

State: KERALA

Agriculture Contingency Plan for District: THRISSUR

1.0 District Agriculture profile					
1.1	Agro-Climatic/Ecological Zone				
	Agro Ecological Sub Region (ICAR)	Konkan, Karnataka and Kerala Coastal plain, hot humid to perhumid eco-subregion (19.3) Central and south Sahyadris, hot moist, subhumid to humid eco-subregion (19.2)			
	Agro-Climatic Region (Planning Commission)	West Coast Plains And Ghat Region (XII)			
	Agro Climatic Zone (NARP)	Central Zone (KE 3)			
	List all the districts or part thereof falling under the NARP Zone	Palakkad, Thrissur, Wayanad, Palakkad, Malappuram			
	Geographic coordinates of district	Latitude	Longitude	Altitude	
		10° 31' 0" N	76° 13' 0" E	1200m above MSL	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	RARS, Pattambi, Mele Pattambi P.O., Palakkad Dist 679 306			
Mention the KVK located in the district	KVK, Thrissur - 680 584				
1.2	Rainfall	Normal RF(mm)	Normal Rainy days (number)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-September):	2095.1	79	23 rd Week (1 st week of June)	39 th week (last week of September)
	NE Monsoon(October-December):	429.7	18	43 rd Week (October)	46 th Week (November)
	Winter (January- February)	30.2	2	-	-
	Summer (March-May)	267.1	13	-	-
	Annual	2822.1	112	-	-

1.3	Land use pattern of the district (latest statistics)2008-09	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)	302.9	103.8	44.3	0.03	8.5	0.4	0.3	10.7	5.5

1.4	Major Soils (common names like shallow red soils etc.,)	Area (000'ha)	Percent (%) of total
	Laterite soils	76.4	26
	Sandy soils	9.8	3
	Sandy loamy soils	72.8	24
	Clayey soils	42.7	14
	Gneissic	97.5	33
	Others (specify):	-	-
1.5	Agricultural land use	Area (000'ha)	Cropping intensity %
	Net sown area	129.3	134%
	Area sown more than once	44.0	
	Gross cropped area	173.3	

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	68.5		
	Gross irrigated area	77.3		
	Rainfed area	60.8		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals		16.2	23.6
	Tanks		5.5	8.0
	Open wells		35.2	51.4

	Bore wells		0.7	1.1
	Lift irrigation	-	1.0	1.5
	Micro-irrigation		-	-
	Other sources	-	9.8	14.4
	Total Irrigated Area		68.5	
	Pump sets			
	No. of Tractors			
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils	(%) area	
	Over exploited	1	5.9	
	Critical	0	0	
	Semi- critical	4	23.5	
	Safe	12	70.6	
	Wastewater availability and use	-	-	
	Ground water quality	Satisfactory		
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

1.7 Area under major field crops & horticulture etc. (2008-09)

1.7	Major Field Crops cultivated	Area ('000ha)					
		<i>Kharif</i>		<i>Rabi</i>		Summer	Total
		<i>Irrigated</i>	<i>Rainfed</i>	<i>Irrigated</i>	<i>Rainfed</i>		
	Paddy	0.2	4.6	14.2	0.1	8.8	27.9
	Tapioca	-	0.3	-	0.3	0.5	1.1
	Other tuber crops	-	-	-	-	-	0.8
	Horticulture crops - Fruits	Total area('000ha)					
	Mango	6.1					
	Plantain	4.3					
	Jack	4.7					

	Nendran banana	2.8
	Cashewnut	2.4
	Papaya	1.9
	Pineapple	0.1
	Horticultural crops - Vegetables	Total area('000ha)
	Drumstick	1.5
	Amaranth	0.1
	Bitter giurd	0.1
	Snake gourd	0.1
	Bhindi	0.1
	Brinjal	0.05
	Chillies	0.2
	Little gourd	0.1
	Ash gourd	0.05
	Pumpkin	0.05
	Cucumber	0.1
	Others vegetables	0.5
	Total vegetables	2.9
	Medicinal and Aromatic crops	Total area('000ha)
	Medicinal plants	0.2
	Spices	Total area('000ha)
	Pepper	4.8
	Nutmeg	4.2
	Ginger	0.1
	Turmeric	0.1
	Plantation crops	Total area
	Coconut	76.7
	Arecanut	7.2
	Rubber	14.7
	Fodder crops	Total area
	Cultivated grass fodders	0.1
	Total fodder crop area	0.1

	Grazing land	0.02
	Sericulture etc	-
	Others (Specify)	-

1.8	Livestock	Male	Female	Total (No)
	Non descriptive Cattle (local low yielding)	-	-	17,359
	Crossbred cattle	-	-	1,30,555
	Non descriptive Buffaloes (local low yielding)	-	-	10,408
	Graded Buffaloes	-	-	-
	Goat	-	-	99,779
	Sheep	-	-	-
	Pig (crossbred)	-	-	7,271
	Pig (indigenous)	-	-	8,488
	Rabbits	-	-	8443
1.9	Poultry	-	-	-
	Hens(desi)	-	-	8,18,527
	Hens(improved)	-	-	3,69,756
	Ducks	-	-	49,404
	Turkey and others	-	-	1,169
	Quail,broiler	-	-	8,62,674
	Commercial dairy farms (Number)			

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)									
	Others									

1.11 Production and Productivity of major crops (Average of last 5 years: 2004, 05, 06, 07, 08)

1.11	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder ('000 tons)
		Production (000' tons)	Productivity (kg/ha)	Production (000' tons)	Productivity (kg/ha)	Production (000' tons)	Productivity (kg/ha)	Production (000' tons)	Productivity (kg/ha)	
Major Field crops (Crops to be identified based on total acreage)										
	Paddy	12.2	2140	34.7	2469	24.4	3560	71.3	2723	-
	Tapioca	-	-	-	-	-	-	38.9	26,375	-
Major Horticultural crops (Crops to be identified based on total acreage)										
	Coconut (nuts in M.)	-	-	-	-	-	-	610	7598 (nuts/ha)	-
	Rubber	-	-	-	-	-	-	245.3	670	-
	Areca nut	-	-	-	-	-	-	7.1	936	-

	Pepper	-	-	-	-	-	-	1.0	185	-
	Banana (Nendran)	-	-	-	-	-	-	23.3	8065	-
	Plantain	-	-	-	-	-	-	32.1	5691	-
	Jack (fruits in M)	-	-	-	-	-	-	0.02	3809 (No./ha)	-
	Cashew	-	-	-	-	-	-	1.1	471	-

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Rice	Tapioca	Banana	Ginger	Turmeric
	Kharif- Rainfed	April- May	April-May	April-May	April-May	April-May
	Kharif-Irrigated	May-June				
	Rabi- Rainfed	Sept - Oct.	Sept. Oct.			
	Rabi-Irrigated	Dec-Jan.		Aug.-Sept.		

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

	Sea water intrusion	√		
	Pests and diseases (specify)	√		
	Others			

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: No
		Soil map as Annexure 3	Enclosed: No

ANNEXURE 1: Location map of THRISSUR



2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition-1			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
Delay by 2 weeks (June 3 rd week)	Coastal sandy soils	Rice-Rice	No change	Direct seeding for the first crop	
		Rice(Pokkali)		Select short duration improved varieties	
		Coconut+ Mango/Jack/mixed trees		Husk burial, mulching, bulky organic manures. For seedlings, white washing, mulching, shading and lifesaving irrigation for Coconut and Arecanut.	NREGA,NHM
		Coconut+ Arecanut-mixed trees		NREGA,NHM	
		Vetiver		No special measures needed	
	Low lands with special reference to Kole lands	Coconut+ Nutmeg+ Plantain	Select drought tolerant varieties	Husk burial, mulching, bulky organic manures. For seedlings, white washing, mulching, shading and lifesaving irrigation.	Micro-irrigation scheme, NREGA,NHM
		Coconut+ Arecanut+ Plantain			
		Coconut+Nutmeg+Plantain			
		Coconut+Vegetables			
	Low lands	Rice-Rice	Choice of drought tolerant and short duration varieties for the first crop	Direct seeding for the first crop	
		Fallow- Rice	.	Start the crop in time by reducing fallow period	
		Rice-vegetables	Choice of drought tolerant and short duration varieties for the first crop	Direct seeding for the first crop	

		Rice-Tapioca	-do-	-do-	
		Rice-Ginger/Turmeric	-do-	Mulching, bulky organic manures	
	Uplands	Coconut+Ginger/Turmeric	-	Mulching, bulky organic manures, Micro-irrigation for coconut. Delayed planting of annual crops	RKVY,NREGA,NHM ,CDB Micro irrigation schemes
		Coconut-Mango/Jack/mixed trees			
		Coconut+ Plantain			
		Coconut+ Nutmeg			
		Coconut+ Nutmeg+ Plantain			
		Coconut+ medicinal plants			
		Rubber monocrop	-	Follow soil and water conservation methods. Manage weeds. Smear the trunks of trees with china clay or lime	
		Cashew monocrop			
		Nendran monocrop	Select drought tolerant and short duration varieties	Follow soil and water conservation methods. Manage weeds. Lifesaving irrigation.	
		Vegetables-vegetables			
		Tapioca alone			
		Tapioca-vegetables			
	Vegetables-vegetables				
	High lands (Malayorum)	Coconut+ Nutmeg		Follow soil and water conservation methods. Manage weeds. Lifesaving irrigation smear the trunks of trees with china clay or lime. Delayed planting of medicinal plants	NREGA, CDB,NHM, Micro irrigation schemes
		Coconut+ pepper			
		Coconut+ Plantain			
		Coconut+ medicinal plants			
		Cashewnut monocrop		Follow soil and water conservation methods. Smear the trunks of trees with china clay or lime	
		Rubber monocrop			

Condition-2			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
Delay by 4 weeks (July 1 st week)	Coastal sandy soils	Rice-Rice	Prefer Ultra short duration Rice varieties	Direct seeding for the first crop	-
		Rice(Pokkali)	Select short duration improved varieties	-	-
		Coconut + Mango/Jack/mixed trees	No change	Husk burial, mulching, bulky organic manures. For seedlings, white washing, mulching, shading and lifesaving irrigation.	Micro-irrigation scheme, RKVY,NREGA, CDB,NHM
		Coconut + Arecanut+ mixed trees	No change		
		Vetiver	No change	No special measures needed	-
	Low lands with special reference to Kole lands	Coconut+Nutmeg+Plantain	Select drought tolerant varieties	Husk burial, mulching, bulky organic manures. For seedlings, white washing, mulching, shading and lifesaving irrigation.	Micro-irrigation scheme, RKVY,NREGA,CDB,NHM
		Coconut+Arecanut+ Plantain			
		Coconut+Nutmeg+Plantain			
		Coconut+Vegetables			
	Low lands	Rice-Rice	Drought tolerant and ultra short duration varieties for the first crop	Direct seeding for the first crop	
		Fallow- Rice	Start the crop in time by reducing fallow period.	No change	
		Rice-Vegetables	Drought tolerant and short duration varieties for the first crop	Direct seeding for the first crop	
		Rice-Tapioca	-do-	Direct seeding for the first crop	
		Rice-Ginger/Turmeric	-do-	Mulching, bulky organic manures	

	Uplands	Coconut+Ginger/Turmeric/Turmeric	-	Mulching, bulky organic manures, Micro-irrigation for coconut. Delayed planting of annual crops	RKVY,NREGA, CDB, NHM, Microirrigation schemes		
		Coconut+Mango/Jack/mixed trees					
		Coconut+Plantain					
		Coconut+Nutmeg					
		Coconut+Nutmeg+Plantain					
		Coconut+medicinal plants					
		Rubber monocrop	-			Follow soil and water conservation methods. Manage weeds. Smear the trunks of trees with china clay or lime	
		Cashew monocrop					
		Nendran monocrop	Select drought tolerant and short duration varieties.			Follow soil and water conservation methods. Manage weeds. Lifesaving irrigation.	RKVY,NREGA, NHM, Microirrigation schemes
	Vegetables-vegetables						
	Tapioca alone						
	Vegetables-vegetables						
	High lands (Malayorum)	Coconut+Nutmeg	-	Mulching, organic manures, Micro-irrigation for coconut. Smear the trunks of trees with china clay or lime. Delayed planting of annual crops	RKVY,NREGA, CDB, NHM, Microirrigation schemes		
		Coconut+pepper					
		Coconut+Plantain					
Coconut+medicinal plants							
Cashewnut monocrop		-	Soil and water conservation methods. Smear the trunks with china clay or lime.	-			
Rubber mono crop							

Condition-3			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agonomic measures	Remarks on Implementation
Delay by 6 weeks			NA		

Condition-4		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
Delay by 8 weeks			NA		

Condition-5		Suggested Contingency measures			
Early season drought (Normal onset)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/ crop stand etc.	Coastal sandy soils	Rice-Rice	Arrange for gap filling by the receipt of rains. Remove weeds and use them as mulch.	Apply P and K as basal dose. Delay N application Apply organic manures	-
		Rice(Pokkali)	Normally, this situation may not affect the crop as it is a flooded		-
		Coconut+Mango/Jack/mixed trees	Weeding	Husk burial, mulching, bulky organic manures.	RKVY,NREGA, CDB
		Coconut+Arecanut-mixed trees			
		Vetiver	Gap filling	Apply P and K as basal dose.	-
	Low lands with special reference to Kole lands	Coconut+Nutmeg+Plantain	Avoid drought susceptible varieties, select tolerant types Provide shade, Gap filling, husk burial	<ul style="list-style-type: none"> • Application of organic manures in bulk • Delay application of fertilizers for the receipt of rains • For tree seedlings, adopt white washing with china clay or lime • Mulching, shading and lifesaving irrigation. 	Micro-irrigation scheme, RKVY,NREGA, CDB
		Coconut+Arecanut+Plantain			
		Coconut+Nutmeg+Plantain			
		Coconut+vegetables			

	Low lands	Rice-Rice	Arrange for gap filling by the receipt of rains. Remove weeds and use them as mulch.	Apply P and K as basal dose. Delay N application. Apply organic manures	-
		Fallow- Rice	The drought period coincide with the fallow period. Start the second crop in time	No change	-
		Rice-Vegetables	Arrange for gap filling by the receipt of rains. Remove weeds and use them as mulch	Apply P and K as basal dose- Delay N application Apply organic manures mulching	NHM
		Rice-Tapioca			
		Rice-Ginger/Turmeric			
	Uplands	Coconut+ Ginger/Turmeric	Avoid drought susceptible varieties, select tolerant types Provide shade, Gapfilling, husk burial	<ul style="list-style-type: none"> • Bulky organic manures. • Delay application of fertilizers for the receipt of rains. • For tree seedlings, adopt white washing with china clay or lime. • Mulching, shading and lifesaving irrigation. 	RKVY,NREGA, CDB, Micro irrigation schemes
		Coconut+ Mango/Jack/mixed trees			
		Coconut+ Nutmeg			
		Coconut+ Plantain			
		Coconut+ Nutmeg+ Plantain			
		Coconut+ Medicinal plants			
		Cashew monocrop	Provide shade, Gapfilling	Delay of fertilizers till the receipt of rains Mulching Follow soil and water conservation methods. Smear the trunks of trees with china clay or lime	
		Rubber monocrop			
		Nendran monocrop	Select drought tolerant varieties (Pls specify the varieties) Gapfilling, manage weeds, provide shade	Apply P and K as basal dose- Delay N application Apply organic manures mulching Lifesaving irrigation	
		Vegetables-vegetables			
		Tapioca alone			
Vegetables-vegetables					
High lands	Coconut+ Nutmeg	-	Follow soil and water conservation		

	(Malayorum)	Coconut+ Plantain		methods. Manage weeds. Lifesaving irrigation Smear the trunks of trees with china clay or lime	
		Coconut+ Nutmeg +Plantain			
		Coconut+ medicinal plants			
		Coconut+ pepper			
		Cashewnut monocrop	-	Follow soil and water conservation methods. Smear the trunks with china clay/lime	
		Rubber monocrop			

Condition-6		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 nutrient & moisture conservation measues	Remarks on Implementation	
At vegetative stage	Coastal sandy soils	Rice-Rice	Remove weeds and use them as mulch.	Apply P and K as basal dose. Delay N application. Apply organic manures		
		Rice (Pokkali)	Normally, this situation may not affect the crop as it is a flooded crop			
		Coconut+ Mango/Jack/mixed trees	Weeding	Husk burial, mulching, bulky organic manures.	NREGA,CDB	
		Coconut+ Arecanut-mixed trees				
		Vetiver		Apply P and K as basal dose.		
	Low lands with special reference to Kole lands	Coconut+ Nutmeg+ Plantain	Avoid drought susceptible varieties, select tolerant types Weeding For tree seedlings, provide shade. Gapfilling, husk burial	Bulky organic manures. Delay application of fertilizers for the receipt of rains. Adopt white washing with china clay or lime. Mulching, shading and lifesaving irrigation.	Micro-irrigation scheme, NREGA,CDB,NHM	
		Coconut+ Arecanut+ Plantain				
		Coconut+Nutmeg+Plantain				
			Coconut+vegetables			

	Low lands	Rice-Rice	Remove weeds and use them as mulch.	Apply P and K as basal dose. Delay N application. Apply organic manures	
		Fallow- Rice	The drought period coincide with the fallow period. Start the second crop in time	No change	
		Rice-vegetables	Remove weeds and use them as mulch. Use anti-transpirants	Apply P and K as basal dose-Delay N application. Apply organic manures. mulching	NHM
		Rice-Tapioca			
		Rice-Ginger/Turmeric			
	Uplands	Coconut+ Ginger/Turmeric	Avoid drought susceptible varieties, select tolerant types. Provide shade for tree seedlings. Use of anti-transpirants	Use bulky organic manures. Delay application of fertilizers for the receipt of rains. For tree seedlings, adopt white washing with china clay or lime. Mulching, shading and lifesaving irrigation.	RKVY,NREGA, CDB, NHM, Microirrigation schemes
		Coconut+ Mango/Jack/mixed trees			
		Coconut+ Nutmeg			
		Coconut+ Plantain			
		Coconut+Nutmeg+Plantain			
		Coconut+medicinal plants			
		Cashew monocrop	For seedlings, provide shade	Delay fertilizers for the receipt of rains. Mulching. Follow soil and water conservation methods. Smear the trunks of trees with china clay or lime	
		Rubber mono crop			
		Nendran monocrop	Provide shade, manage weeds, mulching.	Apply P and K as basal dose-Delay N application	
		Vegetables-vegetables	Resowing	Apply organic manures. mulching.	
		Tapioca alone	Use plant growth regulators to regulate flowering in vegetables. Use anti-transpirants	Lifesaving irrigation.	
	Tapioca-vegetables				
	Vegetables-vegetables				
	High lands (Malayorum)	Coconut+Nutmeg	Provide shade for seedlings. Manage weeds. Use anti-transpirants	Follow soil and water conservation methods. Lifesaving irrigation.	NREGA, CDB, NHM, Microirrigation
Coconut+Plantain					
Coconut+Nutmeg+Plantain					

		Coconut+medicinal plants		Smear the trunks of trees with china clay or lime	schemes
		Coconut+Pepper			
		Cashewnut monocrop	Provide shade for seedlings. Manage weeds	Follow soil and water conservation methods. Smear the trunks with china clay/lime	
		Rubber mono crop			

Condition-7		Suggested Contingency measures				
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation	
At flowering stage/fruited stage	Coastal sandy soils	Rice-Rice	Remove weeds and use them as mulches. Use anti-transpirants.	As a long term strategy, go for rain water harvesting and conservation.	NREGA	
		Rice(Pokkali)	Normally, this situation may not affect the crop as it is a flooded crop			
		Coconut+Mango/Jack/mixed trees	Suppress weed growth. Micro-irrigation.	Rain water harvesting and conservation, mulching, bulky organic manures.	NREGA,CDB,NHM	
		Coconut+ Arecanut+ mixed trees	Use anti-transpirants			
		Vetiver	NA			
	Low lands with special reference to Kole lands	Coconut+Nutmeg+Plantain			Bulky organic manures. Delay application of fertilizers for the receipt of rains. Mulching, shading and life saving irrigation.	Micro-irrigation scheme, NREGA, CDB
		Coconut+ Arecanut+ Plantain				
		Coconut+ Nutmeg +Plantain				
		Coconut-vegetables				

	Low lands	Rice-Rice	Select tolerant varieties. Remove weeds and use them as mulch.	Fertilizer application should be completed before flowering.	
		Fallow- Rice	The drought period coincide with the fallow period. Start the second crop in time	No change	
		Rice-vegetables	Select tolerant varieties. Remove weeds and use them as mulch. Use plant growth regulators to regulate flowering in vegetables. Use anti-transpirants	Fertilizer application should be completed before flowering.	NHM
		Rice-Tapioca			
		Rice-Ginger/Turmeric			
	Uplands	Coconut +Ginger/Turmeric	Avoid drought susceptible varieties. Provide shade, husk burial	Fertilizer application should be completed before flowering. Mulching, shading and lifesaving irrigation.	NREGA, NHM, CDB, Microirrigation schemes
		Coconut +Mango/Jack/mixed trees			
		Coconut+ Nutmeg			
		Coconut+ Plantain			
		Coconut+ Nutmeg+ Plantain			
		Coconut+ medicinal plants			
		Cashew monocrop		Fertilizer application should be completed before flowering. Follow soil and water conservation methods. Smear the trunks of trees with china clay or lime	
		Rubber monocrop		Flowering not important	
		Nendran monocrop	Provide shade, manage weeds, mulching. Resowing Use plant growth regulators to regulate flowering in vegetables. Use anti-transpirants	Fertilizer application should be completed before flowering. Lifesaving irrigation.	NHM
	Vegetables-vegetables				
Tapioca alone					
Tapioca-vegetables					
	Vegetables-vegetables				
High lands	Coconut+ Nutmeg	Select drought tolerant types.	Follow soil and water conservation	NREGA, NHM,	

	(Malayorum)	Coconut +Plantain	Manage weeds. Use anti-transpirants	methods. Manage weeds. Lifesaving irrigation Smear the trunks of trees with china clay or lime	CDB, Microirrigation schemes
		Coconut+ Nutmeg+ Plantain			
		Coconut+ Medicinal plants			
		Coconut+ pepper			
		Cashewnut monocrop	Manage weeds	Follow soil and water conservation methods. Smear the trunks with china clay/lime	
		Rubber mono crop	Flowering not important		

Condition-8		Suggested Contingency measures			
Terminal drought	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi crop planning	Remarks on implementation
	Coastal sandy soils	Rice-Rice	Harvest at physiological maturity	Change the sequence to Rice-pulses or Rice-oilseeds	
		Rice(Pokkali)	Normally, this situation may not affect the crop as it is a flooded crop	No Rice crop during this season.	
		Coconut +Mango/Jack/mixed trees	Mulching, providing shading, etc.	-	RKVY,NREGA
		Coconut+ Arecanut+ mixed trees			
		Vetiver	NA		
	Low lands with special reference to Kole lands	Coconut+ Nutmeg+ Plantain	Mulching, shading and life saving irrigation.	For vegetables, Start the sowing of seeds in containers like polybags /planting trays for shifting to main field after 15-20days.	Micro-irrigation scheme, RKVY,NREGA
		Coconut+ Arecanut+ Plantain			
		Coconut+Nutmeg+Plantain			
		Coconut+ Vegetables			

	Low lands	Rice-Rice	Select tolerant varieties	Change the sequence to Rice-pulses or Rice-oilseeds. As a long term strategy, go for rain water harvesting and conservation.	
		Fallow- Rice	The drought period coincide with the fallow period.	If terminal drought persists, take pulses or oilseeds depending on rainfall	
		Rice-vegetables	Use plant growth regulators to regulate flowering in vegetables. Use anti-transpirants	Select tolerant varieties. For vegetables, Start the sowing of seeds in containers like polybags /planting trays for shifting to main field after 15-20days. Mulching.	NHM
		Rice-Tapioca			
	Rice-Ginger/Turmeric				
	Uplands	Coconut+ Ginger/Turmeric	Avoid drought susceptible varieties. Provide shade, husk burial	Mulching, shading and lifesaving irrigation.	NREGA, CDB, NHM, Microirrigation schemes
		Coconut+ Mango/Jack/mixed trees			
		Coconut+ Nutmeg			
		Coconut+ Plantain			
		Coconut+Nutmeg+Plantain			
		Coconut+ medicinal plants			
		Cashew monocrop	Precautionary measures against tea mosquito in cashew	Follow soil and water conservation methods.	
		Rubber monocrop		Follow soil and water conservation methods. Smear the trunks with china clay/lime	
		Nendran monocrop	Provide shade, manage weeds, mulching. Resowing Use plant growth regulators to regulate flowering in vegetables. Use anti- transpirants	Mulching, Lifesaving irrigation. Select tolerant varieties. For vegetables, Start the sowing of seeds in containers like polybags /planting trays for shifting to main field after 15-20days. Mulching.	NREGA, NHM, Microirrigation schemes
		Vegetables-vegetables			
		Tapioca alone			
		Tapioca-vegetables			
Vegetables-vegetables					
High lands (Malayorum)	Coconut+Nutmeg	Select drought tolerant types. Manage weeds. Use anti-	Follow soil and water conservation methods. Manage weeds. Lifesaving	NREGA, NHM, CDB,	
	Coconut+Plantain				

		Coconut+Nutmeg+Plantain	transpirants	irrigation Smear the trunks of trees with china clay or lime	Microirrigation schemes
		Coconut+medicinal plants			
		Coconut+pepper			
		Cashew nut monocrop	Precautionary measures against tea mosquito in cashew. Manage weeds	Follow soil and water conservation methods.	
		Rubber mono crop		Follow soil and water conservation methods. Smear the trunks with china clay/lime	

2.1.2 Irrigated situation

Condition-1			Suggested Contingency measures		
Delayed release of water in canals due to low rainfall	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
	Coastal sandy	Rice-Rice	Short duration Rice (SD)-Rice	Direct seeding for the first crop. Adopt phasic stress irrigation for the first crop. Use pre-emergence herbicides Use organic manures.	
	Low lands with special reference to Kole lands	Rabi Rice	Delay planting. Use Short duration Rice (SD)	Use pre-emergence herbicides Use organic manures.	
	Low lands	Rice-Rice	Choice of drought tolerant and short duration varieties for the first crop	Direct seeding for the first crop. Adopt phasic stress irrigation for the first crop. Use pre-emergence herbicides Use organic manures.	
		Rice-Vegetables	Rice (SD)-vegetables	Mulching, organic manures, micro-irrigation for vegetables	NREGA,NHM Microirrigation schemes
		Nendran banana	Delay planting	Mulching, organic manures, Microirrigation.	
	Uplands	Nendran banana	Select drought tolerant and short duration varieties.	Mulching, organic manures, Microirrigation. Follow soil and water conservation methods.	

Condition-2		Suggested Contingency measures			
Limited release of water in canals due to low rainfall	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
	Coastal sandy soils	Rice-Rice	Rice(SD)- Rice	<ul style="list-style-type: none"> • Direct seeding for the first crop. Adopt phasic stress irrigation for the first crop. • Use pre-emergence herbicides. Use organic manures. • Reduced depth of irrigation 	
	Low lands with special reference to Kole lands	Rabi Rice	Rice (SD)	<ul style="list-style-type: none"> • Use pre-emergence herbicides. Use organic manures. • Adopt phasic stress irrigation for the first crop. • Reduced depth of irrigation 	
	Low lands	Rice-Rice	Choice of drought tolerant and short duration varieties for the first crop	Direct seeding for the first crop. Adopt phasic stress irrigation for the first crop. Use pre-emergence herbicides. Use organic manures. Reduced depth of irrigation	
		Rice-vegetables	Rice(SD)-pulses/oil seeds	Reduce area under cropping. Adopt phasic stress irrigation for the first crop. Use pre-emergence herbicides. Use organic manures	NREGA,NHM Microirrigation schemes
Nendran banana		Delay planting	Mulching, organic manures., micro-irrigation		
Uplands	Nendran banana	Select drought tolerant and short duration varieties.	Mulching, organic manures, micro-irrigation. Follow soil and water conservation methods		

Condition-3		Suggested Contingency measures			
Non-release of water in canals under delayed onset of monsoon	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
	Coastal sandy	Rice-Rice	Single crop Rice (SD) or	Delayed sowing Use pre-emergence herbicides	

in catchment	soils		pulses or oil seeds	Use organic manures Rainwater harvesting	
	Low lands with special reference to Kole lands	Rabi Rice	Short duration Rice (SD)	Delay planting Use pre-emergence herbicides Use organic manures.	
	Low lands	Rice-Rice	Choice of drought tolerant and short duration varieties for the first crop	Delayed direct seeding for the first crop. Adopt phasic stress irrigation. Use pre-emergence herbicides Use organic manures.	
		Rice-vegetables	Rice (SD)-Pulses/oil seeds	Delayed direct seeding for the first crop. Adopt phasic stress irrigation. Use pre-emergence herbicides Use organic manures.	NREGA,NHM Microirrigation schemes
		Nendran banana	Delay planting	Mulching, organic manures. Micro-irrigation. Follow soil and water conservation methods	
	Uplands	Nendran banana	Select drought tolerant and short duration varieties	Mulching, organic manures. Micro-irrigation. Follow soil and water conservation methods	

Condition-4			Suggested Contingency measures		
Lack of inflows into tanks due to insufficient/delayed onset of monsoon	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
	Coastal sandy soils	Rice-Rice	Short duration Rice (SD)-Rice	Direct seeding for the first crop. Adopt phasic stress irrigation for the first crop. Use pre-emergence herbicides Use organic manures.	
	Low lands	Rice-Rice	Choice of drought tolerant and short duration varieties for the first crop	Direct seeding for the first crop. Adopt phasic stress irrigation for the first crop. Use pre-emergence herbicides Use organic manures.	
		Rice- vegetables	-	-	-

		Nendran banana	Delay planting	Mulching, organic manures.	Microirrigation schemes
	Uplands	Nendran banana	Select drought tolerant and short duration varieties.	Follow soil and water conservation methods. Manage weeds. Lifesaving irrigation.	

Condition-5		Suggested Contingency measures			
Insufficient ground water recharge due to low rainfall	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
	Coastal sandy soils	Rice-Rice	Short duration Rice (SD)-Rice	Make fool proof field bunds. Direct seeding for the first crop. Adopt phasic stress irrigation for the first crop. Use pre-emergence herbicides. Use organic manures. Check dams, percolation dams, rain water harvesting	
	Low lands	Rice-Rice	Choice of drought tolerant and short duration varieties for the first crop	Make fool proof field bunds. Direct seeding for the first crop. Adopt phasic stress irrigation for the first crop. Use pre-emergence herbicides Use organic manures. Check dams, percolation dams, rain water harvesting	
		Coconut+ Medicinal plants	Select drought tolerant and short duration varieties of medicinal plants/vegetables	Delayed planting. Follow soil and water conservation methods. Manage weeds. Check dams, percolation dams, rain water harvesting	NREGA, NHM Micro-irrigation schemes
		Vegetables-Vegetables			
		Nendran banana	Delay planting	Mulching, organic manures. Check dams, percolation dams, rain water harvesting	
	Uplands	Nendran banana	Select drought tolerant and short duration varieties	Follow soil and water conservation methods. Check dams, percolation dams, rain water harvesting.	

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

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Continuous high rainfall in a short span leading to water logging				
Rice	Improve drainage facility	Improve drainage facility	Improve drainage facility, Cultivation of varieties having seed dormancy, Harvest the crop at physiological maturity.	Improve drying facilities, storage facility/ godowns
Tapioca	-do-	-do-	Improve drainage facility, Harvest the crop earlier.	-do-
Horticulture				
Vegetables	-do-	-do-	Improve drainage facility, Harvest the crop at physiological maturity.	-do-
Coconut	Improve drainage facility by the formation of drainage channels. Divert the rainwater to ponds and temporary storage structures.			-do-
Pepper				
Banana				
Arecanut				
Nutmeg				
Cashewnut				
Rubber				
Heavy rainfall with high speed winds in a short span				
Rice	Improve drainage facility	Improve drainage facility	Improve drainage facility, Cultivation of varieties having seed dormancy, Harvest the crop at physiological maturity.	Improve drying facilities, storage facility/ godowns
Tapioca	-do-	-do-	Improve drainage facility, Harvest the crop earlier.	-do-

Horticulture				
Vegetables	Improve drainage facility	Improve drainage facility	Improve drainage facility, Harvest the crop at physiological maturity.	-do-
Coconut	Improve drainage facility by the formation of drainage channels. Divert the rainwater to ponds and temporary storage structures. Propping of Banana plants to avoid lodging			-do-
Pepper				
Banana				
Arecanut				
Nutmeg				
Cashew nut				
Rubber				

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Outbreak of pests and diseases due to unseasonal rains				
Rice	Cultivation of tolerant/ resistant varieties, Application of bio-control agents, Use of disease free seeds, Proper seed treatment, Balanced application of fertilizers, Phyto-sanitation.		Harvest the crop at physiological maturity.	Improve storage facility
Horticulture				
Vegetables	-do-		-do-	
Coconut	Phyto-sanitation. Take appropriate measures for managing root (wilt) disease. Avoid water stagnation in the garden by providing drainage facilities. Prophylactic spray of 1% Bordeaux mixture before the onset of south west monsoon and just before north-east monsoon. Collect and destroy all fallen and infected nuts.			
Pepper	Phyto-sanitation. Remove and burn all infected plant debris and dead vines along with root system to reduce the buildup of the inoculums in the field. Prune the runner shoots or tie back to vines before the onset of monsoon. Prune off the leaves and shoots of vines to a height of 2 feet from the soil. Application			

	of bio-control agents.	
Banana	Phyto-sanitation. Remove and destroy severely infected and completely dried leaves, Use disease free healthy planting material. Avoid any sort of root injury through intercultural operations or by nematode infestation, Provide better drainage.	
Arecanut	Phyto-sanitation. Avoid water stagnation in the garden by providing drainage facilities. Prophylactic spray of 1% Bordeaux mixture with stickers once before the onset of south west monsoon followed by second and third applications at 40-45 days interval. Collect and destroy all fallen and infected nuts.	

2.3 Floods

2.3 Floods

Condition	Suggested contingency measures			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation				
Rice	Improve drainage facility, scientific and proper land utilization, Crop insurance			Harvest the crop at physiological maturity, Cultivation of varieties having seed dormancy
Tapioca	Improve drainage			Harvest the tubers immediately without waiting for water logging to recede
Horticulture & Plantation crops				
Coconut	Timely cleaning, de-silting and deepening of natural water reservoirs and drainage channels, Construction and protection of all the flood protection embankments, ring bunds and other bunds.			
Arecanut				
Rubber				
Banana				
Cashewnut				
Pepper				
Nutmeg				
Ginger				
Turmeric				

Continuous submergence for more than 2 days	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Rice	Cultivation of flood tolerant varieties, Crop insurance, Improve drainage facility, Avoid overflow from streams and rivers through embankments			
Tapioca	Plant setts only on raided mounds, Improve drainage			Harvest the tubers immediately without waiting for floods to recede
Horticulture				
Coconut	Timely cleaning, de-silting and deepening of natural water reservoirs and drainage channels, Construction and protection of all the flood protection embankments, ring bunds and other bunds. Check dams can be constructed which can be used as temporarily storing space which reduces the chances of lower plains getting flooded.			
Arecanut				
Rubber				
Banana				
Cashewnut				
Pepper				
Nutmeg				
Ginger				
Turmeric				

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

Condition	Suggested Contingency measures
Heat wave	NA
Cold wave	NA
Frost	NA
Hailstorm	NA
Cyclone	NA

2.5 Contingent strategies for Livestock, Poultry & Fisheries

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	During the event	After the event	
Drought				Can be linked with ATMA, NREGS, RKVY
Shortage of feed ingredients	Storing of feed and ingredients	Provide kitchen waste and feed additives vitamin mineral mixtures	Cultivation of maize and other feed ingredients	
Drinking water	Storage of clean drinking water	Provide cold clean water	Digging of bore wells for drinking water	
Health and disease management	Vaccination of birds	Medicated water and Balanced feed should be given	Provide clean coops for shelter	
Floods				
Shortage of feed ingredients	Storing of feed and ingredients	Provide balanced feed	Cultivation of maize and fodder	
Drinking water	Storage of clean drinking water	Provide clean water	Construction of tanks and wells	
Health and disease management	Vaccination of birds	Provide medicated water and feed additives	Provide clean coops for shelter	
Cyclone				
Shortage of feed ingredients	Storing of feed and ingredients	Provide feed and clean water	Cultivation of maize and other fodder	
Drinking water	Storage of water	Provide clean feed and water	Construction of wells	
Health and disease management	Vaccination of birds	Medicated water and feed additives	Provide clean shelter	
Heat wave				Can be linked with ATMA, NREGS, RKVY
Shelter/environment management	Planting of trees around shed. Exhaust fan should be fitted on the roof.	Put gunny bags dipped water in the direction of wind.	Provide proper ventilation	
Health and disease management	Vaccination of birds. Provide water and feed	Close the door and ventilation when cold wind comes, during day and night	Provide clean coops and balanced feed	

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	Storing of feed and ingredients	Provide kitchen waste and feed additives vitamin mineral mixtures	Cultivation of maize and other feed ingredients	Can be linked with ATMA, NREGS, RKVY
Drinking water	Storage of clean drinking water	Provide cold clean water	Digging of bore wells for drinking water	
Health and disease management	Vaccination of birds	Medicated water and Balanced feed should be given	Provide clean coops for shelter	
Floods				
Shortage of feed ingredients	Storing of feed and ingredients	Provide balanced feed	Cultivation of maize and fodder	
Drinking water	Storage of clean drinking water	Provide clean water	Construction of tanks and wells	
Health and disease management	Vaccination of birds	Provide medicated water and feed additives	Provide clean coops for shelter	
Cyclone				
Shortage of feed ingredients	Storing of feed and ingredients	Provide feed and clean water	Cultivation of maize and other fodder	
Drinking water	Storage of water	Provide clean feed and water	Construction of wells	
Health and disease management	Vaccination of birds	Medicated water and feed additives	Provide clean shelter	
Heat wave				
Shelter/environment management	Planting of trees around shed. Exhaust fan should be fitted on the roof.	Put gunny bags dipped water in the direction of wind.	Provide proper ventilation	
Health and disease management	Vaccination of birds. Provide water and feed	Close the door and ventilation when cold wind comes, during day and night	Provide clean coops and balanced feed	

2.5.3 Fisheries/ Aquaculture - NA