State: KARNATAKA

Agriculture Contingency Plan for District: RAICHUR

1.0 District Agriculture profile					
1.1	Agro-Climatic/Ecological Zone				
	Agro Ecological Sub Region (ICAR)	Deccan Plateau , Hot Semi arid ecosubregion (6.1,6.2)			
	Agro-Climatic Region (Planning Commission)	Southern plateau and hill region (X)			
	Agro Climatic Zone (NARP)	North Eastern Dry Zone (KA-2, KA-3)			
	List all the districts or part thereof falling under the NARP Zone	Raichur, Kalaburagi, Yadgir and Koppal			
	Geographic coordinates of district	Latitude	Longitude	Altitude	
		15^0 09' N	$75^0$46' 'E	404 m	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Main Agricultural Research Station , University of Agricultural Sciences, Raichur - 584 104			
	Mention the KVK located in the district	Krishi Vignana Kendra, University of Agricultural Sciences Campus , Raichur -584 104.			
1.2	Rainfall	Normal RF(mm) (1991 to 2016)	Normal Rainy days (number) (1991 to 2016)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	426.4	28.0	1st week of June	4th week of September
	NE Monsoon (Oct-Dec):	143.0	7.0	1st week of October	2nd week of November
	Winter (Jan- March)	16.1	1.0	-	-
	Summer (Apr-May)	57.6	4.0	-	-
	Annual	**643.1**	**40.0**	-	-

1.3	Land use pattern of the district (latest statistics) (2011-12)	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)	835.84	18.2	20.6	19.8	10.7	13.7	20.1	116.4	40.8

1. 4	**Major Soils (common names like shallow red soils etc.,)**	**Area ('000 ha)**	**Percent (%) of total**
	Deep black calcareous clayey soils	259.0	30.6
	Medium deep red gravelly clay soils	168.3	20.0
	Deep black clayey soils	135.2	16
	Shallow red loamy soils	89.3	10.5
	Very shallow red gravelly clay soils	30.1	3.6
	Others (specify):	-	-
1.5	**Agricultural land use**	**Area ('000 ha)**	**Cropping intensity %**
	Net sown area	474.99	111.9
	Area sown more than once	90.72	
	Gross cropped area	565.7	

1.6	**Irrigation**	**Area (‘000 ha)**		
	Net irrigated area	155.72		
	Gross irrigated area	160.69		
	Rainfed area	405.30		
	Sources of Irrigation	**Number**	**Area (‘000 ha)**	**Percentage of total irrigated area**
	Canals		111.91	71.86
	Tanks		0.789	0.51
	Open wells		12.795	8.22
	Bore wells		11.80	7.57
	Lift irrigation		8.756	5.62
	Micro-irrigation		-	-
	Other sources		9.67	6.21
	Total Irrigated Area		155.72	100.00
	Pump sets			
	No. of Tractors			
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	**No. of blocks/ Tehsils**	**(%) area**	
	Over exploited		5.0	
	Critical		0.2	
	Semi- critical		8.8	
	Safe		86.0	
	Wastewater availability and use			
	Ground water quality	Majority of the area is having fluoride concentration in the range of 0.10 mg/l to 4.70 mg/l, while the maximum permissible limit being 1.50 mg/l. Water has to be treated for fluoride before it is utilized for drinking purposes.		
*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)					
		Kharif		*Rabi*		**Summer**	**Total**
		Irrigated	***Rainfed***	***Irrigated***	***Rainfed***		
	Paddy	-	-	-	-	-	102.24
	Chickpea	-	-	-	-	-	151.27
	Sorghum	-	-	-	-	-	88.54
	Cotton	-	-	-	-	-	45.41
	Bajra	-	-	-	-	-	37.04
	Groundnut	-	-	-	-	-	35.96
	Redgram	-	-	-	-	-	33.62
	Sunflower	-	-	-	-	-	29.97
	Maize	-	-	-	-	-	1.09
	Sesame	-	-	-	-	-	0.909
	Safflower	-	-	-	-	-	0.584
	Cowpea	-	-	-	-	-	0.460
	Wheat	-	-	-	-	-	0.416
	Sugarcane	-	-	-	-	-	0.375
	Horsegram	-	-	-	-	-	0.285
	Blackgram	-	-	-	-	-	0.262
	Greengram	-	-	-	-	-	0.175
	Castor	-	-	-	-	-	0.092
	Horticulture crops - Fruits	**Total area (ha)**					
	Citrus	1226.0					
	Mango	778.0					
	Pomegranate	492.0					
	Sapota	340.0					
	Papaya	177.0					
	Horticultural crops - Vegetables	**Total area**					
	Green chillies	3,031.0					
	Onion	2,278.0					
	Tomato	343.7					
	Brinjal	286.7					
	Beans	140.0					

		Spice and Plantation crops	**Total area**
	Coconut	5643.30	
	Dry chillies	1961.30	
	Fenugreek	257.70	
	Coriander	239.70	
	Tamarind	153.00	
	Flowers		**Total area**
	Marigold	70.70	
	Jasmine	60.00	
	Rose	59.70	
	Chrysanthemum	52.00	
	Crossandra	34.70	
	Fodder crops		**Total area**
	Total fodder crop area		
	Grazing land		
	Sericulture etc		0.549
	Others (Specify)		

1.8	**Livestock**	**Male (‘000)**	**Female (‘000)**	**Total (‘000)**
	Non descriptive Cattle (local low yielding)	176.8	217.0	393.8
	Crossbred cattle	1.5	9.7	11.2
	Non descriptive Buffaloes (local low yielding)	23.3	187.3	210.7
	Graded Buffaloes			
	Goat			377.0
	Sheep			552.0
	Others (Pigs +Dogs+Rabbits.)			10.73
	Commercial dairy farms (Number)			
1.9	**Poultry**	**No. of farms**	**Total No. of birds (‘000)**	

	Commercial	-	368.9
	Backyard	-	-

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)**	
	NA					

ii) Inland (Data Source: Fisheries Department)	**No. Farmer owned ponds**	**No. of Reservoirs**	**No. of village tanks**
	1500	3	278

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)	1650	5	8250
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 (Crops to be identified based on total acreage)										
1	Rice							518.16	3376	

2	Sunflower							28.14	525
3	Sorghum							142.37	1342
4	Chickpea							66.24	474
5	Bajra							47.42	940
6	Groundnut							35.26	864
7	Cotton							113.21	367 (Bales)
8	Redgram							16.52	356
9	Maize							59.91	3313.5
10	Wheat							1.93	694.5
11	Horsegram							0.275	383
12	Greengram							1.2	161
13	Safflower							1.83	888
14	Castor							0.987	413
15	Sesame							1.82	397
16	Linseed							0.044	494
17	Sugarcane							22.46	102 (t/ha)
Major Horticultural crops (Crops to be identified based on total acreage)									
1	Lemon	-	-	-	-	-	-	3.71	
2	Mango	-	-	-	-	-	-	3.40	
3	Pomogranite	-	-	-	-	-	-	3.74	

4	Sapota	-	-	-	-	-	-	0.688	
5	Papaya		-	-	-	-	-	11.09	
	Banana	-	-	-	-	-	-	3.452	
	Guava	-	-	-	-	-	-	0.663	

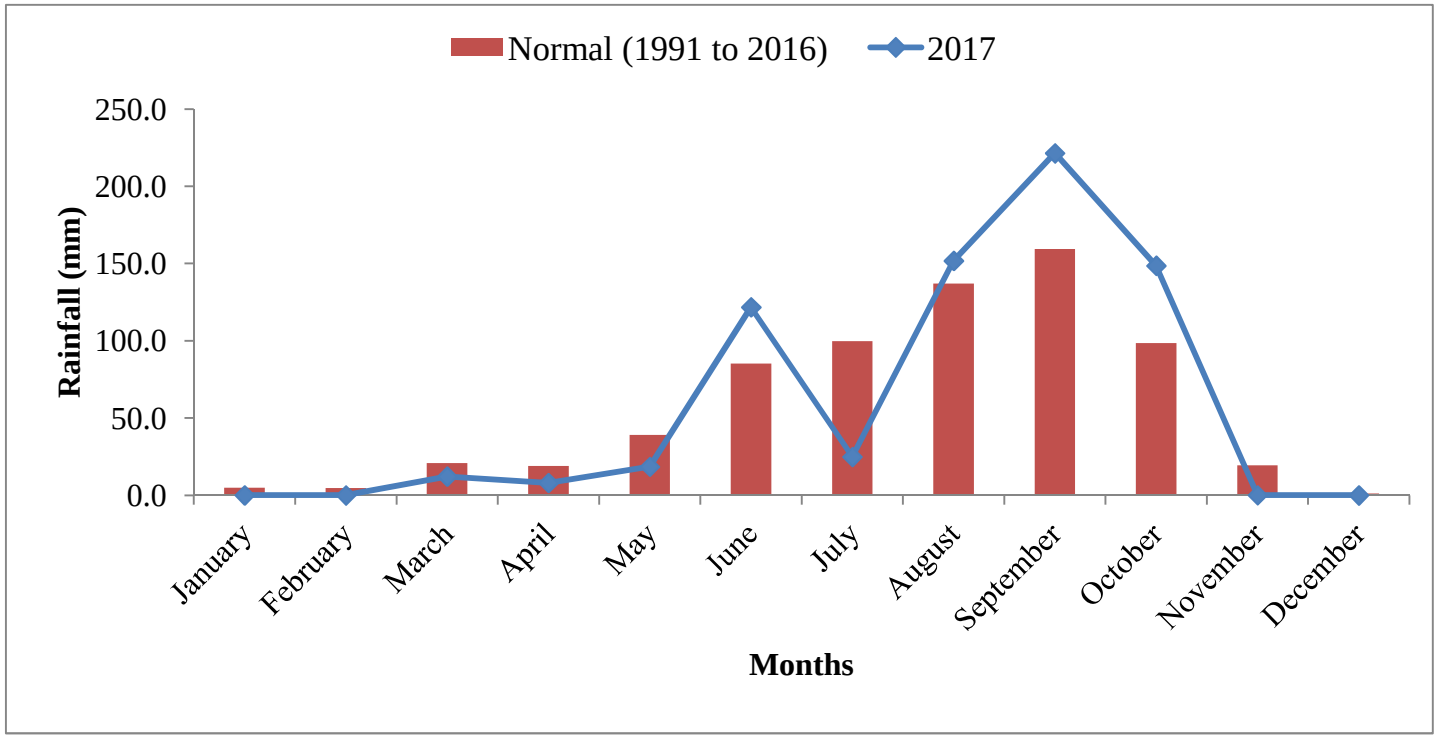
1.12	**Sowing window for 5 major field crops (start and end of normal sowing** period)	**Paddy**	**Chickpea**	**Sorghum**	**Cotton**	**Bajra**	Groundnut	Redgram
	Kharif- Rainfed	-	-	1st week to 4 th week of June	-	1st week of June to 4 th week of July	-	1st week to 4th week of July
	Kharif-Irrigated	1st week to 4 th week of June	-	-	1st week of May to 3 rd week of July	-	1st week to 4th week of July -	1st week of June to 4th week of July
	Rabi- Rainfed	-	1st week of October to 4 th week of November	September 15 th to October 15 th	-	-	-	-
	Rabi-Irrigated	-	1st week to 4 th week of June	-	-	1st week to 4 th week of January (Summer)	December end to January middle	-

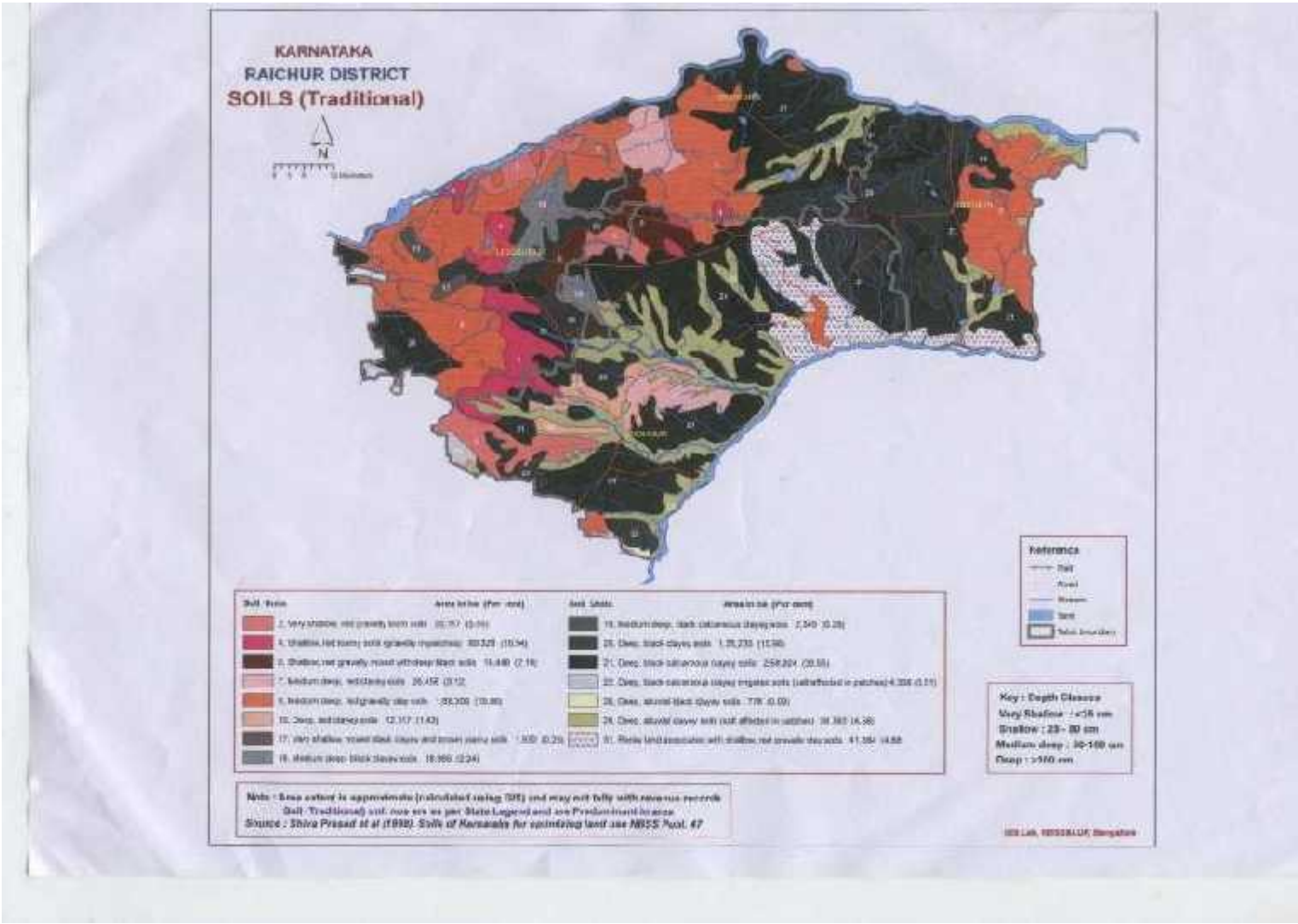
1.13	**What is the major contingency the district is prone to? (Tick mark and mention years if known during the last 10 year period)**	**Regular**	**Occasional**	**None**
	Drought	✓		-
	Flood	-		✓
	Cyclone	-	-	✓
	Hail storm	-	-	✓
	Heat wave	-	-	✓
	Cold wave	-	-	✓
	Frost	-	-	✓
	Sea water intrusion	-	-	✓
	Pests and diseases (specify)	-	-	-
	Others			

1.14	**Include Digital maps of the district for**	**Location map of district within State as Annexure I**	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes (
		Soil map as Annexure 3	Enclosed: Yes

Annexure-1 Location map of Raichur in Karnataka

Annexure-2 : Month-wise Rainfall -Raichur




KARNATAKA
RAICHUR DISTRICT
SOILS (Traditional)
N
Reference
Key : Depth Classes
Very Shallow : <15 cm
Shallow : 15- 30 cm
Medium deep : 30-100 cm
Deep : >100 cm
Note : Area extent is approximate (calculated using GIS) and may not fully with revenue records
Soil Traditional) will now on as per State Legend and are Predominant in area
Source : Shiva Prasad H et al (1998) Soils of Karnataka for optimizing land use NBSS Publ. 47

2.0. Strategies for weather related contingencies

2.1. Kharif (Drought)

. 2.1.1 Kharif Rainfed situation

2.1.1.1 Early season drought (delayed onset)

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)	Medium deep black and red clay loamy soils (kharif and rabi)	Redgram	No change	Follow dry sowing practice in redgram with ridges and furrows at 90 cm apart.	-
		Bajra		Sow bajra in 30 cm paired rows at 60 cm apart.	
		Sorghum		---	
		Sunflower			
		Groundnut			
		Redgram + Greengram (1:2 or 2:4)			
		Redgram + Bajra (1:2)			
		Redgram + Sorghum (1:2)			
		Redgram + Groundnut (2:4)			
	Medium and deep black and red clay loamy soils soils (kharif)	Redgram		Follow dry sowing practice in redgram with ridges and furrows at 90 cm apart	
		Groundnut			
		Castor		.Sow castor at 90 x 45 cm with ridges and furrows	
		Redgram + Bajra(1:2)		-	
		Redgram + Sorghum (1;2)			
		Groundnut + Redgram (4:2)			

		Greengram + Redgram (2:1or 4:2)			
	Medium to deep black soils (rabi)	Rabi sorghum		Keep the land fallow in *kharif* by treating with compartment bunds and furrows for in-situ moisture conservation.	
		Safflower			
		Chickpea			
		Cotton			
		Rabi sorghum + Chickpea (2:1)			
		Chickpea + Safflower (4:2)			
		Pulses (Greengram/ *in situ* green manuring-Rabi crops			
	Shallow black soils and red soils (*kharif*)	Groundnut (bunch)		-----	
		Groundnut (spreading)			
		Bajra			
		Sorghum			
		Sunflower			
		Bajra + Redgram (2:1)			
		Sorghum + Redgram (2:1)			

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)	Medium deep black and red clay loam soils (kharif and rabi	Redgram	No change	1. Follow dry sowing practice in redgram with ridges and furrows at 90 cm apart. 2. Use 25 % higher seed rate in redgram.with 90 x 20 cm spacing 3 Transplant the 25-30 days old redgram seedlings of BSMR-736/ Asha variety 4.Grow medium duration redgram varieties eg Asha, maruti	-
		Bajra		Sow bajra in 30 cm paired rows at 60 cm apart .	
		Sorghum		----	
		Sunflower			
		Groundnut			
		Redgram+Greengram (1:2 or 2:4)			
		Redgram + Bajra (1:2)			
		Sorghum +Redgram (2:1)			
		Redgram + Groundnut (2:4)			

	Medium and deep black and red clay loam soils (kharif)	Redgram	No change	1. Follow dry sowing practice in redgram with ridges and furrows at 90 cm apart. 2. Use 25 % higher seed rate in redgram.with 90 x 20 cm spacing 3 Transplant the 25-30 days old redgram seedlings of BSMR-736 variety 4.Grow medium duration redgram varietes	
		Greengram		---	
		Groundnut			
		Castor		2.Sow castor at 90 x 45 cm with ridges and furrows	
		Redgram + Bajra(1:2)		--	
		Redgram + Sorghum (1:2)			
		Groundnut+Redgram (4:2)			
		Greengram + Redgram (2:1 or4:2)			
	Medium to deep black soils (rabi)	Rabi sorghum	No change	Keep the land fallow in kharif by treating with compartment bunds and furrows for in-situ moisture conservation	
		Safflower			
		Chickpea			
		Sunflower			
		Cotton			
		Rabi sorghum+Chickpea (2:1)			
		Chickpea+Safflower (4:2)			
		Pulses (Greengram)/ insitu green manuring-Rabi crops	Fallow-Rabi crops		

	Shallow black soils and red soils (*kharif*)	Groundnut (Bunch)	No change	---	
		Groundnut (Spreading)			
		Bajra			
		Sorghum			
		Sunflower		Sow sunflower at wider spacing i.e at 90 cm x 20 cm	
		Castor			
		Bajra+Redgram (2:1)			
		Sorghum + Redgram (2:1)			

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 4th week)	Medium deep black and red clay loam soils (kharif and rabi)	Redgram	No change	1. Follow dry sowing practice in redgram with ridges and furrows at 90 cm apart. 2. Use 25 % higher seed rate in redgram.with 90 x 20 cm spacing 3 Transplant the 25-30 days redgram old seedlings of BSMR-736 variety 4.Grow medium duration redgram varieties .	-
		Bajra	No change	---	
		Sorghum	Redgram/Bajra/Sunflower/Groundnut (Spreading		
		Sunflower	No change		
		Groundnut	Ground nut (Spreading)		
		Redgram+Greengram (1:2 or 2;4)	Redgram/Bajra/Sunflower/		

		Redgram+Bajra (1:2)	Groundnut(Spreading		
		Sorghum+Redgram (2:1)			
		Redgram + Ground nut (2:4 or)		---	
	Medium and deep black soils and red clay loam soils (kharif)	Redgram	No change	1. Follow dry sowing practice in redgram with ridges and furrows at 90 cm apart. 2. Use 25 % higher seed rate in redgram.with 90 x 20 cm spacing 3 Transplant the 25-30 days redgram old seedlings of BSMR-736 variety 4. Grow medium duration redgram varieties . 5. Sow sunflower and castor at 90 x 20 cm	
		Greengram	Red gram/Sunflower/Castor/		
		Groundnut			
		Redgram + Sorghum(1;2)			
		Greengram+Redgram (2:1 or 4:2)			
		Bajra + Redgram (2:1)			
		Groundnut + Redgram(4:2)			
	Medium to deep black soils (rabi)	Rabi sorghum	No change	Follow in situ moisture conservation practices like opening of compartment bunds, tied ridges and furrows to conserve rain water for regular sowing of rabi crops	
		Safflower			
		Chickpea			
		Sunflower			
		Cotton			
		Rabi sorghum+Chickpea (2:1)			
		Chickpea+Safflower (4:2)			
		Pulses (Greengram/ insitu green manuring-Rabi crops	Fallow- rabi crops		

	Shallow black soils and red soils (kharif)	Groundnut (Bunch)	Groundnut (spreading)	-	
		Groundnut (Spreading)	No change		
		Sorghum	Ground nut (Spreading)/Sunflower/castor/Setaria		
		Sunflower	No change	1.Sow sunflower at wider spacing at 90 cm x 20 cm	
		Castor			
		Bajra +Redgram (2:1)	Ground nut (Spreading)/Sunflower/castor/Setaria	--	
		Sorghum + Redgram (2:1)			
		Groundnut +Redgram(4:2)			

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 2nd week) August 1st Fortnight	Medium deep black and red clay loam soils (kharif and rabi)	Redgram	Sunflower/Horsegarm/Foxtail millet	1. Follow close spacing in redgram (90 X 10 cm) 2. Sow sunflower crops at wider spacing	-
		Bajra			
		Sorghum			
		Sunflower			
		Redgram+Greengram (2:1 or 4:2)			
		Redgram+Bajra (2:1)			
		Sorghum+Redgram (2:1)			
		Redgram + Ground nut (2:4)			

	Medium and deep black soils and red clay loam (kharif)	Redgram	Sunflower /Fodder crops		
		Groundnut			
		Castor			
		Blackgram+Redgram (2:1)			
		Sorghum+Redgram (2:1)			
		Greengram+Redgram (2:1)			
		Bajra + Redgram (2:1)			
		Groundnut + Redgram(4:2)			
	Rainfed rabi cropping in medium to deep black soils (rabi)	Rabi sorghum	No change	Keep the land fallow in *kharif* by treating with compartment bunds and furrows for in-situ moisture conservation	
		Chickpea			
		Sunflower			
		Cotton			
		Rabi Sorghum+Chickpea (2:1)			
		Chickpea+Safflower (4:2)			
		Pulses (Greengram/ in situ green manuring-Rabi crops	Fallow-Rabi crops		
	Shallow black soils and red soils (kharif)	Groundnut (Bunch)	Sunflower /castor/Setaria/ Niger	-	
		Groundnut (Spreading)			

		Sorghum			
		Sunflower	No change		
		Castor			
		Bajra +Redgram (2:1)	Sunflower /castor/Setaria/		
		Sorghum + Redgram (2:1)	Niger		
		Groundnut +Redgram(4:2)			

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**
August 2nd Fortnight	Medium deep black and red clay loam soils (kharif and rabi)	Redgram	Sunflower, Castor and Millets	1. De-topping in redgram to increase branching.	
		Bajra			
		Sorghum			
		Sunflower			
		Redgram+Greengram (2:1 or 4:2)			
		Redgram+Bajra (2:1)			
		Sorghum+Redgram (2:1)			
		Redgram + Ground nut (2:4)			
	Medium and deep black soils and red clay loam (kharif)	Redgram	Sunflower, Castor and Fodder Crops		
		Groundnut			
		Castor			
		Blackgram+Redgram (2:1)			
		Sorghum+Redgram (2:1)			
		Greengram+Redgram (2:1)			

		Bajra + Redgram (2:1)			
		Groundnut + Redgram(4:2)			
	Rainfed rabi cropping in medium to deep black soils (rabi)	Rabi sorghum	Moisture Conservation Practices followed by Rabi Crops		
		Chickpea			
		Sunflower			
		Cotton			
		Rabi sorghum+Chickpea (2:1)			
		Chickpea+Safflower (4:2)			
		Pulses (Greengram/ insitu green manuring-Rabi crops			
	Shallow black soils and red soils (kharif)	Groundnut (Bunch)	Sunflower, Castor, Niger and Horsegram		
		Groundnut (Spreading)			
		Sorghum			
		Sunflower			
		Castor			
		Bajra +Redgram (2:1)			
		Sorghum + Redgram (2:1)			
		Groundnut +Redgram(4:2)			

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**
September 1st, Fortnight	Medium deep black and red clay loam soils (kharif and rabi)	Redgram	Rabi Sorghum and Sunflower	2. De-topping in redgram to increase branching.	
		Bajra			
		Sorghum			
		Sunflower			
		Redgram+Greengram (2:1 or 4:2)			
		Redgram+Bajra (2:1)			
		Sorghum+Redgram (2:1)			
		Redgram + Ground nut (2:4)			
	Medium and deep black soils and red clay loam (kharif)	Redgram	Rabi Sorghum and Sunflower		
		Groundnut			
		Castor			
		Blackgram+Redgram (2:1)			
		Sorghum+Redgram (2:1)			
		Greengram+Redgram (2:1)			
		Bajra + Redgram (2:1)			
		Groundnut + Redgram(4:2)			
	Rainfed rabi cropping in medium to deep black soils (rabi)	Rabi sorghum	Rabi Sorghum and Sunflower		
		Chickpea			
		Sunflower			
		Cotton			
		Rabi sorghum+Chickpea (2:1)			
		Chickpea+Safflower (4:2)			
		Pulses (Greengram/ insitu green manuring-Rabi crops			

	Shallow black soils and red soils (kharif)	Groundnut (Bunch)	Rabi Sorghum and Sunflower		
		Groundnut (Spreading)			
		Sorghum			
		Sunflower			
		Castor			
		Bajra +Redgram (2:1)			
		Sorghum + Redgram (2:1)			
		Groundnut +Redgram(4:2)			

September 2nd Fortnight	Medium deep black and red clay loam soils (kharif and rabi)	Rabi Sorghum, Chickpea, Sunflower, Safflower, Rabi Sorghum + Chickpea (2:1), Safflower + Chickpea (1:3)	No change	1. At flowering stage of kharif sown redgram spray pulse magic @ 5 ml/ l of water.	
	Medium and deep black soils and red clay loam (kharif)	Rabi Sorghum, Sunflower, Rabi Sorghum + Chickpea (2:1)	No change		
	Rainfed rabi cropping in medium to deep black soils (rabi)	Rabi Sorghum, Sunflower, Safflower Rabi Sorghum + Chickpea (2:1)	No change		
	Shallow black soils and red soils (kharif)	Rabi Sorghum and Sunflower	No change		

2.1.1.2 Early season drought (Normal onset)

Condition			Suggested Contingency measures		
Early season drought (Normal onset)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measures[d]**	**Remarks on Implementation[e]**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Medium deep black and red clay loam soils (kharif and rabi)	Redgram Bajra Sorghum Sunflower Redgram+Greengram (2:1) Redgram+Bajra (2:1)	Thinning & intercultivation weeding Gap filling Re sow the crop within 15 days when population is less than 30 % 5) Reduce population by thinning upto 25 to 66 % depending on stress upto 30-35 DAS	Opening of conservation furrow	-

		Sorghum+Redgram (2:1)			
		Redgram + Ground nut (2:4)			
	Medium and deep black soils and red clay loam (kharif)	Redgram	1) Thinning & intercultivation 2) weeding 3) gapfilling 4) Re sow the crop within 15 days when population is less than 30 %		
		Groundnut			
		Sorghum+Redgram (2:1)			
		Greengram+Redgram (2:1 or 2:4)			
		Bajra + Redgram (2:1)			
		Groundnut + Redgram(4:2)			
	Medium to deep black soils (rabi)	Rabi sorghum	-	Compartment al bunding	
		Chickpea			
		Sunflower			
		Cotton			
		Rabi sorghum+Chickpea (2:1)			
		Chickpea+Safflower (4:2)			
		Pulses (Greengram/insitu green manuring-Rabi crops			
	Medium to deep black soils (kharif)	Groundnut (B)	Thinning & intercultivation weeding Gapfilling Resowing	Opening Conservation furrows to conserve water	
		Groundnut (S)			
		Bajra			
		Sorghum			

		Sunflower	Spraying groundnut with urea (2%) immediately after rains for quick revival.		
		Castor			
		Bajra+Redgram (2:1)			
		Sorghum+ Redgram (2:1)			
		Groundnut+Redgram (4:2)			

2.1.1.3 Mid season drought (long dry spell)

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	Medium deep black and red clay loam soils (kharif and rabi)	Redgram	Removal/ thinning of alternate rows Repeated intercultivation and weeding Grazing leaf tips in bajra Removal of weaklings in sorghum/bajra. .	Surface mulching Spraying of antitranspirants like kaolin @ 5.0 % Provide protective irrigation	-
		Bajra			
		Sorghum			
		Sunflower			
		Redgram+Greengram:(1:2 or 2:4)			
		Redgram+Bajra (2:1)			
		Sorghum+Redgram (2:1)			
		Redgram + Ground nut (2:4)			
	Medium and deep black soils and red clay loam (kharif	Redgram			
		Groundnut			

		Sorghum+Redgram (2:1)			
		Greengram+Redgram (2:1 or 4:2)			
		Bajra + Redgram (2:1)			
		Groundnut + Redgram(4:2)			
	Medium to deep black soils (rabi)	Rabi sorghum	---	Compartment bunding	
		Chickpea			
		Sunflower			
		Cotton			
		Rabi sorghum+Chickpea (2:1)			
		Chickpea+Safflower (4:2)			
		Pulses (Greengram/ insitu green manuring-Rabi crops			
	Shallow black soils and red soils (kharif)	Groundnut (Bunch)	Removal/ thinning of alternate rows Repeated intercultivation and weeding Grazing leaf tips in bajra Removal of weaklings in sorghum/bajra	1. Surface mulching 2. Spraying of antitranspirants like kaolin @ 5.0% 3. Provide protective irrigation	
		Groundnut (Spreading)			
		Bajra			
		Sorghum			
		Sunflower			
		Castor			
		Bajra+Redgram (2:1)			
		Sorghum+ Redgram (2:1)			
		Groundnut+Redgram(4:2)			

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation**
At flowering/ fruiting stage	Medium deep black and red clay loam soils (khrarif and rabi)	Redgram	Harvest the bajra for fodder & allow for ratooning Harvest Greengram for fodder and incorporate into soil Harvest G'nut (B) for fodder Repeated inter cultivation Weed control and Spraying G'nut with 2.0% urea or 0.2 % FeSo4 Stripping of lower and non functional leaves in sorghum and bajra	- Spraying of Kaolin @ 5.0 % - Protective irrigation - Surface mulching	-
		Bajra			
		Sorghum			
		Sunflower			
		Redgram+Greengram (1:2 or 2:4)			
		Redgram+Bajra (2:1)			
		Sorghum+Redgram (2:1)			
		Redgram + Ground nut (2:4)			
	Medium and deep black soils and red day loam (kharif)	Redgram		Surface mulching Spraying of antitranspirants like kaolin @ 5% Provide supplemental irrigation	
		Groundnut			
		Sorghum+Redgram (2:1)			
		Greengram+Redgram (2:1)			
		Bajra + Redgram (2:1)			
		Groundnut + Redgram(4:2)			

	Medium to deep black soils (rabi)	Rabi sorghum	----	Compartment bunding	
		Chickpea			
		Sunflower			
		Cotton			
		Rabi sorghum+Chickpea (2:1)			
		Chickpea+Safflower (4:2)			
		Pulses (Greengram/insitu green manuring-Rabi crops			
	Shallow black soils and red soils (kharif)	Groundnut (Bunch)	Harvest the bajra for fodder & allow for ratoonin Harvest G'nut (B) for fodder Repeated intercultivation Weed control and Spraying G'nut with 2.0% urea or 0.2 % FeSo4 Strippig of lower and non functional leaves in sorghum and bajra	Surface mulching Spraying of antitranspirants like kaolin @ 5% Provide supplemental irrigation	
		Groundnut (Spreading)			
		Bajra			
		Sorghum			
		Sunflower			
		Bajra+Redgram (2:1)			
		Sorghum+ Redgram (2:1)			
		Groundnut+Redgram (4:2)			

2.1.1.4 Terminal drought

Condition			**Suggested Contingency measures**		
	Major Farming situation[a]	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
Terminal drought	Medium deep black and red clay loam soils	Redgram	Life saving irrigation Pigeonpea and greengram can be harvested for vegetable purpose Harvest at physiological maturity Bajra and sorghum could be harvested	Surface mulching	---
		Bajra			

		Sorghum	for fodder & allow for rabi sowing Harvest Greengram for fodder		
		Sunflower	Harvest G'nut (B) for fodder		
		Redgram+Greengram (1:2 or 2;4)			
		Redgram+Bajra (1;2)			
		Sorghum+Redgram (2:1)			
		Redgram + Ground nut (2:4)			
		Bajra			
		Sorghum			
		Sunflower			
		Redgram+Greengram (1:2 or 2:4)			
		Redgram+Bajra (2:1)			
		Sorghum+Redgram (2:1)			
		Redgram + Ground nut (2:4)			
	medium to deep black soils	Rabi sorghum	---	Compartmental bunding	---

2.1.2 *Kharif* irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation[j]**
Delayed release of water in canals due to low rainfall	Canal irrigated area-cropping in all seasons in all types of soils	Paddy- Paddy	Paddy- Paddy with short duration vatieties	For Paddy use 35-40 days old seedlings with 4-5 seedlings per hill. Provide additional 20 % nitrogen to	---
		Cotton	No Change		

		Hybrid Jowar-Sunflower	Fallow-No change	compensate the reduced tillering In Cotton, dibble the seeds at 90X45 cm spacing along with three sprey of NAA + DAP at 45,60 and 75 DAS	
		Paddy-Chickpea	No Change		
		Sunflower- Chickpea			
		Paddy- Groundnut			
		Groundnut – Sunflower			
		Sunflower-Groundnut			

Condition			**Suggested Contingency measures**		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Limited release of water in canals due to low rainfall	Canal irrigated area-cropping in all seasons in all types of soils	Paddy- Paddy	No Change	Irrigate Paddy when soil shows hairline cracks In Cotton ,adopt alternate/alternatively alternate/skip furrow irrigation Give irrigation at critical stages	---
		Cotton			
		Paddy-Chickpea			
		Sunflower- Chickpea			
		Paddy- Groundnut			
		Groundnut – Sunflower			
		Sunflower-Groundnut			

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Non release of water in canals under delayed onset of monsoon in catchment	---	---	**Not applicable to Raichur District**	.---	---

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	1.Tank irrigated paddy areas in all soil types	Paddy- Paddy	Follow rainfed cropping system	---	---
		Cotton			
		Groundnut – Sunflower			
		Redgram			
		Vegetables and horticultural Crops			

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Insufficient groundwater recharge due to low rainfall	NA				

2.2. Rabi

October 1st Fortnight	1. Medium deep black and red clay loam soils (kharif and rabi)	Rabi Sorghum, Chickpea, Sunflower, Safflower, Rabi Sorghum + Chickpea (2:1), Safflower + Chickpea (1:3)	No change	1. Soak sorghum seeds with 30g of calcium chloride per kg of seeds or 25 % cow urine for 8 hrs to increase germination. 2. Soak bengal gram seeds with 2% of calcium chloride + foliar spray of 2% urea + foliar sparay of 2% salicyclic acid at 50 % flowering to induce drought resistance and increase yield. 3. Follow water conservation methods like compartment bunding, scooping etc., during *kharif* fallow period. 4. Seed priming of rabi sorghum with KNO_3 (0.5%) will increase the yield. 5. At flowering stage of *kharif* sown redgram spray pulse magic @ 5 ml/ l of water.	
	2. Medium and deep black soils and red clay loam (kharif)	Rabi Sorghum, Sunflower, Rabi Sorghum + Chickpea (2:1)	No change		
	3. Rainfed rabi cropping in medium to deep black soils (rabi)	Rabi Sorghum, Sunflower, Safflower Rabi Sorghum + Chickpea (2:1)	No change		
	4. Shallow black soils and red soils (kharif)	Rabi Sorghum and Sunflower	No change		
October 2nd Fortnight	1. Medium deep black and red clay loam soils (kharif and rabi)	Rabi Sorghum, Chickpea, Sunflower, Safflower, Rabi Sorghum + Chickpea (2:1), Safflower + Chickpea (2:4)	Linseed, Jowar + Linseed (1:2) Bengalgram + linseed (4:2)	1. Soak sorghum seeds with 30g of calcium chloride per kg of seeds or 25 % cow urine for 8 hrs to increase germination. 2. Soak bengal gram seeds with 2% of calcium chloride + foliar spray of 2% urea + foliar sparay of 2% salicyclic acid at 50 % flowering to induce drought resistance and increase yield. 3. Follow water conservation methods like compartment bunding, scooping etc., during	
	5. Medium and deep black soils and red clay loam (kharif)	Rabi Sorghum, Sunflower, Rabi Sorghum + Chickpea (2:1)	Chickpea, Linseed, Safflower Safflower + Chickpea (1:3)		
	6. Rainfed rabi cropping in medium to deep black soils (rabi)	Rabi Sorghum, Sunflower, Safflower Rabi Sorghum + Chickpea (2:1)	Chickpea, Linseed Safflower + Chickpea (1:3) Jowar + Linseed (1:2)		
	7. Shallow black soils and red soils (kharif)	Rabi Sorghum and Sunflower	Safflower, Fodder Crops		

				kharif fallow period. 4. Seed priming of rabi sorghum with KNO_3 (0.5%) will increase the yield.	
November 1st Fortnight	1. Medium deep black and red clay loam soils (kharif and rabi)	Rabi Sorghum, Chickpea, Sunflower, Safflower, Rabi Sorghum + Chickpea (2:1), Safflower + Chickpea (2:4)	Linseed, Wheat	1. Sow 20-25% more wheat seeds 2. Nipping bengalgram at 35-40 days after sowing 3. Sparing of pulse magic 5 ml/litre at flowering stage of bengalgram.	
	2. Medium and deep black soils and red clay loam (kharif)	Rabi Sorghum, Sunflower, Rabi Sorghum + Chickpea (2:1)	Chickpea, Wheat, Linseed		
	3. Rainfed rabi cropping in medium to deep black soils (rabi)	Rabi Sorghum, Sunflower, Safflower Rabi Sorghum + Chickpea (2:1)	Wheat, Linseed, Fodder Crops, Fodder Sorghum		
	4. Shallow black soils and red soils (kharif)	Rabi Sorghum and Sunflower	Fodder Crops		
November 2nd Fortnight	1. Medium deep black and red clay loam soils (kharif and rabi)	Rabi Sorghum, Chickpea, Sunflower, Safflower, Rabi Sorghum + Chickpea (2:1), Safflower + Chickpea (2:4)	Linseed, Wheat	1. Sow 20-25% more wheat seeds 2. Spray 2% urea to bengalgram at flowering. 3. Nipping bengalgram at 35-40 days after sowing. 4. Spray planofix 0.25 ml/l to bengalgram at flowering.	
	2. Medium and deep black soils and red clay loam (kharif)	Rabi Sorghum, Sunflower, Rabi Sorghum + Chickpea (2:1)	Safflower, Wheat, Linseed		
	3. Rainfed rabi cropping in medium to deep black soils (rabi)	Rabi Sorghum, Sunflower, Safflower Rabi Sorghum + Chickpea (2:1)	Chickpea, Safflower, Wheat, Linseed, Fodder Crops, Fodder Sorghum		
	4. Shallow black soils and red soils (kharif)	Rabi Sorghum and Sunflower	Fodder Crops		

2.3 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	-	-	-	Proper drying and storage
Sunflower	Drain out excess water Top dress the crop with N & K Inter cultivation and weeding	Drain out excess water Earthing up.	Drain out excess water. Harvesting at physiological maturity stage,	
Sorghum				
Bengal gram				
Bajra				
Horticulture -fruits				
Citrus	Providing drainage trench (1.5 cu. ft) across the slope	Providing drainage trench (1.5 cu. ft) across the slope and application of 10 ppm NAA spray	Providing drainage trench (1.5 cu. ft) across the slope	Storing in Cold storage
Mango				-
Pomegranate				Storing in Cold storage
Sapota				-
5. Papaya				
Vegetables				
Green Chillies	Providing drainage trench (1.5 cu. ft) across the slope	Application of 10 ppm NAA spray	-	-
Onion	-do-	Providing drainage trench (1.5 cu. ft) across the slope	2000 ppm of MH spray 15 days before the harvest to control sprouting in storage	Store in well ventilated structure
Tomato		Application of 10 ppm	-	-

		NAA spray		
Brinjal		-do-		
Beans		-do-		
Spice and Plantation Crops				
Coconut	Providing drainage trench (1.5 cu. ft) across the slope	Providing drainage trench (1.5 cu. ft) across the slope	-	-
Dry Chillies	-do-	Application of 10 ppm NAA spray		
Fenugreek	-do-	Providing drainage trench (1.5 cu. ft) across the slope		
Coriander	-do-	-do-		
Tamarind	-do-	-do-		
Flowers				
Marigold	Providing drainage trench (1.5 cu. ft) cross the slope	Providing drainage trench (1.5 cu. ft)across the slope	-	-
Jasmine				
Rose				
Chrysanthemum				
Crossandra				
Heavy rainfall with high speed winds in a short span[2]				
Paddy	Drain out excess water -		Drain out excess water and harvest the crop and dry	Proper drying and storage
Sunflower			Drain out excess water and harvest the crop and dry the earheads	Proper drying and storage

Sorghum			Drain out excess water and harvest the crops	Proper drying and storage
Bengal gram			Drain out excess water and harvest the crop	Proper drying and storage
Bajra			Drain out excess water and harvest the crop	Proper drying and storage
Horticulture - fruits				
Citrus	Providing drainage trench (1.5 cu. ft) across the slope and providing support with locally available material at the initial stage of the crop	-do-	-do-	Storing in Cold storage
Mango	-do-	Providing drainage trench (1.5 cu. ft) across the slope	Providing drainage trench (1.5 cu. ft) across the slope	-
Pomegranate	-do-	-do-	-do-	Storing in Cold storage
Sapota	-do-	-do-	-do-	-
Papaya	-do-	-do-	-do-	-
Vegetable crops				
Green Chillies	Providing drainage trench (1.5 cu. ft) across the slope	Application of 10 ppm NAA spray	-	-
Onion	-do-	Providing drainage trench (1.5 cu. ft) across the slope	2000 ppm of MH spray 15 days before the harvest to control sprouting in storage	Store in well ventilated structure
Tomato	-do-	Application of 10 ppm NAA spray	-	-
Brinjal	-do-	Application of 10 ppm NAA spray	-	-

Beans	Providing drainage trench (1.5 cu. ft) across the slope	Providing drainage trench (1.5 cu. ft) across the slope	-	-
Spice and Plantation Crops				
Coconut	Providing drainage trench (1.5 cu. ft) across the slope	Providing drainage trench (1.5 cu. ft) across the slope	-	-
Dry Chillies	-do-	Application of 10 ppm NAA spray	-	
Fenugreek	Providing drainage trench (1.5 cu. ft) across the slope	Providing drainage trench (1.5 cu. ft) across the slope	-	
Coriander	-do-	Providing drainage trench (1.5 cu. ft) across the slope	-	
Tamarind	-do-	Providing drainage trench (1.5 cu. ft) across the slope	-	
Flowers				
Marigold	Providing drainage trench (1.5 cu. ft) across the slope	Providing drainage trench (1.5 cu. ft) across the slope	-	-
Jasmine	-do-	-do-	-	-
Rose	-do-	-do-	-	-
Chrysanthemum	-do-	-do-	-	-
Crossandra	-do-	-do-	-	-
Outbreak of pests and diseases due to unseasonal rains	Need based plant protection IPM and IDM	Need based plant protection measures		Safe storage against storage pest and diseases
Horticulture Fruits				
Citrus	Pruning of dried and dead	Spraying of COC 0.2 % +	Spraying of COC 0.2 % +	Removal of

Citrus canker Leaf minor	twigs for better aeration and sunlight Spraying of COC 0.2 % + Streptomycine sulphate 0.5 g/l. of water Spraying of NSKE (5.0 %) + imidacloprid 0.5 ml/l	Streptomycine sulphate 0.5 g/l. of water Spraying of NSKE (5.0 %) + imidacloprid 0.5 ml/l	Streptomycine sulphate 0.5 g/l. of water -	the disease affected fruits form the produce and pack in well ventilated package
Mango	Powdery mildew : raying of hexaconazole @ 1.0 ml/l Mango hoppers : raying of carbaryl @ 4.0 g/l			- -
Pomegranate Wilt Bacterial blight	Spraying of Chloryriphos 0.2 % + Propiconazole 0.2 %+ Bioagents (*P. Fluroescens, T. harzianum* Schedules of spraying consisting of UAS, Dharwad package -	Spraying of Chloryriphos 0.2 % + Propiconazole 0.2 %+ Bioagents (*P. Fluroescens, T. harzianum* Schedules of spraying consisting of UAS, Dharwad package	Spraying of Chloryriphos 0.2 % + Propiconazole 0.2 %+ Bioagents (*P. Fluroescens, T. harzianum* Schedules of spraying consisting of UAS, Dharwad package Application of NSKE 5 % + spraying of cypremethrin/ imidacloprid 0.05 %	- - -

Anar Butterfly		Application of NSKE 5 % + spraying of cypremethrin/ imidacloprid 0.05 %		
Sapota - Leaf spot	Spraying of Mancozeb @ 2.0 g/l	Spraying of Mancozeb @ 2.0 g/l	Spraying of Mancozeb @ 2.0 g/l	-
Papaya -	Ring spot virus :Remove affected plants and burn and Spraying systemic insecticide for the control of vectors			-
Vegetable crops				
Green Chillies -	Murda complex : Spraying systemic insecticide like dimethoate (1.7 ml/l) and imidacloprid 0.05 %			
Onion	Thrips :Spraying of dimethoate @ 1.7 ml/l Purple blotch: mSpraying of Mancozeb @ 2.0 g/l			-
Tomato	Thrips and mites : Spraying of Oxydemeton methyl @ 1.0 ml/l			-
Brinjal - Fruit and shoot borer	Application of Neem cake @ 250 kg /ha at the time of transplanting Later two applications at the same concentrations has to be applied the once in a month 2-3 Sprayings of carbaryl @ 4.0 /l with 15 days interval starting from 15 days before flowering.	Application of Neem cake @ 250 kg /ha at the time of transplanting Later two applications at the same concentrations has to be applied the once in a month 2-3 Sprayings of carbaryl @ 4.0 /l with 15 days interval starting from 15 days before flowering.	2-3 Sprayings of carbaryl* @ 4.0 /l with 15 days interval starting from 15 days before flowering. * Harvesting should be done 10-15 days after spraying	Collect the infected fruits from produce and destroy
Beans	Fruit borer - Spraying of Carbaryl @ 4.0 g/l of water Mosiac - Spraying of systemic insecticide to control vectors			-
Flowers				

Marigold -	Sucking pests :praying of systemic insecticides	-
Jasmine	Powdery mildew Spraying with Oxythioquinox (Moreston) @ 2 .0 g/l Mites Spraying of Dicofole @ 2.5 ml /l of water	-
Rose	Sucking pests and Flower bud borer : praying of Systemic insecticide Powdery mildew :Spraying of Carbendizim @ 1g/l	-
Chrysanthemum	Thrips :praying of systemic insecticides	-
Crossandra	Sucking pests: Spraying of systemic insecticide Root rot : Drenching with Carbendizim @1.0 g/l	

Floods

Condition	**Suggested contingency measure[o]**			
Transient water logging/ partial inundation[1]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Crop1 (specify) Paddy	Drain out excess water	Drain out excess water	Drain out excess water	Drain out excess water and harvesting and drying
Crop2 Sunflower				
Crop3 Sorghum				
Crop4 Chickpea				
Crop5 Bajra				
Horticulture Fruit Crops				
1. Citrus	Providing drainage trench (1.5 cu. ft) across theslope	Providing drainage trench (1.5 cu. ft) across the slope and application of 10 ppm NAA spray	Providing drainage trench (1.5 cu. ft) across the slope	Storing in Cold storage
2. Mango	-do-	Providing drainage trench (1.5 cu. ft) across the slope	-do-	-

3. Pomegranate	-do-	Providing drainage trench (1.5 cu. ft) across the slope and application of 10 ppm NAA spray	Providing drainage trench (1.5 cu. ft) across the slope	Storing in Cold storage
4. Sapota	-do-	-do-	-	-
5. Papaya	-do-	-	-	-
Vegetable Crops				
1. Green Chillies	Providing drainage trench (1.5 cu. ft) across the slope	Application of 10 ppm NAA spray	-	-
2. Onion	Providing drainage trench (1.5 cu. ft) across the slope	Providing drainage trench (1.5 cu. ft) across the slope	2000 ppm of MH spray 15 days before the harvest to control sprouting in storage	Store in well ventilated structure
3. Tomato	-do-	Application of 10 ppm NAA spray	-	-
4. Brinjal	-do-	Application of 10 ppm NAA spray	-	-
5. Beans	-do-	-	-	-
Spice and Plantation Crops				
1. Coconut	Providing drainage trench (1.5 cu. ft) across the slope	Providing drainage trench (1.5 cu. ft) across the slope	-	-
2. Dry Chillies	-do-	Application of 10 ppm NAA spray	-	-
3. Fenugreek	-do-	Providing drainage trench (1.5 cu. ft) across the slope	-	-
4. Coriander	-do-	Providing drainage trench (1.5 cu. ft) across the slope	-	-
5. Tamarind	-do-	-do-	-	-
Flowers				

1. Marigold	Providing drainage trench (1.5 cu. ft) across the slope	Providing drainage trench (1.5 cu. ft) across the slope	-	-
2. Jasmine	-do-	-do-	-	-
3. Rose	-do-	-do-	-	-
4. Chrysanthemum	-do-	-do-	-	-
5. Crossandra	-do-	-do-	-	-
Continuous submergence for more than 2 days[2]				
Paddy	Draining the excess water Re-sowing with seed treatment if mortality is more otherwise take up gap filling	Drain out excess water Top dressing with urea weeding		
Sunflower				
Sorghum				
Bengal gram			Drain out excess water Earthing up	Drain out excess water Harvesting and drying
Bajra				
Horticulture –fruits				
Citrus	Providing drainage trench (1.5 cu. ft) across the slope	Providing drainage trench (1.5 cu. ft) across the slope and application of 10 ppm NAA spray	Providing drainage trench (1.5 cu. ft) across the slope	Storing in Cold storage
Mango	-do-	Providing drainage trench (1.5 cu. ft) across the slope	-do-	-
Pomegranate	-do-	Providing drainage trench (1.5 cu. ft) across the slope and application of 10 ppm NAA spray	-do-	-do-
Sapota	-do-	-do-	-	-
Papaya	-do-	-	-	-
Vegetable Crops				

Green Chillies	Providing drainage trench (1.5 cu. ft) across theslope	Application of 10 ppm NAA spray	-	-
Onion	-do-	Providing drainage trench (1.5 cu. ft) across the slope	2000 ppm of MH spray 15 days before the harvest to control sprouting in storage	Store in well ventilated structure
Tomato	-do-	Application of 10 ppm NAA spray	-	-
Brinjal	-do-	Application of 10 ppm NAA spray	-	-
Beans	-do-	-	-	-
Spice and Plantation Crops				
Coconut	Providing drainage trench (1.5 cu. ft) across theslope	Providing drainage trench (1.5 cu. ft) across the slope	-	-
Dry Chillies	Providing drainage trench (1.5 cu. ft) across theslope	Application of 10 ppm NAA spray	-	-
Fenugreek	-do-	Providing drainage trench (1.5 cu. ft) across the slope	-	-
Coriander	-do-	-do-	-	-
Tamarind	-do-	-do-	-	-
Flowers				
Marigold	Providing drainage trench (1.5 cu. ft) across theslope	Providing drainage trench (1.5 cu. ft) across the slope	-	-
Jasmine	-do-	-do-	-	-
Rose	-do-	-do-	-	-
Chrysanthemum	-do-	-do-	-	-
Crossandra	-do-	-do-	-	-

Sea water intrusion[3]	NA

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

Extreme event type	Suggested contingency measure[r]			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave[p]	NA			
Cold wave[q]				
Frost				
Hailstorm				
Cyclone				

Contingent strategies for Livestock, Poultry & Fisheries Livestock

Condition	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 some feed and fodder reserves at any point of the year for mobilization to the drought affected villages Urea molasses mineral bricks (UMMB):50-100 t	Harvest and use all the failed crop (Paddy, Sorghum, Bengal gram, Bajra, Groundnut) material as fodder. Harvest all the top fodder available (Neem, Subabul, Acasia, Pipol etc) and feed the LS during drought	Flushing the stock to recoup Replenish the feed and fodder banks
Cyclone	NA		

Floods	In case of early forewarning (EFW), harvest all the crops (Paddy, Sorghum, Bengal gram, Bajra, Groundnut) that can be useful as fodder in future (store properly) Don't allow the animals for grazing if severe floods are forewarned 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 Capacity building and preparedness of the stakeholders and official staff for the unexpected events	Transportation of animals to elevated areas Stall feeding of animals with stored hay and concentrates Proper hygiene and sanitation of the animal shed In severe floods, un-tether or let loose the animals Avoid soaked and mould infected feeds / fodders to livestock Emergency outlet establishment for required medicines or feed in each village Spraying of fly repellants in animal sheds	Repair of animal shed Bring back the animals to the shed Cleaning and disinfection of the shed Bleach (0.1%) drinking water / water sources Deworming with broad spectrum dewormers 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
Heat & Cold wave	NA		
Health and Disease management	Procure and stock emergency medicines and vaccines for important endemic diseases of the area All the stock must be immunized for endemic diseases of the area 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 animals) Construction of drinking water tanks in herding places/village junctions/relief camp locations	Restrict wallowing of animals in water bodies/resources	Bleach (0.1%) drinking water / water sources Provide clean drinking water

Vaccination schedule in small ruminants (Sheep & Goat)

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

<u>Vaccination programme for cattle and buffalo:</u>

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

Poultry

	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
Drought			
Shortage of feed	Storing of house hold grain like maize, broken rice, bajra etc,	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
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 ammonia accumulation due to dampness	Disposal of dead birds by burning / burying with line powder in pit Disposal of poultry manure to prevent protozoal problem Supplementation of coccidiostats in feed
Cyclone	NA		
Heat wave and cold wave	NA		

Fisheries

	Suggested contingency measures		
	Before the event*	**During the event**	**After the event**
1) Drought			
A. Capture			
Marine	NA	NA	NA
Inland			Report the loss to Revenue & Fisheries Dept.
(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	
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 & Fisheries Dept.	Report the loss to Revenue & Fisheries Dept.
ponds/change in water quality			
(iii) Any other			
2) Floods			
A. Capture			
Marine	NA		

(i) Average compension paid due to loss of fishermen life	Help the district administration in providing the necessary help concerned with Revenue Dept.		
(ii) Avg no.of boats/nets/damaged	authorities.		
(iii)_ Avg no.of boats damaged			
Inland			
(i) Average compension paid due to loss of human life	Revenue authorities pay the compension to boats / nets / houses / fish live stock damaged	Addition of water, lime for tackling salt load	
(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			