

State: KARNATAKA

Agriculture Contingency Plan: District YADGIR

1.0 District Agriculture profile			
1.1	Agro-Climatic/Ecological Zone		
	Agro Ecological Sub Region (ICAR)	Semi and Deccan plateau, Hot and Eco Region (3.0)	
	Agro-Climatic Region (Planning Commission)	Southern plateau and Hills Region (10)	
	Agro Climatic Zone (NARP)	North eastern dry zone (KA-2)	
	List all the districts falling under the NARP Zone	Gulbarga, Yadgir (Yadgir, Shahapur and Shorapur taluk) and Raichur	
	Geographic coordinates of district	Latitude	Longitude
		16. 77° N	77.13° E
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Main Agricultural Research Station , Raichur-584102	
	Mention the KVK located in the district	Krishi Vignan Kendra, Gulbarga -585 101	
	Name and address of the nearest AMFU Station	Main Agricultural Research Station,Raichur-584102	

1.2	Rainfall	Average (mm)	Normal Onset	Normal Cessation
	SW monsoon (June-Sep)	384.4 mm	2 nd Week of June	1 st Week of October
	NE Monsoon(Oct-Dec)	153.2	2 nd Week of October	2 nd week of November
	Winter (Jan- March)	47.5	-	-
	Summer (Apr-May)	50.8	-	-
	Annual	636.0	-	-

1.3	Land use pattern of the district (latest statistics)	Geographical area	Cultivable 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)	516	310.5	34	30	12	12	-	28	0.82	0.17

Source :Gulbarga District at a glance 2008-09 Dept of Statistics, Govt.of Karnataka.

1.4	Major Soils	Area ('000 ha)
	Medium deep red clayey soils	153.0
	Deep black calcareous soils	114.2
	Shallow red gravelly mixed with deep soils	45.2
	Medium deep red clayey soils	27.6
	Very shallow mixed black clayey and brown loamy soils	23.4

Source :NBSS and LUP Bangalore

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	310.5	140.61 %
	Area sown more than once	126.1	
	Gross cropped area	436.6	

1.6	Irrigation	Area ('000 ha)	
	Net irrigated area	128.1	
	Gross cultivated area (3)	436.6	
	Gross irrigated area (4)=(3-1)+2	254.2	
	Rainfed area (3-4)	182.4	
	Sources of Irrigation	Number	Area ('000 ha) % area
	Canals		110.4 86.2

Tanks	NA	2.5	3.6
Open wells	NA	4.6	2.0
Bore wells	NA	6.9	5.4
Lift irrigation	NA	2.8	2.2
Other sources	NA	0.6	0.5
Total		128.1	100
Pumpsets			
Micro-irrigation			
Groundwater availability and use	No. of blocks	% area	Quality of water
Over exploited			
Critical			
Semi- critical			
Safe			
Wastewater availability and use			

Source: Gulbarga District at a glance 2008-09 Dept of Statistics , Govt of Karnataka NA-Not available since yadagir is a new district

1.7	Major Field Crops cultivated	Area ('000 ha)					
		<i>Khariif</i>		<i>Rabi</i>		Summer	Total
		<i>Irrigated</i>	<i>Rainfed</i>	<i>Irrigated</i>	<i>Rainfed</i>	-	-
	Paddy	47.9	0	2.7	0	34.4	85.1
	Sorghum	0.01	0.5	5.3	74.3	0	80.2
	Greengram	0.8	57.5	-	-	-	58.4
	Redgram	2.7	50.7	-	-	-	53.5
	Groundnut	4.7	0.2	29.7	14.0	-	48.7
	Sunflower	5.6	26.4	2.5	8.8	1.4	45.0
	Bajra	7.9	31.3	-	0.1	0	39.3
	Horticulture crops - Fruits	Total area		Irrigated		Rainfed	
		Figures not available for new district (Yadgir)					
	Horticultural crops - Vegetables	Total area		Irrigated		Rainfed	
		Figures not available for new district (Yadgir)					

Medicinal and Aromatic crops	Total area	Irrigated	Rainfed
	Figures not available for new district (Yadgir)		
Fodder crops	Total area	Irrigated	Rainfed
	Figures not available for new district (Yadgir)		
Total fodder crop area			
Grazing land			
Sericulture etc	229.5		

* The area, production and productivity of the crops of the district for 2008 is considered

: Source: Gulbarga District at a glance 2008-09 Dept of Statistics , Govt of Karnataka

1.8	Livestock	Number ('000)		
	Cattle	330236		
	Buffaloes total	105493		
	Commercial dairy farms			
	Goat	237636		
	Sheep	359093		
	Others (Camel, Pig, Yak etc.)	Pigs =12536 , Rabbits = 0 and Dogs = 39391		
1.9	Poultry			
	Commercial	236949		
	Backyard			
1.10	Inland Fisheries	Area (ha)	Yield (t/ha)	Production (tones)
	Brackish water	-	-	-
	Fresh water			1935.93 mt
	Others			

1.11	Production and Productivity of major crops	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)
	Paddy	132.0	2364	4.4	1733	79.7	2014	216.3	2037
	Sorghum	0.6	1167	89.2	1779	0.005	1800	89.8	1582
	Greengram	57.5	261.0	-	-	-	-	57.5	261
	Redgram	32.5	638	-	-	-	-	32.5	638
	Groundnut	5.1	753	29.3	720	-	-	34.4	737
	Sunflower	13.3	444	5.0	455	0.7	547	19.1	469
	Bajra	33.5	875	0.003	875	-	-	33.5	875
	Major Horticultural crops	Figures not available for new district (Yadgir)							
	Vegetables	Figures not available for new district (Yadgir)							
	Spices and plantation crops	Figures not available for new district (Yadgir)							
	Flowers	Figures not available for new district (Yadgir)							

Source: Gulbarga District at a glance 2008-09 Dept of Statistics , Govt of Karnataka

1.12	Sowing window for 5 major crops (start and end of sowing period)	Paddy	Sorghum	Greengram	Redgram	Groundnut
	<i>Kharif</i> - Rainfed	-	June I st FN to June II nd FN	June I st FN to June II nd FN	June I st FN to July II nd FN	June I st FN to July I st FN
	<i>Kharif</i> -Irrigated	June I st to June end	-	-	-	-
	<i>Rabi</i> - Rainfed	-	September II nd FN to October I st FN	-	-	-

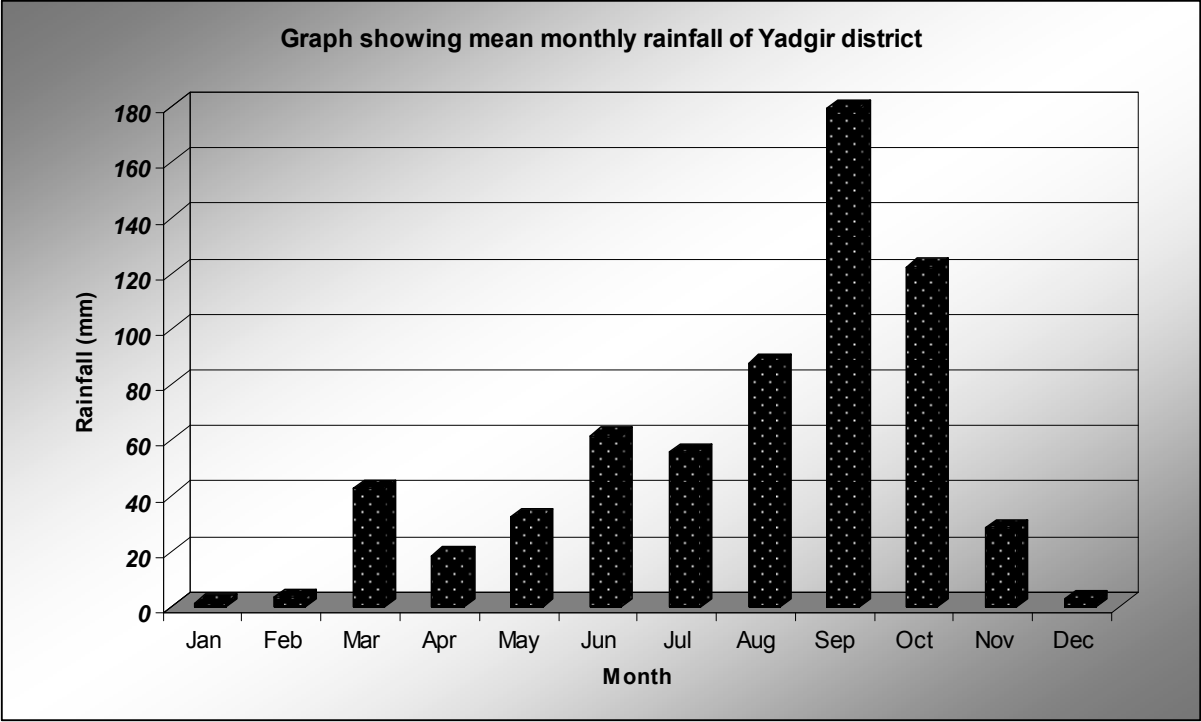
	Rabi-Irrigated		-		-	
	Summer- Irrigated	December II FN to Jan I st FN	-	February to March		December II nd FN to January I st FN

1.13	What is the major contingency the district is prone to? (Tick mark)	Regular	Occasional	None
	Drought	-	√	
	Flood	-	√	
	Cyclone	-		√
	Hail storm	-		√
	Heat wave	-		√
	Cold wave	-		√
	Frost	-		√
	Sea water inundation	-		√
	Pests and diseases (specify)	Pod borer in Redgram Leaf sheath blight and BPH in paddy Leaf spot and leaf minor in groundnut Leaf curl virus in sunflower	√	

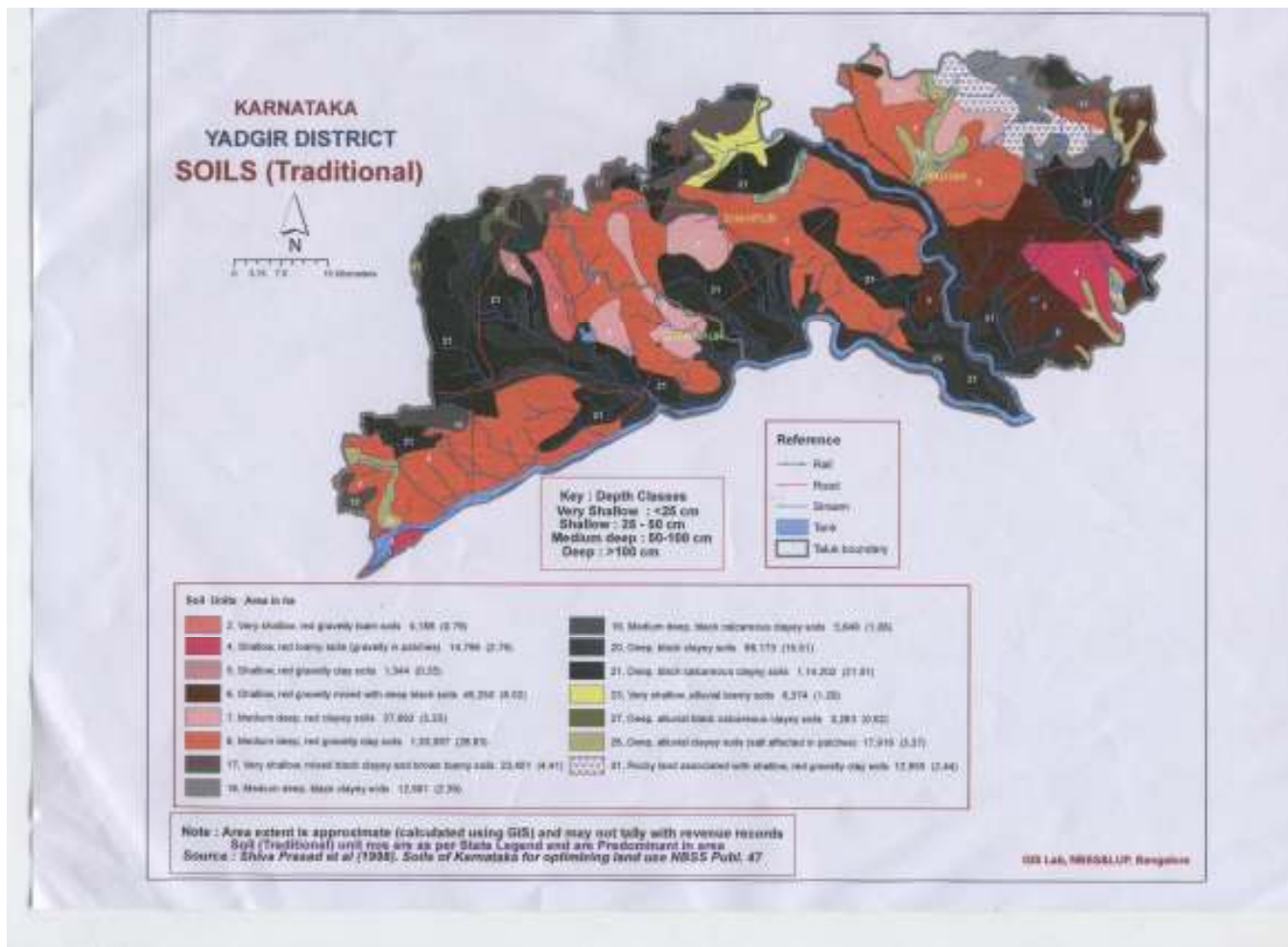
1.14	Include Digital maps of the district for	Location map of district with in State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

Annexure-1 Location map of Yadagir district in the state





Annexure-2: Mean monthly rainfall of Yadgir district



Annexure 3: Soil Map of Yadgir district

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 measure	Remarks on Implementation
Delay by 2 weeks June IV week <i>(kharif sowing</i> June II FN)	Medium deep black and red clay loam soils <i>(kharif and rabi)</i>	Redgram (TS-3 R, ICTP-8863,BSMR-736,WRP-1 and Asha)	No Change	Follow dry sowing practice in red gram with ridges and furrow at 90 cm apart -	
		Green gram (S-4,China mung and Pusa baisaki)	No Change		
		Bajra (ICTP-8203)			
		Sorghum (CSH-14,16,18 and DSV-1 and SSV-74)			
		Sunflower (KBSH-41 and 44,RSFH-1 and 44, DSH-1,RSFV-901, Morden)			
		Sesamum (E-8, DS-1,DSH-9)			
		Groundnut (bunch) (S-206,TMV-2,R-8808,JL-24,R-2001-3)			
		Redgram + Greengram (2:4 or 1:3)			
		Bajra+Redgram (2:1)			
		.Sorghum+Redgram (2:1)			
		Redgram+Sunflower (1:1)			
		Redgram+Groundnut (2:4)			
		Medium and deep black soils and red clay			

	loam soils (<i>kharif</i>)			cm apart	
		Green gram (S-4,China mung and Pusa baisaki)	No Change	-	
		Bajra			
		Sorghum (CSH-14,16,18 and DSV-1 and SSV-74)			
		Sunflower (KBSH-41 and 44,RSFH-1 and 44, DSH-1,RSFV-901, Morden)			
		Sesamum (E-8, DS-1,DSH-9)			
		Groundnut (bunch) (S-206,TMV-2,R-8808,JL-24,R-2001-3)			
		Redgram + Greengram (2:4 or 1:2)			
		Bajra+redgram (2:1)			
		.Sorghum+redgram (1:1)			
		Redgram+Sunflower (1:1)			
	Medium to deep black soils (<i>rabi</i>)	Rabi Sorghum (M -35-1,5-4-1,DSV-5)			
		Sunflower (KBSH-41 and 44,RSFH-1 and 44, DSH-1,RSFV-901, Morden)			
		Chickpea (JG-11,and A-1)			
		Cotton (DB-3-12,RAS-299-1)			
		Rabi Sorghum+ chickpea (1:2)			
		Chickpea+ safflower (4:2)			
		Greengram/insitu green manure-rabi crops			
	Shallow black	Bajra (ICTP-8203)	No change	-	

	and red sandy soils (<i>kharif</i>)	Sorghum (CSH-14,16,18 and DSV-1 and SSV-74)			
		Sunflower (KBSH-41 and 44,RSFH-1 and 44, DSH-1,RSFV-901, Morden)			
		Sesamum (E-8, DS-1,DSH-9)			
		Groundnut (spreading) (S-230)			
		Groundnut (bunch) (S-206,TMV-2,R-8808,JL-24,R-2001-3)			
		Castor (48-1 and GCH-4)			
		Bajra+redgram (2:1)			
		Sorghum+redgram (2:1)			
		Redgram + sunflower (1:1)			
		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 measure	Remarks on Implementation
Delay by 4 weeks July II week (<i>kharif</i> sowing July I FN)	Medium deep black and red clay loam soils (<i>kharif</i> and <i>rabi</i>)	Redgram	No Change	In redgram use 25% extra seeds, avoid long duration varieties, follow dry sowing techniques such as seed soaking in 2% CaCl ₂ , or transplant the 25 to 30 days old seedlings of BSMR-736/Asha varieties	
		Green gram	No change		
		Bajra			

		Sorghum		-	
		Sunflower			
		Sesamum			
		Groundnut			
		Redgram + Greengram (2:4 or 1:3)			
		Bajra+Redgram (2:1)			
		Sorghum+Redgram (2:1)			
		Redgram+Sunflower (1:1)			
		Redgram+Groundnut (2:4)			
	Medium and deep black soils and red clay loam soils (<i>kharif</i>)	Redgram	No Change	<ul style="list-style-type: none"> • Follow dry sowing practice in redgram with ridges and furrows at 90 cm apart • Use 25% higher seed rate in redgram with 90 x 20 cm spacing. • Transplant the 25-30 days old redgram seedlings of BSMR – 736variety. • Grow medium and long duration varieties. 	
		Green gram	No Change	Seed treatment, change in spacing .	
		Bajra			
		Sorghum			
		Sunflower			
		Sesamum			
		Groundnut			
		Redgram + Greengram (2:4 or 1:2)			
		Bajra+Redgram (2:1)			
		Sorghum+Redgram (2:1)			

		Redgram+Sunflower (1:1)			
	Medium to deep black soils (<i>rabi</i>)	Rabi Sorghum	No change	Keep the land fallow in Kharif by treating with compartment bunds and furrows for in- situ moisture conservation.	
		Sunflower			
		Chickpea			
		Cotton			
		Rabi Sorghum+ chickpea (1:2)			
		Chickpea+ safflower (4:2)			
		Greengram/insitu green manure-rabi crops	Fallow-rabi crops		
	Shallow black and red sandy soils (<i>kharif</i>)	Bajra		Sow Sunflower at wider spacing at 90 x 20 cm	
		Sorghum			
		Sunflower			
		Sesamum			
		Groundnut (spreading)			
		Groundnut (bunch)			
		Castor			
		Bajra+redgram (2:1)			
		Sorghum+redgram (2:1)			
		Redgram + sunflower (1:1)			
		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 measure	Remarks on Implementation
Delay by 6 weeks July IV th week (kharif sowing) July II FN)	Medium deep black and red clay loam soils (kharif and rabi)	Redgram	No change	<ul style="list-style-type: none"> Follow dry sowing practice in redgram with ridges and furrows at 90 cm apart Use 25% higher seed rate in redgram with 90 x 20 cm spacing. Transplant the 25-30 days old redgram seedlings of BSMR – 736 variety. Grow medium and long duration varieties. Treat the seeds of redgram and bajra with 2% CaCl₂ 	
		Green gram	Redgram/Bajra/Sunflower/ Groundnut (Spreading)		
		Bajra	No change		
		Sorghum	Redgram/Bajra/Sunflower/ Groundnut (Spreading)		
		Sunflower	No change		
		Sesamum	No change		
		Groundnut	Groundnut(spreading)		
		Redgram + Greengram (2:4 or 1:3)	Redgram/Bajar/Sunflower/ Groundnut (Spreading)		
		Bajra+redgram (2:1)	Redgram/Bajar/Sunflower/ Groundnut (Spreading)		
		.Sorghum+redgram (2:1)	Redgram/Bajra/Sunflower/ Groundnut (Spreading)		
		Redgram+Sunflower (1:1)	Redgram/Bajra/Sunflower/ Groundnut (Spreading)		
		Redgram+Groundnut (2:4)	Redgram/Bajra/Sunflower/ Groundnut (Spreading)		

Medium and deep black soils and red clay loam soils (<i>kharif</i>)	Redgram	No change	Follow dry sowing practice in regram with ridges and furrows at 90 cm apart Use 25% higher seed rate in redgram with 90 x 20 cm spacing. Transplant the 25-30 days old redgram seedlings of BSMR – 736 variety. Grow medium and long duration varieties.
	Green gram	Redgram/Sunflower/ Castor	
	Bajra	Redgram/Sunflower/ Castor	
	Sorghum	Redgram/Sunflower/ Castor	
	Sunflower	No change	
	Sesamum	No change	
	Groundnut (bunch)	Groundnut (spreading)	
	Redgram + Greengram (2:4 or 1:2)	Redgram + Sunflower	
	Bajra+redgram (2:1)	Redgram + Sunflower	
	.Sorghum+redgram (2:1)	Redgram + Sunflower	
	Redgram+Sunflower (1:1)	No Change	
	Medium to deep black soils (<i>rabi</i>)	Fallow- Rabi Sorghum	
Safflower			
Chickpea			
Sunflower			

		Cotton			
		Rabi Sorghum+ chickpea (1:2)			
		Chickpea+ safflower (4:2)			
		Greengram/insitu green manure-rabi crops			
	Shallow black and red sandy soils (<i>kharif</i>)	Bajra	No change	Sow Sunflower at wider spacing at 90 x 20 cm	
		Sorghum	Groundnut (Spreading)/Sunflower /Castor/Setaria/Horsegram		
		Sunflower	No Change		
		Sesamum	Groundnut (Spreading)/Sunflower /castor/Setaria/Horsegram		
		Groundnut (spreading)	No Change		
		Groundnut (bunch)	Groundnut (spreading)		
		Castor	No Change		
		Bajra+redgram (2:1)	Groundnut (Spreading)/Sunflower /castor/Setaria/Horsegram		
		Sorghum+redgram (2:1)	Groundnut (Spreading)/Sunflower /castor/Setaria/Horsegram		

		Redgram + sunflower (1:1)	Groundnut (Spreading)/Sunflower /castor/Setaria/Horsegram		
		Groundnut + Redgram (4:2)	Groundnut (Spreading)/Sunflower /castor/Setaria/Horsegram		

Condition		Suggested Contingency measures			
Early season drought (delayed onset)	Major Farming situation	Normal crop/cropping system	Change in crop/cropping system	Agronomic measure	Remarks on Implementation
Delay by 8 weeks August II week (kharif sowing Aug II FN)	Medium deep black and red clay loam soils (kharif and rabi)	Redgram	Sunflower/Horsegram (JPM-6) /Navane (RS-118 andHMT-100-1)		
		Green gram			
		Bajra			
		Sorghum			
		Sunflower	Sunflower/Horsegram /Navane	Sow sunflower at 90x 20 cm	
		Sesamum	Sunflower/Horsegram /Navane		
		Groundnut (bunch)			
		Redgram + Greengram (2:4 or 1:2)			
		Bajra+redgram (2:1)			
		.Sorghum+redgram (2:1)			
Redgram+Sunflower (1:1)					

		Redgram+Groundnut (2:4)			
Medium and deep black soils and red clay loam soils (<i>kharif</i>)	Redgram	Sunflower/Fodder Crops	No Change		
	Green gram				
	Bajra				
	Sorghum				
	Sunflower	Sunflower/Fodder Crops			
	Sesamum	Sunflower/Fodder Crops			
	Groundnut (bunch)				
	Redgram + Greengram (2:4 or 1:2)				
	Bajra+redgram (2:1)				
	.Sorghum+redgram (2:1)				
	Redgram+Sunflower (1:1)				
Medium to deep black soils (<i>rabi</i>)	Fallow- 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 (1:2)				
	Chickpea+ safflower (4:2)				
	Greengram/insitu green manure-rabi crops				

Shallow black and red sandy soils (<i>kharif</i>)	Bajra	Sunflower/Castor/Setaria/Niger/Horsegram		
	Sorghum			
	Sunflower			
	Sesamum			
	Groundnut (spreading)			
	Groundnut (bunch)			
	Castor			
	Bajra+redgram (2:1)			
	Sorghum+redgram (2:1)			
	Redgram + sunflower (1:1)			
	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 measure	Remarks on Implementation
Normal onset followed by dry spell after sowing leading to poor germination /crop stand etc.	Medium deep black and red clay loam soils (<i>kharif</i> and <i>rabi</i>)	Redgram	Thinning and gap filling in the existing crops.	Opening of Conservation furrow at 15-20 m apart. Mulching	
		Green gram			
		Bajra	Resowing (within 15 days if population is < 30%)		
		Sorghum			

		Sesamum Groundnut (bunch) Redgram + Greengram (2:4 or 1:2) Bajra+Redgram (2:1) .Sorghum+redgram (2:1) Redgram+Sunflower (1:1)?? Redgram+Groundnut (2:4)	thinning upto 25 to 66% depending on stress upto 30-35 days.		
	Medium and deep black soils and red clay loam soils (<i>kharif</i>)	Redgram Green gram Bajra Sorghum Sunflower Sesamum Groundnut (bunch) Redgram + Greengram (2:4 or 1:2) Bajra+redgram (2:1) .Sorghum+redgram (2:1) Redgram+Sunflower (1:1)	<ul style="list-style-type: none"> • Thinning and gap filling in the existing crops. • Resowing (within 15 days if population is < 30%) • Reduce population by thinning upto 25 to 66% depending on stress upto 30-35 days. 	Opening of Conservation furrow at 15-20 m apart.	
	Medium to deep black soils and red clay loam soils (<i>rabi</i>)	Fallow- Rabi Sorghum Safflower Chickpea Sunflower Cotton	Thinning and gap filling in the existing crops. Resowing (within 15 days if population is < 30%) Reduce population by thinning upto 25 to 66%	Compartment bunding/ moisture conservation practices in kharif fallow areas Frequent intercultivations and mulching	

		Rabi Sorghum+ chickpea (1:2)	depending on stress upto 30-35 days.		
		Chickpea+ safflower (4:2)			
		Greengram/insitu green manure-rabi crops			
	Shallow black and red sandy soils (<i>khariif</i>)	Bajra	Thinning and gap filling in the existing crops. Resowing (within 15 days if population is < 30%) Intercultivation and weeding In groundnut spraying with urea (2%) immediately after rains for quick revival.	Opening of Conservation furrow to conserve moisture Frequent intercultivations and mulching	
		Sorghum			
		Sunflower			
		Sesamum			
		Groundnut (spreading)			
		Groundnut (bunch)			
		Castor			
		Bajra+redgram (2:1)			
		Sorghum+redgram (2:1)			
		Redgram + sunflower (1:1)			
		Groundnut + Redgram (4:2)			

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measure	Remarks on Implementation
2. Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm))					

period)				
At vegetative stage	Medium deep black and red clay loam soils (<i>kharif</i> and <i>rabi</i>)	Redgram	<ul style="list-style-type: none"> • Thinning/ removal of alternate rows or plants within in sorghum and bajra rows at 30-45 DAS. • Grazing leaf tips in bajra • Apply gypsum to groundnut after receipt of rains(before 45 days) • Repeated inter cultivation and weeding • Removal of weak seedlings in Sorghum/Bajra 	<ul style="list-style-type: none"> • Spraying of 5% kaolin (Antitranspirant) • Provide supplemental irrigation
		Green gram		
		Bajra		
		Sorghum		
		Sesamum		
		Groundnut (bunch)		
		Redgram + Greengram (2:4 or 1:2)		
		Bajra+redgram (2:1)		
		.Sorghum+redgram (2:1)		
		Redgram+Sunflower (1:1)		
		Redgram+Groundnut (2:4)		
	Medium and deep black soils and red clay loam soils (<i>kharif</i>)	Redgram	<ul style="list-style-type: none"> • Thinning/ removal of alternate rows or plants within in sorghum and bajra rows at 30-45 DAS. • Grazing leaf tips in bajra • Apply gypsum to groundnut after receipt of rains(before 45 days) • Repeated inter cultivation and weeding • Removal of weak seedlings in Sorghum/Bajra 	<ul style="list-style-type: none"> • Spraying of 5% kaolin (Antitranspirant) • Provide supplemental irrigation
		Green gram		
		Bajra		
		Sorghum		
		Sunflower		
		Sesamum		
		Groundnut (bunch)		
		Redgram + Greengram (2:4 or 1:2)		

		Bajra+redgram (2:1)			
		.Sorghum+redgram (2:1)			
		Redgram+Sunflower (1:1)			
	Medium to deep black soils and red clay loam soils (<i>rabi</i>)	Fallow- Rabi Sorghum		Compartment bunding for moisture conservation	
		Safflower			
		Chickpea			
		Sunflower			
		Cotton			
		Rabi Sorghum+ chickpea (1:2)			
		Chickpea+ safflower (4:2)			
		Greengram/insitu green manure-rabi crops			
	Shallow black and red sandy soils (<i>kharif</i>)	Bajra	<ul style="list-style-type: none"> • Removal/thinning of alternate rows. • Repeated intercultivation and weeding • Grazing leaf tips in bajra • Removal of weak seedlings in sorghum/bajra 	<ul style="list-style-type: none"> • Spraying of 5% kaolin (Antitranspirant) • Provide supplemental irrigation 	
		Sorghum			
		Sunflower			
		Sesamum			
		Groundnut (spreading)			
		Groundnut (bunch)			
		Castor			
		Bajra+Redgram (2:1)			

		Sorghum+Redgram (2:1)			
		Redgram + Sunflower (1:1)			
		Groundnut + Redgram (4:2)			

Condition		Suggested Contingency measures			
3. Mid season drought (long dry spell)	Major Farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measure	Remarks on Implementation
At reproductive stage	Medium deep black and red clay loam soils (<i>kharif</i> and <i>rabi</i>)	Redgram	<ul style="list-style-type: none"> Stripping of older leaves and non functional leaves in sorghum & bajra In Bajra, harvest the crop for fodder purpose and allow for ratooning both under sole and intercropping. Harvest groundnut (bunch) and fodder crops for fodder. Repeated intercultivation and weeding. 	<ul style="list-style-type: none"> Spraying the crops with antitranspirants such as kaolin (5%) Provide supplemental irrigation Mulching with crop residues/stubbles/grasses. Follow foliar spray of 2 % urea or 0.2 % FeSO₄ in Groundnut after receipt of fresh showers. 	
		Green gram			
		Bajra			
		Sorghum			
		Sesamum			
		Groundnut (bunch)			
		Redgram + Greengram (2:4 or 1:2)			
		Bajra+redgram (2:1)			
		.Sorghum+redgram (2:1)			
		Redgram+Sunflower (1:1)			
	Redgram+Groundnut (2:4)				
	Medium and deep black soils and red clay loam soils (<i>kharif</i>)	Redgram	-do-	-do-	
		Green gram			
		Bajra			
		Sorghum			
		Sunflower			

		Sesamum			
		Groundnut (bunch)			
		Redgram + greengram (2:4 or 1:2)			
		Bajra+redgram (2:1)			
		.Sorghum+redgram (2:1)			
		Redgram+sunflower (1:1)			
	Medium to deep black soils and red clay loam soils (<i>rabi</i>)	Fallow- Rabi Sorghum		Compartment bunding for moisture conservation	
		Safflower			
		Chickpea			
		Sunflower			
		Cotton			
		Rabi Sorghum+ chickpea (1:2)			
		Chickpea+ safflower (4:2)			
		Greengram/insitu green manure-rabi crops			
	Shallow black and red sandy soils (<i>khariif</i>)	Bajra	<ul style="list-style-type: none"> • Stripping of older leaves and non functional leaves in sorghum & bajra • In Bajra, harvest the crop for fodder purpose and allow for ratooning both under sole and intercropping. • Harvest groundnut (bunch) and fodder crops for fodder. • Repeated intercultivation and weeding. 	<ul style="list-style-type: none"> • Spraying the crops with antitranspirants such as kaolin (5%) • Provide supplemental irrigation • Mulching with crop residues/stubbles/grasses. • Follow foliar spray of 2 % urea or 0.2 % FeSO₄ in Groundnut after receipt of fresh showers. 	
		Sorghum			
		Sunflower			
		Sesamum			
		Groundnut (spreading)			
		Groundnut (bunch)			

		Castor			
		Bajra+redgram (2:1)			
		Sorghum+redgram (2:1)			
		Redgram + sunflower (1:1)			
		Groundnut + Redgram (4:2)			

Condition	Suggested Contingency measures				
Terminal drought	Major Farming situation	Crop/cropping system	Agronomic measures	Rabi crop planning	Remarks on Implementation
	Medium deep black and red clay loam soils (<i>kharif</i> and <i>rabi</i>)	Redgram	<ul style="list-style-type: none"> • Harvest at physiological maturity and go for early rabi crops. • Pigeonpea and greengram can be harvested for vegetable purpose • Bajra and sorghum could be harvested for fodder in case of severe drought. • Close soil cracks by repeated intercultivation 	<ul style="list-style-type: none"> • Plan for early sowing of rabi sorghum, safflower and bengalgram. • Provide supplemental irrigation. 	
		Green gram			
		Bajra			
		Sorghum			
		Sesamum			
		Groundnut (bunch)			
		Redgram + Greengram (2:4 or 1:2)			
		Bajra+redgram (2:1)			
		.Sorghum+redgram (2:1)			
		Redgram+Sunflower (1:1)			
		Redgram+Groundnut (2:4)			
	Medium and deep black soils and red	Redgram	-do-	-do-	
		Green gram			

clay loam soils (<i>kharif</i>)	Bajra			
	Sorghum			
	Sunflower			
	Sesamum			
	Groundnut (bunch)			
	Redgram + greengram (2:4 or 1:2)			
	Bajra+redgram (2:1)			
	Sorghum+redgram (2:1)			
	Redgram+sunflower (1:1)			
	Medium to deep black soils and red clay loam soils (<i>rabi</i>)			
Safflower				
Chickpea				
Sunflower				
Cotton				
Rabi Sorghum+ chickpea (1:2)				
Chickpea+ safflower (4:2)				
Greengram/insitu green manure-rabi crops				
Shallow black and red sandy soils (<i>kharif</i>)	Bajra	<ul style="list-style-type: none"> Harvest at physiological maturity and go for early rabi crops. Pigeonpea and greengram can be harvested for vegetable purpose Bajra and sorghum could be harvested for fodder in case of 	<ul style="list-style-type: none"> Plan for early sowing of Rabi sorghum, safflower and bengalgram Provide supplemental irrigation. 	
	Sorghum			
	Sunflower			
	Sesamum			

		Groundnut (spreading)	severe drought. • Close soil cracks by repeated intercultivation		
		Groundnut (bunch)			
		Castor			
		Bajra+redgram (2:1)			
		Sorghum+redgram (2:1)			
		Redgram + sunflower (1:1)			
		Groundnut + Redgram (4:2)			

2.1.2 Irrigated situation

Condition	Suggested Contingency measures				
	Major Farming situation	Normal crop/cropping system	Change in crop/cropping system	Agronomic measure	Remarks on Implementation
Delayed /limited release of water in canals due to low rainfall	Canal irrigated area-cropping in al types of soils	Paddy-Paddy	Paddy-Paddy with short duration varieties	<ul style="list-style-type: none"> • Maintaining soil moisture at saturation and not at submergence; • Use short duration varieties(IR-64, Early sona, for summer, Gangavati sona for kharif, JGL-1798 for summer(120 days); • For paddy use 35-40 days old seedlings with 4-5 seedlings per hill • Give 25% extra nitrogen. 	
		Cotton	No Change		
		Maize-Bengalgram			

		Paddy-Groundnut			
		Sunflower-Bengalgram			
		Groundnut-Sunflower			
		Sunflower-Groundnut			
		Chilli- drill sown	Transplanted chilli	Raising the chilli seedlings in May I FN-June I FN	
		Pigeon pea	Transplanted Pigeonpea	Raising seedlings in (In May II FN-June II FN)	

Condition	Major Farming situation	Normal crop /cropping system	Suggested Contingency measures		
			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 to the district		

Condition	Major Farming situation	Normal crop /cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Tankfed area	Paddy-Paddy	Follow rainfed cropping system		
		Maize -Bengalgram			
		Cotton			
		Chilli (drill sown)			

Condition	Suggested Contingency measures				
	Major Farming situation	Normal crop /cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
		Pigeon pea			

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	Paddy		Redgram +Greengram Bajra Sorghum Sunflower Sesamum Groundnut (bunch) Intercropping of Redgram +Greengram (2:4 or 1:2) Bajra+Redgram (2:1) Sorghum+Redgram (2:1) Redgram +Sunflower (1:1) Redgram + Groundnut (2:4)		
	Maize				

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				
Paddy	Re sow/ transplant	-	Drain out excess water,	Proper drying and storage
Sorghum	Drain out excess water Top dress the crop with N Re sow/ transplant	Drain out excess water	Drain out excess water. Tying up of lodged plants	-do-

Greengram	Provide drainage	Provide drainage	Drain out excess water. Harvesting at physiological maturity stage	-do-
Pigeonpea	Provide drainage Re sow/ transplant	Provide drainage	-do-	-do-
Groundnut	Drain out excess water Re sow/ transplant/ Fill up gaps.	Drain out excess water	-do-	-do-
Heavy rainfall with high speed winds in a short span²	As above			
Outbreak of pests and diseases due to unseasonal rains	. Need based plant protection IPM and IDM	Need based plant protection		Safe storage against storage pest and diseases

2.3 Floods

Condition	Suggested contingency measures			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation				
Paddy	Re transplant		Drain out excess water	Drain out excess water
Sorghum	Drain out excess water Re sow	-do-	-do-	-do-
Green gram	Drain out excess water Prefer for redgram	-do-	-do-	-do-
Pigeon pea	Drain out excess water Re sow	-do-	-do-	-do-
Ground nut	Drain out excess water prefer for redgram	-do-	-do-	-do-
Continuous submergence				

for more than 2 days				
Paddy	Re transplant			
Sorghum	Drain out excess water Re sow	Drain out excess water	Drain out excess water	
Green gram	Drain out excess water Go for redgram	-do-	-do-	
Pigeon pea	Drain out excess water Re sow	-do-	-do-	
Ground nut	Drain out excess water Go for redgram	-do-	-do-	
Sea water inundation	N.A			

2.4 Extreme events: Heat wave / Cold wave/Frost/ Hailstorm /Cyclone: Not applicable

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave	N.A			
Cold wave				
Frost				

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 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	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
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

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

2.5.2 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 to all
Drinking	Rain water harvesting	Sanitation of drinking water	Give sufficient water as per the bird's
Health and disease	Culling of sick birds. Deworming and vaccination against RD and	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 /
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	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
Cyclone	NA		
Heat wave and cold wave	NA		

2.5.3 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 insufficient rain/inflow	Observe water level. Advice fishermen to harvest as much as possible fish live stock	Harvest the complete fish live stock	
(ii) Changes in water quality	Observe water quality like dissolved 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 insufficient rain/inflow	Observe water level. Advice for fishermen to harvest maximum fish live stock.	Addition of water, lime for tackling salt load	
(ii) Impact of salt load build up in ponds/change in water quality		Report the matter to Revenue & Fisheries Dept.	Report the loss to Revenue & Fisheries Dept.
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. authorities.		
(ii) Avg no.of boats/nets/damaged			
(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	Addition of water, lime for tackling salt load	

(ii) No.of boats/nets/damaged	/ fish live stock 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.)			
3. Cyclone / Tsunami			
A. Capture			
Marine			