

State: KARNATAKA

Agriculture Contingency Plan for District: DAVANAGERE

1.0 District Agriculture profile				
1.1	Agro-Climatic/Ecological Zone			
	Agro Ecological Sub Region (ICAR)	Eastern Ghats And TamilNadu Uplands (8.2) Deccan Plateau, Hot Semi-Arid Eco-Region (6.4)		
	Agro-Climatic Region (Planning Commission)	Southern plateau and Hills region (X)		
	Agro Climatic Zone (NARP)	Northern Dry Zone (KA-3) Central Dry Zone (KA-4)		
	List all the districts or part thereof falling under the NARP Zone	Harapanahalli, Jagalur, Harihara, Davanagere Channagiri, Honnali		
	Geographic coordinates of district	Latitude	Longitude	Altitude
		14°27'14.58"	75°55'07.99"	657m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Research Station, Kathalagere Farm, Kathalagere, Channagiri tq., Davanagere –District- 577 219		
	Mention the KVK located in the district	Taralabalu Krishi Vigyan Kendra, Kadalivana, BIET College Road, LIC Layout, Davanagere-577 004.		

1.2	Rainfall (Jan-2009 to Dec-2009)	Normal RF(mm)	RF(mm) 2009	Normal Rainy days (number)	Normal Onset	Normal Cessation
	SW monsoon (June-September)	360.1	579.9	-	1 st week of June	4 th week of September
	NE Monsoon (October-December)	166.7	214.9	-	1 st week of October	3 rd week of November
	Winter (January-February)	-	-	-		
	Summer (March-May)	123	171.2	-		
	Annual	650	994.8	-		

1.3	Land use pattern of the district (latest statistics)	Geographical area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area (*000 ha)	597.6	89.9	39.0	19.5	8.5	5.0	20.5	19.5	5.9

1.4	Major Soils (common names like shallow red soils etc.)	Area (*000 ha)	Percent (%) of total cultivable area
	Mixed red and black Soils	162	42
	Red sandy Soils	126	33
	Deep to medium deep black Soils	54	14
	Sandy loam Soils	18	4
	Others (specify):		
1.5	Agricultural land use	Area (*000 ha)	Cropping intensity %
	Net sown area	388.0	121 %
	Area sown more than once	82.0	
	Gross cropped area	470.0	

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	146.5		
	Gross irrigated area	216.5		
	Rainfed area	241.6		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals		51.8	35.5
	Tanks	411	1.5	0.01
	Open wells	6508	-	-
	Bore wells	25432	82.5	56.5
	Lift irrigation	1069	-	-
	Micro-irrigation	-	-	-
	Other sources	-	10.2	6.9
	Total Irrigated Area		146.0	100.0
	Pump sets	59253		
	No. of Tractors	30322		
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils	(% area)	
	Over exploited	1	-	
	Critical	1	-	
	Semi- critical	-	-	
	Safe	-	-	
Wastewater availability and use	4	-		
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)

1.7	Major field crops cultivated	Area ('000 ha)					
		<i>Kharif</i>		<i>Rabi</i>		Summer	Total
		<i>Irrigated</i>	<i>Rainfed</i>	<i>Irrigated</i>	<i>Rainfed</i>		
1.	Maize	25.6	150.6	-	-	-	176.2
2.	Rice	62.8		-	-	47.0	109.7
3.	Jowar	2.3	15.0	-	6.8	-	23.9
4.	Groundnut	-	17.0	-	-	5.7	22.5
5.	Sunflower	1.0	7.5	0.9	6.1	5.5	21.1
6.	Ragi	-	16.0	-	-	-	15.9
7.	Cotton	4.9	6.0	-	1.6	-	12.5
8.	Redgram	-	8.1	-	-	-	8.1
9.	Sugarcane	5.8		-	-	2.0	7.8
10.	Greengram	-	2.1	-	-	-	2.1
11.	Avare	-	1.5	-	0.1	-	1.6
12.	Horsegram	-		-	1.1	-	1.1
13.	Blackgram		0.2	-	-	-	0.2
	Horticulture crops - Fruits	Total area('000 ha)					
1	Mango	2.7					
2	Banana	2.2					
3	Sapota	0.8					
4	Papaya	0.3					

	Horticultural crops - Vegetables	Total area('000 ha)
1	Onion	3.9
	Tomato	1.9
2	Green chilly	1.3
3	Brinjal	0.5
4	Bhendi	0.3
5	Cucumber	0.2
	Plantation crops	Total area ('000 ha)
1	Arecanut	25.2
2.	Coconut	17.3
3	Beetelvine	1.1
	Total fodder crop area	-
	Grazing land	19.5
	Sericulture etc	0.3
	Others (Specify)	-

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)	146.5	137.2	283.7
	Crossbred cattle	15.1	96.2	111.3
	Non descriptive Buffaloes (local low yielding)	25.2	198.3	223.5
	Graded Buffaloes			
	Goat			153.8
	Sheep			333.8
	Others (Camel, Pig, Yak etc.)			3.18
	Commercial dairy farms (Number)			

1.9	Poultry	No. of farms	Total No. of birds ('000)				
	Commercial	-	1520				
	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	
		-		1		411	
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)		10098	1.5		6.6		
Others							

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)										
1	Maize	702.9	4002					702.9	4002	-
2	Rice	315.9	5200			309.9	5825	625.8	5512	-
3	Jowar			33.0	1918			32.9	1918	-
4	Ragi	238.5	1499					238.4	1499	-
5	Blackgram	0.5	431.9					0.5	431.9	-
6	Greengram	0.5	955.4					0.4	955.3	-
7	Horsegram	8.5	956.3					8.5	956.3	-
8	Avare	4.3	595.6					4.3	595.6	-
9	Redgram	807.5	1003					807.5	1003	-
10	Groundnut	0.9	16063.7					0.9	16063.7	-
11	Sunflower	877.9	1024					877.8	1024	-
12	Cotton	158.9	245					158.9	245	-
13	Sugarcane	670.7	115					670.7	115	-
Major Horticultural crops (Crops to be identified based on total acreage)										
1	Onion	770.2	2000					770.2	2000	-
2	Tomato	472.7	2469					472.7	2469	-
3	Brinjal	137.3	2500					137.3	2500	-
4	Green chilli	132.8	1059					132.8	1059	-
5	Mango					270.4	984	270.4	984	-
6	Banana	600.7	2772					600.7	2772	-
7	Areca nut	332.0	33 qt/ha.					332.0	33 qt/ha.	-
8	Coconut	199.0	110 (No. of nuts/plant / year)					199.0	110 nuts/plant/year)	-

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Rice	Maize	Cotton	Redgram	Groundnut	Jowar	Sunflower
	Khharif- Rainfed	-	May 4th week – June 3 rd week	May 1st week- May3rd week	May 4 th week-July 3 rd week	June 1st week-July 2 nd week	June - June last week	June to July last week
	Khharif-Irrigated	July 1 st week- July 3 rd week	June 1st week- July 2 nd week	May 2 nd week	-	-	-	-
	Rabi- Rainfed	-	-	-	-	December 4 th week – January 1 st week	September 3 rd week – October 3 rd week	September 2 nd week – October 1 st week
	Rabi-Irrigated	February 4 th week- March 2 nd week		-	-	-	-	December 4 th week – January 2 nd week
	Summer- Irrigated	January 2 nd week - February 2 nd week	January - February	-	-	-	-	-

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		✓	

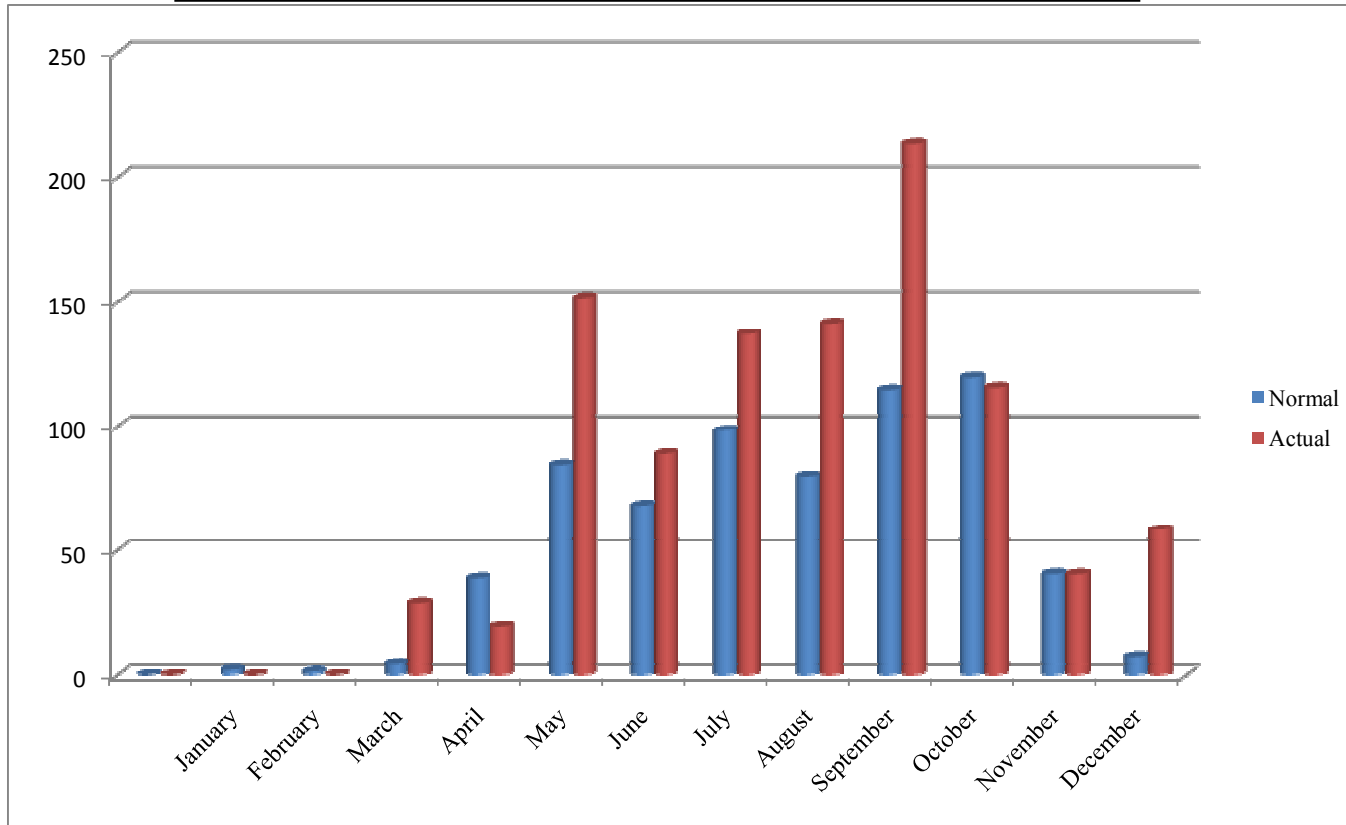
	Sea water intrusion			✓
	Pests and diseases (specify) Rice: Brown Plant Hopper , Bacterial Leaf Blight, Blast, stem borer Maize: Stem borer Cotton: Sucking pest Coconut: Mites and Coconut Black Headed Caterpillar (CHBC) Sunflower: Budnecrosis, Black headed caterpillar and helicoverpa	✓		

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 Davanagere District In Karnataka



Anneure 2: Mean annual rainfall of Davanagere



Month

Annexure 3: Soil map of Davanagere



2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 2 weeks June 3 rd week	Red sandy soils	Maize	No change	<ul style="list-style-type: none"> • Closer spacing in Maize(45X20cm) • Opening of conservations furrows • Optimum plant population 	Supply of seeds through KSSC Supply of seeds through ISOPOM
		Finger millet + Avare Finger millet + Redgram (8:2)	Finger millet (GPU-28) + Redgram (BRG-1/2) (8:2)	Maintain optimum plant population	
		Redgram	No change		
	Deep to medium deep black soils	Maize	Maize + Redgram (BRG-1/2) (8:1)	<ul style="list-style-type: none"> • Harrowing and sowing to be done 	
		Cotton	Cotton + Bhendi (as a trap crop Cotton + Groundnut (1:3)	<ul style="list-style-type: none"> • Wider row spacing in cotton 120 cm x 120 cm • Sowing of 2seeds/hill • Application of the Vermicompost to hills 	
		Sunflower	Sunflower (KBSH-53)	<ul style="list-style-type: none"> • Sunflower 60 cm x 30 cm Maintain opt population and dibbling of the seeds 	

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 1 st week	Red sandy soils	Maize	Maize + Redgram (BRG-2)	<ul style="list-style-type: none"> Select the short duration pulses Sowing of the maize in 60x30 cm spacing Application of the organic manures 	Supply of seeds through KSSC	
		Finger millet + Avare Finger millet + Redgram (8:2)	Finger millet + Avare (8:1) Prefer medium to short duration varieties of Ragi GPU-48, GPU-45	In Finger millet Sowing with high seed rate[20%] than recommendation		
		Redgram	Finger millet(GPU-28) + Redgram (BRG-2) (8:1)	Nursery (Transplanting of long duration finger millet varieties : Pagadi lines)If we want to go for sowing of long duration Ragi varieties like Indof-8, MR-1, MR-6, HR-911 (110-115 days). It is better to make nursery to get higher yields.		
	Deep to medium deep black soil	Maize	Maize + Redgram (BRG-2)	<ul style="list-style-type: none"> Soaking the seeds overnight and sowing with the closer spacing (45x30) 		
		Cotton	Sunflower /Maize/Redgram	Sowing of the sunflower or maize instead of cotton. Medium duration varieties		Breeder seeds supply by UAS(B)
		Sunflower	Sunflower (KBSH-53) + Redgram	Soaking of the seed in the water and dibbling two seeds per hill.		

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)	Red sandy soils	Maize	Finger millet : GPU-28 Finger millet + Horsegram Sunflower (KBSH-53)	<ul style="list-style-type: none"> Higher seed rate by 20% 	Supply of seeds through KSSC Supply of seeds through UAS(B)
		Finger millet + Avare Finger millet + Redgram (8:2)	Selection of the drought tolerant and short duration minor millets and pulses Little millet : CO-2, PRC-3 Foxtail millet:RS-118,K-221 Redgram –BRG-2	<ul style="list-style-type: none"> Higher seed rate by 20% 	
		Redgram	Finger millet + Niger-6:1 Soybean : KB-79, LSB-1	<ul style="list-style-type: none"> Seed soaking in water for 18h followed by 24h, shade drying for seed hardening 	
	Deep to medium deep black soils	Maize	Maize + Redgram (BRG-2)	<ul style="list-style-type: none"> Soaking the seeds overnight and sowing with the closer spacing (45x30) 	
		Cotton	Sunflower –KBSH-53,44 Castor (DCS-9)	<ul style="list-style-type: none"> In Sunflower go for dibbling of 2 seeds per hill Seed hardening soaking of Castor seeds in water for 6h 	
		Sunflower	Sunflower(KBSH-53) Soybean : KB-79, LSB-1	<ul style="list-style-type: none"> In Sunflower go for dibbling of 2 seeds per hill 	

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 (Aug 1 st week)	Red sandy soils	Maize	Finger millet + Horse gram (GPU-28, GPU-26, GPU-46)	<ul style="list-style-type: none"> Dry sowing 8-10 days before rains with 15-20% higher seed rate. 	<ul style="list-style-type: none"> Supply of seeds through KSSC Supply of seeds through UAS(B)
		Finger millet + Avare Finger millet + Redgram (8:2)	Sunflower (KBSH-53)	-	
		Redgram	Little millet : CO-2, PRC-3 Foxtail millet:RS-118, K-221-1 Fodder maize	<ul style="list-style-type: none"> Seed soaking in water for 18h followed by 24h, shade drying for seed hardening Sowing of fodder maize- dry sowing 	
	Deep to medium deep black soils	Cotton	Horsegram : PHG-9 Field bean : HA-3, HA-4	<ul style="list-style-type: none"> Higher seed rate for Horsegram 	
		Maize	Maize + Redgram (BRG-2)	<ul style="list-style-type: none"> Soaking the seeds overnight and sowing with the closer spacing (45x30) 	
		Sunflower	Sunflower(KBSH-53)	<ul style="list-style-type: none"> In sunflower go for dibbling of the 2 seeds per hill 	

Condition			Suggested Contingency measures		
Early season drought	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.)	Red sandy soils	Maize	<ul style="list-style-type: none"> • Thinning • Protective irrigation through sprinkler 	Repeated inter cultivation	-
		Finger millet + Avare Finger millet + Redgram (8:2)	<ul style="list-style-type: none"> • Thinning of Ragi passing spine harrow • Sowing of the minor millets like Navane 	<ul style="list-style-type: none"> • Brush harrow to break the crust 	
		Redgram	<ul style="list-style-type: none"> • Thinning • Protective irrigation through sprinkler 	<ul style="list-style-type: none"> • Repeated inter cultivation • Opening of the conservative furrows between the redgram rows 	
	Deep to medium deep black soils	Cotton	<ul style="list-style-type: none"> • Thinning, Gapfilling • Protective irrigation through sprinkler 	<ul style="list-style-type: none"> • Repeated inter cultivation • Mulching with weeds 	
		Maize	<ul style="list-style-type: none"> • Optimum plant population, thinning 	<ul style="list-style-type: none"> • Passing of the harrower to break the clods and reduce the moisture loss 	
		Sunflower (KBSH-1)	<ul style="list-style-type: none"> • Thinning • Protective irrigation through sprinkler 	<ul style="list-style-type: none"> • Repeated inter cultivation • Mulching with weeds 	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)					
At vegetative stage	Red sandy soils	Maize	<ul style="list-style-type: none"> Split application of the nitrogen Mulching with organics to extend the period of moisture availability. Thin out the 25% of the crop and use them as a feed/mulch 	<ul style="list-style-type: none"> Repeated inter cultivation opening of furrow for the conservation weeds 	-
		Finger millet + Avare (8:1)	Thinning of crops- Ragi	Repeated Inter cultivation-	
		Redgram	<ul style="list-style-type: none"> Mulching with organics to extend the period of moisture availability. Thin out the 25% of the crop and use them as a feed/mulch 	<ul style="list-style-type: none"> Repeated inter cultivation opening of furrow for the conservation weeds 	
	Deep to medium deep black soils	Maize	Complete hoeing and weeding in the field to provide dust mulch	Repeated inter cultivation	
		Cotton	Take 2 Sprays of planofix 2ml/9 l of water at 45 and 55 DAS in cotton to prevent the square drying	Blade harrowing , Ridges and furrow	
		Sunflower	Intercultivation Protective irrigation	Mulching	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)					
At flowering/ fruiting stage	Red sandy soils	Maize	Protective irrigation	Nutrient spray with 2% urea or DAP- Maize, Redgram, Ragi,	-
		Finger millet + Avare (8:1)			
		Redgram			
	Deep to medium deep black soils	Maize	Repeated Inter cultivation	Protective irrigation	
Cotton					
Sunflower					

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Rabi Crop planning	Remarks on Implementation
Terminal drought					
	Red sandy soils	Maize	<ul style="list-style-type: none"> Protective irrigation- Maize Redgram harvested for vegetable purpose. Harvested at physiological maturity stage harvest for fodder- Maize, Ragi 	<ul style="list-style-type: none"> Horse gram (October month) Safflower, Chickpea, Jowar 	-
		Finger millet + Avare (8:1)			
		Redgram			
	Deep to medium deep black soils	Maize	<ul style="list-style-type: none"> Protective irrigation Harvesting at physiological maturity stage 	Rabi cotton- In some areas of Harapanahalli tq. Farmers will take up sowing of cotton during the month of Oct. those who have protective irrigation facility in red and black cotton soils	
		Cotton			
		Sunflower			

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 / Limited release of water in canals due to low rainfall	Deep to medium deep black soils	Rice - Rice	<ul style="list-style-type: none"> • Greengram • Maize • Aerobic rice - Upto 25 DAS 	<ul style="list-style-type: none"> • Alternate furrow irrigation • Limited irrigation • Drip irrigation 	<ul style="list-style-type: none"> • Seeds supplied through KSSC and UAS(B) • Aerobic varieties, MAS-1

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	Deep to medium deep black soils	Rice - Rice	Go for crops like minor millets, ground nut-If the rainfall occurs at the time of sowing and then it will with stand up to 25 days	soil mulching	-

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	Deep to medium deep black soils	Rice – Rice	Maize + Pigeon pea Ragi + cowpea Irrigate crops in critical stages. Vegetative stage, Dough stage grain filling stage	Repeated intercultivation Earthingup,	-

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	Deep to medium deep black soils	Maize Cotton	No change	Adopt alternate row/ furrow irrigation	-
Any other condition (specify)					

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

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Continuous high rainfall in a short span leading to water logging				
Maize	Provide surface drainage, If the water logging is permanent then go for sub surface drainage - for all soils Foliar application of NPK and micro nutrients in early stages, for crop recovery from excess moisture. Take up plant protection measures with endosulfan and mancozeb (both@ 0.2%) to manage stem borer, cob worm and diseases. De-top at physiological maturity to provide aeration for effective management of sheath blight and to avoid crop lodging. Postpone harvesting of crop till dry weather prevails.	Provide drainage	Drain out excess water Harvesting at physiological maturity stage	Transport / Shift to dry place
Pigeonpea	Provide surface drainage, If the water logging is permanent then go for sub surface drainage - for all soils Foliar application of NPK and micro nutrients in early stages, for crop recovery from excess moisture.	Provide drainage	Harvest pigeon pea for vegetable purpose	
Ragi		Provide drainage		
Ground nut	Provide surface drainage, If the water logging is permanent then go for sub surface drainage - for all soils	Provide drainage		
Sunflower				

Cotton	Provide surface drainage, If the water logging is permanent then go for sub surface drainage - for all soils Foliar application of NPK and micro nutrients in early stages, for crop recovery from excess moisture. Go in for spray with fungicides to prevent rotting of reproductive parts.			
Horticulture				
All vegetables	Draining out of excess water	Draining out of excess water	Draining out of excess water	Protected Storage
Arecanut	-do-	-do-	-do-	
Banana	-do-	-do-	-do-	
Heavy rainfall with high speed winds in a short span				
All crops	Draining out of excess water Foliar spray with 2% urea	Draining out of excess water Wrapping and propping Foliar spray with 2% urea	Draining out of excess water Wrapping and propping	Protected Storage
Horticulture				
All crops	Draining out of excess water	Draining out of excess water Wrapping and propping	Draining out of excess water Wrapping and propping	Protected Storage

Outbreak of pests and diseases due to unseasonal rains				
Maize	Stem borer	Use of carbaryl 4G (15 kg/ha) or spray with chloropyriphos or Endosulfan @ 2 ml / 1t	Use of carbaryl 4G (15 kg/ha) or spray with chloropyriphos or Endosulfan @ 2 ml / 1t	-
	Downey mildew	Seed treatment with Ridomyl MZ @ 2.5 gm/1kg seed and spray with Ridomyl MZ 2.3	Seed treatment with Ridomyl MZ @ 2.5 gm/1kg	

		gm / 1t	seed and spray with Ridomyl MZ 2.3 gm / 1t	
Pigeonpea	Pod borer	During flowering spray with profenophos 2ml/1t. Use of pheromone traps @ 10 traps / ha. Spray with chlorpyriphos (2ml/1t) or Indoxicarb 1 ml/1t	During flowering spray with profenophos 2ml/1t. Use of pheromone traps @ 10 traps / ha. Spray with chlorpyriphos (2ml/1t) or Indoxicarb 1 ml/1t	-
	Sterility mosaic	Remove affected plants and destroy spray with Dicofol 20 EC @ 2.5 ml/1t after 30 and 45 days sowing Use of sterility mosaic resistant variety ICP-7035	Remove affected plants and destroy spray with Dicofol 20 EC @ 2.5 ml/1t after 30 and 45 days sowing Use of sterility mosaic resistant variety ICP-7035	-
Avare	Pod borer	During flowering dust with Fenvelrate or malathion @ 25 kg /ha	During flowering dust with Fenvelrate or malathion @ 25 kg /ha	-
	Yellow mosaic	Remove affected plants and destroy spray with Dimethoate 1.7 ml / 1t	Remove affected plants and destroy spray with Dimethoate 1.7 ml / 1t	-
Sunflower	Bud necrosis	Spray with Imidachloprid 0.5 – 1.0 ml/1t or oxydemotan methyl 1.5 ml/1t	Spray with Imidachloprid 0.5 – 1.0 ml/1t or oxydemotan methyl 1.5 ml/1t	-
	Leaf eating caterpillar	Hand picking of eggs and larva and destroy. Spray with cypermethrin 1ml/1t	Hand picking of eggs and larva and destroy. Spray with cypermethrin 1ml/1t	-
Arecanut	Kole roga	Remove and burn infected fallen nuts Before initiation of early monsoon spray with 1 bordex mixture or Blitox 0.3 % (3 gm/1t) and after 40-50 days after 1 spray repeat the	Remove and burn infected fallen nuts Before initiation of early monsoon spray with 1 bordex mixture or Blitox 0.3 % (3 gm/1t) and after 40-50 days after 1 spray repeat the spray.	-

		spray.		
	Inflorescence drying	Remove dried inflorescence and destroy spray Dithone M-45 (3 gm/1 t) during inflorescence opening and 20-25 days later.	Remove dried inflorescence and destroy spray Dithone M-45 (3 gm/1 t) during inflorescence opening and 20-25 days later.	-
	Spindle bug	During summer spray monocrotophos (1-3 ml/1 t) or place 5-10 gm carbofuron or phorate inside the centers portion of plant	During summer spray monocrotophos (1-3 ml/1 t) or place 5-10 gm carbofuron or phorate inside the centers portion of plant	-
Coconut	Bud rot	Remove affected bud portion and paste 1 % Bordeaux paste. Spray with 1 % Bordeaux mixture.	Remove affected bud portion and paste 1 % Bordeaux paste. Spray with 1 % Bordeaux mixture.	-
Banana	Leaf spot	Remove and burn affected leaves. Fallow recommended spacing while planting Drain out the excess water Spray with Blitox (3gm/1t) or Hexaconazol (1ml / 1t)	Remove and burn affected leaves. Fallow recommended spacing while planting Drain out the excess water Spray with Blitox (3gm/1t) or Hexaconazol (1ml / 1t)	-
Tomato	Blight	Fallow recommended spacing (3 feet Row to Row x 1 feet plant to plant)	Fallow recommended spacing (3 feet Row to Row x 1 feet plant to plant)	-
		Spray Ridomyl MZ (2 gm / 1t)	Spray Ridomyl MZ (2 gm / 1t)	-

2.3 Floods

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation				
All others except rice	Resowing	Top dressing with 25 ¼ Recommended Fertilizer Dose. Foliar application of NPK and micro nutrients in early stages, for crop recovery from excess moisture.	Draining out water after flood recedes	Draining out water after flood recedes
Rice	No action required Re-sowing in nursery Foliar application of NPK and micro nutrients	No action required Top dressing with 25 ¼ Recommended Fertilizer Dose	No action required	No action required
Horticulture				
Vegetables	Resowing	Top dressing with 25 ¼ Recommended Fertilizer Dose	Draining out water after flood recedes	Draining out water after flood recedes
Continuous submergence for more than 2 days				
All Others except rice	Resowing	Top dressing with 25 ¼ RFD	Draining out water after flood recedes	Draining out water after flood recedes
Rice	resowing / re transplanting	no action required	no action required	no action required
Horticulture				
Vegetables	Resowing	Top dressing with 25 ¼ RFD	Draining out water after flood recedes	Draining out water after flood recedes
Coconut	Raised Nursery bed	Grow cover crops	Open drainage	Harvest at maturity stage
Arecanut	-do-	-do-	-do-	-do-
Sea water intrusion	NA			

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				
All crops	Re-planting	Re-planting if necessary	Re-planting if necessary	protected storage of produce
All vegetables	-do-	-do-	-do-	-do-
Cyclone	NA			

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event	During the event	After the event
Drought	<p>As the district is occasionally prone to drought the following measures to be taken to ameliorate the fodder deficiency</p> <p>Sowing of cereals (Sorghum/Bajra) and leguminous crops (Lucerne, Berseem, Horse gram, Cowpea) during North-East monsoon under dry land system for fodder production.</p> <p>Available sorghum stover, sugarcane tops and groundnut haulms should be properly stored for future use.</p> <p>Encourage silage making with available maize fodder and sugar cane tops in the</p>	<p>Harvest and use biomass of dried up crops (Maize, Paddy, Sorghum, Groundnut, Bajra, green gram, horsegram, balckgram etc.,) material as fodder.</p> <p>Use of unconventional and locally available cheap feed ingredients especially groundnut cake and haulms as protein supplement for livestock during drought</p> <p>Concentrate ingredients such as Grains, brans, chunnies & oilseed cakes, low grade grains etc. unfit for human consumption should be procured from Govt. Godowns for feeding as supplement for high productive animals during drought</p> <p>Continuous supplementation of mineral mixture to prevent infertility</p>	<p>Training/educating farmers for feed & fodder storage.</p> <p>Maintenance / repair of silo pits and feed/fodder stores.</p> <p>Encourage progressive farmers to grow fodder crops of sorghum/bajra/maize(UP chari, MP chari, HC-136, HD-2, GAIN T BAJRA, L-74, K-677, Ananad/African Tall etc., on their own lands & supporting them with assisting infrastructures like seeds, manure.</p> <p>Supply of quality fodder seed (multi cut sorghum/bajra/maize varieties) and fodder slips of Napier, guinea grass well before monsoon</p> <p>Replenish the feed and fodder banks</p>

	<p>villages Collection of groundnut haulms, soya meal waste and groundnut cake for use as feed supplement during drought</p> <p>Chopping of fodder should be made as mandatory in every village through supply and establishment of good quality chaff cutters. Harvesting and collection of perennial vegetation particularly grasses which grow during monsoon Proper drying, bailing and densification of harvested grass from previous season Creation of permanent fodder, feed and fodder seed banks in all drought prone villages</p>	<p>Harvest the tree fodder (Neem, Subabul, Acasia, Pipal etc) and unconventional feeds resources available and use as fodder for livestock (LS). Available feed and fodder should be cut from CPRs and stall fed in order to reduce the energy requirements of the animals Advise the farmers about the practice of mixing available kitchen waste with dry fodder while feeding</p>	
Floods	<p>In case of early forewarning (EFW), harvest all the crops (Maize, Paddy, Sorghum, Groundnut, Bajra, green gram, horsegram, balckgram etc.) that can be useful as fodder in future (store properly) Don't allow the animals for grazing if severe floods are forewarned In flood prone mandals, arrange for storing minimum required quantity of hay (25-50kg) and concentrates (25kgs) per animals in farmer / LS keepers house / shed for feeding animals during floods Keep stock of bleaching powder and lime Carry out Butax spray for control of external parasites Identify the Clinical staff and trained paravets and indent for their services as per schedules</p>	<p>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 Emergency outlet establishment for required medicines or feed in each village Spraying of fly repellants in animal sheds</p>	<p>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 for use as fodder.</p>

	<p>Identify the volunteers who can serve in need of emergency</p> <p>Arrangement for transportation of animals from low lying area to safer places and also for rescue animal health workers to get involve in rescue operations</p> <p>Capacity building and preparedness of the stakeholders and official staff for the unexpected events</p> <p>Capacity building and preparedness of the stakeholders and official staff for the unexpected events</p>		
Cyclone	NA		
Health and Disease management	<p>List out the endemic diseases (species wise) in that district</p> <p>Procure and stock emergency medicines and vaccines for important endemic diseases of the area</p> <p>All the stock must be immunized for endemic diseases of the area</p> <p>Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district</p>	<p>Constitution of Rapid Action Veterinary Force</p> <p>Performing ring vaccination (8 km radius) in case of any outbreak</p> <p>Restricting movement of livestock in case of any epidemic</p> <p>Rescue of sick and injured animals and their treatment</p> <p>Rescue of sick and injured animals and their treatment</p>	<p>Conducting mass animal health camps</p> <p>Conducting fertility camps</p> <p>Mass deworming camps</p>
Drinking water	<p>Identification of water resources</p> <p>Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals)</p>	<p>Restrict wallowing of animals in water bodies/resources</p>	<p>Bleach (0.1%) drinking water / water sources</p> <p>Provide clean drinking water</p>
Insurance	<p>Encouraging insurance of livestock</p>	<p>Listing out the details of the dead animals</p>	<p>Submission for insurance claim and availing insurance benefit</p> <p>Purchase of new productive animals</p>

2.5.2

Poultry

	Suggested contingency measures		
	Before the event	During the event	After the event
Drought			
Shortage of feed ingredients	Storing of house hold grain like maize, broken rice etc, in to use as feed in case of severe drought	Supplementation only for productive birds with house hold grain Supplementation of shell grit (calcium) for laying birds Culling of weak birds	Supplementation to all survived birds
Drinking water		Use water sanitizers or offer cool hygienic drinking water	
Health and disease management	Culling of sick birds. Deworming and vaccination against RD and fowl pox	Mixing of Vit. A,D,E, K and B-complex including vit C in drinking water (5ml in one litre water)	Hygienic and sanitation of poultry house Disposal of dead birds by burning / burying with lime powder in pit
Floods			
Shortage of feed ingredients	In case of early forewarning of floods, shift the birds to safer place Storing of house hold grain like maize, broken rice, bajra etc,	Use stored feed as supplement Don't allow for scavenging Culling of weak birds	Routine practices are followed Deworming and vaccination against RD
Drinking water		Use water sanitizers or offer cool hygienic drinking water	
Health and disease management	In case of EFW, add antibiotic		

	powder (Terramycin/Ampicilline/ Ampiclox etc., 10g in one litre) in drinking water to prevent any disease outbreak	Prevent water logging surrounding the sheds through proper drainage facility Assure supply of electricity by generator or solar energy or biogas Sprinkle lime powder to prevent ammonia accumulation due to dampness	Sanitation of poultry house Treatment of affected birds Disposal of dead birds by burning / burying with lime powder in pit Disposal of poultry manure to prevent protozoal problem Supplementation of coccidiostats in feed Vaccination against RD
Cyclone	NA		
Heat & Cold waves	NA		

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event	During the event	After the event
1) Drought			
A. Capture	NA		
Marine	NA		
Inland			
(i) Shallow water depth due to insufficient rains/inflow	No action	Reduced fishing activity, emergency harvest	Shifting of activity to live reservoirs
(ii) Changes in water quality	No action	No action	No action
(iii) Any other			
B. Aquaculture			

(i) Shallow water in ponds due to insufficient rains/inflow	Deepening of ponds in narrow bottom areas.	Reduced fishing activity, emergency harvest	Shifting of activity to live reservoirs
(ii) Impact of salt load build up in ponds / change in water quality	No action	Reduce feeding intensity	Reduce manuring
(iii) Any other			
2) Floods			
A. Capture	NA		
Marine	NA		
B. Aquaculture			
(i) Inundation with flood water	Mesh gate installation; Strengthen bunds	Drain off excess water; Avoid escape of fishes using mesh gates	Drain off excess water; Emergency harvest
(ii) Water continuation and changes in water quality	No action required	Apply lime to restore pH	Apply lime and manure
(iii) Health and diseases	No action required	Apply lime to restore pH; Observe for any abnormality in fish behaviour and consult nearby dept or KVK official	Apply lime and manure
(iv) Loss of stock and inputs (feed, chemicals etc)	--	Inform fisheries dept	
(v) Infrastructure damage (pumps, aerators, huts etc)	--	Inform fisheries dept	
(vi) Any other			
3. Cyclone / Tsunami	NA		
4. Heat wave and cold wave	NA		