State: TAMILNADU

Agriculture Contingency Plan for District: NILGIRIS

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Region / Sub Region (ICAR)	Western Ghats and Coastal Plain, hot humid-per humid eco-region (19.2.)		
	Agro-Climatic Region (Planning Commission)	Southern Plateau and Hills Region (X)		
	Agro Climatic Zone (NARP)	High altitude and hilly region (7.0)		
	List all the districts or part thereof falling under the NARP Zone	The Nilgiris, Kodaikanal, Shevroy, Elagiri, Javadhi, Kollimalai, Pachamalai, Yercaud, Anamalais, Palani and Podhigaimalai.		
	Geographic coordinates of district	Latitude	Longitude	Altitude
		11° 10' and 11° 45'	76°14' and 77°2' E	750 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	TNAU Horticultural Research Station, Ooty-643001		
	Mention the KVK located in the district	UPASI - KVK, Glenview, Coonoor - 643101, The Nilgiris Dt.		
1.2	**Rainfall**	Average (mm)	Normal Onset	Normal Cessation
	SW monsoon (June-Sep):	794	1st Week of June	1st week of October
	NE Monsoon(Oct-Dec):	361	2nd week of October	4th Week of December
	Winter (Jan- Feb)	56		
	Summer (Mar-May)	230		
	Annual	1441		

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)	254.5	142.6	10.0	5.1	2.0	3.8	3.4	8.2	1.9

1. 4	**Major Soils**	Area (‘000 ha)	Percent (%) of total
	Deep Red Soil	79.6	32.7
	Moderately Deep Black	71.5	29.3
	Moderately Shallow	8.6	3.5
	Shallow Black	9.2	3.7
	Shallow Red	21.1	8.7
	Very Deep Black	12.2	5.01
	Very Deep Red	32.0	13.1
1.5	**Agricultural land use**	Area (‘000 ha)	Cropping intensity %
	Net sown area	79.2	100.0
	Area sown more than once	-	
	Gross cropped area	79.3	

1.6	**Irrigation**	Area (‘000 ha)		
	Net irrigated area	0.7		
	Gross irrigated area	0.7		
	Rainfed area	78.5		
	Sources of Irrigation	Number	Area (‘000 ha)	% area
	Canals		0.4	2.2
	Tanks	-	-	-
	Open wells	-	-	-
	Bore wells	-	0.5	-
	Lift irrigation schemes	-	-	-
	Other sources	-	0.1	20.3
	Total	-	-	-
	Pump sets	-	1.1	100.0
	Micro-irrigation			
	Groundwater availability and use	No. of blocks	% area	Quality of water
	Over exploited			Good
	Critical			
	Semi- critical			
	Safe	4	100	
	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 (ha)**
			Irrigated	***Rainfed***	***Irrigated***	***Rainfed***		
	1	Paddy	0.8	--	0.5	--	**--**	1.3
		Horticulture crops - Fruits	**Total (ha)**					
	1	Carrot	2.3					
	2	Potato	1.6					
	3	Cabbage	0.6					
	4	Beans	0.5					
	5	Garlic	-					
		Other vegetables	0.5					
		Medicinal and Aromatic crops	**Total (ha)**					
	1	Ginger	0.9					
	2	Medicinal plants	0.7					
		Plantation crops						
	1	Banana	-					
	2	Tea	-					
	3	Coffee	-					
	4	Pepper	-					
	5	Cut flowers	-					
		Fodder crops	**Total (ha)**					
		Total fodder crop area						
		Grazing land	5.078					
		Sericulture etc						

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Non descriptive Cattle (local low yielding)	1.4	6.3	7.7
	Crossbred cattle	4.8	24.7	29.6
	Non descriptive Buffaloes (local low yielding)			
	Graded Buffaloes	0.2	0.9	1.1
	Goat	-	-	17.7
	Sheep	-	-	1.6
	Others (Camel, Pig, Yak etc.)	-	-	0.09
	Commercial dairy farms (Number)			Above 50

1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**
	Commercial	--	74.9
	Backyard	--	45.0

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)	

ii) Inland (Data Source: Fisheries Department)	**No. Farmer owned ponds**	**No. of Reservoirs**	**No. of village tanks**
	-	-	-

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)

1.11	Name of crop	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	Paddy	2.726	3370	1.579	3250	-	-	4.305.83	3310
2	Banana	23.961	36750	-	-	-	-	23.961.00	36750
Major Horticultural crops									
1	Potato	4.214	22540	16.487	22710	15.955	22410	36.658	22550
2	Cabbage	7.320	67160	20.202	72410	15.971	73600	43.494	71060
3	Carrot	16.927	26700	25.743	30180	27.212	30610	69.883	29160
4	Beans	1.096	8630	2.106	9120	1.684	9360	4.887	9040
5	Garlic	0.139	5560	0.117	5600	100	5560	0.356	5570
6	Tea	592.477	9850	-	-	-	-	592.477	9850
7	Coffee	3.751	560	-	-	-	-	3.751	560
8	Pepper	0.403	190	-	-	-	-	0.403	190
9	Cut flowers	0.632	8750	-	-	-	-	0.632	8750
10	Medicinal plants	1.306	17300	-	-	-	-	1.306	17300

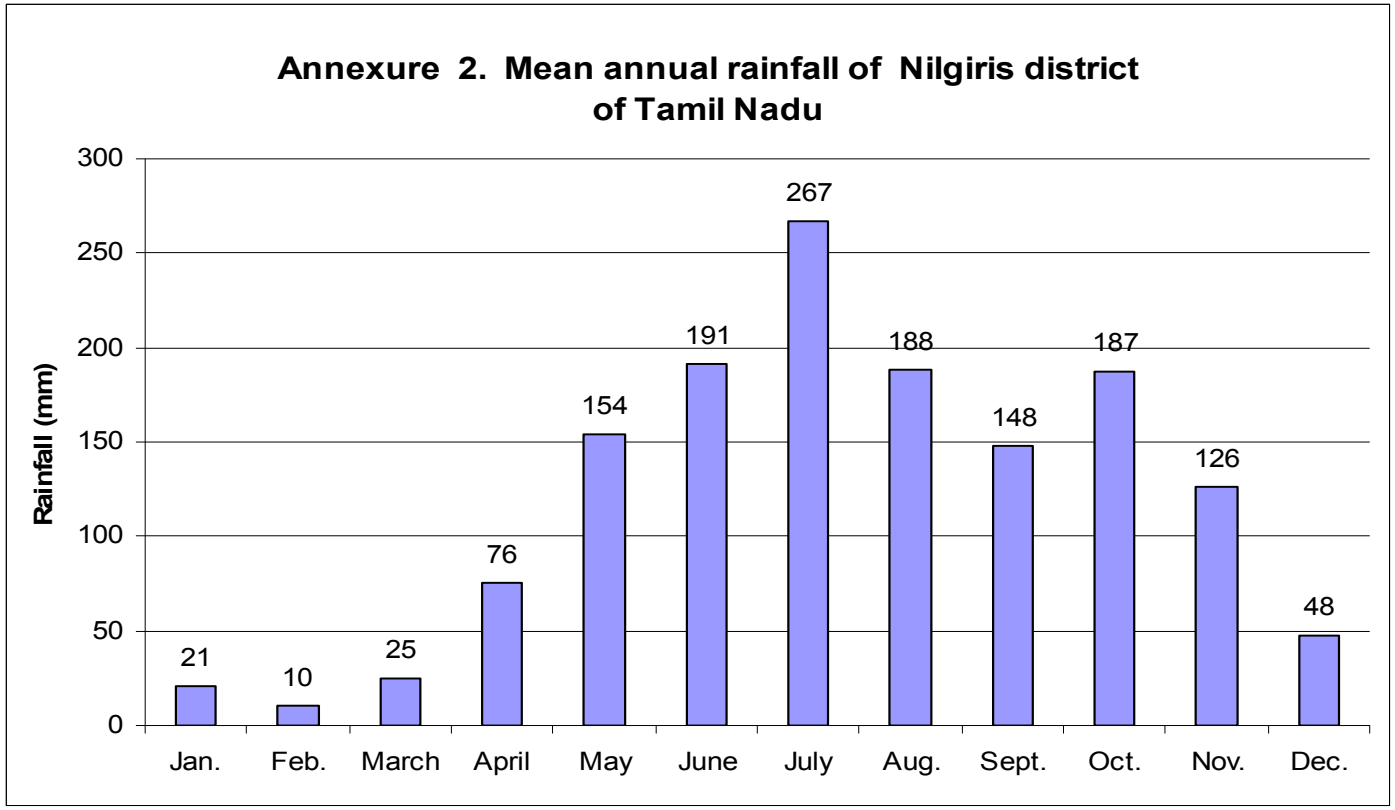
1.12	**Sowing window for 5 major crops (start and end of sowing period)**	Potato	Cabbage	Carrot	Beans	Beetroot
	Kharif- Rainfed	July 1st week to Aug 4th week	July 1st week to Aug 4th week	July 1st week to Aug 4th week	July1st week to Aug 4th week	July1st week to Aug 4th week
	Kharif-Irrigated	Jan 1st week to Feb 4th week	Jan 1st week to –Feb 4th week	Jan 1st week to Feb 4th week	Jan1st week to Feb 4th week	Jan1st week to Feb 4th week
	Rabi- Rainfed	March 1st week to April	March 1st week to April 4th	March1st week to April	March 1st week to April	March1st week to

		4th week	week	4th week	4th week	April 4th week
	Rabi-Irrigated	-	-	-	-	-

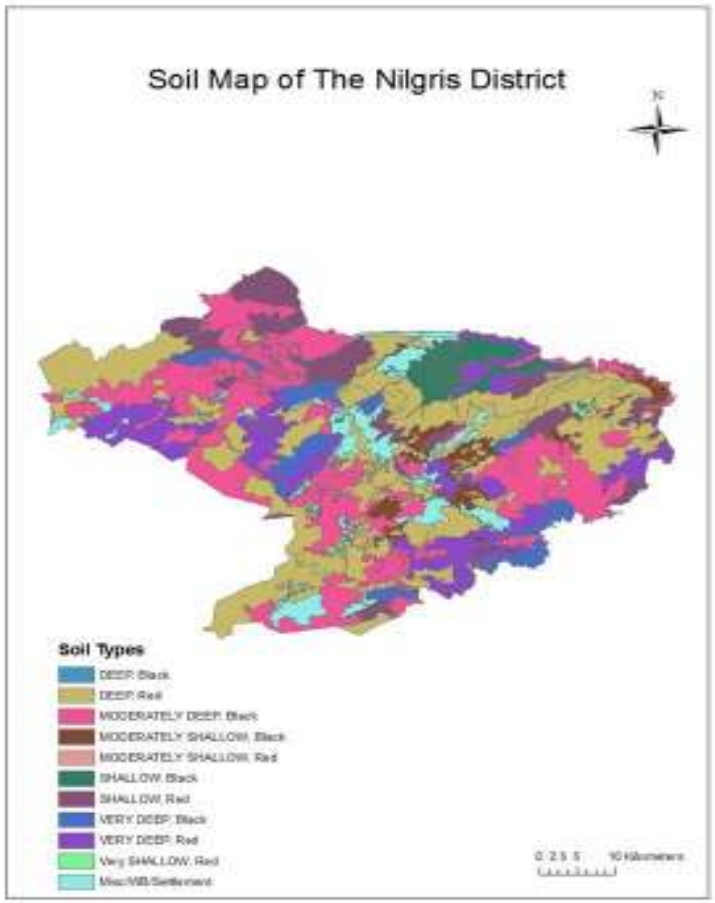
1.13	**What is the major contingency the district is prone to? (Tick mark and mention years if known during the last 10 year period)**	Regular	Occasional	None
		-	-	-
	Drought	-	-	✔
	Flood	-	✔	-
	High intense storms	-	-	✔
	Cyclone	-	-	✔
	Hail storm	-	-	✔
	Heat wave	-	-	✔
	Cold wave	✔	-	-
	Frost	✔	-	-
	Sea water inundation			✔
	Pests and diseases Powdery mildew, Downey mildew, Root grubs, Nematode infestation, Blister blight (Tea)	✔	-	-

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 The Nilgiris district and the blocks


Annexure 2. Mean annual rainfall of Nilgiris district of Tamil Nadu
Rainfall (mm)
300
250
200
150
100
50
0
21
10
25
76
154
191
267
188
148
187
126
48
Jan.
Feb.
March
April
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.

Annexure 3. Soil map of The Nilgiris district of Tamil Nadu



2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation (for both seasons of South west monsoon and north east monsoon)

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	Potato – Carrot – Potato	Varieties: Potato – Kufri jyoti Kufri Giridhari Kufri Giriraj (late blight resistant) Kufri Swarna Carrot – New koroda Super koroda King koroda Yearly nants Ooty -1 F1 hybrid – Bijjo Class 1	-	-

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 (July 1st week)	Shallow red soils	Potato – Carrot – Potato	Beetroot / Radish / Cauliflower – Carrot – Potato Varieties : Beetroot: Ooty - 1. Crimson globe and redball Radish: Japanese long, Pusa rashmi and Arka nishant Cauliflower: Ooty 1, Swarna, Sandoz Hybrid. Pusadapoli and Snowmistique		
		Cabbage – Potato - Carrot	Beetroot / Radish / Caluliflower – Carrot – Potato Varieties : Beetroot: Ooty - 1. Crimson globe and redball Radish: Japanese long, Pusa rashmi and Arka nishant Cauliflower: Ooty 1, Swarna, Sandoz Hybrid. Pusadapoli and Snowmistique		

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 (July 3rd week)	Shallow red soil	Potato – Carrot – Potato	Greens – Carrot – Potato Greens: Chakravarthi keerai Ooty - 1. Amranthus : Ooty - 1		
		Cabbage – Carrot - Potato	Greens – Carrot – Potato Greens: Chakravarthi keerai Ooty - 1. Amranthus : Ooty - 1		

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 (August 1st week)	Shallow red soil	Potato – Carrot – Potato	Green manure –Carrot – Potato Green manure: Lupin Buckwheat	-	-
		Cabbage – Carrot – Potatot	Green manure –Carrot – Potato Green manure: Lupin Buckwheat Varieties : Buck wheat – Ooty local Lupin – Ooty local		

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 soil	Potato – Carrot – Potato Cabbage – Carrot – Potato	Thinning Life saving irrigation Anti transparent spray with kaoline	Earthing up Mulching with pine leaves Mulching with plastic sheets Rain water harvesting by pond lining	Plastic sheet for mulching may be supplied with subsidy. Plastic sheets for pond lining may be supplied with subsidy.

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 soil	Potato – Carrot – Potato Cabbage – Carrot – Potato	Thinning of crop Life saving irrigation Anti transparent spray with kaoline	Earthing up Mulching with pine leaves Mulching with plastic sheets Rain water harvesting by pond lining	Plastic sheet for mulching may be supplied with subsidy. Plastic sheets for pond lining may be supplied with subsidy.

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 soil	Potato – Carrot – Potato	Thinning Life saving irrigation Anti transparent spray with kaoline	Earthing up Mulching with pine leaves Mulching with plastic sheets Rain water harvesting by pond lining	Subsidy may be granted for forming rain water harvesting ponds. Plastic sheet for mulching may be supplied with subsidy. Plastic sheets for pond lining may be supplied with subsidy.
	Shallow red soil	Cabbage – Carrot – Potato	Thinning Life saving irrigation Incase of severe drought, Potato and carrot may be harvested in earlier date. The produce can be sold as table vegetables.	Earthing up Mulching with pine leaves Mulching with plastic sheets Rain water harvesting by pond lining	

Condition			Suggested Contingency measures		
Terminal drought	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
	Shallow red soil	Cabbage – Carrot – Potato Potato – Carrot – Potato	Life saving irrigation Incase of severe drought, Potato and carrot may be harvested in earlier date. The produce can be sold as table vegetables. Harvest at physiological maturity stage	--	--

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	Not applicable				

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	Not applicable.				

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	Not applicable.				

Condition			Suggested Contingency measures		
	Major Farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation

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	Tube well red soil	Paddy	Maize and vegetables (Potato, Carrot, Beetroot, Radish, Beans)	1.Limited irrigation by alternate crops. 2. Alternate Furrow irrigation 3. Drip irrigation	-
Any other condition (specify)	-	-	-	-	-

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**
Horticulture				
Potato	Form trenches to drain excess water	Form trenches to drain excess water	Form trenches to drain excess water. Harvest and shift the crop to a safer place.	0.1% spray with carbendazim on the stored produce to prevent decaying / spoilage.
Cabbage	Form trenches to drain excess water. spray with 0.1% carbendazim to prevent disease onset	-	Form trenches to drain excess water. spray with 0.1% carbendazim to prevent disease onset. Incase of severe rain, harvest and market the product.	-
Carrot		-		-
Beans		-	Form trenches to drain excess water. spray with 0.1% carbendazim to prevent disease onset.	-
Radish		-		-

			Incase of severe, continuous rain, harvest and market the product.	
Garlic		-	Form trenches to drain excess water. spray with 0.1% carbendazim to prevent disease onset.	Form trenches to drain excess water. spray with 0.1% carbendazim to prevent disease onset.
Heavy rainfall with high speed winds in a short span				
Potato / Cabbage / Carrot / Garlic / Beans				
Horticulture				
Potato / Cabbage / Carrot / Garlic / Beans/ Tea / Cofee	Form trenches to drain excess water. spray with 0.1% carbendazim to prevent disease onset	-	Form trenches to drain excess water. spray with 0.1% carbendazim to prevent disease onset	Form trenches to drain excess water. spray with 0.1% carbendazim to prevent disease onset
Outbreak of pests and diseases due to unseasonal rains				
Horticulture				
Potato / Cabbage / Carrot / Garlic / Beans / Cofee / Tea	Need based plant protection IPDM for pluses	-	Need based plant protection IPDM for pluses	Safe storage against storage pest and diseases

2.3 Floods

Condition	**Suggested contingency measure**			
Transient water logging/ partial inundation	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Paddy	Drain excess water	Drain excess water	Drain water excess water	Drain water completely by forming vertical and radial drains
Banana	Drain excess water	Drain excess water	Drain excess water Support trees with plastic ropes / Poles	Drain water completely by forming vertical and radial drains Support trees with plastic ropes / Poles
Potato / Cabbage / Carrot / Garlic / Beans / Garli / Cofee / Tea	Drain excess water	Drain excess water	Drain excess water	Drain water completely by forming vertical and radial drains
Continuous submergence for more than 2 days				
Paddy	Drain excess water If damage is more, raise new nursery	Drain excess water Foliar spray with 1% urea / DAP	Drain water completely by forming vertical and radial drains	Drain water completely by forming vertical and radial drains
Banana	Drain excess water If damage is more, plant new suckers	Drain excess water Foliar spray with 1% urea / DAP	-	-

Horticulture				
Potato / Cabbage / Carrot / Garlic / Beans / Garlic	Drain excess water If damage is more, raise new crop spray with 0.1% carbendazim to prevent disease onset	Drain excess water Foliar spray with 1% urea / DAP spray with 0.1% carbendazim to prevent disease onset	Drain water completely by forming vertical and radial drains spray with 0.1% carbendazim to prevent disease onset	Drain water completely by forming vertical and radial drains

Tea / Coffee	-	Drain excess water Foliar spray with 1% urea / DAP	-	-
Sea water inundation	Not applicable	-	-	-

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

Extreme event type	**Suggested contingency measure**			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave	Not applicable	Not applicable	Not applicable	Not applicable
Cold wave				
Paddy / Banana	spray with 0.1% carbendazim to prevent disease onset	spray with 0.1% carbendazim to prevent disease onset	-	-
Horticulture				
Potato / Cabbage / Carrot / Garlic / Beans / Garlic	Cover with pine leaves / tree leaves Cover with plastic sheets spray with 0.1% carbendazim to prevent disease onset	Cover with pine leaves / tree leaves Cover with plastic sheets spray with 0.1% carbendazim to prevent disease onset	Cover with pine leaves / tree leaves Cover with plastic sheets spray with 0.1% carbendazim to prevent disease onset	-
Frost				
Paddy / Banana	spray with 0.1% carbendazim to prevent disease onset	spray with 0.1% carbendazim to prevent disease onset	-	-
Horticulture				

Potato / Cabbage / Carrot / Garlic / Beans / Cauliflower	Cover with pine leaves / tree leaves Cover with plastic sheets spray with 0.1% carbendazim to prevent disease onset	Cover with pine leaves / tree leaves Cover with plastic sheets spray with 0.1% carbendazim to prevent disease onset	Cover with pine leaves / tree leaves Cover with plastic sheets spray with 0.1% carbendazim to prevent disease onset	-
Hailstorm	Not applicable	Not applicable	Not applicable	Not applicable
Cyclone				
Paddy / Banana	If damage is high, raise New nursery / Seedling	If damage is high, Go for short duration crop like Potato / Cabbage / Carrot / Garlic / Beans / Cauli flower	If damage is high, Go for short duration crop like Potato / Cabbage / Carrot / Garlic / Beans / Cauli flower	-
Horticulture				
Potato / Cabbage / Carrot / Garlic / Beans / Cauli flower	If damage is high, raise New nursery / Seedling	If damage is high, raise New short duration crops like carrot / radish / amaranths	If damage is high, raise New short duration crops like carrot / radish / amaranths	-

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	As the district is sporadically affected with draught, the under mentioned measures should be taken to overcome fodder shortage problem Sowing of sorghum, maize, oats, Lucerne, Horsegram, Cowpea etc., during North-East monsoon under Rainfed for fodder production Fodder production with Sorghum – stylo-Sorghum on rotation basis. Create awareness on establishment of pasture with kikyu grass, rye, Phalaris aquatica, stylo, berseem, desmanthus, kolukkattai grass etc Creation of tree fodder models with Subabul, Glyricidia, Agathi, etc for tree fodder production during summer. Encouraging farmers to cultivate short-term fodder crops like sunhemp. 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 unexpected events	Transport dry fodder bales from the fodder grid at DLF, Hosur to the drought affected villages Harvest the failed vegetable crops like Carrot and potato and supplement to the high productive livestock Harvest all the top fodder available (Subabul, Glyricidia, Agathi, Prosopis etc) and feed the LS during drought All the hay should be enriched with 2% Urea molasses solution or 1% common salt solution and fed to LS Encourage mixing available kitchen waste with dry fodder while feeding to the milch animals Use of unconventional and locally available cheap feed ingredients for feeding of livestock. Promotion of cultivation of Horse gram as contingent crop and harvesting it at vegetative stage as fodder	Flushing the stock to recoup Replenish the feed and fodder banks 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
Cyclone	**NA**		

Floods	In case of early forewarning (EFW), harvest all the crops that can be useful as fodder in future (store properly) Don't allow the animals for grazing if severe floods are forewarned Keep stock of bleaching powder and lime Carry out Butax spray for control of external parasites Identify the Clinical staff and trained paravets and indent for their services as per schedules Identify the volunteers who can serve in need of emergency 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	Transportation of animals to elevated areas Proper hygiene and sanitation of the animal shed In severe storms, un-tether or let loose the animals Avoid soaked and mould infected feeds / fodders to livestock Emergency outlet establishment for required medicines or feed in each village Spraying of fly repellants in animal sheds	Repair of animal shed Bring back the animals to the shed Cleaning and disinfection of the shed Bleach (0.1%) drinking water / water sources Deworming with broad spectrum dewormers Proper disposable 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 Drying the harvested crop material and proper storage for use as fodder.
Cold wave	**Cold wave:** Covering all the wire meshed walls / open area with gunny bags/ polyethylene sheets (with a mechanism for lifting during the day time and putting down during night time)	Allow for grazing between 10AM to 3PM during cold waves Add 25-50 ml of edible oil in concentrates and fed to the animal during cold waves Apply / sprinkle lime powder in the animal shed during cold waves to neutralize ammonia accumulation	Feed the animals as per routine schedule Allow the animals for grazing (normal timings)
Heat wave	**NA**		
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 Precaution notice and vaccination during April: July: 1. Foot and Mouth Disease – Udagamandalam Block. Precaution notice and vaccination during June:	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 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	Keep close surveillance on disease outbreak. Undertake the vaccination depending on need Keep the animal houses clean and spray disinfectants

	September: 1. Black Quarter – Gudalur Block. Precaution notice and vaccination during September December: 1. Anthrax – Gudalur Block. Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district Adequate refreshment training on draught /flood/cyclone management to be given to VAS, Jr.VAS, LI with regard to health & management measures. Procure and stock multivitamins & area specific mineral mixture		
Insurance	Encouraging insurance of livestock	Listing out the details of the dead animals	Submission for insurance claim and availing insurance benefit Purchase of new productive animals
Drinking water	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	Restrict wallowing of animals in water bodies/resources	Bleach (0.1%) drinking water / water sources Provide clean drinking water

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**	**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 line 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 ammonia accumulation due to dampness	Disposal of dead birds by burning / burying with line powder in pit Disposal of poultry manure to prevent protozoal problem Supplementation of coccidiostats in feed Vaccination against RD
Cold wave			
Shelter/environment management	Provision of proper shelter Arrangement for brooding Assure supply of continuous electricity	Close all openings with polythene sheets In severe cases, arrange heaters Don't allow for scavenging during early morning and late evening	Routine practices are followed
Health and disease management	Arrangement for protection from chilled air	Supplementation of grains Antibiotics in drinking water to protect birds from pneumonia	Routine practices are followed
Cyclone	**NA**		
Heat wave	**NA**		

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Drought			
Feed and fodder availability	1. Dry fodder production – sorghum, maize, oats etc. - hay making 10-13% before flowering and creation of fodder banks at village levels based on the livestock population. 2. Ensiling and enrichment (1% salt + 2.5% molasses) of fodder varieties like oats, A T maize, Kikyu grass, Phalaris aquatica etc. 3. Creation of fodder models for draught with kikyu grass, rye, Phalaris aquatica, stylo, berseem, desmanthus, kolukkattai grass etc. 4. Conservation of green and dry fodder through chaffing. 5. Creation of tree fodder models with Subabul, Glyricidia, Agathi, Mara masal, Acacia melanoxilan Prosopis etc. 6. 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 for feeding livestock. 3. Enrichment of dry fodder with urea Salt and molasses. 4. Continuous supplementation of Minerals to prevent infertility. 5. Sprinkling of Sodium chloride solution on crop residues. 6. Supplementation of probiotics to milch cows.	1. Mineral supplementation for heifers and cows. 2. Use of salt licks for goats, calves etc. 3. Feeding ad libitum green 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. 2. Ensuring availability of water in community water tanks by frequent filling.	
Health and disease management	Precaution notice and vaccination during December: March: 1. Foot and Mouth Disease – Gudalur Block.	1. Reporting the outbreak to local veterinarian. a. Reporting to the local veterinarian in case of sudden death in livestock. b, Proper disposal of the carcasses only after	1. Sending disease outbreak annual and completion report. 2. Keeping vigil on the disease outbreak.

	General: 1. Anthrax vaccination in endemic areas 2. Deworming of all livestock 3. FMD vaccination for all livestock 4. Control of ectoparasites	post-mortem examination by the local veterinarian. 2. Reporting to the district ADIU and VUTRC for disease confirmation. 3. Entering the data and information in the electronic media at the NIC Centre at the district Collectorate. 4. Preparation of disease investigation report and sending collected specimens to CRL and CUL. 5. Isolation and treatment of affected animals. 6. Deployment of vaccination squad for performing ring vaccination (8 k.m. radius). 7. Preventing movement of livestock in the affected area. 8. Sending regular reports to the Directorate of Animal Husbandry. 9. Submission final report to the Directorate of Animal Husbandry. General: 1. Nutritional supplementation 2. Summer management of livestock 3. Snail control measures in the Water bodies	General: 1. Nutritional supplementation 2. Breeding management
Floods			
Feed and fodder availability			
Drinking water			
Health and disease management			
Cyclone			

Feed and fodder availability			
Drinking water			
Health and disease management			
Heat wave and cold wave/ Frost			
Shelter/environment management	Feed and Fodder: 1. Dry fodder production – sorghum, maize, oats etc. and hay making 10-13% before flowering and creation of fodder banks at village levels based on the livestock population. 2. Ensiling and enrichment (1% salt + 2.5% molasses) of fodder varieties like oats, A T maize, Kikyu grass, Phalaris aquatica etc. 3. Creation of pasture lands with frost resistant Kikyue grass, rye, oats, Phalaris aquatica, berseem etc. 4. Establishment of frost resistant fodder tree models with Acacia melanoxilan, Mara masal etc. which will also protect the pasture lands from frost. 5. Conservation of green and dry fodder through chaffing. 6. Protecting the pasture lands with frost (Net) covers. 7. Procurement and storage of sorghum straw from the plains to meet to the fodder deficit during frost. Shelter management: 1. Providing frost proof shelters for animals	1. Avoiding grazing of animals during frost in open fields.	
Health and disease management	Precaution notice and vaccination during April: July: 1. Foot and Mouth Disease – Udagamandalam Block. Precaution notice and vaccination during June:	1. Reporting the outbreak to local veterinarian. a. Reporting to the local veterinarian in case of sudden death in livestock.	1. Sending disease outbreak annual and completion report. 2. Keeping vigil on the

	September: 1. Black Quarter – Gudalur Block. Precaution notice and vaccination during September December: 1. Anthrax – Gudalur Block. General: 1. Protecting animals against Anthrax, Foot and Mouth Disease, Blue Tongue, ET etc. 2. Deworming of all animals 3. Control of ectoparasites	b, Proper disposal of the carcasses only after post-mortem examination by the local veterinarian. 2. Reporting to the district ADIU and VUTRC for disease confirmation. 3. Entering the data and information in the electronic media at the NIC Centre at the district Collectorate. 4. Preparation of disease investigation report and sending collected specimens to CRL and CUL. 5. Isolation and treatment of affected animals. 6. Deployment of vaccination squad for performing ring vaccination (8 k.m. radius). 7. Preventing movement of livestock in the affected area. 8. Sending regular reports to the Directorate of Animal Husbandry. 9. Submission final report to the Directorate of Animal Husbandry. General: 1. Nutritional supplementation	disease outbreak. General: 1. Nutritional supplementation 2. Breeding 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 potable water to poultry 2. Water sanitation		
Health and disease management	1. Vaccination against Ranikhet disease 2. Deworming of poultry	1. Prevention and control of Coccidiosis in poultry 2. Summer management of poultry		
Floods				
Shortage of feed ingredients				
Drinking water				
Health and disease management				
Cyclone				
Shortage of feed ingredients				
Drinking water				
Health and disease management				
Heat wave and cold wave / Frost				

Shelter/environment management	Feed and Fodder 1. Procurement and storage of feed ingredients to meet to the shortage during frost period 2. Protection of poultry by frost resistant shelters/sheds	1. Nutritional supplementation of poultry	1. Nutritional supplementation of poultry	
Health and disease management	1. Vaccination against Ranikhet disease 2. Deworming of poultry	1. Prevention and control of Coccidiosis in poultry 2. Frost management of poultry		

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
(iii) Any other			

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
(iii) Any other			
2) Floods			
A. Capture	-	-	-
Marine	-	-	-
Inland	• 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
(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	-	-	-

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	-	-	-
A. Capture	-	-	-
Marine	-	-	-
Inland	-	-	-
B. Aquaculture		-	-
(i) Changes in pond environment (water quality)	• Strengthening of pond bundh to prevent seepage • Shifting of stock to a more sheltered pond	• Shifting of stock to a more sheltered pond • Improve aeration and water recycling	• Shifting of stock to normal ponds to ensure proper growth
(ii) Health and Disease management	-	-	-