State: ANDHRA PRADESH

Agriculture Contingency Plan for District: YSR KADAPA

Contributors

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State: ANDHRA PRADESH

Agriculture Contingency Plan for District: Y.S.R. District (Kadapa)

1.0 District Agriculture profile					
1.1	**Agro-Climatic/Ecological Zone**				
	Agro Ecological Sub Region (ICAR)	Deccan plateau, hot arid eco sub región (7.1)			
	Agro-Climatic Region (Planning Commission)	Southern plateau and hill region (X)			
	Agro Climatic Zone (NARP)	Southern Zone (AP-3)			
	List all the districts or part thereof falling under the NARP Zone	Chittoor, Nellore, parts of Prakasam and Kadapa			
	Geographic coordinates of district	Latitude		Longitude	Altitude
		13^0 43' & 15^0 14' N		77^0 55' & 79^0 29'	136 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	RARS, Tirupathi-517502			
	Mention the KVK located in the district	DAATT Centre , Utukur, Kadapa (YSR district)-516001			
1.2	**Rainfall**	Normal RF(mm)	Normal Rainy days (no)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	394	26	1st week of June	2nd week of October
	NE Monsoon(Oct-Dec):	251	24	2nd week of October	Last week of December
	Winter (Jan- Feb)	7	1		
	Summer (Mar-May)	48	3		
	Annual	700		-	-

1.3	**Land use pattern of the district** (latest statistics)	**Geographical Area (ha)**	**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)	1535.9	500.3	177.4	9.7	49.6	6.9	224.7	98.9	76.0

1. 4	**Major Soils (common names like shallow red soils etc.,)**	**Area (‘000 ha)**	**Percent (%) of total**
	1. Black soils	206	49
	2. Red soils	155	42
	3. Sand & Saline soils	22	9
1.5	**Agricultural land use**	**Area (‘000 ha)**	**Cropping intensity %**
	Net sown area	313.2	116.5 %
	Area sown more than once	51.8	
	Gross cropped area	365.0	

1.6	**Irrigation**	**Area (‘000 ha)**		
	Net irrigated area	124.3		
	Gross irrigated area	149.8		
	Rainfed area	188.9		
	Sources of Irrigation	**Number**	**Area (‘000 ha)**	**Percentage of total irrigated area**
	Canals	3	23.7	16.1
	Tanks	1874	15.0	10.2
	Open wells	14693		
	Bore wells	39302	108.1	73.3

	Lift irrigation schemes	---		
	Micro-irrigation	--		
	Other sources	---	0.6	0.4
	Total Irrigated Area		147.4	100.0
		--		
	Pump sets	88,905		
	No. of Tractors	23,666		
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of Mandals	(%) area	
	Over exploited	17	17	
	Critical	16	16	
	Semi- critical	29	29	
	Safe	13	13	
	Wastewater availability and use	Nil		
	Ground water quality	Suitable for Irrigation		
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

Area under major field crops & horticulture etc. (2008-09) Actual *sown Area*

1.7		**Major Field Crops cultivated**	**Area ('000 ha)**					
			Kharif		*Rabi*		Summer	Total
			Irrigated	*Rainfed*	*Irrigated*	*Rainfed*		
	1	Groundnut		124.4	16.6	---	---	141.0
	2	Sunflower		5.7	---	87.8	---	93.5
	3	Bengal gram	---	---	--	72.0	--	72.0
	4	**Rice**	50.2	--	14.9	--	---	65.1
	5	Coriander		---	--	16.5	--	16.5
	6	Cotton		11.4	---	0.02	--	11.4

	7	Redgram		10.5	---	---	--	10.5
	8	Sesame				6.5		6.5
		Horticulture crops - Fruits	**Total area**					
	1	Mango	19.02					
	2	Orange & Batavian	6.79					
	3	Banana	3.82					
	4	Lemon	3.13					
	5	Papaya	3.03					
		Horticultural crops - Vegetables	**Total area**					
	1	Chillies	8.42					
	2	Onion	2.60					
	3	Tomato	2.58					
		Medicinal and Aromatic crops	**Total area**					
	1	Coriander	8.08					
		Fodder crops	**Total area**		**Irrigated**		**Rainfed**	
	1							
	2							
	3							
	4							
	5							
		Total fodder crop area	1250 ha		1250 ha		----	
		Grazing land	---		---		-----	
		Sericulture etc	240 ha		240 ha		----	
		Others (Specify)	----		----		----	

1.8	**Livestock**	**Male (number)**	**Female (number)**	**Total (number)**
	Non descriptive Cattle (local low yielding)	154.3	201.4	355.7
	Crossbred cattle	91.6	656.9	748.5
	Non descriptive Buffaloes (local low yielding)	21.9	117.8	139.7
	Graded Buffaloes			
	Goat			490.9

	Sheep			1116.6
	Others (Camel, Pig, Yak etc.)			11.93
	Commercial dairy farms (Number)			
1.9	**Poultry**	**No. of farms**	**Total No. of birds (number)**	
	Commercial		214150	
	Backyard		1418692	

1.10	**Fisheries** (Data source: Chief Planning Officer)						
	A. Capture						
	i) Marine (Data Source: Fisheries Department)	**No. of fishermen**	**Boats**		**Nets**		**Storage facilites (Ice plants etc.)**
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
		20016	nil				
	ii) Inland (Data Source: Fisheries Department)	**No. Farmer owned ponds**		**No. of Reservoirs**		**No. of village tanks**	
		17		-			
	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)	16		-			
	Others					0.5	

1.11	**Production and Productivity**	**Kharif**	**Rabi**	**Summer**	**Total**	**Crop residue as**

	of major crops (Average of last 5 years: 2004,05,06, 07, 08)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	**fodder** ('000 tons)
Major Field crops (Crops to be identified based on total acreage)										
1	Rice	175	3340	34.6	2560		---	209.6	2950	---
2	Groundnut	26.6	240	28.7	1750		---	55.3	995	---
3	Sunflower	3.6	1217	42.1	480		---	45.7	848.5	---
4	Bengal gram	--	---	54.01	750		---	54.01	750	---
Major Horticultural crops (Crops to be identified based on total acreage)										
Fruits										
1	Mango							157.4	8267	
2	Orange & Batavian							90.7	13300	
3	Banana							115.8	30000	
4	Lemon							45.5	14667	
5	Papaya							238.8	78667	
vegetables										
1	Chillies							2.8	3264	
2	Onion							44.3	17000	
3	Tomato							49.0	19000	
Spices and Plantation crops										
1	Coriander							9.7	800	

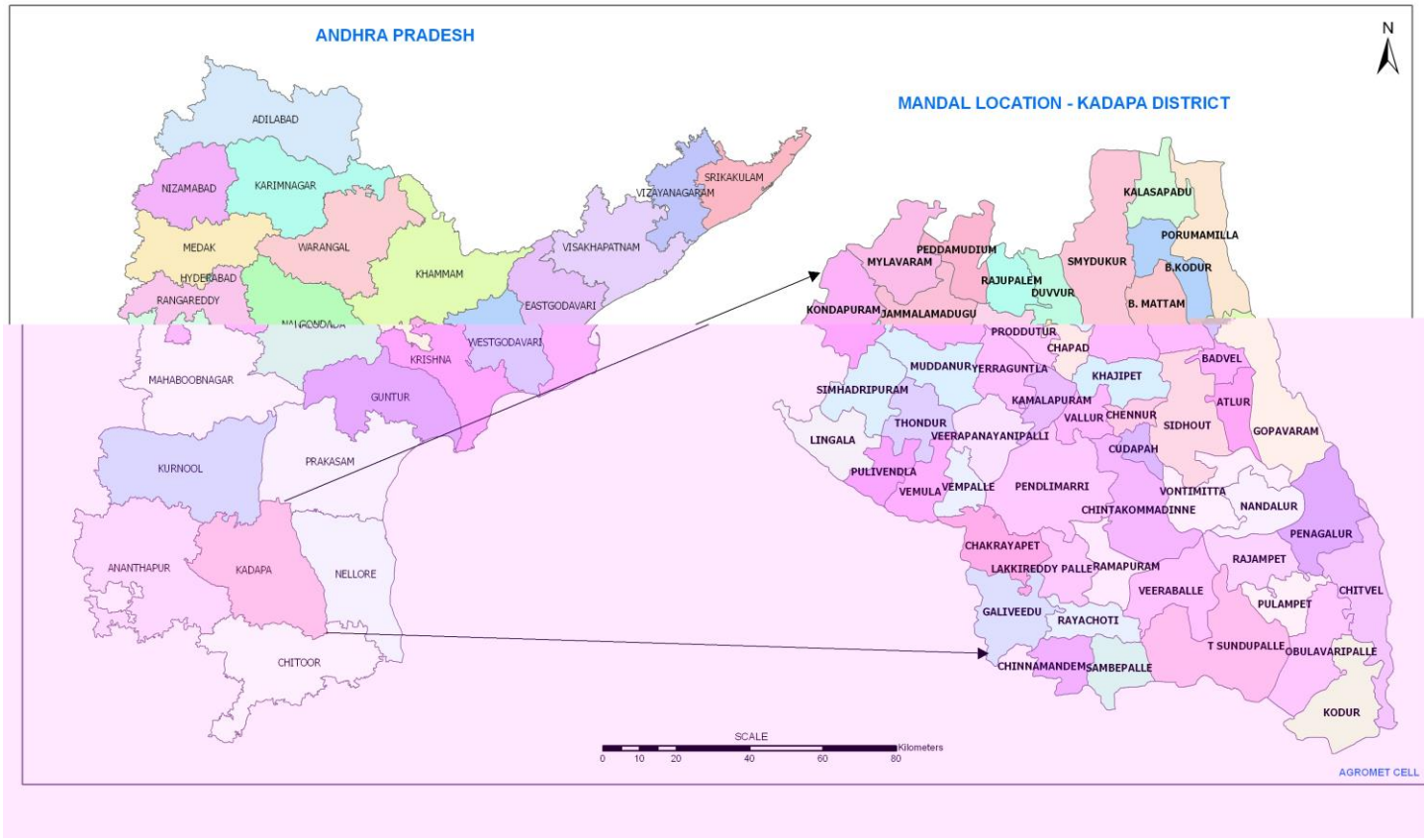
1.12	**Sowing window for 5 major field crops (start and end of normal sowing period)**	Groundnut	Paddy	Cotton	Bengal gram	Sun flower
	Kharif- Rainfed	1st June – 31st July		June -- July	Nov - Jan	
	Kharif-Irrigated		June - August		----	
	Rabi- Rainfed	---	---	---	----	

	Rabi-Irrigated	Nov - Dec	Nov - Jan			

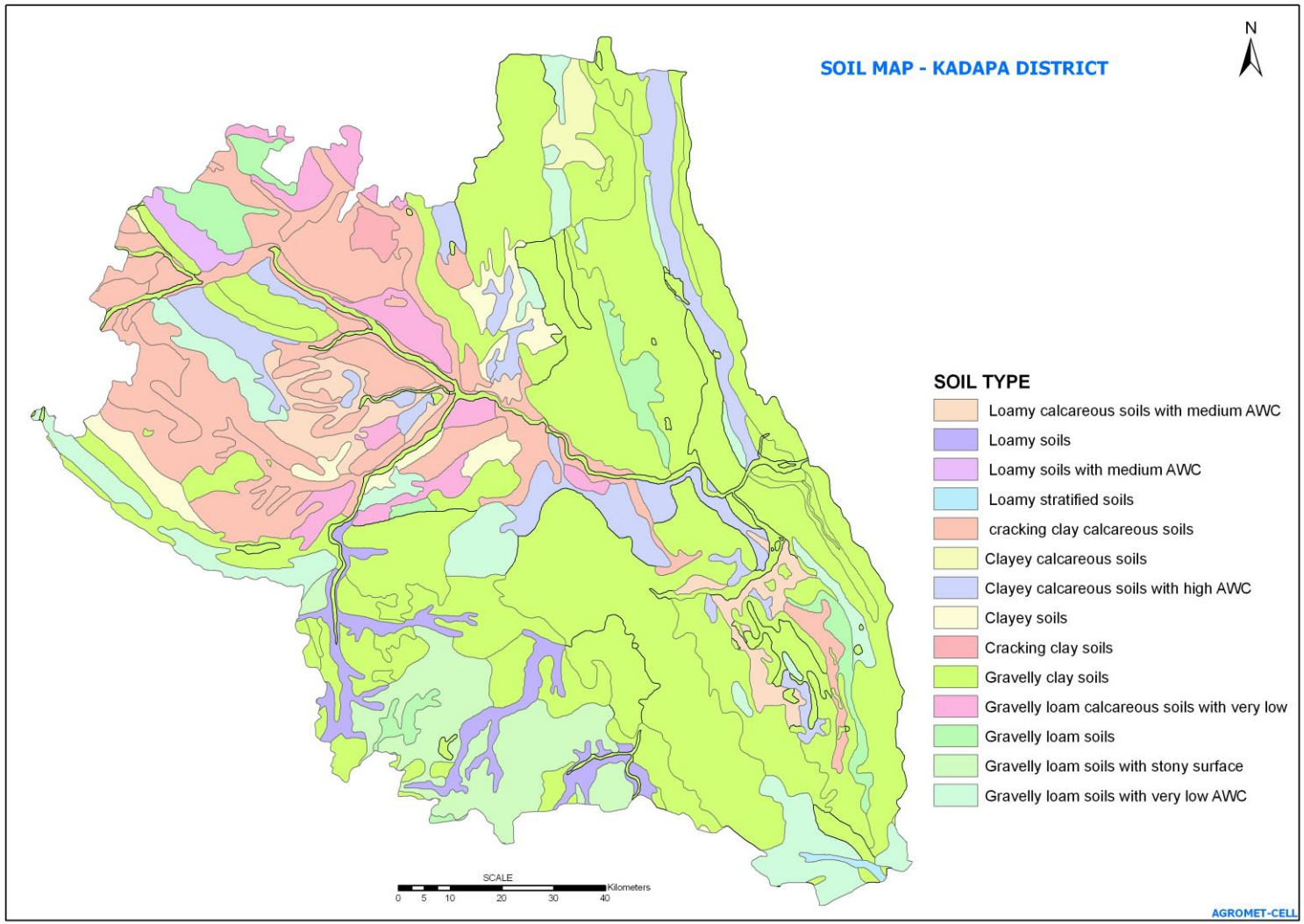
1.13	**What is the major contingency the district is prone to? (Tick mark and mention years if known during the last 10 year period)**	Regular		
		Regular	occasional	None
	Drought	✓		
	Flood			✓
	Cyclone			✓
	Hail storm			✓
	Heat wave			✓
	Cold wave			✓
	Frost			✓
	Sea water intrusion			✓
	Pests and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

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

KADAPA DISTRICT INDEX MAP




MANDAL WISE - NORMAL RAINFALL (mm)
KADAPA DISTRICT
N
KALASAPADU 889.7
PORUMAMILLA 909.2
B.KODUR 687.2
SMYDUKUR 719.7
MYLAVARAM 625.9
PEDDAMUDIUM 581.4
RAJUPALEM 700.5
DUVVUR 704.2
B. MATTAM 753
KONDAPURAM 572
JAMMALAMADUGU 667
PRODDUTUR 643.2
CHAPAD 680.9
BADVEL 866.2
MUDDANUR 545.9
YERRAGUNTLA 647.2
KHAJIPET 732.6
SIMHADRIPURAM 643.2
KAMALAPURAM 663.9
ATLUR 694
GOPAVARAM 827.1
THONDUR 624.3
VALLUR 710.2
CHENNUR 688.6
SIDHOUT 749
LINGALA 606.3
VEERAPANAYANIPALLI 582.9
CUDAPAH 723.3
PULIVENDLA 618.4
VEMULA 501.6
VEMPALLE 673.8
PENDLIMARRI 675.3
VONTIMITTA 572.4
NANDALUR 741.5
PENAGALUR 782.8
CHINTAKOMMADINNE 589.9
CHAKRAYAPET 668.9
RAJAMPET 795.2
LAKKIREDDY PALLE 658.5
RAMAPURAM 604.9
CHITVEL 924.1
VEERABALLE 613.4
PULAMPET 764.3
GALIVEEDU 728.9
RAYACHOTI 603.5
T SUNDUPALLE 777.5
OBULAVARIPALLE 846.4
CHINNAMANDEM 651.5
SAMBEPALLE 625.8
KODUR 926.5
SCALE
Kilometers
0 5 10 20 30 40
AGROMET CELL


SOIL MAP - KADAPA DISTRICT
N
SOIL TYPE
Loamy calcareous soils with medium AWC
Loamy soils
Loamy soils with medium AWC
Loamy stratified soils
cracking clay calcareous soils
Clayey calcareous soils
Clayey calcareous soils with high AWC
Clayey soils
Cracking clay soils
Gravelly clay soils
Gravelly loam calcareous soils with very low
Gravelly loam soils
Gravelly loam soils with stony surface
Gravelly loam soils with very low AWC
SCALE
0 5 10 20 30 40 Kilometers
AGROMET-CELL

2.0 Strategies for weather related contingencies

Rainfall distribution pattern in Southern zone districts during *Kharif* & Rabi

Month	Normal rainfall (mm)	Actual Rainfall (mm)									
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
January	2.2	0	0	1.6	0.0	0.0	2.2	11.9	1.0	0.0	10.1	
February	1.2	0	2.7	0	29.4	0.0	0.1	0.1	0.0	1.4	0.6	
March	3.7	31.8	3.4	0.1	7.8	3.8	7.4	0.7	0.0	40.0	0.2	
April	11.2	2.8	19.1	31.6	8.9	4.5	60.2	0.1	0.0	12.4	16.0	
May	36.7	45.3	36.2	27.6	22.7	16.4	17.2	33.6	4.0	20.2	9.5	
June	69.2	39.1	20.9	37.6	41.8	60.9	40.6	62.3	119.9	87.1	31.9	
July	96.7	116	138	117	125.0	85.2	34.8	31.5	115.9	46.3	21.5	
August	114.0	99.4	10.4	168	88.2	122.7	70.0	128.3	52.1	188.9	58.1	
September	113.7	76	169	52	37.1	177.7	65.6	124.5	107.6	163.1	90.8	
October	131.9	302	64.4	114	76.5	208.5	65.5	78.1	13.9	177.8	31.4	
November	93.4	101	30.1	92	75.4	27.5	32.4	323.5	3.4	28.6	29.6	
December	25.7	60.7	0	23.8	57.7	1.5	13.8	27.0	26.4	0.0	4.2	

Coverage of crops and Productivity levels in Southern zone districts during *Kharif* 2018

S. No.	Name of the crop	Normal area (ha)	Actual area (ha)	Production (tonnes)	Productivity (kg/ha)
1	Rice	37521	39041	171546	4394
2	Jowar	4821	533	774	1452
3	Bajra	3159	845	1744	2064
4	Maize	609	665	2328	3500
5	Ragi	15	10	10	1000
6	Small millets		114	70	616
7	Horsegram	1056	222	0	0
8	Greengram	1208	32	39	1232

9	Black gram	1948	46	23	507
10	Redgram	8979	4178	531	127
11	Cowpea & other pulse crops	1099	185	65	350
13	Sugarcane	396	402	31677	78799
14	Cotton	28901	10940	8402	768
15	Groundnut	32803	8627	8420	976
16	Sesame	208	379	405	1068
17	Sunflower	934	28	13	450
18.	Castor	831	412	630	1528
19.	Soybean & Other Oil seeds		432	432	1000

Coverage of crops and Productivity levels in Southern zone districts during *Rabi* 2018-19

S. No.	Name of the crop	Normal area (ha)	Actual area (ha)	Production (tonnes)	Productivity (kg/ha)
1	Rice	13312	6799	29665	4363
2	Jowar	9740	16701	23812	1426
3	Bajra	2372	1,011	1730	1711
4	Maize	2693	3545	17141	4835
5	Ragi	122	91	140	1544
6	Small millets	415	142	117	827
7	Horsegram	2487	6,948	3273	471
8	Greengram	3634	1,954	1421	727
9	Black gram	7149	2,454	2252	918
10	Redgram	50	121	135	1118
11	Cowpea & other pulse crops	714	1,381	699	506
12	Bengal gram	84719	101,525	86398	851
13	Sugarcane	214	80	0	0
14	Cotton	944	677	508	750
15	Groundnut	16657	11,113	23631	2126
16	Sesame	7474	5,219	2528	484
17	Sunflower	12078	4,265	4066	953
18	Castor	13	230	142	617
19	Soybean & Other Oil seeds		75	54	726

Source wise irrigation particulars

S. No	Source of Irrigation	YSR kadapa (ha)
1.	Canals	30,571

2.	Tanks	7524
3.	Tube wells	1,45,573
4.	Dug wells	6,030
5.	Other	88
6.	Lift Irrigation	554
	Total	1,90,340

Sowing window for major crops grown in Southern zone districts during *Kharif* & Rabi

Sl. No.	**Name of the Crop**	**Sowing window**	
		Kharif	**Rabi**
1	Rice	15th July to 15th September	15th October to 15 th November
2	Jowar	1st week of June to 2nd week of July,	II FN September to October end.
3	Bajra	Complete sowing by 15th July	September, October
4	Maize	15th June to 15th July	15th October to 15th November
5	Horsegram		
6	Greengram	15th June to 15th July	I FN October
7	Black gram	15th June to 15th July	I FN October
8	Redgram	15th June to August	20th September to 20th October
9	Cowpea		
10	Sugarcane	**Early varieties:** December – January **Mid varieties :** February **Late varieties** : March	
11	Cotton		
12	Groundnut	II FN June to first week of August (Best time I FN July)	November – December (I FN of December)
13	Sesame		II FN January
14	Sunflower	II FN June – IIFN July	September to I FN October (Rainfed) November (irrigated) 15th January to first week of February
15	Castor	15th June to 15th July	First week of October,

2.1 Drought

2.1.1 Rainfed situation

Rainfed situation
Condition 1

Early season drought (delayed onset)	Soil type and farming situation	Cropping system	**Change in crop/cropping system**	Varieties	**Agronomic measures**
Delay by 2 weeks (June 3rd week)	Rainfed red soils (30 cm depth)	Sole Groundnut	Groundnut + Redgram (7:1 or 11:1)	**Groundnut**:- Narayani , Dharani, K-6, K-9 , TAG-24, Kadiri Anatha, Kadiri Harithandra, Dheeraj, Nitya Haritha, ICGV 91114 **Redgram:** **Medium Duration:** LRG 52, LRG 41, LRG 38, LRG 30, ICPL 332, ICP 8863, ICPL 87119, ICPL 85063, TRG 22 **Short duration:** ICPL 84031 (Dhurga), ICPL 85010, **Wilt resistant :** ICP 8863 and ICPL 87119 **SMD Resistant:** ICPL 87119, BSMR 736 and BSMR 853, **Cotton: Desi cotton varieties:** Aravinda, Srinandi (NDLA-2463), Yaganti (NDLA-2933) **American Cotton Varieties:** Kanchana (LPS 141), LK-861, L-839, L-603, L-604, Narasimha (NA-1325), Sivanandi (NDLH-1755), NDLH-1938, MCUS VT, LRA-5166, and LRK-516 **Intra-specific Cotton Hybrids:** LAHH-1, LAHH-4, LAHH-5, Lam Cotton Hybrid-7, NDLHH-390, NDLHH-240, and Orugallu Krishna (WGHH-2), NHH-44, JKHyI, Savitha, H-6, H-8, anH-10	Border crop with Maize/ Jowar
		Groundnut + Redgram (7:1 or 11:1)	No change		-
	Rainfed red soils (30-50 cm)	Sole Groundnut	Groundnut + Redgram (7:1 or 11:1)		Border crop with Maize/ Jowar
		Cotton	No change		-
	Rainfed Black soils (> 50 cm) (silty clay, sandy clay and clayey)	Sole Groundnut	Groundnut+ Redgram (7:1 or 11:1)		Border crop with Maize/ Jowar
		Cotton	No change		

Early season drought (delayed onset)	Soil type and farming situation	Cropping system	**Change in crop/cropping system**	Varieties	**Agronomic measures**
Delay by 4 weeks (July 1st week)	Rainfed red soils (upto 30 cm)	Sole Groundnut	Groundnut + Redgram (7:1 or 11:1)	**<u>Groundnut</u>:-** Narayani , Dharani, K-6, K-9 , TAG-24, Kadiri Anatha, Kadiri Harithandra, Dheeraj, Nitya Haritha, ICGV 91114 **<u>Redgram:</u>** **Medium Duration:** LRG 52, LRG 41, LRG 38, LRG 30, ICPL 332, ICP 8863, ICPL 87119, ICPL 85063, TRG 22 **Short duration:** ICPL 84031 (Dhurga), ICPL 85010, **Wilt resistant :** ICP 8863 and ICPL 87119 **SMD Resistant:** ICPL 87119, BSMR 736 and BSMR 853, **Cotton:** **Desi cotton varieties:** Aravinda, Srinandi (NDLA-2463), Yaganti (NDLA-2933) **American Cotton Varieties:** Kanchana (LPS 141), LK-861, L-839, L-603, L-604, Narasimha (NA-1325), Sivanandi (NDLH-1755), NDLH-1938, MCUS VT, LRA-5166, and LRK-516 **Intra-specific Cotton Hybrids:** LAHH-1, LAHH-4, LAHH-5, Lam Cotton Hybrid-7, NDLHH-390, NDLHH-240, Orugallu Krishna (WGHH-2), NHH-44, JKHyI, Savitha, H-6, H-8, anH-10 **Sunflower:-** Hybrids – NDSH 1012 (Prabhath), DRSF-113, KBSH- 44, NDSH-1, LSFH 171, DRSH-1 **Castor:-** PCH-222, PCH-111, DCH-519, DCH-177(Deepak), DCH-32(Deepthi), GCH-4(SHB-18), PCS-262(Pragathi), Jwala(48-1), Kiran(PCS-136), Haritha (PCS-124, Kranthi (PCS-4), Jyothi (DCS-9)	
		Groundnut + Redgram (7:1)	No change,		
		Groundnut + Castor (7:1)	No change		
	Rainfed red soils (30-50 cm)	Sole Groundnut	Groundnut + Redgram (7:1 or 11:1)		
		Cotton	No change		
		Redgram	No change		
	Rainfed Black soils (> 50 cm) (silty clay, sandy clay and clayey)	Sole Groundnut	Groundnut + Redgram (7:1 or 11:1)		
		Cotton	No change		
		Sunflower			
		Redgram			

Early season drought (delayed onset)	Soil type and farming situation	Cropping system	Change in crop/cropping system	Varieties	Agronomic measures
Delay by 6 weeks (July 3rd week)	Rainfed red soils (upto 30 cm)	Sole Groundnut	Groundnut + Redgram (7:1 or 11:1)	**<u>Groundnut</u>:-** Narayani , Dharani, , Kadiri Anatha, ICGV 91114 **<u>Redgram:</u>** **Medium Duration:** LRG 52, LRG 41, LRG 38, LRG 30, ICPL 332, ICP 8863, ICPL 87119, ICPL 85063, TRG 22 **Short duration:** ICPL 84031 (Dhurga), ICPL 85010, **Wilt resistant :** ICP 8863 and ICPL 87119 **SMD Resistant:** ICPL 87119, BSMR 736 and BSMR 853, **Cotton:** **Desi cotton varieties:** Aravinda, Srinandi (NDLA-2463), Yaganti (NDLA-2933) **American Cotton Varieties:** Kanchana (LPS 141), LK-861, L-839, L-603, L-604, Narasimha (NA-1325), Sivanandi (NDLH-1755), NDLH-1938, MCUS VT, LRA-5166, and LRK-516 **Intra-specific Cotton Hybrids:** LAHH-1, LAHH-4, LAHH-5, Lam Cotton Hybrid-7, NDLHH-390, NDLHH-240, Orugallu Krishna (WGHH-2), NHH-44, JKHyI, Savitha, H-6, H-8, & H-10 **Sunflower:-** Hybrids – NDSH 1012 (prabhath), DRSF-113, KBSH- 44, NDSH-1, LSFH 171, DRSH-1	Create weed free situation
		Groundnut + Redgram	No change		
	Rainfed red soils (30-50 cm)	Sole Groundnut	Groundnut + Redgram (7:1 or 11:1)		Create weed free situation
		Cotton	No change		
	Rainfed Black soils (> 50 cm) (silty clay, sandy clay and clayey)	Sole Groundnut	Groundnut + Redgram (7:1 or 11:1)		Create weed free situation
		Cotton	No change		
		Sunflower			

Early season drought (delayed onset)	Soil type and farming situation	Cropping system	**Change in crop/cropping system**	Varieties	**Agronomic measures**
Delay by 8 weeks (August 1st week)	Rainfed red soils (upto 30 cm)	Sole Groundnut	Sole Redgram Field bean Tomato Maize Sunflower	**Redgram:** **Medium Duration:** LRG 52, LRG 41, LRG 38, LRG 30, ICPL 332, ICP 8863, ICPL 87119, ICPL 85063, TRG 22 **Short duration:** ICPL 84031 (Dhurga), ICPL 85010, **Wilt resistant :** ICP 8863 and ICPL 87119 **SMD Resistant:** ICPL 87119, BSMR 736 and BSMR 853, **Castor:-** PCH-222, PCH-111, DCH-519, DCH-177(Deepak), DCH-32(Deepthi), GCH-4(SHB-18), PCS-262(Pragathi), Jwala(48-1), Kiran(PCS-136), Haritha (PCS-124, Kranthi (PCS-4), Jyothi (DCS-9), DCS 107. **Foxtail millet:** Sri Lakshmi, Surya Nandi, SiA 3085 and SiA 3156 **Field bean:-** TFB-1, TFB -2 **Maize:-** **Short duration:** DHM 115, Pioneer 3342, KH 5991, DKC 7074R, JKMH 1701, MMH 133, Bio605 and Sun Vamana **Sweet corn:** Sugar 75, Bright Gene **Sorghum:-** PSV-1, Palem-2, CSV-10, CSV-11, CSV-13, CSV-1, Srisaila(PSV 56), N-15 and NTJ-5, Hybrids: CSH-10, CSH-11, CSH-14, CSH-16, CSH-18, CSH-21, CSH-23, CSH-25, CSH-30, PSH-1 **Single Cut :** CSH 24 MF & .Pant Chari - 6 6. **Multicut :** SSG 59-3 & SSG 898 **Multicut :** Co FS 29 (Perennial) **Sunflower:-** Hybrids – NDSH 1012, DRSF-113, KBSH- 44, NDSH-	Protective irrigation at critical stages. Add groundnut shells @ 5T/ ha Short duration variety of groundnut i.e Greeshma, Narayani
			Sole castor		
			Foxtail millet – Bengal gram (*Rabi*)		
		Groundnut + Redgram	Sole Redgram 60X20 cm		Sole Redgram
	Rain fed red soils (30-50 cm)	Sole Groundnut	Sunflower		As above
		Cotton	Sunflower		
			Tomato		
	Rain fed Black soils (> 50 cm) (silty clay, sandy clay and clayey)	Sole Groundnut	Sorghum / Sunflower		Apply FYM @ 10 t/ acre
		Cotton	Sorghum / Sunflower		
		Fallow - Sunflower (Sept-Oct)	No change		
		Fallow – Chickpea (Oct - Nov)	No change		

				1, LSFH 171, DRSH-1	

Condition 2

Early season drought (Normal onset)	**Soil type and farming situation**	**Cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**
Normal onset followed by 15-20 days dry spell after sowing	Rainfed red soils (upto 30 cm)	Sole Groundnut	Groundnut + Redgram (7:1 or 11:1)	Weed free condition to be maintained through inter cultivation.
		Groundnut + Redgram 7:1 ratio	No change	**Weed free condition to be maintained through inter cultivation.**
	Rainfed red soils (30-50 cm)	Sole Groundnut	Groundnut + Redgram (7:1 or 11:1)	Weed free condition to be maintained through inter cultivation.
		Cotton	-	Soil mulch
		Sunflower		Soil mulch
	Rain fed Black soils (> 50 cm) (silty clay, sandy clay and clayey)	Sole Groundnut	Groundnut + Redgram (7:1 or 11:1)	Weed free condition to be maintained through inter cultivation.
		Cotton	Gap filling	Soil mulch
		Sunflower	-	Soil mulch

Condition 3

Mid season drought (long dry spell, consecutive 2 weeks rainless period)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measues
At vegetative stage	Rainfed red soils (upto 30 cm)	Sole Groundnut	Protect against thrips which transmit bud necrosis and peanut stem necrosis disease with chemical spraying or neem oil 0.3 % spray.	Soil mulch, weed free situation,
		Groundnut + Redgram 7:1 ratio	-	
	Rainfed red soils (30-50 cm)	Sole Groundnut		
		Cotton	Protect against Jassids and other sucking pests with neem oil 0.3 % or chemical spraying	Supplemental irrigation of 20 mm for sunflower & cotton at 10-15 days interval.
		Sunflower		
	Rainfed Black soils (> 50 cm) (Silty clay, sandy clay and clayey)	Sole Groundnut		-do-
		Cotton		

Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At reproductive stage	Rainfed red soils (upto 30 cm)	Sole Groundnut	2 % Urea spraying at 15 days interval	Protective irrigation if possible	
		Groundnut + Redgram 7:1 ratio	Supplemental irrigation of 20mm at critical stages. **Groundnut**- pod development and maturity stage		
	Rainfed red soils (30-50 cm)	Sole Groundnut			
		Cotton			
		Sunflower			

	Rainfed Black soils (> 50 cm) (silty clay, sandy clay and clayey)	Sole Groundnut Cotton Sunflower	**Cotton**- flowering and boll development stages **Sunflower**- flowering and seed formation.		

Condition 4

Terminal drought	**Major Farming situation**	**Normal Crop/ cropping system**	**Crop management**	***Rabi* Crop planning**	**Remarks on Implementation**
	Rainfed red soils (upto 30 cm)	Sole Groundnut	Supplemental irrigation	Horsegram (CRHG 9, VZM-1, Palem-1 & 2)	Supplemental irrigation of 20 mm with harvested rain water through sprinklers to groundnut, Redgram, Cotton, Sunflower and Bengal gram at critical stages
		Groundnut + Redgram 7:1 ratio	-do-	Horsegram (CRHG 9, VZM-1, Palem-1 & 2)	
	Rainfed red soils (30-50 cm)	Sole Ground nut		Sunflower / Bengal gram **Bengal gram:-** **Desi:** Nandyal Gram 49(NBeG 49), Dheera (NBEG 47), Nandyala Sanagal (NBeG3), JG 11 and JAKI 9218 **Kabuli:** Nandyal Gram 119(NBeG 119), KAK 2, Vihar (Phule G 95311) and LBeG 7 (Lam sanaga), MNK 1 (Extra large seeded kabuli) and Kripa **Sunflower:-** Hybrids – NDSH 1012, DRSF-113, KBSH- 44, NDSH-1, LSFH 171, DRSH-1	
		Cotton		-	
		Sunflower		Bengal gram/ Coriander	
	Rainfed Black soils (> 50 cm) (Silty clay, sandy clay and clayey)	Sole Groundnut		Bengal gram/ Coriander	
		Cotton		-	
		Sunflower		Coriander	

Irrigated situation

Condition	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Delayed release of water in canals	K.C canal fed black soils	Rice	Green manure crop as preceding crop (Dhaincha, Pillipesara) Rice short duration varieties (Swathi (125 days), Swarnamukhi (135 days), Sravani (120 days)	
	Bramham sagar fed clay loams	Rice	**Prefer medium/short duration varieties**: Swathi, Swetha, Satya, Varalu, Sri Satya, Deepti, BPT-5204, JGL-384, JGL 17004 (Prathyumma), Chandra, NLR-34449, NDLR-7, 8, Vijetha, ADT-37, Swarna mukhi, Sravani, Somasila, NLR-33636, NLR-33671,Swarnamukhi, NLR 34449, MTU-1010, NLR 40024, MTU 1156, MTU 1153 .	Dry direct drill sown paddy Drum seed paddy Alternate wetting and drying method of irrigation
Limited release of water in canals	K.C canal fed black soils	Rice	**Sorghum:-** PSV-1, Palem-2, CSV-10, CSV-11, CSV-13, CSV-1, Srisaila(PSV 56), N-15 and NTJ-5, Hybrids: CSH-10, CSH-11, CSH-14, CSH-16, CSH-18, CSH-21, CSH-23, CSH-25, CSH-30, PSH-1 **Single Cut :** CSH 24 MF & Pant Chari 6. **Multicut :** SSG 59-3 & SSG 898 **Multicut :** Co FS 29 (Perennial) **Sunflower:-** Hybrids – NDSH 1012, DRSF-113, KBSH- 44, NDSH-1, LSFH 171, DRSH-1 **Greengram:** - LGG-450, LGG-460, TM96-2 WGG42, IPM 2-14.	Irrigation at critical stages Sorghum (flowering & grain formation), Sunflower (bud initiation, flowering & seed formation), Greengram (flowering & seed development)
	Bramham sagar fed clay loams	Rice		

Condition	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Non release of water in canals	K.C canal fed black soils	Rice	Sorghum Field bean (TFB1, TFB 2) Greengram /Sorghum (fodder)	
	Braham sagar fed clay loams	Rice	Sorghum Field bean (TFB-1, TFB 2) Greengram Bengal gram,	

Condition	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Lack of inflows into tanks	Black soils	Rice	Sorghum Greengram, Cowpea Field bean, Horsegram	--

Condition	Major Farming situation	Normal Crop/ cropping system	Change in crop/cropping system	Agronomic measures
Insufficient groundwater recharge due to low rainfall	Red soils-Tube well irrigation	Rice	Groundnut	Micro Irrigation through sprinklers
	Alluvial soils	Rice	Sunflower Groundnut	Micro irrigation with drip / Sprinklers
Any other condition (specify)	Problematic soils	Rice	Salt tolerant Varieties NLR 145 (135 days), NLR 33641 (150 days)	Soil reclamation methods (gypsum application, FYM application, Green manure crop etc)

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**
Groundnut	provide drainage facility	Induced Iron deficiency management – FeSO4- 2 g/l	drainage facility	Shifting of produce to safer place
Rice	Blast – Tricyclozole @ 0.6 g/l Leaf folder – Cartaphydrochloride @ 2g/l	Provide drainage facility Blast – Isoprothiolane @ 1.5 ml/l	Neck blast – Kasugamycin 2.5 ml/l Provide drainage facility	5% salt solution application to prevent insitu germination
Chickpea	Provide drainage facility	Provide drainage facility	Provide drainage facility	Shifting of produce to safer place
Sunflower	Provide drainage facility	Provide drainage	Provide drainage	Shifting of

		facility	facility	produce to safer place
Cotton	Provide drainage facility Apply booster dose of N & K	Provide drainage facility Black arm – COC @ 30 g + Streptomycin @ 1g/10L	Provide drainage facility	Shifting of produce to safer place
Horticulture				
Mango	• Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times. • Wind damaged branches should be pruned using disinfected secatures and cut ends must be smeared with Bordeaux paste	• Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times.	• Drain the excess water as soon as possible • Harvest the mature produce in a clear sunny day'	• Store the fruits in well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible.
Orange & Batavian	• Drain the excess water as soon as possible. • Spray 1% KNO3 or Urea 2% solution 2-3 times. • Foliar spray of micronutrient mixture is also to be taken up. • Sand casting around the tree trunks should be removed up to the collar region of the tree to prevent fungal infections. • If the tree age is above eight years a booster dose of 500 g of Urea and 750 g	• Drain the excess water as soon as possible. • Spray 1% KNO3 or Urea 2% solution 2-3 times. • Foliar spray of micronutrient mixture is also to be taken up. • Sand casting around the tree	• Drain the excess water as soon as possible. • Harvest the mature fruits in a clear sunny day. .	• Store the fruits in well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible.

	MOP per tree should be applied. • Wind damaged branches should be pruned using disinfected secatures and cut ends must be smeared with Bordeaux paste	trunks should be removed up to the collar region of the tree to prevent fungal infections. • If the tree age is above eight years a booster dose of 500 g of Urea and 750 g MOP per tree should be applied.		
Banana	• Drain the excess water as soon as possible • Inter-cultivate the soil with gorru for aeration. • Spray 0.5 % KNO3 or Urea 2% solution 2-3 times. • Topdressing of booster dose of 80 g MOP + 100 g Urea per plant at two to three times intervals. • Gap filling may be taken up if the plants are two weeks old and sowing window is still available for the crop. • If the age of the plant is less than three months and submergence up to three feet better to replant the garden. • Wind damaged branches should be pruned using disinfected secatures and cut ends must be smeared with Bordeaux paste	• Drain the excess water as soon as possible • Spray 0.5 % KNO3 or Urea 2% solution 2-3 times. • Topdressing of booster dose of 80 g MOP + 100 g Urea per plant at two to three times intervals. • If the age the plant is more than three months and less than seven months allow one sword sucker for ratoon and take up	• Drain the excess water as soon as possible • Harvest the marketable bunches in a clear sunny day. • Spray 0.5 % KNO3 or Urea 2% solution 2-3 times for quick development of immature bunches. • Staking with bamboos to prevent further lodging.	• Use ripening chambers for quick ripening • Market the produce as soon as possible.

		fertilization at monthly intervals for four months. • Staking with bamboos to prevent further lodging.		
Lemon	• Drain the excess water as soon as possible. • Spray 1% KNO3 or Urea 2% solution 2-3 times. • Foliar spray of micronutrient mixture is also to be taken up. • Sand casting around the tree trunks should be removed up to the collar region of the tree to prevent fungal infections. • If the tree age is above eight years a booster dose of 500 g of Urea and 750 g MOP per tree should be applied. • Wind damaged branches should be pruned using disinfected secatures and cut ends must be smeared with Bordeaux paste	• Drain the excess water as soon as possible. • Spray 1% KNO3 or Urea 2% solution 2-3 times. • Foliar spray of micronutrient mixture is also to be taken up. • Sand casting around the tree trunks should be removed up to the collar region of the tree to prevent fungal infections. • If the tree age is above eight years a booster dose of 500 g of Urea and 750 g MOP per tree should be applied.	• Drain the excess water as soon as possible. • Harvest the mature fruits in a clear sunny day. .	• Store the fruits in well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible.
Papaya	• Drain out the excess water • out break of any sucking past should be controlled using systemic insecticides • Water logging near trunk should be prevented	• Drain out the excess water • out break of any sucking pest should be controlled using	• Drain out the excess water • Harvest the marketable fruits in a clear sunny day	• Store the fruits in well ventilated place temporarily

	• Wind damaged branches should be pruned using disinfected secatures and cut ends must be smeared with Bordeaux paste	systemic insecticides • Water logging near trunk should be prevented	• out break of any sucking pests should be controlled by using systemic insecticides • Water logging near trunk should be prevented • Micronutrient deficiencies should be corrected by foliar sprays of Fe, Mg, Zn, Bo and Mn	before it can be marketed. • Market the fruits as soon as possible.
Horticulture crops vegetables				
Chillies	• Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible. • Gap filling may be taken up if the plants are two weeks old and sowing window is still available for the crop. • In case of severe damage (considered as complete economical loss), and the contingency period is between June to August, sowing of best alternative crop must be taken up.	• Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible.	• Drain the excess water as soon as possible • Harvest the matured fruits in a clear sunny day.	• Dry the pods on concrete floor immediately after the appearance of sunlight (or). • Use poly house solar driers for quick drying • Grade the pods and market as soon as possible. • Do not store such produce for long periods.

Onion	• Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times.	• Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 10 kg MOP + 30 kg Urea per acre as soon as possible.	• Drain the excess water as soon as possible • Harvest the mature produce in a clear sunny day	• Dry the harvested onions in thin layers under shade in well ventilated places • Store the produce in well ventilated place temporarily before it can be marketed. • Market the produce as soon as possible.
Tomato	• Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 12 kg MOP + 30 kg Urea per acre as soon as possible. • Gap filling may be taken up if the plants are two weeks old and sowing window is still available for the crop. • In case of severe damage (considered as complete economical loss), and the contingency period is between June to August, sowing of best alternative crop must be taken up.	• Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 10 kg MOP + 30 kg Urea per acre as soon as possible.	• Drain the excess water as soon as possible • Harvest the marketable fruits in a clear sunny day’	• Store the harvested fruits in well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible.

Spices and Plantation crops				
Coriander	• Drain the excess water as soon as possible • Spray Urea 2% or 1% KNO3 solution 2-3 times.	• Drain the excess water as soon as possible • Spray Urea 2% or 1% KNO3 solution 2-3 times.	• Drain the excess water as soon as possible • Harvest the marketable umbels as soon as possible.	• Dry the produce immediately • Market the produce immediately after drying.
Heavy rainfall with high speed winds in a short span	-NA-	-NA-	-NA-	-NA-
Outbreak of pests and diseases due to unseasonal rains				
Groundnut	Prophylactic measures for early leaf spot – Mancozeb @ 2.5 g/l	Stem rot – Carbendazim @ 1g + Mancozeb 2.5 g/l	Late leaf spot – Hexaconazole @ 2ml/l	Storage pest control measures
Paddy	Blast – Tricyclozole @ 0.6 g/l Leaf folder – Cartaphydrochloride @ 2g/l BPH – Thiomethoxam – 0.2 g/l	Blast – Isoprothiolane @ 1.5 ml/l Sheath rot – Propiconazole @ 1ml/l	Neck blast – Kasugamycin 2.5 ml/l Panicle mite – Profenophos @ 2ml/l False smut – COC 3g/l	Malathion spraying on walls and Gunny bags
Chickpea	Root rot - Hexaconazole @ 2 ml/l	Root rot - Hexaconazole @ 2ml/l Colletotrichum blight – Saaf 3g/l	Root rot - Hexaconazole @ 2ml/l Colletotrichum blight – Saaf 3g/l	Harvest and shift to Market
Sunflower	Alternaria leaf spot- COC @ 3g/l	Alternaria leaf spot- COC @ 3g/l	Alternaria leaf spot- COC @ 3g/l	Harvest and shift to Market
Cotton	MgSO4 deficiency – MgSO4 @ 10g/l	Black arm- COC @ 30 g + Streptomycin @ 1g/10L	Black arm -COC @ 30 g + Streptomycin @ 1g/10L Dusky cotton bug –	Harvest and shift to Market

			Profenophos @ 2ml/l	
Horticulture				
Papaya	Collar rot – COC @ 3g/l	Collar rot – COC @ 3g/l	Collar rot – COC @ 3g/l	Harvest and shift to Market
Banana	Sigatoka leaf spot – Propiconazole @ 1ml/l	Sigatoka leaf spot – Propiconazole @ 1ml/l	Sigatoka leaf spot – Propiconazole @ 1ml/l	Harvest and shift to Market
Turmeric	Rhizome rot – Ridomyl MZ -2.0g/l Leaf spot – Chlorothalonil @ 2.0 g/l	Rhizome rot – Ridomyl MZ -2.0g/l Leaf spot – Chlorothalonil @ 2.0 g/l	Rhizome rot – Ridomyl MZ -2.0g/l Leaf spot – Chlorothalonil @ 2.0 g/l	Harvest and shift to Market
Sweet Orange	Root rot – Soil drenching with Carbendazim @ 1g/l	Drainage	Drainage	Harvest and shift to Market

2.3 Floods

Condition	**Suggested contingency measure**			
Transient water logging/ partial inundation	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Groundnut	Resowing/	Drain out (Making of channels based on the slope) Spraying of KNO3 @ 20 g/l after 2 days of draining Application of Urea @ 25 kg/ac & MOP @ 10 kg/ac	Drain out	Shift to safer place drainout
Paddy	Resowing/ Transplant	Drain out (Making of channels based on the slope) Spraying of KNO3 @ 20 g/l after 2 days of draining Application of Urea @ 25	Drainout	5% salt solution spraying

		kg/ac & MOP @ 10 kg/ac		
Chickpea	Resowing	Drain out (Making of channels based on the slope) Spraying of KNO3 @ 20 g/l after 2 days of draining Application of Urea @ 25 kg/ac & MOP @ 10 kg/ac	Drainout	
Sunflower				Shift to safer place drain out
Cotton		Spraying of KNO3 @ 20 g/l after 2 days of draining Application of Urea @ 25kg/ac, & MOP @ 10 kg/ac		Shift to safer place drainout
Horticulture crops – Fruits				
Mango	• Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times.	• Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times.	• Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times.	• Drain the excess water as soon as possible. • Harvest the mature fruits as soon as possible. • Store the fruits in well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible.
Orange & Batavian	• Drain the excess water as soon as possible. • Spray 1% KNO3 or Urea 2% solution 2-3 times.	• Drain the excess water as soon as possible. • Spray 1% KNO3 or Urea 2% solution 2-3 times. • Foliar spray of micronutrient mixture is also to be taken up. • Sand casting around the tree trunks should be removed up to the collar	• Drain the excess water as soon as possible. • Spray 1% KNO3 or Urea 2% solution 2-3 times. • Foliar spray of	• Drain the excess water as soon as possible. • Harvest the mature fruits as soon as possible. • Store the fruits in well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible.

		region of the tree to prevent fungal infections. • If the tree age is above eight years a booster dose of 500 g of Urea and 750 g MOP per tree should be applied.	micronutrient mixture is also to be taken up. • Sand casting around the tree trunks should be removed up to the collar region of the tree to prevent fungal infections. • If the tree age is above eight years a booster dose of 500 g of Urea and 750 g MOP per tree should be applied.	
Banana	.	• Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times. • Topdressing of booster dose of 80 g MOP + 100 g Urea per plant in two to three splits at monthly intervals. • If the age the plant is more than three months and less than seven	• Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times. • Stake the plants with bamboos to prevent further	• Drain the excess water as soon as possible. • Harvest the mature bunches as soon as possible. • use ripening chambers for quick and uniform ripening • Store the harvested bunches in well ventilated place temporarily before it can be marketed. • Market the fruits as soon

		months allow one sword sucker for ratoon and take up fertilization at monthly intervals for four months.	lodging.	as possible.
Lemon	• Drain the excess water as soon as possible. • Spray 1% KNO3 or Urea 2% solution 2-3 times. • Plant protection measures may be taken for control of insect vectors and diseases.	• Drain the excess water as soon as possible. • Spray 1% KNO3 or Urea 2% solution 2-3 times. • Foliar spray of micronutrient mixture is also to be taken up. • Sand casting around the tree trunks should be removed up to the collar region of the tree to prevent fungal infections. • If the tree age is above eight years a booster dose of 500 g of Urea and 750 g MOP per tree should be applied.	• Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times.	• Drain the excess water as soon as possible. • Harvest the mature produce as soon as possible. • Store the produce in well ventilated place temporarily before it can be marketed. • Market the produce as soon as possible.
Papaya	• Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times.	• Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times.	• Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times.	• Drain the excess water as soon as possible. • Harvest the mature produce as soon as possible. • Store the produce in well ventilated place temporarily before it can be marketed. • Market the produce as soon as possible.
Horticulture crops vegetables				

Chillies	• Drain the excess water as soon as possible	• Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible. Gap filling may be taken up if the plants are two weeks old and sowing window is still available for the crop.	• Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible.	• Drain the excess water as soon as possible. • Dry the pods on concrete floor/ tarpaulins. • Spray any drying oil after the pods are free from surface moisture for quick drying. • Use poly house solar driers for quick drying • Remove the pest and disease infected pods. • Market the produce as soon as possible.
Onion	• Drain the excess water as soon as possible	• Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 10 kg MOP + 30 kg Urea per acre as soon as possible.	• Drain the excess water as soon as possible • Spray Urea 2% solution once.	• Drain the excess water as soon as possible. • Harvest the mature produce as soon as possible. • Store the produce in well ventilated place temporarily before it can be marketed. • Market the produce as soon as possible.
Tomato	-do-	-do-	-do-	-do-
Spices and Plantation crops				
Coriander		• Drain the excess water as soon as possible • Spray Urea 2% or 1% KNO3 solution 2-3 times.	• Drain the excess water as soon as possible • Spray Urea 2% or 1% KNO3 solution 2-3	• Drain the excess water as soon as possible. • Harvest the marketable umbels as soon as possible. • Dry the produce immediately • Market the produce

			times.	immediately after drying.

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**
Cyclone				
Paddy	Resowing/ delay of Transplant	Drainout	Drainout	Drainout
Sunflower	Resowing	No contengency	No contengency	Shift to Safer Place
Groundnut		Drain out	Drain out	
Castor		Drain out / application of Carbendazim@1g/lit	Drainout / application of Carbendazim@1g/lit	
Horticulture				
Horticulture crops – Fruits				
Mango	If the damage is severe, go for resowing	• Trees fallen on ground may be lifted and earthed up • Manuring and plant protection measures have to be taken up. Broken and damaged branches may be pruned and applied with Bordeaux paste	• Tress fallen on ground may be lifted and earthed up • Manuring and plant protection measures have to be taken up. Broken and damaged branches may be pruned and applied with Bordeaux paste	• Drain the excess water as soon as possible. • Harvest the mature fruits as soon as possible. • Collect the fallen fruits and sell immediately or go for preparation of processed products. • If to store, store the produce in well ventilated place temporarily before it can be marketed. Broken and damaged branches may be pruned and applied

				with Bordeaux paste
Orange & Batavian	-do-	-do-	-do-	-do-
Banana		• Wind damaged plants should be pruned using disinfected secateurs and cut ends must be smeared with Bordeaux paste • Drain the excess water as soon as possible • The fallen tress may be cut leaving two suckers • Inter-cultivate the soil with gorru for aeration. • Spray 0.5 % KNO_3 or Urea 2% solution 2-3 times. • Topdressing of booster dose of 80 g MOP + 100 g Urea per plant at two to three times intervals. • Gap filling may be taken up if the plants are two weeks old and sowing window is still available for the crop. • If the age of the plant is less than three months and submergence up to three feet better to replant the garden.	• Wind damaged plants should be pruned using disinfected secateurs and cut ends must be smeared with Bordeaux paste • Drain the excess water as soon as possible • The fallen tress may be cut leaving two suckers • Topdressing of booster dose of 80 g MOP + 100 g Urea per plant at two to three times intervals • Mature bunches on the completely damaged plants be covered with Leaves and harvested with in 15-20days	• Wind damaged plants should be pruned using disinfected secateurs and cut ends must be smeared with Bordeaux paste • Drain the excess water as soon as possible. • Harvest the mature bunches as soon as possible. use ripening chambers for quick and uniform ripening • Store the harvested bunches in well ventilated place temporarily before it can be marketed. • Market the produce as soon as possible. • 3-4 foliar application of KNO_3on immature/developi ng bunches and leaves at weekly intervals. • Staking with bamboo for support .

Lemon	• Spray Carbendazim 1 g or COC 3g per litre to prevent spread of diseases • If the damage is severe, go for resowing.	• Tress fallen on ground may be lifted and earthed up • Manuring and plant protection measures have to be taken up. • Broken and damaged branches may be pruned and applied with Bordeaux paste	• Tress fallen on ground may be lifted and earthed up • Manuring and plant protection measures have to be taken up. • Broken and damaged branches may be pruned and applied with Bordeaux paste	• Drain the excess water as soon as possible. • Harvest the mature fruits as soon as possible. • Collect the fallen fruits and sell immediately or go for preparation of processed products. • If to store, store the produce in well ventilated place temporarily before it can be marketed. • Broken and damaged branches may be pruned and applied with Bordeaux paste
Papaya	• Drain the excess water as soon as possible and drench the plants with any copper fungicide to prevent collar rot	• Drain the excess water as soon as possible and drench the plants with any copper fungicide to prevent collar rot • Spray 1% KNO_3 or Urea 2% solution 2-3 times.	• Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times.	• Drain the excess water as soon as possible. • Harvest the mature produce as soon as possible. • Store the produce in well ventilated place temporarily before it can be marketed. • Market the produce as soon as possible. • Collect the fallen

				fruits and sell immediately or go for preparation of processed products.
Horticulture crops vegetables				
Chillies	• Grow nursery on raised beds.	• Uprooted plants may be lifted and earthed up • Drain the excess water as soon as possible • Gap filling must be done immediately • If damage is more go for replanting Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible.	• Uprooted plants may be lifted and earthed up • Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible.	• Drain the excess water as soon as possible. • Dry the pods on concrete floor/ tarpaulins immediately • use poly house solar driers for quick drying • Remove the pest and disease infected pods. .
Onion	-do-	-do-	-do-	-do-
Tomato	• Grow nursery on raised beds. • If damage is more go for resowing	• Uprooted plants may be lifted and earthed up • Drain the excess water as soon as possible • Gap filling must be done immediately • Spray Urea 2% solution 2-3 times.	• Uprooted plants may be lifted and earthed up • Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 15	• Drain the excess water as soon as possible. • Harvest the mature produce as soon as possible. • Store the produce in well ventilated place temporarily before it can be marketed.

		• Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible.	kg MOP + 30 kg Urea per acre as soon as possible.	• Market the produce as soon as possible.
Spices and Plantation crops				
Coriander	.	• Drain the excess water as soon as possible • Spray Urea 2% or 1% KNO3 solution 2-3 times.	• Drain the excess water as soon as possible • Spray Urea 2% or 1% KNO3 solution 2-3 times.	• Drain the excess water as soon as possible. • Harvest the marketable umbels as soon as possible. • Dry the produce immediately • Market the produce immediately after drying.

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

General contingency measures:

Before the event	During the event	After the event
Feed and fodder availability		
1.Conserving fodder/crop residues/ forest grass by silage / hay making either by individual or on community basis 2. Preparing complete diets and storing in strategic locations 3. Organize procurement of dry fodders / feed ingredients from surplus areas 4. Establish fodder banks and feed banks 5. Livestock relief camps during floods/cyclones must be planned in the vicinity of relief camps for people 6. Capacity building and preparedness	1.Organise relief camps 2.Supply silage / hay to farmers with productive stock on subsidized rates 3.Segregate old, weak and unproductive stock and send for slaughter 4. Supply mineral mixture to avoid deficiencies 5. Dry fodder must be offered to the livestock in little quantities for number of times 6.Concentrate feed or complete feed must be offered to only productive and young stock only	1. Capacity building to stake holders on drought /cyclone/flood mitigation in livestock sector 2. Promote fodder cultivation. 3. Flushing the stock to recoup 4. Avoid soaked and mould infected feeds / fodders to livestock 5. Replenish the feed and fodder banks 6.Promote fodder preservation techniques like silage / hay making
Drinking water		
1.Construct drinking water tanks in herding places, village junctions and in relief camp locations 2.Plan for sufficient number of tanks for water transportation 3.Identify bore wells, which can sustain demand. 4.Procure sufficient quantities of water Sanitizers	1.Regular supply of clean drinking water to all tanks 2.Cleaning the tanks in regular intervals 3.Keep the livestock away from contaminated flood/cyclone/stagnated waters 3.Add water sanitizers	1.Hand over the maintenance of the structures to panchayats 2.Sensitize the farming community about importance of clean drinking water
Health and disease Management		

1.Procure and stock emergency medicines and vaccines for important endemic diseases of the area 2. All the stock must be immunized for endemic diseases of the area 3. Carry out deworming to all young stock 4. Keep stock of bleaching powder and lime 5.Carry out Butax spray for control of external parasites 6.Identify the Clinical staff and trained paravets and indent for their services as per schedules 7.Identify the volunteers who can serve in need of emergency	1.Keep close watch on the health of the stock 2.Sick animals must be isolated and treated Separately. 3. Carry out deworming and spraying to all animals entering into relief camps 4. Clean the animal houses regularly and apply disinfectants. 5.Safe and hygienic disposal of dead animal carcasses 6. Organize with community daily lifting of dung from relief camps	1.keep close surveillance on disease outbreak. 2.Undertake the vaccination depending on need 3.Keep the animal houses clean and spray disinfectants

2.5.1 Detailed contingent strategies for Livestock

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Drought			
Feed and Fodder availability	Establishment of silvi-pastoral system in CPRs with ***Stylosanthus hamata*** and ***Cenchrus ciliaris*** as grass with ***Leucaena leucocephala*** as tree component (or suggest suitable similar system to your district) Top dressing of N in 2-3 split doses @ 20-25 kg N/ha in common property resources (CPRs) like temple lands, panchayat lands or private property resources (PPRs) like waste and degraded lands with the monsoon pattern for higher biomass production In chronically drought prone districts promote	Harvest and use biomass of dried up crops (Groundnut, Sorghum, Bajra, Maize, Rice, Horse gram) material as fodder. 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 UMMB, hay, concentrates and vitamin & mineral mixture should be transported to the	Concentrates supplementation should be provided to all the animals. The farmers may be advised to practice "flushing the stock" to recoup Short duration fodder crops should be sown in

	cultivation of short duration fodder crops of sorghum/bajra/maize(UP chari, MP chari, HC-136, HD-2, GAINT BAJRA, L-74, K-677, Ananad/African Tall, Kisan composite, Moti, Manjari, B1-7 Chopping of fodder should be made as mandatory in every village through supply and establishment of good quality chaff cutters. Avoid burning of maize stover Harvesting and collection of perennial vegetation particularly grasses which grow during monsoon Proper drying, bailing and densification of harvested grass from previous season Creation of permanent fodder, feed and fodder seed banks in all drought prone areas	needy areas from the reserves at the district level initially and latter stages from the near by districts. Educate the farmers about mixing groundnut haulms and paddy straw (1:3) before feeding the animals. All the hay should be enriched with 2% Urea molasses solution or 1% common salt solution and fed to LS Herd should be split and supplementation should be given only to the highly productive and breeding animals Provision of emergency grazing/feeding (Cow-calf camps or other special arrangements to protect high productive & breeding stock) Available kitchen waste should be mixed with dry fodder while feeding Arrangements should be made for mobilization of small ruminants across the districts where no drought exits with subsidized road/rail transportation and temporary shelter provision for the shepherds Unproductive livestock should to be culled during severe drought Create transportation and marketing facilities for the culled and unproductive animals Supply silage and or hay on subsidized rates to the farmers having high productive stock Subsidized loans should be provided to the livestock keepers	unsown and crop failed areas where no further routine crop sowing is not possible Supply of quality seeds of fodder varieties and motivating the farmers to cultivate at least 10% of their land holding for fodder production
Heat wave	As the district being chronically prone to heat waves the following permanent measures are suggested i) Plantation of trees like Neem, Pipal,	Allow the animals preferably early in the morning or late in the evening for grazing during heat waves Feed green fodder/silage / concentrates during	Feed the animals as per routine schedule Allow the animals

	Subabul around the shed ii) Spreading of husk/straw/coconut leaves over the roof top of the shed iii) Water sprinklers / foggers in the animal shed **iv)** Application of white reflector paint on the roof to reduce thermal radiation effect	day time and roughages / hay during night time in case of heat waves Put on the foggers / sprinkerlers during heat weaves in case of high productive animals In severe cases, vitamin 'C' (5-10ml per litre) and electrolytes (Electral powder @ 20g per litre) should be added in water during severe heat waves.	for grazing (normal timings)
Health and Disease management	Timely vaccination (as per enclosed vaccination schedule) against all endemic diseases Procurement of emergency medicines and medical kits 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	Conducting mass animal health camps Conducting fertility camps Mass deworming camps Farmers should be advised to breed their milch animals during July-September so that the peak milk production does not coincide with mid summer Keeping vigil on disease outbreak
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 programme for cattle and buffalo:

Disease	**Age and season at vaccination**
Anthrax	In endemic areas only, Feb to May
Haemorrhagic septicaemia (HS)	May to June
Black quarter (BQ)	May to June
Foot and mouth disease (FMD)	July/August and November/December

Vaccination schedule in small ruminants (Sheep & Goat)

Disease	**Season**
Foot and mouth disease (FMD)	Preferably in winter / autumn
Peste des Petits Ruminants (PPR)	Preferably in January
Black quarter (BQ)	May / June
Enterotoxaemia (ET)	May
Haemorrhagic septicaemia (HS)	March / June
Sheep pox (SP)	November

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, bajra 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 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)	Hygiene and sanitation of poultry house Disposal of dead birds by burning / burying with lime powder in pit
Heat wave			
Shelter/environment management	Provision of proper shelter with good ventilation	In severe cases, foggers/water sprinklers/wetting of hanged gunny bags should be arranged Don't allow for scavenging during mid day	Routine practices are followed
Health and disease management	Deworming and vaccination against RD and fowl pox	Supplementation of house hold grain Provide cool and clean drinking water with electrolytes and vit. C (5-10 ml per litre) In hot summer, add anti-stress probiotics in drinking water or feed (Reestobal etc., 10-20ml per litre)	Routine practices are followed

2.5.2 Fisheries/ Aquaculture : -Not applicable-