State: KARNATAKA

Agriculture Contingency Plan for District: CHITRADURGA

1.0 District Agriculture profile						
1.1	**Agro-Climatic/Ecological Zone**					
	Agro Ecological Sub Region (ICAR)	Eastern Ghats And Tamil Nadu Uplands And Deccan (Karnataka) Plateau, Hot Semi-Arid Eco-Region (8.2)				
	Agro-Climatic Region (Planning Commission)	Southern Plateau And Hills Region (10)				
	Agro Climatic Zone (NARP)	Central Dry Zone (KA-4)				
	List all the districts or part thereof falling under the NARP Zone	KA-4 : Chitradurga, Davanagere, Tumkur, Mandya				
	Geographic coordinates of district	Latitude		Longitude		Altitude
		14º13'18.40" N		76º24'02.31 "E		732 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Zonal Agricultural Research Station, Babbur farm, Hiriyur, Chitradurga District-572143				
	Mention the KVK located in the district	Babbur farm, Hiriyur, Chitradurga District-572143				
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	AMFU, Agro-met Advisory Services, Zonal Agricultural Research Station, Babbur Farm, Hiriyur-572 143,Chitradurga district, Karnataka State, India				
1.2	**Rainfall**	**Normal RF(mm)**	**RF(mm) 2008**	**Normal Rainy days (number)**	**Normal Onset (specify week and month)**	**Normal Cessation (specify week and month)**
	SW monsoon (June-September):	227.9	352.6	-	1st week of June	Last week of September
	NE Monsoon(October -December):	157.0	113.5	-	1st week of October -	Last week of December
	Winter (January- February)	6.9	103.7	-		
	Summer (March-May)	94.9	67.6	-		

	Annual	486.7	637.5	-		

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)	770.7	73.7	51.2	88.7	21.6	11.3	47.0	60.2	-

Source:, www.raitamithra.kar.nic.in (2008-09)

1. 4	**Major Soils (common names like shallow red soils etc.,)**	**Area ('000 ha)**	**Percent (%) of total**
	Black soils	477.835	38
	Red soils	292.867	62
1.5	**Agricultural land use**	**Area ('000 ha)**	**Cropping intensity %**
	Net sown area	429.980	**112**
	Area sown more than once	51.450	
	Gross cropped area	481.430	

Source:, www.raitamithra.kar.nic.in (2008-09)

1.6	**Irrigation**	**Area ('000 ha)**		
	Net irrigated area	88.161		
	Gross irrigated area	93.170		
	Rainfed area	341.819		
	Sources of Irrigation	**Number**	**Area ('000 ha)**	**Percentage of total irrigated area**
	Canals		4.940	5.60

	Tanks	**166**	0.806	0.91
	Open wells	-	-	-
	Bore wells	**9030**	82.415	93.5
	Lift irrigation	NA		
	Micro-irrigation			
	Other sources			
	Total Irrigated Area	**9196**	88.161	
	Pump sets			
	No. of Tractors			
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	**No. of blocks/ Tehsils**	**(%) area**	
	Over exploited	**Not Available**	**Not Available**	
	Critical			
	Semi- critical			
	Safe			
	Wastewater availability and use			
	Ground water quality			
***over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%**				

1.7 Area under major field crops & horticulture (2009-10)

1.7	**Major Field Crops cultivated**	**Area ('000 ha)**					
		Kharif		***Rabi***		**Summer**	**Total**
		Irrigated	***Rainfed***	***Irrigated***	***Rainfed***		
	Groundnut		120.92	-	-	4.26	125.18
	Maize	-	80.02	3.89	-	0.83	84.74
	Ragi	-	48.10	0.22	-	1.57	49.89
	Sunflower	-	24.24	-	5.12	0.77	30.11
	Jowar		10.75	-	15.86	0.54	27.15

	Bengal gram		-	-	21.91	-	21.91
	Redgram		8.12	-	-	-	8.12
	Paddy	5.399	-	1.430	-	3.980	10.809
	Horticulture crops - Fruits	**Including (Irrigated and rainfed) for all the season**					
	Banana	4.7					
	Mango	2.8					
	Pomegranate	1.3					
	Sapota	1.5					
	Mosumbi	0.8					
	Horticultural crops - Vegetables						
	Onion	17.0					
	Chilly	1.6					
	Tomato	1.8					
	Brinjal	0.3					

Source of data: Department of Horticulture & Agriculture, Chitradurga, 2009-10

	Plantation crops	
	Coconut	52.6
	Arecanut	16.9
	Beetle vine	0.3
	Flower crops	
	Crosandra	0.3
	Jasmine	0.2
	Chrysanthmum	0.3
	Tuberose	0.2
	Total fodder crop area	-
	Grazing land	88.7

	Sericulture etc	1.7
	Others (Specify)	-

Note: Almost all the crops under horticulture is irrigated except onion which is grown under both rainfed and irrigated conditions

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Non descriptive Cattle (local low yielding)	178.6	138.1	316.8
	Crossbred cattle	2.0	22.1	24.1
	Non descriptive Buffaloes (local low yielding)	20.6	172.5	193.1
	Graded Buffaloes			
	Goat			368.6
	Sheep			931.2
	Others (Camel, Pig, Yak etc.)			7.8
	Commercial dairy farms (Number)			20
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**	
	Commercial	123	-	
	Backyard	-	238287	

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	**No. Farmer owned ponds**		**No. of Reservoirs**		**No. of village tanks**	

	Department)	118	3	320

	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)	90753	20 mt/year	124.6 mt
	Others			

1.11 Production and Productivity of major crops

1.11	**Name of crop**	**Kharif**		**Rabi**		**Summer**		**Total**		**Crop residue as fodder ('000 tons)**
		Production 000't	**Productivity (kg/ha)**	**Production 000't**	**Productivity (kg/ha)**	**Production 000't**	**Productivity (kg/ha)**	**Production ('000 t)**	**Productivity (kg/ha)**	
Major Field crops										
	Groundnut	77.145	638	-	-	5.960	1399	25.353	174	-
	Maize	317.351	3966	15.614	4006	3.281	3953	168.126	2591	-
	Ragi	72.139	1500	0.441	1978	4.026	2554	73.030	1143	-
	Jowar	16.723	1555	9.106	0074	1.419	2451	13.326	1180	-
	Sunflower	13.160	543	3.058	0596	0.780	1066	9.758	0336	-
	Redgram	4.541	559	-	-	-	-	3.983	417	-
	Paddy	21.346	3954	4.486	3137	16.016	4024	41.848	3871	
Major Horticultural crops										

	Coconut	-	-	-	-	-	-	5.729	110	-
	Areca nut	-	-	-	-	-	-	21.885	1290	-
	Onion	-	-	-	-	-	-	340.030	19950	-
	Banana	-	-	-	-	-	-	127.131	27020	-

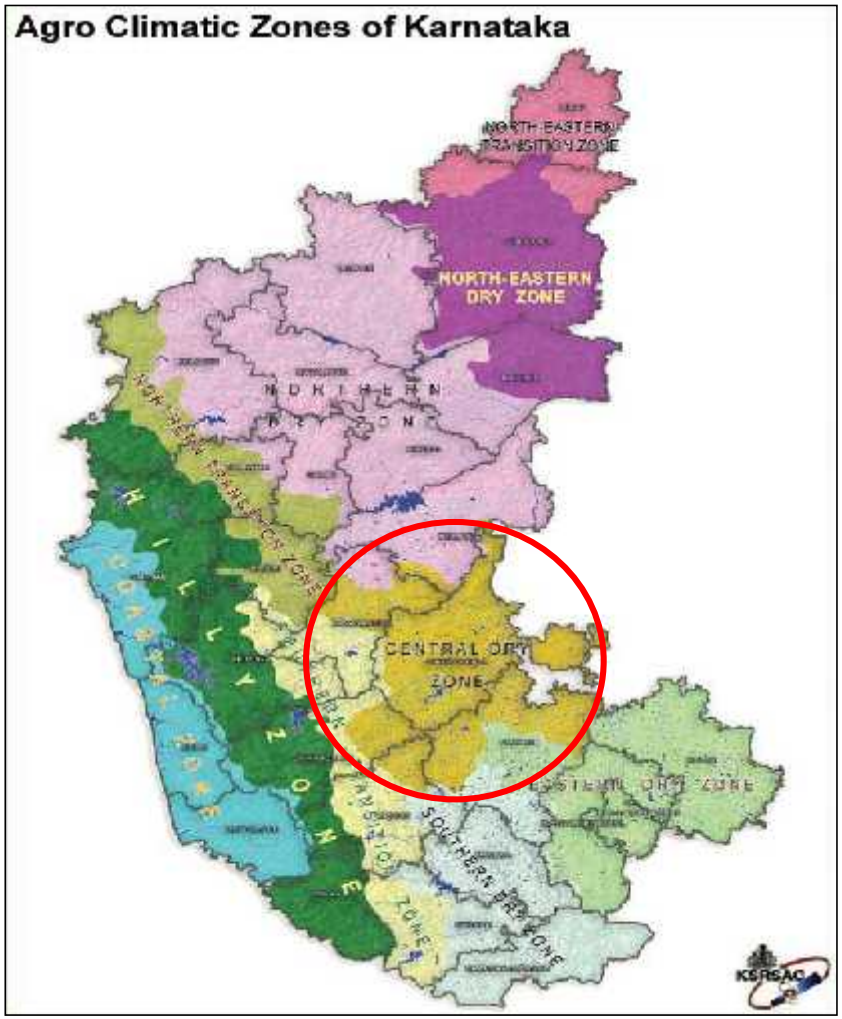
Source and year: Department of Horticulture and Agriculture, Chitradurga 2009-10

1.12	**Sowing window for 5 major field crops (start and end of normal sowing period)**	**Groundnut**	**Maize**	**Ragi**	**Sunflower**	**Redgram**
	Kharif- Rainfed	End of May to End of July	June 1st week to July 2nd week	July 2nd week to August 1st week	June 1st week to - July last week	May last week to July 2nd week
	Kharif-Irrigated	-	June 1st week to July 2nd week	June 2nd week –July last week	June 2nd week – July last week	-
	Rabi- Rainfed	-	-	-	September2nd week – October2nd week	-
	Rabi-Irrigated	End of December to January 2nd week	September 2nd week to October 2nd week	September 2nd week to October 2nd week r	September 2nd week to October 2nd week	-

1.13	**What is the major contingency the district is prone to? (Tick mark and mention years if known during the last 10 year period)**	**Regular**	**Occasional**	**None**
	Drought	✔		
	Flood			✔
	Cyclone			

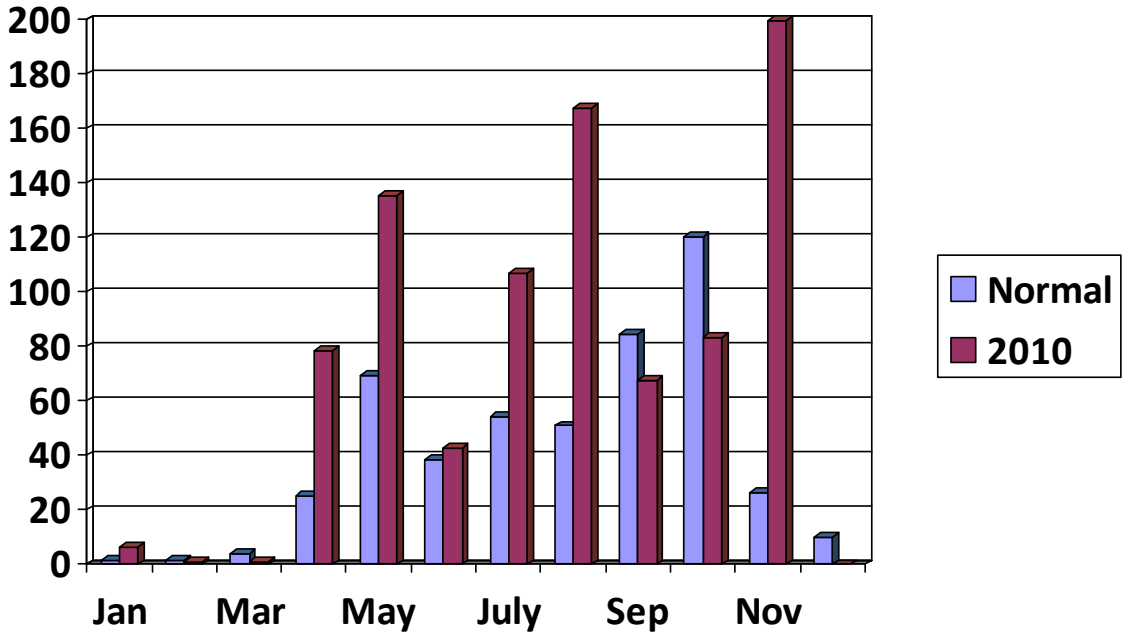
				✔
	Hail storm			✔
	Heat wave			✔
	Cold wave			✔
	Frost			✔
	Sea water intrusion			✔
	Pests and diseases	Sunflower : Powdery mildew, necrosis, Groundnut : Bud necrosis , Pigeon pea : Pod borer, leaf Webber, Areca nut: Bud rot and Leaf spot, Coconut: Stem bleeding and leafspot, Onion: purple blotch, bulb rot and leaf twisting, Banana :Sigatoka and panama wilt	Maize: TLB and downy mildew, Shoot borer, Ragi: Caterpillar	

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

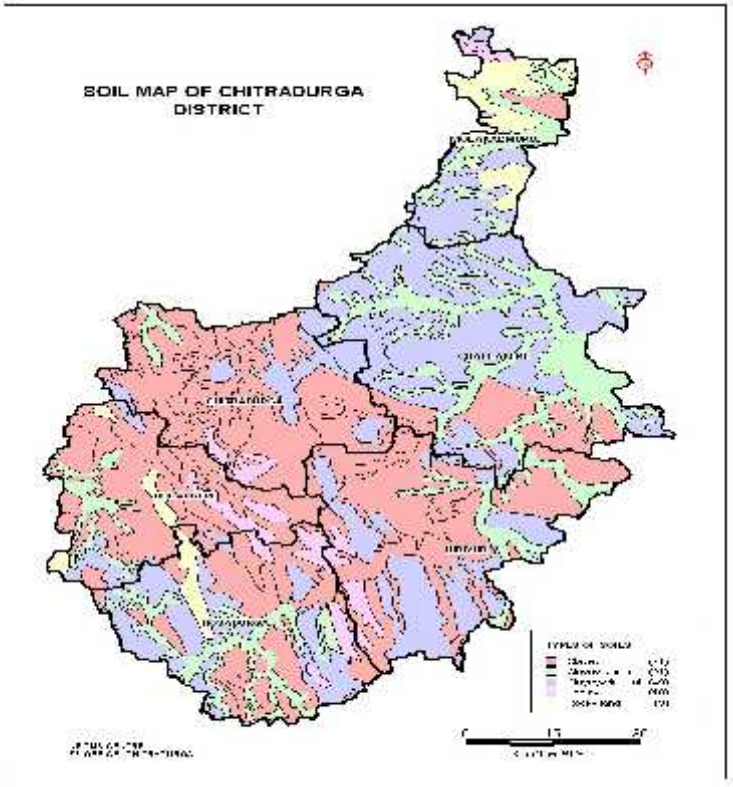

Agro Climatic Zones of Karnataka
NORTH-EASTERN DRY ZONE
CENTRAL DRY ZONE
EASTERN DRY ZONE
SOUTHERN DRY ZONE
HILLY ZONE
KSRSAC

Annexure – 1: LOCATION MAP OF CHITRDURGA DISTRICT IN KARNATAKA

Annexure – 2: MEAN ANNUAL RAINFALL OF CHITRADURGA DISTRICT



Annexure – 3: SOIL MAP OF CHITRADURGA DISTRICT, KARNATAKA



2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks June 3rd week	Red soils	Groundnut sole crop	No Change	• Wider spacing (90cm x 30 cm) for Pigeon pea Dead furrows, Ridges and furrows Compartmental Bunding Deep ploughing	Seed drills under RKVY Supply of seeds through KSSC NFSM, ISOPOM
		Groundnut + Pigeon pea	No Change		
		Groundnut + Castor	No Change		
		Finger millet + Field bean	No Change		
		Finger millet + Pigeon pea	No Change		
		Pigeon Pea sole crop	No Change		
	Black soils	Sunflower	Sunflower + Pigeon pea (Sunflower: KBSH-1, 41, 42, 44 & 53) Pigeon Pea (TTB-7 & BRG-1 & 2)		
		Maize	Maize + pigeon pea (Maize : NAH-2049, NAH-1137, NAC-6004 & 6002) (pigeon pea: TTB-7 & BRG-1,2)		
		Maize + Field bean	No Change		
		Maize + Castor	No Change		

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 4weeks July 1st week	**Red soils**	Groundnut	No change	Finger millet : • Dry sowing 8-10 days before rains with 15-20% higher seed rate • Nursery-transplanting (Long duration varieties of Finger millet) • Seed hardening-(18 hrs. soaking in water followed by 24 hrs. shade drying • repeated Intercultivation • Conservation furrow	Seed drills under RKVY Supply of seeds through KSSC Supply of seeds through NFSM Sunflower: Breeder seeds supply-UAS(B) F1 seeds supply – KSSC
		Groundnut + Pigeon pea	No Change		
		Groundnut + Castor	No Change		
		Figer millet + Field bean	No Change		
		Finger millet + Pigeon pea	No Change		
		Pigeon Pea sole crop	No Change		
	Black soils	Sunflower	Sunflower+ Pigeon Pea Sunflower: (KBSH-1, 41, 42, 44 & 53) Pigeon Pea (TTB-7 & BRG-1,2)	• Follow insitu moisture conservation practices • Conservation furrow • Wider spacing (90cm x 30 cm) for Pigeon pea • Dead furrows, • Ridges and furrows • Compartmental Bunding • Deep ploughing	
		Maize	No Change		
		Maize + Castor	Maize + Castor (DCS-9 & 48-1)		
		Maize + field bean	No change		

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	**Red soils**	Groundnut	No change	• In Finger millet • Dry sowing 8-10 days before rains with 15-20% higher seed rate • Nursery-(Medium duration) transplanting • Seed hardening-(18 hrs. soaking in water followed by 24 hrs. shade drying • Seed hardening- • Soaking of castor seeds in water for 6hrs) • repeated Intercultivation • conservation furrow • Dead furrows • Ridges and furrows • Compartmental Bunding • Deep ploughing	1.Seed drills under RKVY 2.Supply of seeds through KSSC 3.Supply of seeds through NFSM
		Groundnut + Castor	No change		
		Groundnut + Pigeon Pea	No change		
		Finger millet + Pigeon pea	No Change		
			Finger millet + Horsegram (GPU-28, HR-911,Indaf-5)		
			Finger millet + Niger		
		Finger millet + field bean	No Change		
	Black soils	Sunflower	Sunflower+ Pigeon Pea Sunflower: (KBSH-1, 41, 42, 44 & 53) Pigeon Pea (TTB-7 & BRG-1,2)		
		Maize	No Change		
		Maize + Castor	Maize + Castor (DCS-9 & 48-1)		
		Maize + field bean	No change		

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**	**Red soils**	Groundnut	Foxtail millet	In Finger millet : 1.Dry sowing 8-10 days before rains with 15-20% higher seed rate 2. Nursery-(Medium duration) transplanting 3. Seed hardening-(18 hrs. soaking in water followed by 24 hrs. shade drying Thinning to retain one seedling at 30 cm • Inter cultivation Conservation furrow • sowing maize for fodder purpose • growing short duration legumes like cowpea or horse gram or field bean • Growing of short duration coarse cereal like foxtail millet • Dead furrows, • Ridges and furrows • Compartmental Bunding • Deep ploughing	1.Seed drills under RKVY 2.Supply of seeds through KSSC 3.Supply of seeds through NFSM
		Groundnut + Castor	Finger millet		
		Groundnut + Pigeon Pea	Horse gram		
		Finger millet + Pigeon pea	Field bean		
		Finger millet+ Field bean	No change		
			Maize		
			Cowpea		

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**
	Red soils	• Groundnut • Groundnut + Castor • Groundnut + Pigeon Pea • Finger millet + Pigeon pea • Figer millet + Field bean • Pigeon pea	Thinning and gap filling for suitable existing crops Re sowing	Intercultivation Opening of conservation Furrow Earthing up compartment bunding Ridges and furrows mulches	Supply of inter cultural implements through RKVY Pigeon pea seeds supply through NFSM
	Black soils	• Maize • Sunflower+ Pigeon Pea • Maize + pigeon pea • Maize+ field bean • Maize + Castor	Thinning and gap filling for suitable existing crops Re sowing		

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	**Red soils**	• Groundnut • Groundnut + Castor • Groundnut + Pigeon Pea • Finger millet + Pigeon pea • Figer millet + Field bean • Pigeon pea	Finger millet Thinning, Grazing leaf tips, postponement of top dressing Life saving irrigation Groundnut Earthing up, apply Gypsum after receipt of rains Life saving irrigation Weeding and intercultivation Foliar application (2% DAP spray)	Intercultivation soil and stubble mulching ,opening of conservation Furrow Earthing up	1.Supply of inter cultural implements through RKVY 2.Farm ponds through IWSM programme 3.Pigeon pea seeds supply through NFSM
	Black soils	• Maize • Sunflower+ Pigeon Pea • Maize + pigeon pea • Maize+ field bean • Maize + Castor	Thinning Earthing up Life saving irrigation Weeding and Intercultivation Harvest for fodder		

Deleted: ¶

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	**Red soils**	• Groundnut • Groundnut + Castor • Groundnut + Pigeon Pea • Finger millet + Pigeon pea • Figer millet + Field bean • Pigeon pea	Thinning Life saving irrigation Spraying of anti transpirants Weeding and Weed mulching Removal of alternative row Could be harvested for fodder purpose Life saving irrigation Weeding and Weed mulching Pigeon pea could be harvested for vegetable/fodder purpose	• Blade harrowing if possible	Farm ponds through IWSM programme Farm ponds through IWSM programme
	Black soils	Maize Sunflower+ Pigeon Pea Maize + pigeon pea Maize+ field bean Maize + Castor	Life saving irrigation Spraying of anti transparents Pigeon pea and field bean could be harvested for Vegetable/fodder purpose Maize could be harvested for fodder purpose		Supply of inter cultural implements through RKVY

Condition			Suggested Contingency measures		
Terminal drought	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
	Red soils	Groundnut + castor	Life saving irrigation Pigeon pea/field bean harvested for vegetable purpose Harvest at physiological maturity stage harvest for fodder	Horse gram (October month)	• Farm ponds through IWSM programme • Threshing implements through RKVY • Groundnut digger and plucker through RKVY • Seed supply through KSSC/NFSM
		Groundnut + Pigeon pea			
		Finger millet + Pigeon pea			
		Figer millet + Field bean			
	Black soils	Maize+ Castor	Life saving irrigation Pigeon pea /field bean harvested for vegetable purpose Harvest at physiological maturity stage harvest for fodder	Safflower, Chickpea Sunflower, Jowar Jayadhar cotton (October)	
		Maize+ field bean			
		Sunflower+ Pigeon Pea			
		Maize + pigeon pea			

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	NA				
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	NA				
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	Tank irrigation in Black soils	Paddy	Aerobic Paddy, Sunflower, Ragi, Maize and vegetables Aerobic Paddy: MAS-946-1 MAS-26	• Limited irrigation • Alternate Furrow irrigation • Drip irrigation	Seeds through KSSC, NFSM, NHM, & NAREGA

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 irrigation in red soil /Black Soils	Paddy	Aerobic Paddy, Sunflower, Ragi, Maize and vegetables Aerobic Paddy: MAS-946-1 MAS-26	• Limited irrigation • Alternate Furrow irrigation	Seeds through KSSC, NFSM, NHM, & NAREGA

Condition			Suggested Contingency measures		
	Major Farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
				• Drip irrigation	
Any other condition (specify)	-				

2.2 Unusual rains (untimely, unseasonal etc)

Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**
Groundnut	Provide drainage/ Drain out excess water	Drain out excess water and earthing up Gypsum application	Drain out excess water Harvesting at physiological maturity stage	Shift to safe place dry in shade and proper storage,
Finger millet	Provide drainage/ Drain out excess water and top dressing with urea	Drain out excess water and earthing up	-do-	-do-
Pigeon pea	Provide drainage/ Drain out excess water	Drain out excess water Earthing up Gypsum application	Drain out excess water Harvesting at physiological maturity stage Harvest of pigeon pea for	Shift to safe place dry in shade Sun drying for 25 hours, Proper storage,

			vegetable purpose	Use metal or plastic bins, bins cover with 3 cm sand layer to control storage pests
Sunflower	Provide drainage/ Drain out excess water Top dressing with urea	Drain out excess water and earthing up	Drain out excess water Harvesting at physiological maturity stage	Shift to safe place dry in shade and proper storage,
Maize	Provide drainage/ Drain out excess water Top dressing with urea	Drain out excess water and earthing up	Drain out excess water Harvesting at physiological maturity stage	Shift to safe place dry in shade and proper storage,
Horticulture				
Coconut	Provide drainage/ Drain out excess water	Provide drainage/ Drain out excess water and application of nutrients	Drain out excess water	Shift to safe place dry in shade and proper storage,
Arecanut	Provide drainage/ Drain out excess water	Provide drainage/ Drain out excess water and application of nutrients	Drain out excess water Drain out excess water	Shift to safe place dry in shade and proper storage,
Onion	Provide drainage/ Drain out excess water	Provide drainage/ Drain out excess water and application of Gypsum and micronutrients	Drain out excess water and spraying of carbendizim 1gm/litre	Shift to safe place dry in shade and proper storage with good aeration
Banana	Provide drainage/ Drain out excess water	Provide drainage/ Drain out excess water and foliar application of nutrients	Provide drainage/ Drain out excess water and foliar application of nutrients	Shift to safe place dry in shade and proper storage with good aeration
Heavy rainfall with high speed winds in a short span	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**
Groundnut	Provide drainage/ Drain out excess water	Provide drainage/ Drain out excess water	Drain out excess water	Shift to safe place dry in shade and proper storage,

		and earthing up	Harvesting at physiological maturity stage	
Finger millet	Provide drainage/ Drain out excess water, top dressing with urea Tying the tillers to ovoid lodging	Drain out excess water and earthing up Tying the tillers to ovoid lodging	Drain out excess water Harvesting at physiological maturity stage Tying the tillers to ovoid lodging	-do-
Pigeonpea	Provide drainage/ Drain out excess water	Drain out excess water Earthing up Gypsum application	Drain out excess water Harvesting at physiological maturity stage Harvest of pigeon pea for vegetable purpose	Shift to safe place dry in shade Sun drying for 25 hours, Proper storage, Use metal or plastic bins, bins cover with 3 cm sand layer to control storage pests
Sunflower	Provide drainage/ Drain out excess water Top dressing with urea	Drain out excess water and earthing up	Drain out excess water Harvesting at physiological maturity stage	Shift to safe place dry in shade and proper storage,
Maize	Provide drainage/ Drain out excess water Top dressing with urea	Drain out excess water and earthing up	Drain out excess water Harvesting at physiological maturity stage	Shift to safe place dry in shade and proper storage,
Horticulture				
Coconut	Provide drainage/ Drain out excess water and provide Stalking	Provide drainage/ Drain out excess water and application of nutrients	Drain out excess water	Shift to safe place dry in shade and proper storage,
Arecanut	Provide drainage/ Drain out excess water and provide Stalking	Provide drainage/ Drain out excess water and application of nutrients	Drain out excess water	Shift to safe place dry in shade and proper storage,
Onion	Provide drainage/ Drain out excess water	Provide drainage/ Drain out excess water and application of Gypsum and micronutrients	Drain out excess water and spraying of carbendizim 1gm/litre	Shift to safe place dry in shade and proper storage with good aeration
Banana	Provide drainage/ Drain out excess water	Provide drainage/ Drain out excess water	Provide drainage/ Drain out	Shift to safe place dry in

	and provide Stalking	, provide Stalking and foliar application of nutrients	excess water and provide Stalking	shade and proper storage with good aeration
Outbreak of pests and diseases due to unseasonal rains	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**
Finger millet	Blast : Carbendazim 2 g/lt Caterpillar :Chloropyriphos-2ml/lt	Blast : Carbendazim 2 g/lt Caterpillar: Chloropyriphos-2ml/lt	Blast : Carbendazim 2 g/lt cater pillar Chloropyriphos-2ml/lt	Safe storage against storage pest and diseases
Groundnut	**Leaf miner**- Monocrotophos-1.5ml/lt **Spodoptera**- SNPV – 250 LE/ac, Chloropyriphos-2ml/lt **Bud necrosis**- Imidacloprid-0.5 ml/lt	**Leaf miner**- Monocrotophos-1.5ml/lt **Spodoptera**- SNPV – 250 LE/ac, Chloropyriphos-2ml/lt **Bud necrosis**- Imidacloprid-0.5 ml/lt	**Collar rot** – Drenching of Carbendazim 2 g/lt	Safe storage against storage pest and diseases
pigeon pea	**Plant hoppers**- Dimethoate 1.7 ml/lt **Webber:** Profenofos	**Pod borer** – NSKE 5%, HNPV 250 LE/ac, Methomyl 2 g/lt, **Webber:** Profenofos	**Pod fly-** Quinalphos 2 ml/lt **Bruchid-** Malathion 2ml/lt	Storage pest-Sun drying for 25 hours, Proper storage, Use metal or plastic bins, bins cover with 3 cm sand layer.
Sunflower	**Hairy Caterpillar**- Cypermethrin- 1ml/lt **Bud necrosis**- Imidacloprid-0.5 ml/lt	**Head borer**- HNPV-250 LE/ac, Methomyl-2g/lt	**Head borer**- HNPV-250 LE/ac, Methomyl-2g/lt	Safe storage against storage pest and diseases
Maize	**Stem borer** – Endosulfan-20ml /lt **Downy mildew**- Metalaxyl-2g/lt	**Stem borer** – Endosulfan-20ml /lt **Downy mildew**- Metalaxyl-2g/lt	Cob borer : Chloropyriphos-2ml/lt	Safe storage against storage pest and diseases
Horticulture				
Coconut	Bud rot: COC 3gm/lit	-	-	Shift to safe place dry in shade and proper storage with good aeration
Arecanut	Bud rot: COC 3gm/lit	Inflorescence rot: Mancozeb 2 gm/lit	Nut rot: Mancozeb 2 gm/lit	Shift to safe place dry in shade and proper storage with good aeration
Onion	Purple blotch: Mancozeb 2 gm/lit Leaf twisting: Mancozeb + Carbendizim 2 gm/lit	Purple blotch: Mancozeb 2 gm/lit Leaf twisting: Mancozeb + Carbendizim 2 gm/lit	Bulb rot: Carbendizim 1gm/lit	Shift to safe place dry in shade and proper storage with good aeration

Banana	Cicatoka: Chlorothalonil: 2gm/lit Panama wilt: Carbendizim 1gm/lit and Tricoderma 25 gm/plant	Cicatoka: Chlorothalonil: 2gm/lit Panama wilt: Carbendizim 1gm/lit and Tricoderma 25 gm/plant	-	-

2.3 Floods

Condition	**Suggested contingency measure**			
Transient water logging/ partial inundation	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Finger millet	Drain out excess water and gap filling	• Drain out excess water, • earthing up and top dressing with urea	• Drain out excess water, • earthing up	• Drain out excess water, • tying of lodged plants, • harvest and drying of ear heads
Groundnut	Drain out excess water	• Drain out excess water, • earthing up and top dressing with urea	• Drain out excess water, • gypsum application and earthing up	• Drain out excess water, • harvest and drying of pods
pigeon pea	Drain out excess water and gap filling	• Drain out excess water, • earthing up and top dressing with urea	• Drain out excess water, • earthing up • 2% DAP foliar spray	• Drain out excess water, • harvest and drying of pods
Sunflower	Drain out excess water and gap filling	• Drain out excess water, • earthing up and top dressing with urea	• Drain out excess water, • earthing up • spraying of Borax 2gm/litre at flowering	• Drain out excess water, harvest and drying of ear heads
Maize	Drain out excess water and gap filling	• - Drain out excess water, • earthing up and top dressing with urea	• Drain out excess water, • earthing up	Drain out excess water, harvest and drying of cobs

Continuous submergence for more than 2 days				
Finger millet	Drain out excess water gap filling, Resowing if necessary.	Drain out excess water, earthing up, weeding top dressing with urea (if needed)	Drain out excess water and earthing up	Drain out excess water, tying of lodged plants, harvest and drying of ear heads
Groundnut	-do-	-do-	Drain out excess water, gypsum application and earthing up	Drain out excess water, harvest and drying of pods
pigeon pea	-do-	-do-	Drain out excess water, earthing up	-do-
Sunflower	-do-	-do-	Drain out excess water, earthing up spraying of borax at 0.2 %	Drain out excess water, harvest and drying of ear heads
Maize	-do-	-do-	Drain out excess water and earthing up	Drain out excess water, harvest and drying of cobs
Horticulture				
Coconut	Provide drainage/ Drain out excess water	Provide drainage/ Drain out excess water and application of nutrients	Drain out excess water	Shift to safe place dry in shade and proper storage,
Arecanut	Provide drainage/ Drain out excess water	Provide drainage/ Drain out excess water and application of nutrients	Drain out excess water	Shift to safe place dry in shade and proper storage,
Onion	Provide drainage/ Drain out excess water	Provide drainage/ Drain out excess water and application of Gypsum and micronutrients	Drain out excess water and spraying of carbendizim 1gm/litre	Shift to safe place dry in shade and proper storage with good aeration
Banana	Provide drainage/ Drain out excess water	Provide drainage/ Drain out excess water and foliar application of nutrients	Provide drainage/ Drain out excess water and foliar application of nutrients	Shift to safe place dry in shade and proper storage with good aeration

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	NA			
Cold wave	NA			
Frost	NA			
Hailstorm	NA			
Cyclone	NA			

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event	During the event	After the event
Drought			
Feed and fodder availability	Insurance Encourage perennial fodder on bunds and waste land on community basis Establishing fodder banks, encouraging fodder crops in irrigated area Silage – using excess fodder for silage	Utilizing fodder from perennial trees and Fodder bank reserves Utilizing fodder stored in silos Transporting excess fodder from adjoining districts Use of feed mixtures	Availing Insurance Culling unproductive livestock
Drinking water	Preserving water in the tank for drinking purpose Excavation of Bore wells	Using preserved water in the tanks for drinking Wherever ground water resources are available priority for drinking purpose	
Health and disease management	Veterinary preparedness with medicines and vaccines	Conducting mass animal Health Camps and treating the affected once in Campaign	Culling sick animals
Floods	_	_	_
Feed and fodder availability	_	_	_
Drinking water	_	_	_

Health and disease management	–	–	–
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	Insurance & Integration Establishing feed serve Bank	Utilizing from feed serve banks	Availing insurance Strengthening feed Reserve Banks
Drinking water	Preserving water in the tank for drinking purpose Excavation of Bore wells	Using preserved water in the tanks for drinking Wherever ground water resources are available priority for drinking purpose	Culling affected birds
Health and disease management	Emergency Veterinary preparedness with medicines vaccination to birds	Campaign and Mass Vaccination	Culling affected birds
Floods	_	_	_
Shortage of feed ingredients	_	_	_
Drinking water	_	_	_
Health and disease management	_	_	_

Cyclone	NA
Heat wave and cold wave	NA

2.5.3 Fisheries: NA

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Drought	–	–	–
Shallow water in ponds due to insufficient rains/inflows	–	–	–
Impact of heat and salt load build up in ponds / change in water quality	–	–	–
Any other (specify)	–	–	–
Floods	–	–	–
Inundation with flood waters	–	–	–
Water contamination and changes in BOD	–	–	–
Health and disease management	–	–	–
Loss of stock and inputs (feed, chemicals etc.)	–	–	–

Infrastructure damage	–	–	–
Cyclone	–	–	–
Overflow / flooding of ponds	–	–	–
Change in fresh/brackish water ratio	–	–	–
Health and disease management	–	–	–
Loss of stock and inputs (feed, chemicals etc.)	–	–	–
Infrastructure damage	–	–	–
Heat wave and cold wave	–	–	–
Management of pond environment	–	–	–
Health and disease management	–	–	–