

State: KARNATAKA
Agricultural Contingency Plan for District: CHIKMAGALUR

1.0 District Agriculture profile					
1.1	Agro-Climatic / Ecological Zone				
	Agro Ecological Region / Sub Region (ICAR)	Western Ghats And Coastal Plain, Hot Humid region (19.1)			
	Agro-Climatic Region (Planning Commission)	Southern Plateau and Hills Region (X) and West Coast Plains & Ghats Region (XII)			
	Agro Climatic Zone (NARP)	Hilly zone (KA-9), Southern transition zone (KA-7) and Central dry zone (KA- 4)			
	List all the districts or part thereof falling under the NARP Zone	Chitradurga, Davanagere, Tumkur, Hassan Chikmagalur, Shimoga, Mysore Kodagu			
	Geographic coordinates of district	Latitude	Longitude	Altitude	
		13 ⁰ 18' 44.72" N	75 ⁰ 46' 13.10" E	1119 m	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Agricultural Research Station (ARS) (Po): Mudigere - 577132 University of Agricultural Sciences (Bangalore) KARNATAKA(State)			
Mention the KVK located in the district	Krishi Vigyan Kendra, (PO): Mudigere - 577132 Chikmagalur (Dist), KARNATAKA(State)				
1.2	Rainfall	Average (mm)	Normal rainy days (number)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-September):	1506.3	60	First week of June	Second Week of September
	NE Monsoon(October-December):	217.7	11	First week of October	Second Week of November
	Winter (January- February)	17.0	01		
	Summer (March-May)	162.0	09		
	Annual	1903	81		

1.3	Land use pattern of the district (latest statistics)	Geographical area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Cultivable area	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area (000' ha)	722.1	200.5	42.6	90.2	19.4	296.5	21.2	28.3	18.2	4.8

1.4	Major Soils	Area ('000 ha)	Percent (%) of total geographical area
	Red sandy loam soils	214.8	29.7
	Lateritic soils	149.9	20.7
	Red sandy soils	138.8	19.2
	Red clayey soils	120.1	16.6
	Alluvial soils	58.8	8.1
	Deep black soils	24.2	3.3
	Miscellaneous	15.1	2.1
1.5	Agricultural land use	Area ('000 ha)	
	Net sown area	296.5	111.5 %
	Area sown more than once	34.0	
	Gross cropped area	330.5	

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	35.4		
	Gross irrigated area	41.1		
	Rainfed area	261.1		
	Sources of Irrigation	Number	Area ('000 ha)	% area
	Canals		2.8	8.0
	Tanks	2201	10.7	31.1
	Open wells	2182		

Bore wells	2382	12.9	37.3
Lift irrigation schemes	22		
Other sources(Reservoirs)	02		
Total		26.4	23.6
Pumpsets	36313	34.5	100.0
Micro-irrigation			
Groundwater availability and use	No. of blocks	% area	Quality of water
Over exploited			Quality of the ground water is found to be potable and suitable for domestic as well as for irrigation purposes. The presence of various chemical constituents falls within the permissible limits prescribed by the B.I.S. and WHO. Nitrate concentration of more than permissible limit occurs along the border of Chikmagalur-Kadur taluks and in north eastern parts of Kadur and Tarikere taluks.
Critical	1	15	
Semi- critical	1	12	
Safe	5	73	
Wastewater availability and use			

*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%

1.7 Area under major Field crops & horticulture etc.

1.7	Major Field Crops cultivated	Area ('000 ha)*					
		<i>Kharif</i>		<i>Rabi</i>		Summer	Total
		<i>Irrigated</i>	<i>Rainfed</i>	<i>Irrigated</i>	<i>Rainfed</i>		
1	Ragi	-	55.0	-	-		55.5
2	Paddy	9.0	33.0	-	-	3.65	45.6
3	Sunflower	-	16.0	-	0.15	-	16.1
4	Horsegram	-	4.0	-	8.0	-	12.0
5	Jowar	-	2.8	-	7.0	-	9.8
6	Bengal gram	-		-	7.0	-	7.0
7	Groundnut	-	4.7	-		0.5	5.2
8	Maize	-	2.3	-			2.3
	Horticulture crops - Fruits	Total area('000 ha)					
1	Mango	4.6					
2	Banana	4.8					
3	Sapota	1.5					
4	Grapes	0.01					
5	Lemon	0.4					

6	Orange	0.2
	Horticultural crops - Vegetables	Total area('000 ha)
1	Vegetable	9.3
2	Flowers	-
	Medicinal and Aromatic crops	Total area ('000 ha)
1	Sweet flag (Bajra)	0.1
2	Lemon grass	0.04
	Plantation crops	Total area ('000 ha)
1	Coconut	32.0
2	Arecanut	42.8
3	Betelvine	0.5
4	Cocoa	0.2
5	Oil palm	0.2
6	Cashew	0.5
	Fodder crops	-
	Grazing land	-
	Sericulture etc	-
	Spice crops	Total area ('000 ha)
1	Pepper	3.5
2	Cardamom	3.0
3	Ginger	1.9
4	Turmeric	0.2
5	Dry chillies	1.9

1.8	Livestock		Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)		145.0	191.1	336.1
	Crossbred cattle		4.9	45.0	49.9
	Non descriptive Buffaloes (local low yielding)		15.8	82.4	98.2
	Graded Buffaloes				
	Goat				74.7
	Sheep				96.2
	Others (Camel, Pig, Yak etc.)				5.1
	Commercial dairy farms (Number)				148
1.9	Poultry				
	Commercial	308			
	Backyard birds				
1.10	Fisheries	Area (ha)	Yield (t/ha)	Production (tones)	
	Brackish water	-	-	-	
	Fresh water	25063.7	0.4	10025	
	Others				

1.11	Production and Productivity of major crops (Average of last 3 years: 2006, 07, 08)	Kharif		Rabi		Summer		Total	
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)
1	Paddy	112.2	2459	-	-	-	-	112.2	2459
2	Ragi	64.6	1164	-	-	-	-	64.6	1164
3	Sunflower		-	-	-	-	-	6.6	413
4	Horsegram	1.7	427	3.4	426			5.1	426
6	Maize	8.7	3758					8.7	3758

7	Bengalgram			0.9	132			0.9	132
8	Groundnut							2.3	455
	Major Horticultural crops								
1	Total fruit crops							30.1	5735
2	Total vegetable crops							124.3	11813
3	Total spices and condiments							36.3	1287
Others	-								

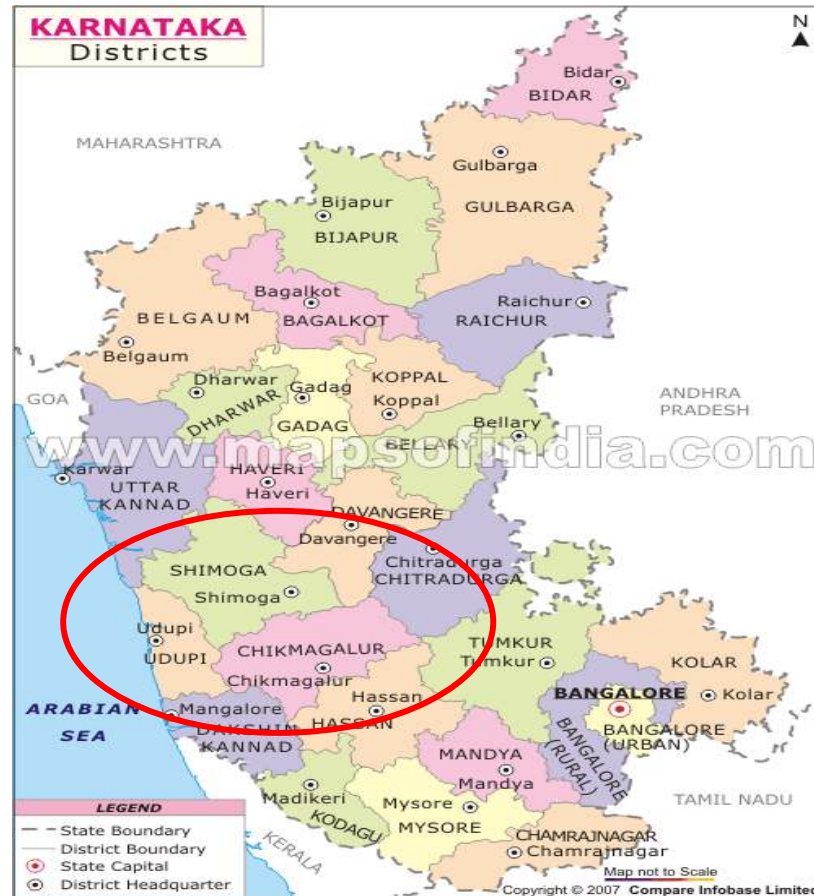
1.12	Sowing window for 5 major crops (start and end of sowing period)	Paddy	Ragi	Jowar	Sunflower	Horsegram
	Kharif- Rainfed	June 1 st week to July 1 st week	June 1 st week to August 1 st week	April 1 st week to June 4 th week	June 1 st week to August 1 st week	July 4 th week to August 4 th week
	Kharif-Irrigated	-	-	-	-	-
	Rabi- Rainfed	-	-	August 2 nd week to September 2 nd 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			√
	Cyclone			√
	Hail storm			√

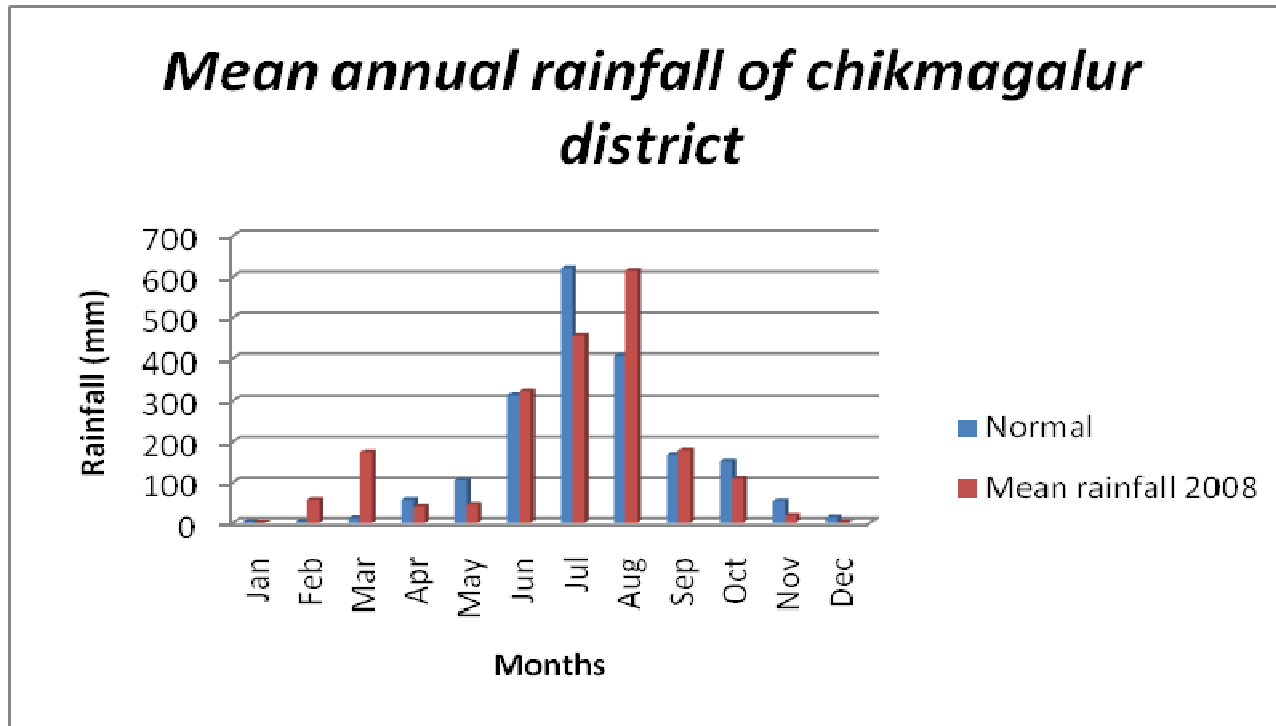
	Heat wave			√
	Cold wave		√	
	Frost			√
	Sea water inundation			√
	Pests and diseases (specify) Rice Blast, Bud necrosis in Sunflower, Groundnut tikka leaf spot			√

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

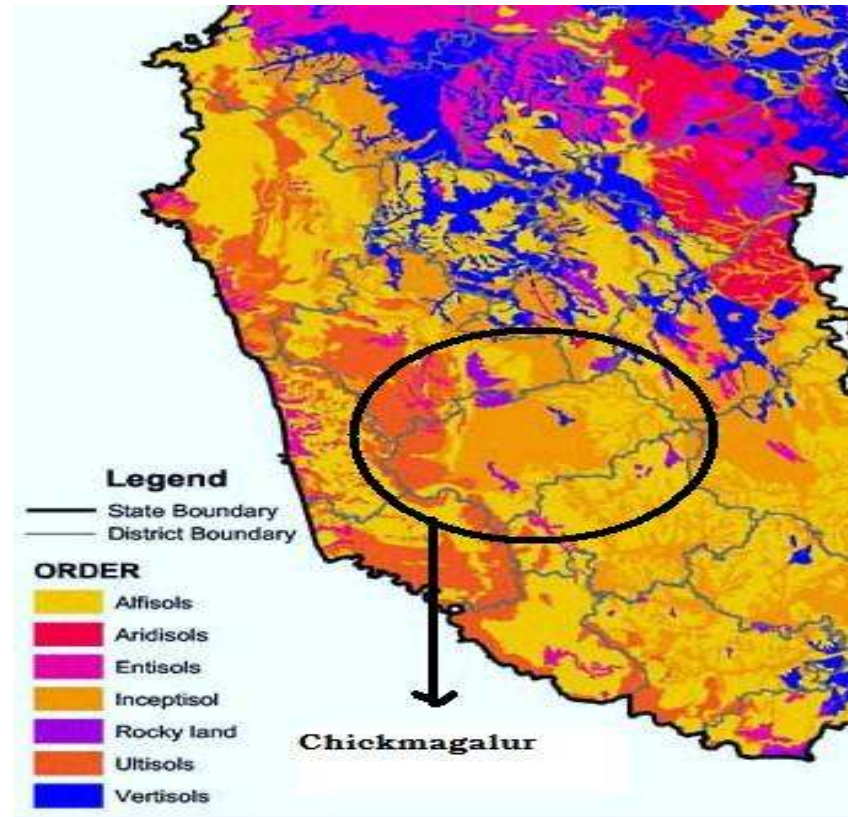
Annexure 1 : Location map of District



Annexure – 2: Mean Annual Rainfall Of Chikmagalur District



Annexure – 3: Soil Map Of Chickmagalur 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	Normal crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation	
Delay by 2 weeks June 3 rd week	Upland situation	Transplanted Paddy	No change	SRI method of cultivation	Supply of seeds through NFSM and KSSC.	
	Midland situation	-do-	No change			
	Lowland situation	-do-	No change			
	Red sandy loam soils	Ragi		No change	Opening of dead furrows in between paired rows	Supply of seeds through KSSC
		Sunflower		No change	<ul style="list-style-type: none"> • Inter cultivation • Thinning (removal of alternate rows and mulching the same) 	<ul style="list-style-type: none"> • Seed drills under RKVY • Supply of seeds through KSSC • Supply of seeds through NFSM
		Groundnut		Groundnut sole crop/ Groundnut + Redgram (8:2) Variety – TMV -2	Seed treatment with Rhizobium Application of Gypsum, earthing up, ZnSO ₄ application @ 10 kg/ha. Use of BRG-2 short duration Redgram variety for vegetable purpose	Supply of seeds through KSSC

Condition	Major Farming situation	Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 4weeks July 1st week	Upland Paddy	Transplanted Paddy	Prefer short duration varieties Thunga, Tanu, KRH-1, IR-20	Hand weeding 40-50 days after sowing	Seed drills under RKVY Supply of seeds through KSSC Supply of seeds through NFSM
	Mid land paddy	-do-	Prefer varieties Thunga,KHP-10 and KHP-5	-	Supply of seeds through NFSM
	Low land paddy	-do-	Prefer varieties Jeerige sanna,KHP-9,KHP-5,CTH-1.CTH-2	-	Supply of seeds through KSSC Supply of seeds through NFSM
	Red sandy loam soils	Ragi	Prefer varieties MR-1,MR-6,Indaf-8,L-5, GPU-28 and HR-911	<ul style="list-style-type: none"> • Use 20% higher seed rate than the recommended • Seed hardening by storing the seeds in a gunny bag for 36-40 hours in well aerated place after soaking it for 24 hours in water then keep a weight over gunny bag • Thinning upto 30% depending on the severity and 	Supply of seeds through KSSC and NFSM and growing of short duration varieties.

Condition	Major Farming situation	Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)				intercultivation • Opening of small furrows to conserve moisture	
		Sunflower	Prfer varieties KBSH-41 and Modern	Thinning of crop (maintenance of alternate rows) OR Opening of dead furrows in between the paired rows	Supply of seeds through KSSC and NFSM
		Groundnut	Sunflower / Ragi	Mulching using farm residues	Breeder seeds supply- UAS(B) F1 seeds supply – KSSC
Groundnut + Redgram (8:2)					

Condition	Major Farming situation	Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)					
Delay by 6 weeks July 3 rd week	Red sandy soils	Groundnut (TMV-2 and other local varieties) - Horsegram: (Local varieties) Ragi: MR-2, MR-6	Ragi-cow pea Sunflower: KBSH-41, KBSH-44, Gangakaveri hybrid Ragi: MR-2, GPU-28, MR-6, Indaf-5 Cow pea: TVX-944, KBC-1	In Finger millet : 1. Dry sowing 8-10 days before rains with 15-20% higher seed rate 2. Wider spacing between the plant rows (40x30cm)	Seed drills under RKVY Supply of seeds through KSSC Supply of seeds through NFSM

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	Deep black soils	Onion-Jowar	Sunflower/ Ragi Ground nut-Fodder sorghum Sunflower: : KBSH-41, KBSH-42, KBSH-44, Gangakaveri hybrid Ragi: GPU-45,GPU-48 Indaf-5 Ground nut : GPBD-4,JL-24 Fodder sorghum : JS-3, GS-20, Salabane	Sunflower: wider spacing (75x30cm) seed treatment with azospirilum @ 500g/ha Ground nut: 2:1 opening of furrow Thinning of crops	Seed drills under RKVY Supply of seeds through KSSC Supply of seeds through NFSM

Condition			Suggested Contingency measures		
Early season drought (Normal Drought)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient and moisture conservation measures	Remarks on Implementation
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/ Crop stand etc.	Upland/Medium/ Low land	Paddy	Use rock phosphate (RP 30% @ 250 kg/ha) as fertilizer source, use of storage water in tanks and rivers, reduction in basal fertilizer dose, weed management	-	Farm ponds through IWSM programme
	Red sandy loam soils	Ragi	Thinning and resowing	-	-
		Sunflower	-	-	Intercultivation Thinning

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient and moisture conservation measures	Remarks on Implementation
Early season drought (Normal Drought)		Groundnut	2:1 skip row method of planting in groundnut with opening of furrow in skipped row after 25-30 days of sowing	-	-

Condition	Major Farming situation	Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil management	Remarks on Implementation
Mid season drought (long dry spell) At vegetative stage	Upland/Mid land/ Lowland Paddy	Paddy	life saving irrigation predominantly during the critical stages of crop growth	Use rock phosphate as fertilizer source, use of PSB, use of storage water in tanks and rivers, reduction in basal fertilizer dose, weed management, Intercultivation . Split application of fertilizer doses	Supply of inter cultural implements through RKVY Farm ponds through IWSM programme
		Red sandy loam soils	Ragi	-	In-situ green manuring incorporation, soil mulch, inter cultivation, weed management, reducing plant population
		Sunflower	Thinnng and resowing	Repeated intercultivation and	-

Condition	Major Farming situation	Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil management	Remarks on Implementation
Mid season drought (long dry spell)				thinning	
		Groundnut			

Condition	Major Farming situation	Crop/cropping system	Suggested Contingency measures			
			Crop management	Soil management	Remarks on Implementation	
Mid season drought (long dry spell)	Upland/Mid land/ Lowland Paddy	Paddy	Irrigation at panicle initiation and grain filling stages	Life saving irrigation using storage water from tank and river	Farm ponds through IWSM programme	
		Red sandy loam soils	Ragi	Protective irrigation at ear head formation and grain filling stages	-do-	
			Sunflower	Critical stages of irrigation during flowering, anthesis and grain filling stages	-do-	-do-
			Groundnut	Earthing up before 40 days after sowing Life saving irrigation Thinning of the crops	Mulching of the soil to be done to conserve moisture	-do-

Condition	Major Farming situation	Crop/cropping system	Suggested Contingency measures		
			Crop management	Rabi Crop planning	Remarks on Implementation
Terminal drought	Upland/Mid land/ Lowland Paddy	Paddy	Harvest the crop even at 75% physiological maturity	Cowpea, Greengram, Field bean, Soybean Greengram varieties PDM-84-178, PS-16 Soybean varieties KHSB-2, KB-79 Field bean varieties HA-3 and HA-4	
		Red sandy loam soils	Ragi	Harvest at physiological maturity stage	Horsegram and Jowar
	Sunflower		-do-	Horsegram and fodder Jowar	-do-
	Groundnut		Life saving irrigation Harvest at physiological maturity stage	Cowpea, Fodder sorghum, Field bean, Horsegram (October month)	Farm ponds through IWSM programme Threshing implements through RKVY

2.1.2 Irrigated situation

Condition	Major Farming situation	Crop/cropping system	Suggested Contingency measures		
			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
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
Lack of inflows into tanks due to insufficient / delayed onset of monsoon	NA			

Condition	Suggested Contingency measures			
	Major Farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures
Insufficient groundwater recharge due to low rainfall	NA			
Any other condition (specify)	-			

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				
Groundnut	Provide drainage (surface drainage with proper channels)	Provide drainage	Drain out excess water Harvesting at physiological	Shift to safer place

	all around the field) Depth of drainage channel-1- 1.5 ft.		maturity stage	
Finger millet	-do-	-do-	-do-	-do-
Maize	Surface drainage	-do-	De-top to provide aeration	Shift to safe place dry in shade and turn frequently
Fieldbean	Provide drainage	-do-	Harvest for vegetable purpose	Safe storage against storage pest and disease
Horsegram	Provide drainage	-do-	Drain out excess water	Safe storage against storage pest and disease
Horticulture				
Coconut	Proper drainage should be ensured			
Arecanut	Proper drainage should be ensured by constructing drainage channels, 25-30 cm deep			

Outbreak of pests and diseases due to unseasonal rains				
Paddy	Blast - Seed treatment with agrosan @ 2.5-3.0 g/kg seed	Blast – tricyclazole @ 0.6g/lt	Neck blast - tricyclazole @ 0.6g/lt	Rice weevil Control measures: Melathion 50%EC -1 lt in 100 lt of water (use 3 lt of solution per 100 sq.mt area) at 15 days interval Use neem leaves in storage bins
Ragi	Aphids,- Dimethoate – 1.7 ml/lit.	Aphids,- Dimethoate – 1.7 ml/lit.	Neck blast- carbendazim – 0.5gm/lit	
Sunflower		Bud necrosis-0.3ml/lit. imidacloprid	Bud necrosis-0.3ml/lit. Imidacloprid Head / Flower rot- spray with 0.2% mancozeb	
Ground nut	Tikka leaf spot - Carbendazim @ 1 g/lt (625 g/ha)	Collar rot – Seed treatment with Captan @ 2 g/lt (200 g/ha)	Foot rot- spray with 0.1 % carbendazim.	Afflatoxin Use of rock salts (2%), plant products like Asafoetida (hing) (0.1%) Turmeric powder

				(2%) and leaf extracts of neem and Mehendi (Henna)
Horticulture				
Arecanut	Root grub: Drench with chlorpyrifos (0.04%) suspension twice, in May and September.	Inflorescence die back : spray Zineb (4 g/litre) twice, one just after female flowers are set and again 15-28 days later	Koleroga/ Mahali: spraying Bordeaux mixture (1%) twice a year, one just before the onset of South-West monsoon and another 40 days later	
Coconut	Black headed caterpillar : Release of parasitoids like Gorrizus nephantidis, Elasmus nephantidis		Mites : Spraying biopesticides on the bunches - 2% neem oil - garlic emulsion (20ml neem oil + 20g garlic + 5g bar soap in 1 litre water)	

2.3 Floods

Condition	Suggested contingency measures			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation	NA			
Continuous submergence for more than 2 days	NA			
Sea water inundation	NA			

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

Extreme event type	Suggested contingency measures			
	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	<p>As the district is occasionally prone to drought the following measures to be taken to ameliorate the fodder deficiency</p> <p>Sowing of cereals (Sorghum/Bajra) and leguminous crops (Lucerne, Berseem, Horse gram, Cowpea) during North-East monsoon under dry land system for fodder production.</p> <p>Available Bajra/sorghum stover and groundnut haulms should be properly stored for future use.</p> <p>Encourage silage making with available maize fodder in the villages</p> <p>Collection of groundnut haulms and groundnut cake for use as feed supplement during drought</p> <p>Chopping of fodder should be made as mandatory in every village through supply and establishment of good quality chaff cutters.</p> <p>Harvesting and collection of perennial vegetation particularly grasses which grow during monsoon</p> <p>Proper drying, bailing and densification</p>	<p>Harvest and use biomass of dried up crops (Bajra, Paddy, Horse gram, Sorghum, Groundnut, Maize, Bengal gram green etc.,) material as fodder.</p> <p>Use of unconventional and locally available cheap feed ingredients especially groundnut cake and haulms as protein supplement for livestock during drought</p> <p>Concentrate ingredients such as Grains, brans, chunnies & oilseed cakes, low grade grains etc. unfit for human consumption should be procured from Govt. Godowns for feeding as supplement for high productive animals during drought</p> <p>Continuous supplementation of mineral mixture to prevent infertility</p> <p>Harvest the tree fodder (Neem, Subabul, Acasia, Pipal etc) and unconventional feeds resources available and use as fodder for livestock (LS).</p> <p>Available feed and fodder should be cut from CPRs and stall fed in order to reduce the energy requirements of the animals</p> <p>Advise the farmers about the practice of mixing available kitchen waste with dry fodder while feeding</p>	<p>Training/educating farmers for feed & fodder storage.</p> <p>Maintenance / repair of silo pits and feed/fodder stores.</p> <p>Encourage progressive farmers to grow fodder crops of sorghum/bajra/maize (UP chari, MP chari, HC-136, HD-2, GAIN T BAJRA, L-74, K-677, Ananad/African Tall etc., on their own lands & supporting them with assisting infrastructures like seeds, manure.</p> <p>Supply of quality fodder seed (multi cut sorghum/bajra/maize varieties) and fodder slips of Napier, guinea grass well before monsoon</p> <p>Replenish the feed and fodder banks</p>

	<p>of harvested grass from previous season</p> <p>Creation of permanent fodder, feed and fodder seed banks in all drought prone villages</p>		
Floods	<p>In case of early forewarning (EFW), harvest all the crops (Bajra, Paddy, Horse gram, Sorghum, Groundnut, Maize, Bengal gram green etc.) that can be useful as fodder in future (store properly)</p> <p>Don't allow the animals for grazing if severe floods are forewarned</p> <p>In flood prone mandals, arrange for storing minimum required quantity of hay (25-50kg) and concentrates (25kgs) per animals in farmer / LS keepers house / shed for feeding animals during floods</p> <p>Keep stock of bleaching powder and lime</p> <p>Carry out Butax spray for control of external parasites</p> <p>Identify the Clinical staff and trained paravets and indent for their services as per schedules</p> <p>Identify the volunteers who can serve in need of emergency</p> <p>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</p> <p>Capacity building and preparedness of the stakeholders and official staff for the unexpected events</p> <p>Capacity building and preparedness of the</p>	<p>Transportation of animals to elevated areas</p> <p>Stall feeding of animals with stored hay and concentrates</p> <p>Proper hygiene and sanitation of the animal shed</p> <p>In severe floods, un-tether or let loose the animals</p> <p>Emergency outlet establishment for required medicines or feed in each village</p> <p>Spraying of fly repellants in animal sheds</p>	<p>Repair of animal shed</p> <p>Bring back the animals to the shed</p> <p>Cleaning and disinfection of the shed</p> <p>Bleach (0.1%) drinking water / water sources</p> <p>Deworming with broad spectrum dewormers</p> <p>Vaccination against possible disease out breaks like HS, BQ, FMD and PPR</p> <p>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</p> <p>Drying the harvested crop material and proper storage for use as fodder.</p>

	stakeholders and official staff for the unexpected events		
Cyclone	<p>Harvest all the possible wetted grain (Bajra, Paddy, Horse gram, Sorghum, Groundnut, Maize, Bengal gram green etc) and use as animal feed.</p> <p>Stock of anti-diarrheal drugs and electrolytes should be made available for emergency transport</p> <p>Don't allow the animals for grazing in case of early forewarning (EFW) of cyclone</p> <p>Incase of EFW of severe cyclone, shift the animals to safer places.</p>	<p>Treatment of the sick, injured and affected animals through arrangement of mobile emergency veterinary hospitals / rescue animal health workers.</p> <p>Diarrhea out break may happen. Health camps should be organized</p> <p>In severe cases un-tether or let loose the animals</p> <p>Arrange transportation of highly productive animals to safer place</p> <p>Spraying of fly repellants in animal sheds</p>	<p>Repair of animal shed</p> <p>Deworm the animals through mass camps</p> <p>Vaccinate against possible disease out breaks like HS, BQ, FMD and PPR</p> <p>Proper dispose 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</p> <p>Bleach / chlorinate (0.1%) drinking water or water resources</p> <p>Collect drowned crop material, dry it and store for future use</p> <p>Sowing of short duration fodder crops in unsown and water logged areas when crops are damaged and no chance to replant</p> <p>Application of urea (20-25kg/ha) in the inundated areas and CPR's to enhance the bio mass production.</p>

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 late 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 In severe cases, put on the heaters at night times 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)
Health and Disease management	List out the endemic diseases (species wise) in that district Procure and stock emergency medicines and vaccines for important endemic diseases of the area All the stock must be immunized for endemic diseases of the area Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district	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 Rescue of sick and injured animals and their treatment	Conducting mass animal health camps Conducting fertility camps Mass deworming camps
Drinking water	Identification of water resources Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals)	Restrict wallowing of animals in water bodies/resources	Bleach (0.1%) drinking water / water sources Provide clean drinking water
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

2.5.2

Poultry

	Suggested contingency measures		
	Before the event ^a	During the event	After the event
Drought			
Shortage of feed ingredients	Storing of house hold grain like maize, broken rice etc, in to use as feed in case of severe drought	Supplementation only for productive birds with house hold grain Supplementation of shell grit (calcium) for laying birds Culling of weak birds	Supplementation to all survived birds
Drinking water		Use water sanitizers or offer cool hygienic drinking water	
Health and disease management	Culling of sick birds. Deworming and vaccination against RD and IBD	Mixing of Vit. A,D,E, K and B-complex including vit C in drinking water (5ml in one litre water)	Hygienic and sanitation of poultry house Disposal of dead birds by burning / burying with lime powder in pit
Floods			
Shortage of feed ingredients	In case of early forewarning of floods, shift the birds to safer place Storing of house hold grain like maize, broken rice, bajra etc,	Use stored feed as supplement Don't allow for scavenging Culling of weak birds	Routine practices are followed Deworming and vaccination against RD
Drinking water		Use water sanitizers or offer cool hygienic drinking water	
Health and disease management	In case of EFW, add antibiotic powder (Terramycin/Ampicilline/ Ampiclox etc., 10g in one litre) in drinking water to prevent any disease outbreak	Prevent water logging surrounding the sheds through proper drainage facility Assure supply of electricity by generator or solar energy or biogas Sprinkle lime powder to prevent ammonia accumulation due to dampness	Sanitation of poultry house Treatment of affected birds Disposal of dead birds by burning / burying with lime powder in pit Disposal of poultry manure to prevent protozoal problem

			Supplementation of coccidiostats in feed Vaccination against RD
Cyclone			
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 Protect from thunder storms	Routine practices are followed
Drinking water		Use water sanitizers or offer cool 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 (5-10g per square feet) to prevent ammonia accumulation due to dampness	Disposal of dead birds by burning / deep burying with lime powder in pit Disposal of poultry manure to prevent protozoal problem Supplementation of coccidiostats in feed Vaccination against Ranikhet Disease (0.5ml S/c)
Cold wave	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
Heat wave	NA		

2.5.3 Fisheries

	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	<ul style="list-style-type: none"> Sustain the water depth 	<ul style="list-style-type: none"> Rearing of early stage fish seeds for 15-20 days 	<ul style="list-style-type: none"> Harvest and sale the crop
(ii) Changes in water quality	<ul style="list-style-type: none"> Sustain the inflow of water 	<ul style="list-style-type: none"> Maintain low stocking density Common carps or Mrugal carps are suitable 	<ul style="list-style-type: none"> Harvest and sale the crop
(iii) Any other		<ul style="list-style-type: none"> Cultivate commercial aquatic weeds like Azolla, lemna, plankton production 	<ul style="list-style-type: none"> Harvest and sale Weeds can be used as feed for other fishes & livestock
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	-	-	-
(ii) Impact of salt load build up in ponds / change in water quality			
(iii) Any other			
2) Floods			
A. Capture		-	-
Marine	-	-	-
Inland			
(i) Average compensation paid due to loss of human life	<ul style="list-style-type: none"> Asses the intensity of loss 	<ul style="list-style-type: none"> Shifting of domicile 	<ul style="list-style-type: none"> Temporary sheds has to provide Information regarding help line
(ii) No. of boats / nets/damaged	-	-	-
(iii) No.of houses damaged			
(iv) Loss of stock			
(v) Changes in water quality			
(vi) Health and diseases			
B. Aquaculture			
(i) Inundation with flood water	<ul style="list-style-type: none"> Precautionary measures for inlet and outlet valves of the cultured area 	<ul style="list-style-type: none"> Flooded water should be diverted away from the culture pond / tanks Provide drainage for flood water 	<ul style="list-style-type: none"> Check out water quality parameters and depth of water and confirm the stock
(ii) Water continuation and changes in water quality	<ul style="list-style-type: none"> Asses the un towards of the flood water 	<ul style="list-style-type: none"> Strengthen the pond / tank bunds, dykes 	<ul style="list-style-type: none"> Maintain the water depth and check out the stock of fish
(iii) Health and diseases	-	<ul style="list-style-type: none"> Application of potassium permanganate as per recommendation 	<ul style="list-style-type: none"> Harvest the crop and remove disease affected stock and apply lime and

			potassium permanganate
(iv) Loss of stock and inputs (feed, chemicals etc)	<ul style="list-style-type: none"> Immoderately harvest the fish before the flood 	-	<ul style="list-style-type: none"> Maintain the remaining stock of lesser growth fishes
(v) Infrastructure damage (pumps, aerators, huts etc)	<ul style="list-style-type: none"> Shift the equipments to the safer places 	<ul style="list-style-type: none"> Temporary diversion of inflow water through drainage away from the pond 	<ul style="list-style-type: none"> Reassemble the infrastructure for sustainability
(vi) Any other	<ul style="list-style-type: none"> Information to the flood relief authority for precautionary measures 	-	<ul style="list-style-type: none"> Insurance may be claimed depending on the intensity of loss
3. Cyclone / Tsunami			
A. Capture			
Marine	-	-	-
(i) Average compensation paid due to loss of fishermen lives			
(ii) Avg. no. of boats / nets/damaged			
(iii) Avg. no. of houses damaged			
Inland			
B. Aquaculture			
(i) Overflow / flooding of ponds	<ul style="list-style-type: none"> Strengthening of ponds / tanks 	<ul style="list-style-type: none"> Deviate the drainage from culture ponds 	<ul style="list-style-type: none"> Check out water quality parameters and depth of water and confirm the stock
(ii) Changes in water quality (fresh water / brackish water ratio)	<ul style="list-style-type: none"> Asses the un towards of the rain water 	-	<ul style="list-style-type: none"> Maintain the water depth and check out the stock of fish
(iii) Health and diseases	-	<ul style="list-style-type: none"> Application of potassium permanganate as per recommendation 	<ul style="list-style-type: none"> Harvest the crop and remove disease affected stock and apply lime and potassium permanganate
(iv) Loss of stock and inputs (feed, chemicals etc)	<ul style="list-style-type: none"> Immoderately harvest the fish before the cyclone 	-	<ul style="list-style-type: none"> Maintain the remaining stock of lesser growth fishes
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)	<ul style="list-style-type: none"> Shift the equipments to the safer places 	<ul style="list-style-type: none"> Temporary diversion of inflow water through drainage away from the pond 	<ul style="list-style-type: none"> Reassemble the infrastructure for sustainability
(vi) Any other	-	-	<ul style="list-style-type: none"> Insurance may be claimed depending on the intensity of loss
4. Heat wave and cold wave			
A. Capture			
Marine	-	-	-
Inland	-	-	-
B. Aquaculture			
(i) Changes in pond environment (water quality)	-	<ul style="list-style-type: none"> Exchange of fresh water into cultured ponds during cold wave 	-
(ii) Health and Disease management	-	<ul style="list-style-type: none"> Application of potassium permanganate as per recommendation 	<ul style="list-style-type: none"> Harvest the crop and remove disease affected stock and apply lime and

			potassium permanganate
(iii) Any other	-	<ul style="list-style-type: none"> • Installation of wooden planks to side walls of the ponds during cold wave • Creation or erection of temporary poly house structure during cold wave 	-