 1% KH_2PO_4 Sowing with tractor drawn seed drill to maintain optimum plant population	Composted coir pith application Hand weeding at shallow depths	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil management**	**Remarks on Implementation**
At vegetative stage	Black soil	Cotton	Cotton intercrop with legumes	Mulching with crop residues. Inter cultivation and earthing up operations.	
		Maize	Weeding and thinning out population	Mulching	
		Groundnut	Supplementary irrigation using micro sprinkler	Polythene mulching	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil management**	**Remarks on Implementation**
At reproductive stage	Black soil	Cotton	KCl foliar spraying @ 0.3% Kaolin foliar spraying @ 1.25%	Top dressing with potash fertilizer	
		Maize	Fodder purpose	-	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil management**	**Remarks on Implementation**
		Groundnut	Foliar spraying of 0.5% KCl and 2% Kaolin spray	-	

Condition			Suggested Contingency measures		
Terminal drought	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
	Black soil	Cotton	Foliar spraying multi K @ 2% (or) Poly feed @ 2% Foliar spraying of NAA 40 ppm	-	-
		Maize	Insitu incorporation in the same field	-	-
		Groundnut	Crop for Fodder purpose	-	-

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	-	-	-	-	-

2.1.2. Irrigated Situation (Tankfed /well irrigation)

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.Black soil Tank fed irrigation	Rice (Oct - Jan) – Pulses (Feb - April)	Cucumber (Jan - April)	Pit method of sowing	-

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	-Black soil -upland -well irrigation	Rice (Aug - Jan)/ Groundnut/ Gingelly(Feb-May)	Cotton (Aug-Feb) -Fallow	Ridges and furrow Alternate furrow irrigation Foliar spraying of nutrients	
		Sugarcane (Dec - Nov) - 2year rotation	Maize (Sep-Dec) – Sunflower (Dec - March)	Ridges and furrow Alternate furrow irrigation	

Condition			Suggested Contingency measures		
	Major Farming situation	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
				Foliar spraying of nutrients	

(No canal irrigated area)

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**
Maize (Rainfed)	Draining the excess water	Foliar spraying of Multi K @ 2%	Draining the excess water at micro ponds	Safe storage Use of mechanical driers to reduce moisture content of the produce.
Cotton (Rainfed)	Draining the excess water	Foliar spraying of urea @ 2% (or) Multi K (or) Poly feed @ 2% at 10 days internal	Draining the excess water at micro ponds	Safe storage
Groundnut (Rainfed)	Draining the excess water	Draining the excess water	Draining the excess water at micro ponds	
Rice (Irrigated)	Top dressing urea and spraying of fungicide	Foliar spraying of urea 1%	Draining the excess water	

Sugarcane (Irrigated)	Top dressing urea and spraying of fungicide	Foliar spraying of urea 1% + KCl 1%	-	
Outbreak of pests and diseases to unseasonal rains For major crops	Need based IPDM	Need based plant protection	- 	

2.3 Flood – NOT APPLICABLE

2.4 Extreme events - NOT APPLICABLE

2.5 Contingent strategies for Livestock, Poultry & Fisheries – To be provided by TANUVAS, Chennai

2.5.1 Livestock

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Drought			
Feed and fodder availability	Collect all tapioca waste and store properly for use as feed supplement during drought Motivating the sugarcane farmers to convert green sugarcane tops in to silage by the end of February All the available crop residues especially sorghum stover, groundnut haulms, paddy straw, and sugarcane tops should be stored properly in the farm of hay at individual farmer level. Sowing of cereals (Sorghum) and leguminous crops (Lucerne, Horse gram, Cowpea) during	Harvest and use biomass of dried up crops (paddy/Sorghum//maize/ Groundnut/Black gram/Green gram) material as fodder Use of unconventional and locally available cheap feed ingredients especially tapioca for feeding of livestock during drought Harvest all the top fodder available (Subabul, Glyricidia, Agathi, Prosopis etc) and feed the LS during drought Promotion of cultivation of Horse gram as contingent crop and harvesting it at vegetative stage as fodder	Encourage progressive farmers to grow multi cut fodder crops of sorghum/bajra/maize(UP chari, MP chari, HC-136, HD-2, GAINT BAJRA, L-74, K-677, Ananad/African Tall, Kisan composite, Moti, Manjari, B1-7 on their own lands with some input subsidy Supply of quality seeds of

	North-East monsoon under dry land system for fodder production Encourage fodder production with Sorghum – stylo- Sorghum on rotation basis and also to cultivate short-term fodder crops like sunhemp Create awareness on establishment of pasture with drought resistant fodder Varities like Guinea grass, stylo, kolukkattai grass, Acacia trees, etc. Creation of tree fodder models with Subabul, Glyricidia, Agathi, etc for tree fodder production during summer. Promote Azola cultivation at backyard Chopping of fodder should be made as mandatory in every village through supply and establishment of good quality crop cutters. Capacity building and preparedness of the stakeholders and official staff for the drought/floods	All the hay should be enriched with 2% Urea molasses solution or 1% common salt solution and fed to LS. Continuous supplementation of minerals to prevent infertility. Encourage mixing available kitchen waste with dry fodder while feeding to the milch animals Arrangements should be made for mobilization of small ruminants across the districts where no drought exits Unproductive livestock should to be culled during severe drought Create transportation and marketing facilities for the culled and unproductive animals (10000-20000 animals) Subsidized loans (5-10 crores) should be provided to the livestock keepers	COFS 29, Stylo and fodder slips of CO3, CO4, guinea grass well before monsoon Flushing the stock to recoup Replenish the feed and fodder banks
Drinking water	Adopt various water conservation methods at village level to improve the ground water level for adequate water supply. Identification of water resources Desilting of ponds Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals) Construction of drinking water tanks in herding places/village junctions/relief camp locations Community drinking water trough can be arranged in shandies /community grazing areas	Adequate supply of drinking water. Restrict wallowing of animals in water bodies/resources	Watershed management practices shall be promoted to conserve the rainwater. Bleach (0.1%) drinking water / water sources Provide clean drinking water
Health and disease management	Procure and stock emergency medicines and vaccines for important endemic diseases of the area All the stock must be immunized for endemic diseases of the area Surveillance and disease monitoring network to be	Carryout deworming to all animals entering into relief camps Identification and quarantine of sick animals Constitution of Rapid Action Veterinary Force Performing ring vaccination (8 km radius) in case of any outbreak	Keep close surveillance on disease outbreak. Undertake the vaccination depending on need Keep the animal houses clean and spray disinfectants Farmers

	established at Joint Director (Animal Husbandry) office in the district Adequate refreshment training on draught management to be given to VAS, Jr.VAS, LI with regard to health & management measures. Procure and stock multivitamins & area specific mineral mixture	Restricting movement of livestock in case of any epidemic Rescue of sick and injured animals and their treatment Organize with community, daily lifting of dung from relief camps	should be advised to breed their milch animals during July-September so that the peak milk production does not coincide with mid summer
Floods	**NA**		
Cyclone	**NA**		
Heat wave and cold wave	**NA**		

2.5.2 Poultry

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Drought			
Shortage of feed ingredients	Storing of house hold grain like maize, broken rice etc, in to use as feed in case of severe drought	Supplementation only for productive birds with house hold grain Supplementation of shell grit (calcium) for laying birds Culling of weak birds	Supplementation to all survived birds
Drinking water		Use water sanitizers or offer cool hygienic drinking water	

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 (5ml in one litre water)	Hygienic and sanitation of poultry house Disposal of dead birds by burning / burying with lime powder in pit
Floods	**NA**		
Cyclone	**NA**		
Heat wave and cold wave	**NA**		

2.5.3 Fisheries/ Aquaculture

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

Inland: Shallow water depth due to in sufficient rains / in flow	* Rain water harvesting. * Check dams. * Deepening / Desilting of existing water bodies. * Strengthening of pond embankments.	* Shallow areas of direct water bodies can be used for raising table sized fishes using stunted fish seeds, Tilapia. * Murrel and Pungasius sp culture can be carried out. * Temporarily raising the height of the enclosures may be done to prevent loss of stock in the event.	* Due to water shortage farmers have to harvest fish * Adoption of short term culture.
(i) Shallow water depth due to insufficient rains/inflow			
(ii) Changes in water quality		* Reduced water volume in the pond / local water bodies lower its buffering capacity, reduced manuring should be done to prevent algal bloom and water quality change.	
(iii) Any other		* Production of stunted major carps can be carried out. * Ornamental fish rearing can be done. * Conditioning of ponds.	
B. Aquaculture / Marineculture			

(i) Shallow water in ponds due to insufficient rains/inflow	* Further loss of water due to seepage should be prevented by to polythene sheet lining of ponds murrel culture / cat fish farming can be tried. * Short term fish farming should be planned. * Preparations should be made to preserve / maintains the brood stock for the forth coming season. * The summer crop and the culture area can be minimized based on the availability of water.	* The stocking density or the stocks in pond should be reduced and marketed or stored in other pond. * Culture of cat fish can be curred out. * Minimize use of feed fertilizers and chemicals to maintain water quality. * Strict observation should be carried out to carry out spread of fdisease due to high density and high temperature. * Vegelable crops / short term crops / Low water requirement plants / fodder can be grown in the ponds / types as source of income.	* The ponds can be prepared for the next crop.
(ii) Impact of salt load build up in ponds / change in water quality	Deepening and desilting of existing water bodies.	Application of feed and manures should be minimized.	
(iii) Any other	The quality and quantity of water has to be monitored.	* Recirculatory system can be adopted to as to used mineral water. * Use of aerators to overcome thermal stratifications and ammonia build up. * Regular training to the farmers on fish culture, integrated farming and management of drought. * Seed banks / Brood stock banks of Government fish farm should hotel the breeders / seeds for next season.	* The government should provide quality seeds for the farmers for starting culture

2) Floods			
A. Capture			
Aquaculture / Marine	* Strengthening of banks. * Clearing of near by water channels for easy flow of water without entering the ponds. * The main inlet provision in the farm should be maintained. * The farmers / entrepreneurs should be trained to manage flood situation. * The stocks in low lying products of ponds prone to flooding should be transferred to other pond.	* Water storage to the maximum level should be taken. * Entry of flood water in to the pond should be prevented as to reduce silt and mortality and spread of disease. * Nets at every possible ways should arent escape of fished.	
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	T h crop duration should be reduced The cropping area should be reduced	*The loss should be reported to the fisheries departme nt	New stock has to be procured *Disease free stock should be maintained
Change in water quality			

Health and diseases			
B.Aquaculture			
Inundation with flood water	i. Avoid culture of fishes requiring longer duration of culture. ii. Initiating fish culture in advance in areas frequently prone to flooding.		
Infrastructure damage(pumps, aerators, huts etc)	i. Initiating fish culture in advance in areas frequently prone to flooding to prevent damage to the infrastructure		
Any other			
3. Cyclone / Tsunami	Before the event	During the event	After the event
A. Capture			
Inland			
B.Aquaculture	Before the event	During the event	After the event
Mariculture			
Overflow / flooding of ponds	i. Planting trees like casuarinas along coastal belt to avoid coastal erosion and inundation of sea waters.		
Changes in water quality(fresh water / brackish water ratio)	Stocking fishes which can tolerate wide salinity changes eg. milkfish, pearl spot etc.,		
Health and diseases			

Loss of stock and inputs (feed, chemicals etc.,)			
Infrastructure damage(pumps, aerators,shelters/huts etc.,			
Any other	Training programmes for stakeholders including resource users, planners and policy makers on coastal regulations, shoreline protection and environmental awareness.		
Heat wave and cold wave	Before the event	During the event	After the event
A. Capture			
Marine			i. To conduct studies on the ecological changes to assess the density and diversity of phyto and zooplankton and other benthic macro fauna (collaborative work with State Universities-TANUVAS)
Inland			
B.Aquaculture	Before the event	During the event	After the event
Changes in pond environment (water quality)			
Health and Disease management			
Any other	i. Conservation of our coral reefs (natural treasures) as they are the most diversified		

	and complex marine ecosystems ii. Conserve sea grass beds by imposing strict measures on trawling, removal for commercial purposes.		