State: KARNATAKA

Agriculture Contingency Plan for District: UTTARA KANNADA

1.0 District Agriculture profile					
1.1	**Agro-Climatic/Ecological Zone**				
	Agro Ecological Sub Region (ICAR)	Western Ghats And Coastal Plain, Hot Humid region (19.2, 19.3)			
	Agro-Climatic Region (Planning Commission)	West coast plains and Ghat region (XII)			
	Agro Climatic Zone (NARP)	Hilly zone, Coastal Zone (KA-9& KA-10)			
	List all the districts or part thereof falling under the NARP Zone	Uttara Kannada, Chikkamagalore, Kodagu, Shimoga, Belgaum, Dharwad and Haveri			
	Geographic coordinates of district	Latitude	Longitude	Altitude	
		14°42'33.23"N	74°46'35.11"E	605m	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Agricultural Research Station, Sirsi, Banvasi Road, Uttara Kannada Dist., Pin- 581401			
	Mention the KVK located in the district	Krishi Vigyan Kendra, Sirsi, Banvasi Road, Uttara Kannada Dist., Pin- 581401			
1.2	**Rainfall**	Normal RF(mm)	Normal Rainy days (number)	Normal Onset	Normal Cessation
	SW monsoon (June–October)	2470	-	1st week of June	2nd week of October
	NE Monsoon (October-December)	222	-	3rd week of October	2nd of November
	Winter (January - Febraury)	5	-		
	Summer (March-May)	133	-		
	Annual	2830	103		

1.3	**Land use pattern of the district**	Geographical Area	Forest area	Land under non-agricultural use	Net sown area	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area ('000 ha)	1024.7	813.6	34.4	115.6	16.0	6.5	4.8	16.2	5.9	11.7

1. 4	**Major Soils (common names like shallow red soils etc.,)**	**Area ('000 ha)**	**Percent (%) of total**
	Red Sandy loam soils	552.9	54
	Sandy soils	144.6	14
	Red clay loam, red lateritic soils	36.3	3
	Other soils	291.7	28
1.5	**Agricultural land use**	Area ('000 ha)	Cropping intensity %
	Net sown area	115.6	109.6 %
	Area sown more than once	11.1	
	Gross cropped area	126.7	

1.6	**Irrigation**	Area ('000 ha)		
	Net irrigated area	25.9		
	Gross irrigated area	26.7		
	Rainfed area	89.7		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals		0.0	0.0
	Tanks	-	5.0	18.5
	Open wells	-		

	Bore wells	-	10.2	37.9
	Lift irrigation	-		
	Micro-irrigation			
	Other sources	-	11.7	43.6
	Total Irrigated Area	-	26.9	100.0
	Pump sets	40986		
	No. of Tractors	2289		
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils	(%) area	
	Over exploited	-	-	
	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 etc. (2008-09)

	Plantation crops	**Total area**
	Arecanut	14.6
	Coconut	7.3
	Cashew	2.8
	Fodder crops	**-**
	Total fodder crop area	-
	Grazing land	-
	Sericulture etc	0.2
	Others	-

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Non descriptive Cattle (local low yielding)	146.7	185.3	332.0
	Crossbred cattle	5.0	30.3	35.3
	Non descriptive Buffaloes (local low yielding)	30.3	88.3	118.6
	Graded Buffaloes			
	Goat			12.0
	Sheep			2.7
	Others (Pig + Dogs + Rabbit)			1.24
	Commercial dairy farms (Number)			

1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**
	Commercial	N.A	682.9
	Backyard		

1.10 Fisheries (Data source: State Fisheries Dept)

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)	
	98517	1544	18780	6007	1025	55

ii) Inland (Data Source: Fisheries Department)	**No. Farmer owned ponds**	**No. of Reservoirs**	**No. of village tanks**
	168	7	930

B. Culture

	Water Spread Area (ha)	**Yield (t/ha)**	**Production ('000 tons)**

	i) **Brackish water** (Data Source: MPEDA/ Fisheries Department)	129.2	4.1	527.2
	ii) **Fresh water** (Data Source: Fisheries Department)	NA	NA	NA

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 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 (Crops to be identified based on total acreage)										
	Paddy	189	2451	33.7	2451	-	-	222.6	2451	-
	Maize	12.4	3213	-	-	-	-	12.4	3213	-
	Cotton	3.8	1500	-	-	-	-	3.8	1500	-
	Groundnut	39	120	23.3	120	-	-	62.2	120	-
	Sugarcane	92.0	75463	-	-	-	-	92.0	75463	-
	Pulses	-	-	-	-	10.4	300	10.4	300	-
Major Horticultural crops (Crops to be identified based on total acreage)										
	Arecanut	-	-	-	-	-	-	41	3000	-
	Coconut	-	-	-	-	-	-	23366.4 nuts	3200 nuts /ha	-
	Onion	-	-	-	--	-	-	45.0	15000	-
	Cashew	-	-	-	-	-	-	1.7	650	-
	Ginger	-	-	-	-	-	-	3.8	15000	-
	Mango	-	--	-	-	-	-	20	15000	-

	Banana	-	-	-	-	-	-	83.4	45000	-
	Pineapple	-	-	-	-	-	-	27.0	52000	-
	Turmeric	-	-	-	-	-	-	5.6	16000	-
	Black pepper	-	-	-	-	-	-	0.7	3300	-

1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	Paddy	Maize	Pulses	Groundnut	Cotton
	Kharif- Rainfed	1st week of May- 4th week of July	1st week of May –1st week of July		1st week of June -4th week of June	1st week of May- 2nd week of June
	Kharif-Irrigated		-			-
	Rabi- Rainfed			4th week of November – 4th week of January		
	Rabi-Irrigated	November to January end	1st week of September- 4th week of October		1st week of November – 4th week of December	-

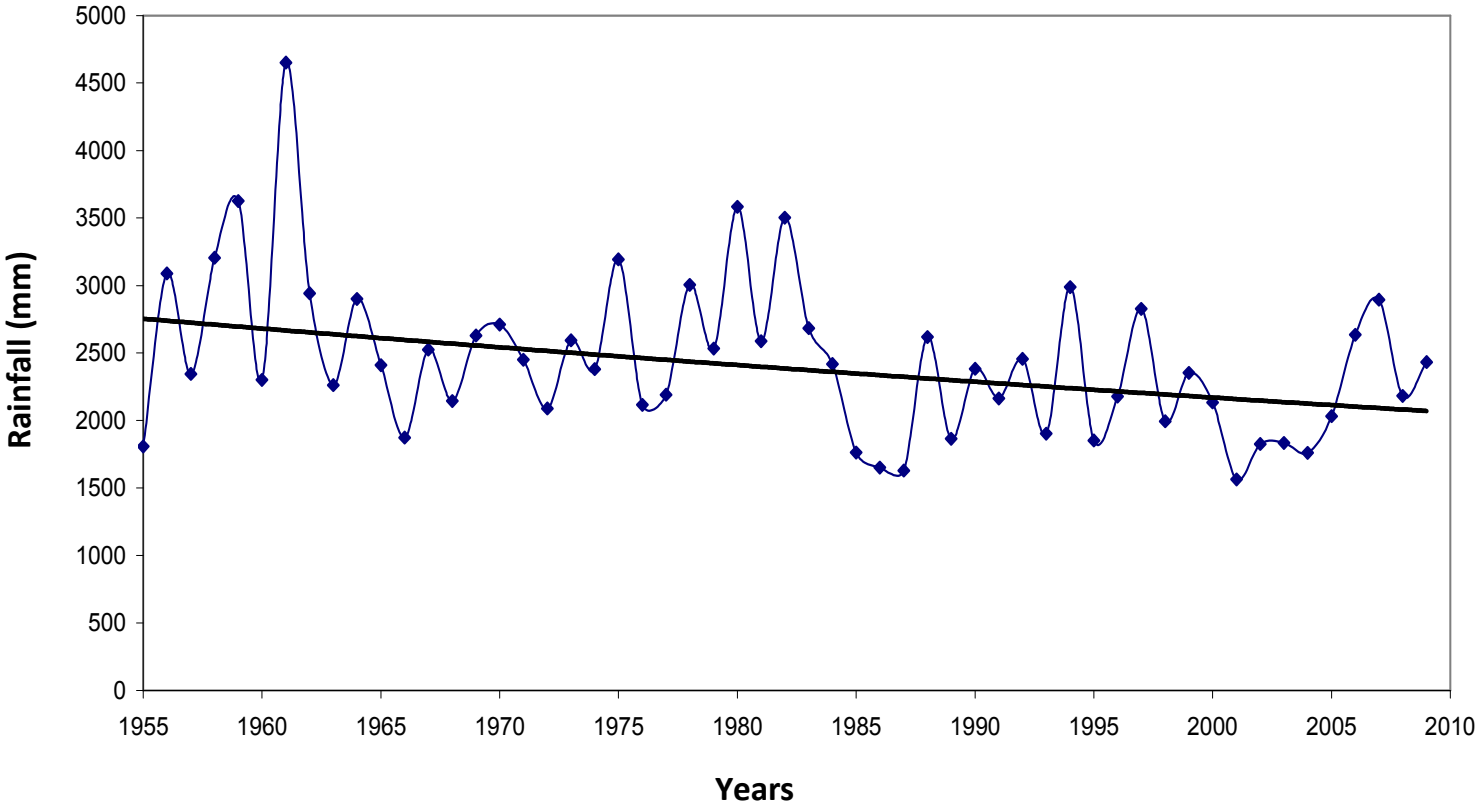
1.13	**What is the major contingency the district is prone to?** (Tick mark and mention years if known during the last 10 year period)	Regular	Occasional	None
	Drought	√		
	Floods	√		
	Cyclone			√
	Hail storm			√
	Heat wave			√
	Cold wave			√

	Frost			√
	Pests and diseases (specify) Paddy: WBPH and Blast, Army worm in Varada and Sharavathi belt, Bacterial Blight in paddy, Leaf Folder Groundnut: Pod rot Cotton: Boll worm	√		
	Sea water intrusion (About 1000 acres in Kumta, Ankola and Honnavar taluks)			

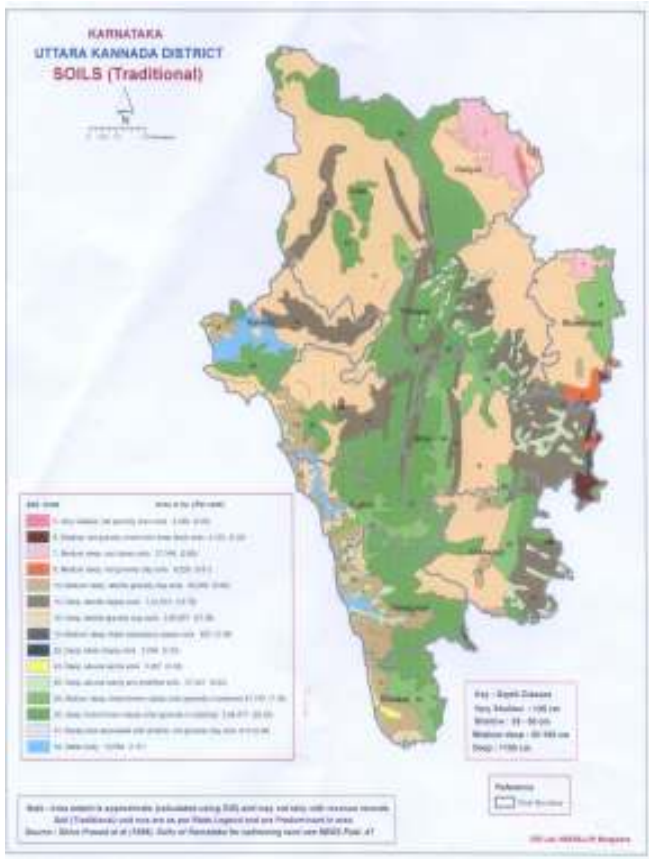
1.14	**Include Digital maps of the district for**	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: No
		Soil map Annexure as 3	Enclosed: Yes

Annexure 1: Location map of Uttara kannada

Annexure 2: Rainfall pattern of Agricultural Research Station (Paddy), Sirsi (1955-2010)



Annexure3: Soil Map of Uttara Kannada



Source: NBSS & LUP

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 3rd week)	Red Sandy loam soils High Rainfall – Rainfed transplanted situation (Sirsi, Siddpur, Joida, Yellapur taluks)	Paddy - Pulses	No Change If paddy is not sown during May, plan for medium duration varieties of paddy (MTU-1001, Jaya, IR-64, Rasi) for transplanted situation.	Go in for staggered nursery, if drought occurs during June. If dry period (or period not suitable for transplanting) continues, use medium duration rice cultivars. Repeat the puddling operation to manage weeds or go in for herbicides.	
	Sandy soils Medium rainfall – rainfed drill sown situation (Parts of Mundgod, Sisri, Siddapur, Haliyal taluks)	Paddy– Pulses	No change	Dry spells during 1st and 2nd weeks of June allows to go for intercultivation Go in for dry sowing of treated rice seeds using drill or if semi wet condition prevails (and sowing with drill is not possible), go in for plough sole method of sowing.	Seed Source Karnataka State Seeds Corporation /National Seeds Corporation

		Maize	Maize sowing can be continued up to end of June if rain is received during 3rd / 4th week of June If heavy rains received, go in for sowing of up land rice cultivars	Maize sowing can be continued up to end of June if rain is received during 3rd / 4th week of June Dry spells during 1st and 2nd weeks of June allows to go for intercultivation	
	Red clay loam, red lateritic soils Coastal belt (Karwar, Ankola, Kumta, Honnavar and Bhatkal talukas)	Paddy – Paddy	No change		
		Paddy – Pulses	No change		
		Paddy – Groundnut	No change		
		Paddy – Vegetables	No change		

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 4 weeks **(July 1st week)**	High Rainfall – Rainfed transplanted situation (Sirsi, Siddpur, Joida, Yellapur taluks)	Paddy - Pulse	No change	Plan for medium duration varieties of paddy like MTU 1010 and MGD 101 if early sown nursery fails. If early sown nursery is protected by protective irrigation, plan for early land preparation and planting.	-
	Medium rainfall – rainfed drill sown situation (Parts of Mundgod, Sisri, Siddapur, Hliyal taluks)	Paddy – Pulses	No change But plan for medium duration varieties of paddy (MTU-1001, Jaya, IR-64, and Rasi) for transplanted situation.	repeated inter cultivations in drill sown paddy Go in for planking when it rains to manage weeds	Seed Source KSSC/NSC
		Maize	No Change	Go in for repeated inter cultivations and earthing up.	
		Cotton	No Change	Go in for repeated inter cultivations and earthing up.	
	Coastal belt (Karwar, Ankola, Kumta, Honnavar and Bhatkal talukas)	Paddy – Paddy	-do-	Impound water and apply fertilizers (1st top dressing) No change suggested.	
		Paddy – Pulses	-do-	-do-	
		Paddy – Groundnut	-do-	-do-	
		Paddy – Vegetables	-do-	No change suggested	

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 6 weeks **(July 3rd week)**	High Rainfall – Rainfed transplanted situation (Sirsi, Siddpur, Joida, Yellapur taluks)	Paddy - Pulses	No change	Plan for medium duration varieties of paddy like MTU 1010 and MGD 101 if early sown nursery fails. If early sown nursery is protected by protective irrigation, plan for early land preparation and planting. Go in for staggered nursery, if drought occurs during June. If dry period (or period not suitable for transplanting) continues, use medium duration rice cv.s. Repeat the puddling operation to manage weeds or go in for herbicides.	Seed Source KSSC/NSC
	Medium rainfall – rainfed drill sown situation (Parts of Mundgod, Sisri, Siddapur, Hliyal taluks)	Paddy – Pulses	No change	Repeated inter cultivations in drill sown paddy Go in for dry sowing of treated rice seeds using drill or if semi wet condition prevails(and sowing with drill is not possible), go in for plough sole method of sowing.	
		Maize	-do-	Maize sowing can be continued upto end of June if rain is received during 3rd / 4th week of June	
		Cotton	-do-	Go in for repeated inter cultivations and earthing up	
	Coastal belt (Karwar, Ankola, Kumta, Honnavar and Bhatkal talukas)	Paddy – Paddy	No change in cropping system	Impound water and apply fertilizers (1st top dressing)	Seed Source KSSC/NSC
		Paddy – Pulses	-do-	No change	

		Paddy – Groundnut	-do-	-do-	
		Paddy – Vegetables	-do-	-do-	

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 8 weeks (August 1st week)	**-NA-**	**-NA-**	**-NA-**	**-NA-**	**-NA-**

Condition			**Suggested Contingency measures**		
Early season drought **(Normal onset)**	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	High Rainfall – Rainfed transplanted situation (Sirsi, Siddpur, Joida, Yellapur taluks)	Paddy - Pulses	No change	-	
	Medium rainfall – rainfed drill sown situation (Parts of Mundgod, Sisri, Siddapur, Hliyal taluks)	Paddy – Pulses	-do-	Dry spells during 1st and 2nd week of June helps in taking intercultivation in drill sown rice	
		Maize	-do-	-do	

		Cotton	-do-	-do-	
	Coastal belt (Karwar, Ankola, Kumta, Honnavar and Bhatkal talukas)	Paddy – Paddy	-do-	-	
		Paddy – Pulses	-do-	-	
		Paddy – Groundnut	-do-	-	
		Paddy – Vegetables	-do	-	

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell, consecutive 2 weeks rainless (<2.5 mm) period)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measues**	**Remarks on Implementation**
At vegetative stage	High Rainfall – Rainfed transplanted situation (Sirsi, Siddpur, Joida, Yellapur taluks)	Paddy - Pulses	Spray the crop with 2% KNO_3 solution and postpone top dressing with N	Plugging holes made by crab to keep the water which is already there in the field for longer period.	
	Medium rainfall – rainfed drill sown situation (Parts of Mundgod, Sisri, Siddapur, Hliyal taluks)	Paddy – Pulses	Spray the crop with 2% KNO_3 solution and postpone top dressing with N	Weeding, intercultivation	
		Maize	Life saving irrigation for maize	-do- Go in for repeated inter cultivations and earthing up.	
		Cotton	Life saving irrigation for cotton	-do-	

				Go in for repeated inter cultivations and earthing up.	
	Coastal belt (Karwar, Ankola, Kumta, Honnavar and Bhatkal talukas)	Paddy – Paddy	Spray the crop with 2% KNO_3 solution and postpone top dressing with N	Plugging holes made by crab to keep the water which is already there in the filed for longer period	
		Paddy – Pulses	-do-	-do- No Change	
		Paddy – Groundnut	-do-	-do- No Change	
		Paddy – Vegetables	-do-	-do- No Change	

Condition			**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/ fruiting stage	High Rainfall – Rainfed transplanted situation (Sirsi, Siddpur, Joida, Yellapur taluks)	Paddy - Pulses	Spray the paddy crop with 2% KNO_3 solution. Protective irrigation for rice	Plugging holes made by crab to keep the water which is already there in the field for longer period.	
	Medium rainfall – rainfed drill sown situation	Paddy – Pulses	Spray the paddy crop with 2% KNO_3 solution. Protective irrigation for rice	-do-	

	(Parts of Mundgod, Sisri, Siddapur, Hliyal taluks)	Maize	Protective irrigation	Weeding, intercultivation	
		Cotton	Protective irrigation	-do-	
	Coastal belt (Karwar, Ankola, Kumta, Honnavar and Bhatkal talukas)	Paddy – Paddy	Spray the paddy crop with 2% KNO_3 solution.	Plug crab holes to keep the water for longer period	
		Paddy – Pulses	Protective irrigation for rice	-do-	
		Paddy – Groundnut	-do-	-do-	
		Paddy – Vegetables	-do-	-do-	

Condition			**Suggested Contingency measures**		
Terminal drought	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
	High Rainfall – Rainfed transplanted situation (Sirsi, Siddpur, Joida, Yellapur taluks)	Paddy - Pulses	Life saving irrigation	Pulses in Paddy fallows Greengram, DU1 Blackgram, Dh-86 Groundnut	
	Medium rainfall – rainfed drill sown situation (Parts of Mundgod, Sisri, Siddapur, Hliyal taluks)	Paddy – Pulses	Life saving irrigation	Pulses in paddy fallows Greengram, DU1 Blackgram, Dh-86 Groundnut	
		Maize	-do-	-	
		Cotton	-do-	-	
	Coastal belt (Karwar, Ankola, Kumta, Honnavar	Paddy – Paddy	Life saving irrigation	Pulses / groundnut in paddy fallows	

	and Bhatkal talukas)	Paddy – Pulses	-do-	-do-	
		Paddy – Groundnut	-do-	-do-	
		Paddy – Vegetables	-do-	-do-	

2.1.2 Irrigated situation

Condition			**Suggested Contingency measures**		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delayed release of water in canals due to low rainfall	**Not Applicable**				

Condition			**Suggested Contingency measures**		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Limited release of water in canals due to low rainfall	**Not Applicable**				

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Non release of water in canals under delayed onset of monsoon in catchment	**Not Applicable**				

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal 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	Bachanaki Dam area (Paddy growing areas) in Mundgod taluk	Long duration rice	Plan for medium (MTU-1001, Jaya, IR-64, Rasi) /short duration (Mangala, MTU 1010,) varieties of paddy	Go in for dry sowing of treated rice seeds using drill or if semi wet condition prevails(and sowing with drill is not possible), go in for plough sole method of sowing. or Go in for staggered nursery, if drought occurs during June. If dry period (or period not suitable for transplanting) continues, use medium duration rice cultivars. Repeat the puddling operation to manage weeds or go in for herbicides.	Seed Source KSSC/NSC

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Insufficient groundwater recharge due to low rainfall	**Not Applicable**				

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

Condition	**Suggested contingency measure**			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**
Paddy	Foliar application of nutrients after rain recedes. If transplanting is delayed by 2 weeks transplant 4-5 seedlings per hill If transplanting is delayed by 2 weeks nipping of seedlings is recommended	Top dressing of N after rain recedes. Use non lodging variety Abhilash	Go in for plant protection measures with mancozeb @2g/l or carbendazim @1g/l to manage grain discoloration disease.	-
Cotton	Provide sufficient drainage Foliar application of nutrients @ 2% (N,P,K) after rain recedes, Go for reseeding, if the season is not advanced	Provide sufficient drainage Foliar application of nutrients@ 2% (N,P,K) after rain recedes,	Provide sufficient drainage Drying of wet kapas after rain recedes + Go in for plant protection measures with mancozeb @2g/l or carbendazim @1g/l or copper oxy chloride @ 3g/l to manage disease.	

Maize	Provide sufficient drainage Foliar application of nutrients@ 2% (N,P,K) after rain recedes,	Provide sufficient drainage Foliar application of nutrients@ 2% (N,P,K) after rain recedes,	Provide sufficient drainage	Drying of wet Cobs after rain recede
Heavy rainfall with high speed winds in a short span	-NA-			
Horticulture	-NA-			
Outbreak of pests and diseases due to unseasonal rains	Need based plant protection measures for the control of pests and diseases like WBPH (Imidacloprid @.25 ml/litre)), Bacterial(tricycaozone @0.6 g/litre), Sheath Blight and Blast in Paddy (carbondizim @ 1.0 g/litre) , Pod rot in Ground nut (seed treatment with tebuconazole @ 1g/kg seed), Bollworm in Cotton (indaxo carb @ .5 ml/ltre or Spinosad @ 0.25 ml/litre) and			
Horticulture	-NA-			

2.3 Floods

Condition	**Suggested contingency measure**			
Transient water logging/ partial inundation	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
	NA	NA	NA	NA
Continuous submergence for more than 2 days				
Paddy in Varada (1100 ha) , Aghanashini(700 ha) & Sharavati (1000ha) belts of Sirsi, Kumta and Honnavar respectively		Additional 25% recommended NK should be supplied as top dressing After water level recedes broadcast Phorate @ 12.5 kg/ha for control of WBPH and apply	After water level recedes broadcast Phorate @ 12.5 kg/ha for control of WBPH and apply Poision bait (Monocrotophos @ 250 ml +2 kg	After water level recedes go for early harvest and proper drying of produce.

		Poision bait (Monocrotophos @ 250 ml +2 kg Jaggerysolution +20 kg rice bran) for control of Army worm	Jaggerysolution +20 kg rice bran) for control of Armyworm	
Sea water intrusion	-	-	-	-

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	As the district is frequently prone for drought, it should have reserves (feeding 5000 ACU (maintenance ration) for about 1-3 weeks period) of the following at any point of the year for mobilization to the needy areas Silage:20-50 t Urea molasses mineral bricks (UMMB):50-100 t Hay:100-250 t Concentrates: 20-50 t Minerals and vitamin supplements mixture:1-5 t Available sugarcane tops should be preserved for use as fodder Top dressing of N in 2-3 split doses @ 20-25 kg N/ha in CPRs with the monsoon pattern for higher biomass production Increase area under short duration fodder crops of sorghum/bajra/maize(UP chari, MP chari, HC-136, HD-2, GAINT BAJRA, L-74, K-677, Ananad/African Tall, Kisan composite, Moti, Manjari, B1-7	Harvest and use all the failed crop (Rice, Maize, Groundnut, Bengal gram, green gram) material as fodder. Harvest the top fodder (Neem, Subabul, Acasia, Pipol etc) and unconventional feeds resources available and use as fodder for livestock (LS) during drought. Stall fed the LS so as to reduce feed requirements of the animals In severe drought, supply silage / hay to farmers with productive stock on subsidized rates **Mild drought:** hay should be transported to the drought affected villages **Moderate drought:** hay, silage and vitamin & minerals mixture should be transported to the drought affected villages **Severe drought:** UMMB, hay, concentrates and vitamin & mineral mixture should be transported to the drought affected villages. All the hay should be enriched with 2% Urea molasses solution or 1% common salt solution and fed to LS Herd should be split and supplementation should be given only to the highly productive	Short duration fodder crops of Sorghum / Bajra / Maize (UP Chari, Pusa Chari, HC-136, HD-2/Rajkoo, Gaint Bajra, L-74, K-6677, Ananand / African tall, Kissan composite, Moti, Manjari, BI-7) should be sown in unsown and crop failed areas Capacity building to stake holders on drought/flood mitigation in livestock sector Flushing the stock to recoup Replenish the feed and fodder banks

	Chopping of fodder should be made as mandatory in every village through supply and establishment of good quality crop cutters. Avoid burning of maize stover Harvesting and collection of perennial vegetation particularly grasses which grow during monsoon Proper drying, bailing and densification of harvested grass Creation of permanent fodder, feed and fodder seed banks in all drought prone villages Capacity building and preparedness of the stakeholders and official staff for the unexpected events	and breeding animals Provision of emergency grazing/feeding (Cow-calf camps or other special arrangements to protect high productive & breeding stock) Encourage mixing available kitchen waste/pineapple pulp with dry fodder while feeding to the milch animals Arrangements should be made for mobilization of small ruminants across the districts where no drought exits Unproductive livestock should to be culled during severe drought Create transportation and marketing facilities for the culled and unproductive animals (10000-20000 animals) Subsidized loans (5-10 crores) should be provided to the livestock keepers	
Cyclone	**NA**		
Floods	In case of early forewarning (EFW), harvest all the crops (Rice, Maize, Groundnut, pulses) that can be useful as fodder/feed in future (store properly) Don't allow the animals for grazing if severe floods are forewarned Procure and stock water sanitizing tablets Motivate the farmers to store a minimum required quantity of hay (25-50kg) and concentrates (25kgs) per animals in farmer / LS keepers house / shed for feeding animals during floods	Transportation of animals to elevated areas Stall feeding of animals with stored hay and concentrates Let loose the animals in shed Proper hygiene and sanitation of the animal shed In severe floods, un-tether or let loose the animals Emergency outlet establishment for required medicines or feed in each village Spraying of fly repellants in animal sheds	Repair of animal shed Bring back the animals to the shed Cleaning and disinfection of the shed Bleach (0.1%) drinking water / water sources Deworming with broad spectrum dewormers Vaccination against possible disease out breaks like HS, BQ, FMD and PPR Proper disposable of the dead animals / carcasses by burning / deep burying (4-8 feet) with lime powder (1kg for small ruminants and 5kg for large ruminants) in pit Drying the harvested crop material and proper storage

	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		for use as fodder.
Heat & Cold wave	NA		
Health and Disease management	Timely vaccination (as per enclosed vaccination schedule) against all endemic diseases Procure and stock emergency medicines vaccines for important endemic diseases of the area Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district	Carryout deworming to all animals entering into relief camps Identification and quarantine of sick animals Constitution of Rapid Action Veterinary Force Performing ring vaccination (8 km radius) in case of any outbreak Restricting movement of livestock in case of any epidemic Rescue of sick and injured animals and their treatment Organize with community daily lifting of dung from relief camps	Keep close surveillance on disease outbreak. Undertake the vaccination depending on need Keep the animal houses clean and spray disinfectants Farmers should be advised to breed their milch animals during July-September so that the peak milk production does not coincide with mid summer
Insurance	Encouraging insurance of livestock	Listing out the details of the dead animals	Submission for insurance claim and availing insurance benefit Purchase of new productive animals
Drinking water	Identification of water resources Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for	Restrict wallowing of animals in water bodies/resources	Bleach (0.1%) drinking water / water sources Provide clean drinking water

	animals) Construction of drinking water tanks in herding places/village junctions/relief camp locations		

Vaccination schedule in small ruminants (Sheep & Goat)

Disease	**Season**
Foot and mouth disease (FMD)	Preferably in winter / autumn
PPR	All seasons, preferably in June-July
Black quarter (BQ)	May / June
Enterotoxaemia (ET)	May
aemorrhagic septicaemia (HS)	March / June
Sheep pox (SP)	December / march

Vaccination programme for cattle and buffalo:

Disease	**Age and season at vaccination**
Anthrax	In endemic areas only, Feb to May
HS	May to June
BQ	May to June
FMD	November to December

2.5.1 Poultry

Drought	Before the event[a]	During the event	After the event
Shortage of feed ingredients	Storing of house hold grain like maize, broken rice, bajra etc, Culling of weak birds	Supplementation only for productive birds with house hold grain Supplementation of shell grit (calcium) for laying birds	Supplementation to all
Drinking water	Rain water harvesting	Sanitation of drinking water	Give sufficient water as per the bird's requirement
Health and disease management	Culling of sick birds. Deworming and vaccination against RD and fowl pox	Mixing of Vit. A,D,E, K and B-complex including vit C in drinking water	Hygienic and sanitation of poultry house Disposal of dead birds by burning / burying with line powder in pit
Floods			
Shortage of feed ingredients	In case of EFW, shift the birds to safer place Storing of house hold grain like maize, broken rice, bajra etc, Culling of weak birds	Use stored feed as supplement Don't allow for scavenging	Routine practices are followed
Drinking water	Provide clean drinking water	Sanitation of drinking water	Sanitation of drinking water
Health and disease management	In case of EFW, add antibiotic powder in drinking water to prevent any disease outbreak	Sanitation of poultry house Treatment of affected birds Prevent water logging surrounding the sheds Assure supply of electricity Sprinkle lime powder to prevent	Disposal of dead birds by burning / burying with line powder in pit Disposal of poultry manure to prevent protozoal problem Supplementation of coccidiostats in feed Vaccination against RD

		ammonia accumulation due to dampness	
Cyclone	**NA**		
Heat wave and cold wave	**NA**		

2.5.2 Fisheries/ Aquaculture:

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
1) Drought			
A. Capture			
Marine	NA	NA	NA
Inland	-	-	-
(i) Shallow water depth due to	Observe water level. Advice fishermen to harvest as much as possible fish live stock	Harvest the complete fish live stock	Report the loss to Revenue & Fisheries Dept.
insufficient rain/inflow			
(ii) Changes in water quality	Observe water quality like dis- solved Oxygen & pH	Report the matter to Revenue & Fisheries Dept.	
(iii) Any other	To explore the possibility of shifting the live stock to other water resources	-	-
B. Aquaculture			
(i) Shallow water in ponds due to	Observe water level. Advice for fishermen to harvest maxi-mum fish live stock.	Addition of water, lime for tackling salt load	
insufficient rain/inflow			
(ii) Impact of salt load build up in		Report the matter to Revenue &	Report the loss to Revenue &

ponds/change in water quality	-	Fisheries Dept.	Fisheries Dept.
(iii) Any other	-	-	-
2) Floods	-	-	-
A. Capture			
Marine	1) Helpt the district administration in providing Savi monsoon and boat 2) Prior wawrning is given for fishrmen as per advice of Meteorological Dept.	-	-
		-	-

Inland			
(i) Average compension paid due to	Revenue authorities pay the compension to boats / nets / houses / fish live stock damaged	Addition of water, lime for tackling salt load	
loss of human life			
(ii) No.of boats/nets/damaged			Report the loss to Revenue & Fisheries Dept.
(iii) No.of houses damaged		Report the matter to Revenue & Fisheries Dept.	
(iv) Loss of stock			
(v) Changes in water quality			
(vi) Health and diseases	should be reported to Revenue Dept.authorities.		
B. Aquaculture			
(i) Inundation with flood water	Monitor the floods and harvest maximum fish live stock before floods. Report the loss to Revenue and Fisheries Dept. authorities.		
(ii) Water continuation and changes			
in water quality			
(iii) Health and Diseases			
(iv) Loss of stock and inputs (ffed,			
chemicals etc.)			
(v) Infrastructure damage (pumps,			
aerators, huts etc.)			
(vi) Any other			

3. Cyclone / Tsunami			
A. Capture			
Marine			
Inland			
B. Aquaculture			
(i) Overflow / flooding of ponds			
(ii) Changes in water quality (fresh			
water / brackishwater ratio)			
(iii) Health and Diseases			
(iv) Loss of stock and inputs (feed,	Help the district administration in providing the necessary help concerned with Revenue Dept.		
chemicals etc.)	authorities.		
(v) Infrastructure damage (pumps,			
aerators, shelters/huts etc)			
4. Head wave and Cold Wave	NA		