State: ANDHRA PRADESH

Agriculture Contingency Plan for District: SRIKAKULAM

1.0 District Agriculture profile					
1.1	**Agro-Climatic/ Ecological Zone**				
	Agro Ecological Sub Region (ICAR)	Eastern coastal plain Hot Sub Humid to Semi Arid Sub Region (18.1)			
	Agro-Climatic Region (Planning Commission)	East Coast Plains and Hills region (XI)			
	Agro Climatic Zone (NARP)	North Coastal Zone (AP-2)			
	List all the districts or part thereof falling under the NARP Zone	Srikakulam, Vizianagaram, Visakhapatnam (excluding tribal hill areas) and upland areas of East Godavari			
	Geographic coordinates of district	Latitude		Longitude	Altitude
		18º 20'and 19º 10' N		83º 51' and 84º 51' E	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	RARS, Anakapalle and Agricultural Research Station, Ragolu.			
	Mention the KVK located in the district	KVK , Amadalavalasa , PIN 532182.			
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):	705		June 2nd Week	1st week of October
	NE Monsoon(Oct-Dec):	277		October 2nd Week	December 4th Week
	Winter (Jan- March)	47			
	Summer (Apr-May)	133			
	Annual	1162			

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 (ha) 000ha	583.7	68.6	100.3	0.9	0.7	8.6	49.7	10.1	17.6

1. 4	**Major Soils (common names like shallow red soils etc.,)**	**Area ('000 ha)**	**Percent (%) of total**
	1. Red soils	344	58.6
	2. Brown forest soils	85	14.6
	3. Alluvial soils	61	10.31
	4. Black soils	30	5.11
	5. Sandy soils	13	2.21
	6.other soils	50	9.17
	Total	549	100

1.5	**Agricultural land use**	Area ('000 ha)	Cropping intensity %
	Net sown area	322.0	140 %
	Area sown more than once	128.8	
	Gross cropped area	450.9	

1.6	**Irrigation**	Area (‘000 ha)		
	Net irrigated area	196.7		
	Gross irrigated area	211.9		
	Rainfed area	125.4		
	Sources of Irrigation	Number	Area (‘000 ha)	Percentage of total irrigated area
	Canals		105.8	53.0
	Tanks	8025	70.6	35.4
	Open wells			
	Bore wells		21.0	10.5
	Lift irrigation			
	Micro-irrigation			
	Other sources		2.2	1.1
	Total Irrigated Area		199.6	100.0
	Pump sets	5317		
	No. of Tractors	851		
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils	(%) area	
	Over exploited			
	Critical			
	Semi- critical			
	Safe			
	Wastewater availability and use			
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

Area under major field crops & horticulture etc. (2004-05 & 2008-09)

1.7			Area ('000 ha)					
			Kharif		Rabi		Summer	Total
		Major Field Crops cultivated	Irrigated	Rainfed	Irrigated	Rainfed		
	1	Paddy	*189*	-	*3*	-		192.8
	2	Groundnut	-	26	7.0	-		33.0
	3	Sugarcane	10	-	-	-		10.0
	4	Mesta		9	-	-		9.2
	5	Sesame	-	3	3	-		6.0
	6	Green gram		2	-	31		33
		Horticulture crops – Fruits	Total area		Irrigated		Rainfed	
	1	Mango	13.097					22.9
		Horticultural crops – Vegetables	Total area		Irrigated		Rainfed	
	1	Chillies	3.2					
	2	Onion	1.7					

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Non descriptive Cattle (local low yielding)	168.0	262.6	430.6
	Crossbred cattle	144.3	234.2	378.5
	Non descriptive Buffaloes (local low yielding)	38.8	86.5	125.3
	Graded Buffaloes			
	Goat			185.9
	Sheep			484.5
	Others (Camel, Pig, Yak etc.)			21.0
	Commercial dairy farms (Number)			

1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**
	Commercial		739412
	Backyard		1719948

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)	
	20016	**nil**	**443 / 3049**	**0 / 85333**	**1136 / 1**	**-**

	No. Farmer owned ponds	**No. of Reservoirs**	**No. of village tanks**

	ii) Inland (Data Source: Fisheries Department)	21	-	238
	B. Culture			
		Water Spread Area (ha)	**Yield (t/ha)**	**Production ('000 tons)**
	i) **Brackish water** (Data Source: MPEDA/ Fisheries Department)	260	0.001	0.135
	ii) **Fresh water** (Data Source: Fisheries Department)	168	0.003	0.514
	Others		0.000	40.448

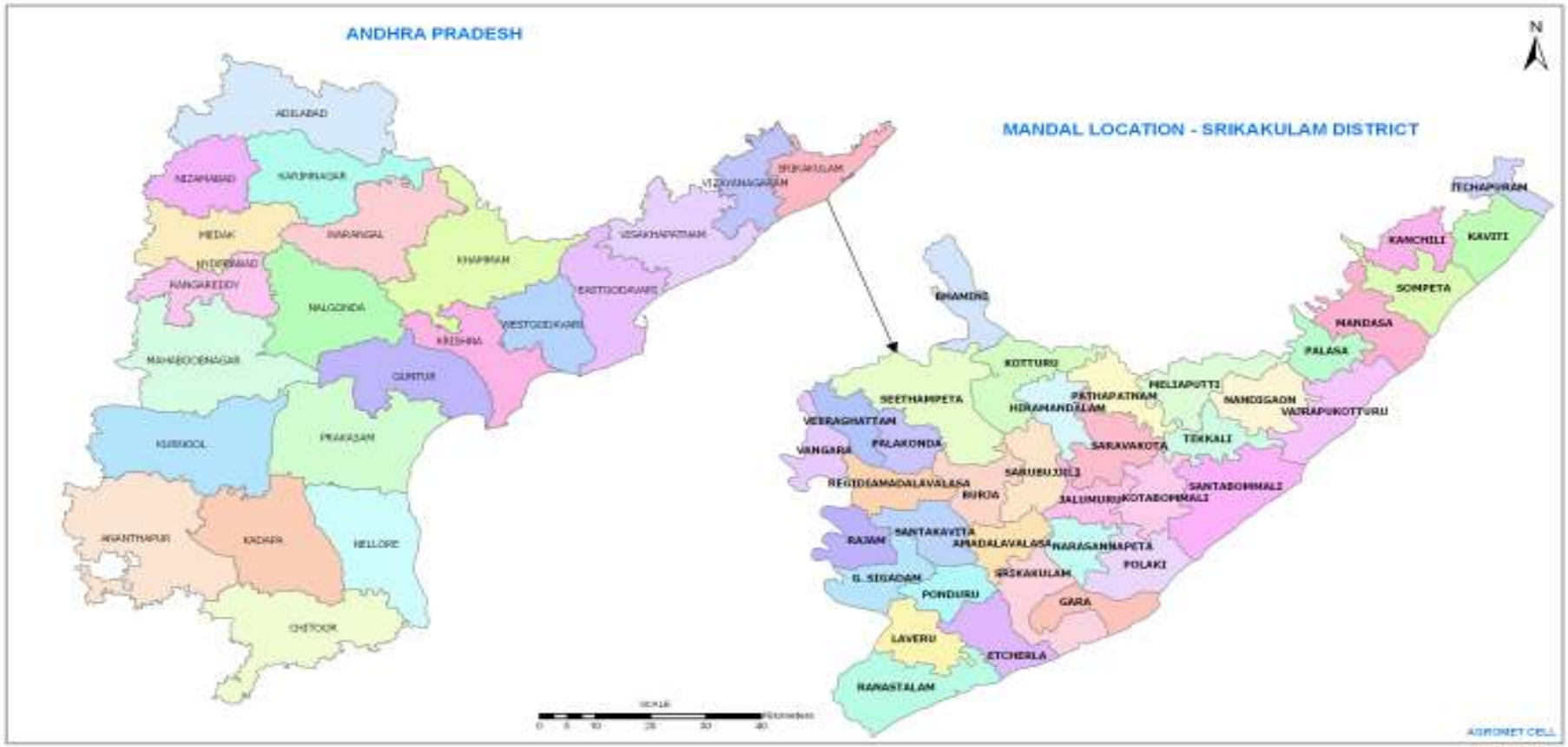
1.11	**Production and Productivity of major crops** (Average of last 5 years: 2004,05,06, 07, 08)	**Kharif**		**Rabi**		**Summer**		**Total**		**Crop residue as fodder** (‘000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
Major Field crops										
1	Paddy	631.0	3044	8.0	3290	-	-	639.0	3167	-
2	Groundnut	26.2	980	11.8	1542	-	-	38.1	1411	-
3	Mesta	1.3	1274	-	-	-	-	1.3	1274	-
4	Sugarcane	763.1	77250	-	-	-	-	763.1	77250	-
5	Greengram	-	-	15.2	534	-	-	15.2	534	-
6	Blackgram	-	-	22.7	583	-	-	22.7	583	-
7	Horsegram	-	-	5.8	500	-	-	5.8	500	-
Major Horticultural crops										
1	Mango							108.3	8237	
Horticultural crops – Vegetables										
1	Chillies							5.1	1750	
2	Onion							29.0	17000	
Plantation & Spice crops										
1	Coconut							13.1	625	
2	Cashew							45.0	30000	
3	Arecanut & Oil Palm							6.8	4667	

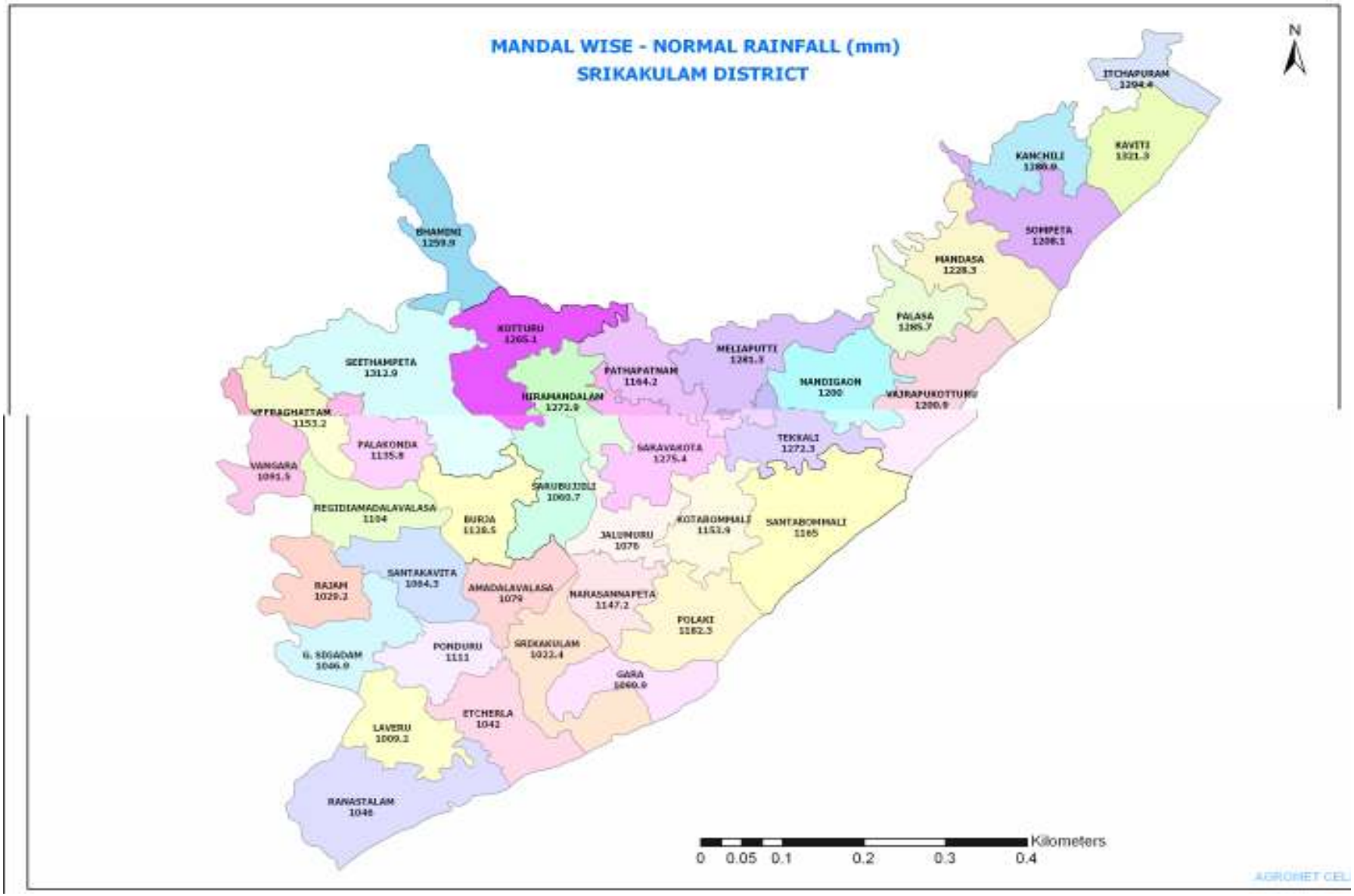
1.12	**Sowing window for 5 major field crops (start and end of normal sowing period)**	Paddy	Groundnut	Mesta	Greengram	Blackgram
	Kharif- Rainfed		June 2nd Week to July 4th Week	May 2nd week to July 2nd Week	June 1st week to June 4th week	June 1st week to June 4th week

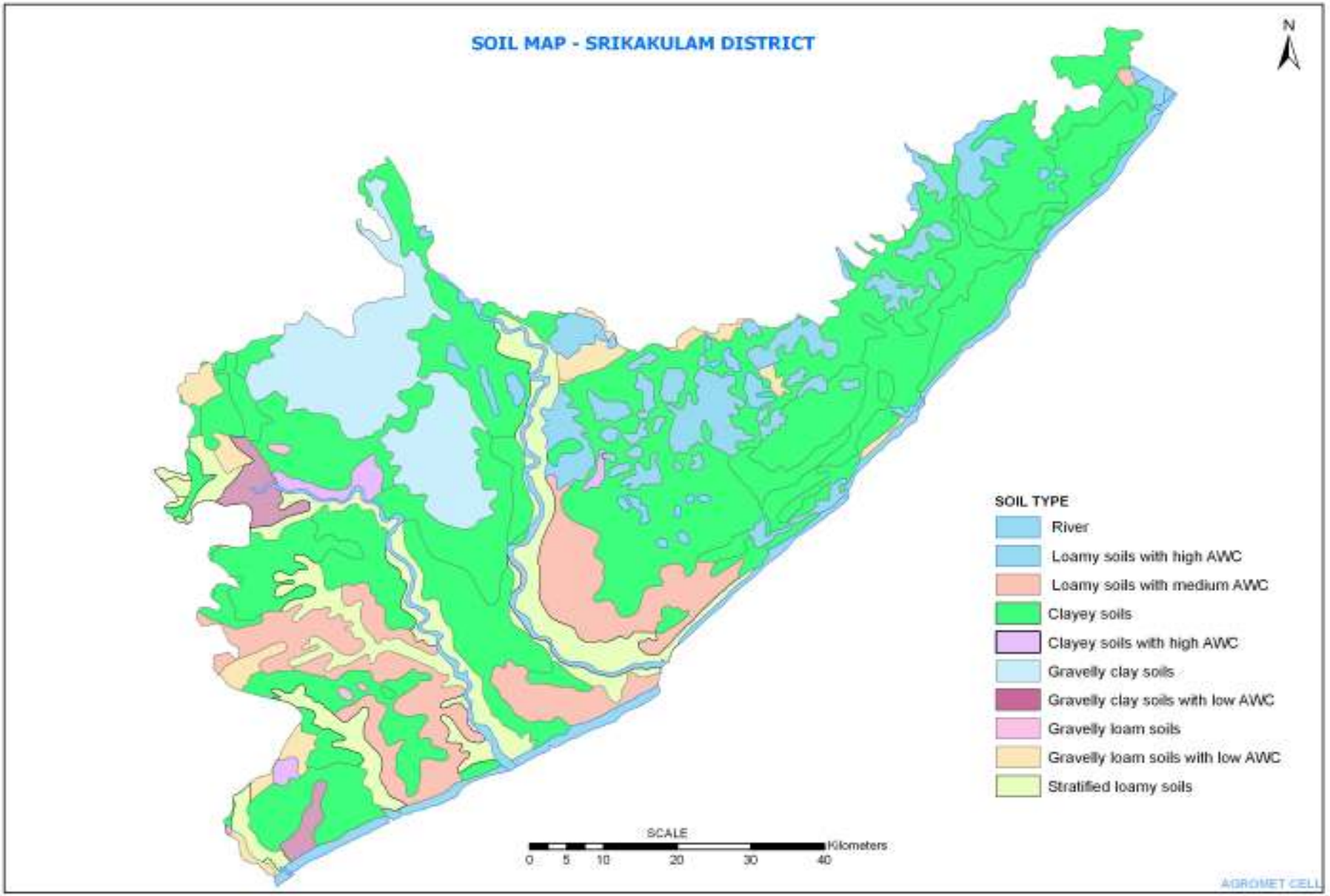
	Kharif-Irrigated	July 1st Week to July 4th Week		-		
	Rabi- Rainfed	-	-	-	November 1st to Dec2nd week	November 1st to Dec2nd week
	Rabi-Irrigated	Dec 4th week to January 2nd week	Oct 4th Week to Dec 4th Week	-		

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)			

1.14	**Include Digital maps of the district for**	Location map of district within State as Annexure 1	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes


ANDHRA PRADESH
MANDAL LOCATION - SRIKAKULAM DISTRICT
N
ADILABAD
NIZAMABAD
KARIMNAGAR
MEDAK
WARANGAL
KHAMMAM
HYDERABAD
RANGAREDDY
NALGONDA
MAHABOOBNAGAR
KRISHNA
GUNTUR
PRAKASAM
KURNOOL
ANANTHAPUR
KADAPA
NELLORE
CHITTOOR
VISAKHAPATNAM
EASTGODAVARI
WESTGODAVARI
SRIKAKULAM
VIZIANAGARAM
TECHAPURAM
KAVITI
KAMCHILI
SOMPETA
MANDASA
PALASA
KOTTURU
ITCHAPURAM
PATHAPATNAM
NANDIGAM
HIRAMANDALAM
VEERAGHATTAM
SEETHAMPETA
VANGARA
PALAKONDA
SARAVAKOTA
TEKKALI
SARUBUJJILI
REGIDIAMADALAVALASA
BURJA
JALUMURU
KOTABOMMALI
SANTABOMMALI
RAJAM
SANTAKAVITA
AMADALAVALASA
NARASANNAPETA
POLAKI
SRIKAKULAM
G. SIGADAM
PONDURU
GARA
LAVERU
ETCHERLA
RANASTALAM
AGRINET CELL


MANDAL WISE - NORMAL RAINFALL (mm)
SRIKAKULAM DISTRICT
N
ITCHAPURAM
1294.4
KAVITI
1321.3
KANCHILI
1289.9
SOMPETA
1298.1
MANDASA
1228.3
PALASA
1285.7
BHAMINI
1259.9
KOTTURU
1265.1
SEETHAMPETA
1312.9
MELIAPUTTI
1281.3
PATHAPATNAM
1164.2
NANDIGAON
1200
VAJRAPUKOTTURU
1200.9
HIRAMANDALAM
1272.9
VEERAGHATTAM
1153.2
TEKKALI
1272.3
PALAKONDA
1135.9
NARAYANAPURAM
1275.4
VANGARA
1091.5
SARUBUJJILI
1060.7
REGIDIAMADALAVALASA
1104
BURJA
1138.5
KOTABOMMALI
1153.9
SANTABOMMALI
1165
JALUMURU
1076
SANTAKAVITI
1084.3
AMADALAVALASA
1079
NARASANNAPETA
1147.2
BAIAM
1029.2
POLAKI
1162.3
PONDURU
1111
SRIKAKULAM
1022.4
G. SIGADAM
1046.9
GARA
1060.9
ETCHERLA
1042
LAVERU
1009.1
RANASTALAM
1048
Kilometers
0 0.05 0.1 0.2 0.3 0.4
AGROMET CELL


SOIL MAP - SRIKAKULAM DISTRICT
N
SOIL TYPE
River
Loamy soils with high AWC
Loamy soils with medium AWC
Clayey soils
Clayey soils with high AWC
Gravelly clay soils
Gravelly clay soils with low AWC
Gravelly loam soils
Gravelly loam soils with low AWC
Stratified loamy soils
SCALE
Kilometers
0 5 10 20 30 40
AGROMET CELL

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/ cropping system**	**Change in crop/ cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks (June 4th Week)	Rain fed Red sandy loamy	Groundnut-Horsegram	N0 change	Same as normal crop	
		Mesta-Horsegram			
		Sesamum			
		Green gram			
	Rainfed Red clay Loams	Mesta-Horsegram			

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 2nd Week)	Rain fed Red sandy loamy	Groundnut-Horsegram	Maize/Ragi /Greengram	Direct sowing of Ragi	
		Mesta-Horsegram	Red gram /Redgram + Maize (1:2) Greengram		
		Sesamum	Greengram	-	
		Green gram	No change		
	Rainfed Red clay Loams Red loams Sandy soils	Groundnut-Horsegram	Ragi	-	
		Mesta-Horsegram	Maize + Redgram (2:1) Greengram	Sowing of maize on ridge and furrow method	
		Sesamum	Greengram /Ragi		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/ cropping system**	**Change in crop/ cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 6 weeks (July 4th Week)	Rain fed Red sandy loamy	Groundnut-Horse gram	Greengram (LGG-460)/ Plan for Early Rabi Horse gram		Linkage with NFSM for seed of pulse crop
		Mesta-Horsegram	Green gram (LGG-460) /Ragi (VR-847)		supply of Ragi seed
		Sesamum	Green gram (LGG-460)		Greengram and ragi seed arrangements
		Green gram	No change		
	Rainfed Red clay Loams	Groundnut-Horsegram	Green gram (LGG-460) /Ragi (VR-847)		
		Mesta-Horsegram	Cow pea, Green gram Early rabi Horsegram/		
		Sesamum	Green gram/cow pea		

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 (Specify month)* (August 2nd week)	Rain fed Red sandy loamy	Groundnut-Horsegram	Green gram (LGG-460,TM-96-2) /Horsegram		
		Mesta-Horsegram	Greengram/Horsegram		
		Sesamum	Greengram /Horsegram	Plan for early rabi Horsegram	
		Green gram	No change		
	Rainfed Red sandy clay Loams	Groundnut-Horsegram	Greengram, Cowpea		
		Mesta-Horsegram	Greengram /Horsegram	Short duration Green varieties LGG-460,TM-96-2	

Condition			Suggested Contingency measures		
Early season drought **(Normal onset)**	**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.	Rainfed Red sandyloamy	Groundnut-Horsegram	Re sowing in case of total crop failure with ground nut.	1. Making Dead furrows at every 3.5 m distance	Encourage digging of farm ponds under NREGS
		Mesta-Horsegram	Foliar spray with 1% urea and 1% MOP to protect the crop		
		Sesamum			
		Green gram			
	Rainfed Red clay Loams	Groundnut- Horse gram	Life saving irrigation Foliar spray with 2 % urea and 1% MOP to protect the ground nut crop from moisture stress. Re sowing in case of total crop failure with ground nut	1. Making Dead furrows at 3.5 m 2. Maintain weed free condition ,Inter cultivation with hand hoe (shallow depth)	Encourage digging of farm ponds under MGNREGS
		Mesta-Horsegram	As above		

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell, consecutive 2 weeks and above	**Major Farming situation**	**Normal Crop/ cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At vegetative stage	Rain fed Red sandy loamy	Groundnut-Horsegram	Life saving irrigation if water availble Foliar spray with 2% urea and 1%MOP control sucking pest complex by spraying Dimethoate@2ml/lt ir Acephate @ 1.5 g per litre of water.	1. Making dead furrows at 3.5 mt 2. Maintain weed free condition , Intercultivation with hand hoe (shallow depth)	Encourage digging of farm ponds under NREGS
		Mesta-Horsegram			
		Sesamum			
		Green gram			
	Rainfed Red clay Loams	Groundnut-Horsegram	Life saving irrigation Foliar spray with 2% urea and 1%MOP		
		Mesta-Horsegram	As above and control measures for mealybug with profinophos 2ml per litre		

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	**Major Farming situation**	**Normal Crop/ cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At reproductive stage	Rain fed Red sandy loamy	Groundnut-Horsegram Mesta-Horsegram Sesamum Green gram	Life saving Irrigation if water available Protect against sucking pest complex by spraying Acephate@1gm/l	1. Maintain weed free condition ,Inter cultivation with hand hoe (shallow depth	Digging of farm ponds under MGNREG
	Rainfed Red clay Loams	Groundnut-Horsegram Mesta-Horsegram	Life saving Irrigation if water available	1. Digging form ponds 2. Making Dead furrows at 3.5 mt 3. Maintain weed free condition ,Inter cultivation with hand hoe (shallow depth	

Condition			Suggested Contingency measures		
Terminal drought	**Major Farming situation**	**Normal Crop/ cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
Terminal drought	Rain fed Red sandy loamy	Groundnut-Horsegram Mesta-Horsegram Sesamum Green gram	Supplemental irrigation Prolonged dry spell may flare up incidence of jassids/thrips/flea beetles hence need based application of Acephate@1gm/l	Horsegram/Greengram	Linkage with NFSM for seed supply.

	Rainfed Red clay Loams	Groundnut-Horsegram			
		Mesta-Horsegram			
		Sugarcane			

2.1.2 Irrigated situation

Condition			**Suggested Contingency measures**		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delayed release of water in canals due to low rainfall	Tankfed sandy Clay loamy	Paddy- Pulse	No Change	1. Medium or Short duration varieties like , Jagtiala Sannalu, , JGL-3844, NLR-3449 MTU-1010 and Tellahamsa 2. Life saving irrigation to already sown nurseries. 3. Plating of aged seed lings with special management Colse palnting 44pl/sqmt) 4-5 plants /hill 4. N in2 splits instead of 3 splits 2/3 as basal 5. Direct sowing of paddy with paddy drum seeder or broad casting of sprouted seed Adopt preventive control measures for pest like gallmidge.	
		Paddy-Groundnut/Sunflower	Paddy-Groundnut		
		Paddy-Maize	Paddy-Maize		
		Paddy- Sesame	No change		

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delayed release of water in canals due to low rainfall	Canal fed Red sandy clay loamy	Paddy- Pulse	No Change	1. Direct seeding with Drum seeder with Medium or Short duration varieties like, JGL-1798, , NLR-3449 JGL-3844, MTU-1010 2. Sowing of Greengram before paddy for green manure and seed. 3. Raising nurseries with medium duration rice varieties like , JGL-1798, , NLR-34449 JGL-3844, MTU-1010 and 4. Planting aged seedling 5. During Rabi season select greengram varieties like LGG 460, 410, ML 267, TM-96-2 which are early maturing and suitable for delayed sowings.	Linkage with NFSM for seed supply and drum seeder.
		Paddy-Groundnut/Sunflower	Paddy-Groundnut		
		Paddy-Maize	Paddy-Maize		
		Paddy- Sesame			
		Paddy -Paddy	No change / Paddy-Groundnut	If paddy Raising nurseries with medium duration or short rice varieties like , JGL-1798, , NLR-34449 JGL-3844, MTU-1010	

condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Limited release of water in canals due to low rainfall	Canalfed Red sandy loamy	Paddy- Pulse	No Change / Grow irrigated crops like Maize/Greengram	Paddy: 1. Paddy in SRI method. 2. Direct seeding with Drum seeder with Medium or Short duration varieties like, JGL-1798, , NLR-3449 JGL-3844, MTU-1010 3. Sowing of Greengram before paddy for green manure and seed. 4. Raising nurseries with medium duration rice varieties like , JGL-1798, , NLR-34449 JGL-3844, MTU-1010 and 5. Rotational irrigation should be followed 6. Maize should be sown in ridge and furrow method.	
		Paddy-Groundnut/Sunflower	Paddy-Groundnut		
		Paddy-Maize	Paddy-Maize		
		Paddy- Sesame	No change		

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	Canalfed Red sandy clay loamy	Paddy- Pulse Paddy-Groundnut/Sunflower Paddy-Maize Paddy- Sesame Pulses-Paddy-Groundnut	Greengram/Jowar Grow fodder crops for cattle (specify crops). Pillipesara, Cowpea, Fodder Maize, Jowar and Stylo hemata for Sheep	Sowing of Greengram	Supply greengram and fodder seed

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	Tankfed Sandy clay loamy	Paddy- Pulse Paddy-Groundnut/Sunflower Paddy-Maize Paddy- Sesame Pulses-Paddy-Groundnut	Greengram/Jowar Grow fodder crops for cattle (specify crops). Pillipesara, Cowpea, Fodder Maize, Jowar and Stylo hemata for Sheep	Sowing of Greengram	-

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	Irrigated Red clay and Alluvial clay	Paddy- Pulse	No change (or) Grow irrigated dry crops like maize , green gram in place of paddy Grow fodder crops for cattle.	If paddy : SRI cultivation may be adopted. 1. Adopt alternate wetting and drying upto primordial	

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
				initiation stage to save water. 2. Irrigate upto a depth of 3 – 5 cm from Primordial Initiation to maturity 3. Take up effective weed control measures either mechanically or through herbicides Maize in ridges and furrow method so as to save water Plan for early rabi with green gram short duration varieties like LGG-460 or TM-96-2	
		Paddy-Maize	No change	As above	
		Paddy- Sesame			
		Sugarcane		Formation of ridges and furrows and irrigate the crop alternate row to save water If possible provide drip irrigation system	
	Irrigated Red sandy loamy	Ground nut – Groundnut / Maize	No change (or) Maize	Maize in ridges and furrow method so as to	

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
		Groundnut/Sunflower groun	No change	save water Irrigate the maize crop alternate row In case of groundnut strip irrigation or miro-irrigation for groundnut.	

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Any other condition (specify)	Insufficient flows from Hill Streams	Paddy-Pulses	No change		
		Paddy-Groundnut			
		Paddy-Maize			
		Paddy-Vegetables			

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

Condition	Suggested contingency measure			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**
Paddy	Drain out excess water Incase of loss of plant population Survived hills are to be split into individual tillers and use for gap filling. Apply a booster dose of 20-25kg of urea and 15kg of MOP per acre hasten the establishment and promote more tillering Pests like Leaf folder and swarming caterpillar may emerge so monitor the	Drain out excess water Monitor incidence of BPH and initiate Control measures for BPH Bufrofizin 1.6ml/lt or Acephate 1.5 gm/lt Spraying shpuld be done in evening times only.	Drain out excess water. Control measures for BPH Spraying of Bufrofizin 1.6ml/lt or Acephate 1.5 gm/lt	Spraying of 5% salt solution to prevent germination and discolouration of grain

	pest and control measures like spraying of chloripyriphos 2.5 ml/l or car tap hydrochloride 2gm/l may be taken up.			
Groundnut	Drain out the water as early as possible Inter cultivation as soon as possible for quick evaporation of excess moisture. Spraying with Poly feed 500gm/acre to correct nutrient deficiencies and enhance growth Spraying with carbendiazm 1gm /+ Mancozeb 3gm/l as prophylactic measure against fungal diseases	Drain out the water as early as possible Pests like Spodoptera may attack the crop. control measures like Thiodicarb 1gm/l may be sprayed Spraying with carbendiazm 1gm /+ Mancozeb 3gm/lt as prophylactic measure against fungal diseases	Drain out the water as early as possible . Spraying with carbendiazm 1gm /+ Mancozeb 3gm/l as prophylactic measure against fungal diseases. Harvesting may be planned in case of advanced maturity stage.	Drain out the water as early as possible. Pluck the pods from plants and dry
Mesta	Drain out water Spray 2% urea +1% Potash Incase of foot and stem rot occurrence Drench and spray the crop with COC 3gm/l	Drain out the water as early as possible.	Drain out the water Harvesting may be planned in case of advanced maturity stage.	Use the excess water for retting process. Stack the sticks vertically To enhance retting of basal portion.
Horticulture crops – Fruits				
Mango	• Drain the excess water as soon as possible • Spray 1% KNO_3 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% KNO_3 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 • Harvest the mature produce in a clear sunny day' • Wind damaged branches should be pruned using disinfected secatures and cut ends must be smeared with Bordeaux paste	• Store the fruits in well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible. • Grade the damaged or infected fruits. • Store the graded fruits in well ventilated place temporarily before it can be marketed.

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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.
Spices and Plantation crops				
Areca nut , Oil palm and Coconut	• Planting should be done on mounts or bunds • Drainage system, suited to local conditions may be provided to remove surplus water from root zone • Relief drains [shallow] channels are opened at places where water accumulates and connected with main drain to remove water from the surface	• Drain the excess water as soon as possible • Apply booster dose of NPK fertilizers	• Drain the excess water as soon as possible • .Apply booster dose of NPK fertilizers • Harvest the mature nuts as soon as possible.	• Store the produce in well ventilated place temporarily before it can be market • Market the nuts as soon as possible.

Cashew	• 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. • Harvest the mature fruits as soon as possible	• Separate seed from the fruits and dry the seeds separately. • Store the fruits in well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible or use for the preparation of processed products.
Heavy rainfall with high speed winds in a short span[2]				
Paddy	Drain out excess water Incase of loss of plant population Survived hills are to be split into individual tillers and use for gap filling. Apply a booster dose of 20-25kg of urea and 15kg of MOP per acre hasten the establishment and promote more tillering Pests like Leaf folder and swarming caterpillar may emerge so monitor the pest and control measures like spraying of chloripyriphos 2.5 ml/lt or car tap hydrochloride 2gm/lt may be taken up.	Drain out excess water Monitor incidence of BPH and initiate Control measures for BPH Bufrofizin 1.6ml/lt or Acephate 1.5 gm/lt Spraying shpuld be done in evening times only. In case of lodging staking of 3-4 hills may done	Drain out excess water. Control measures for BPH Spraying of Bufrofizin 1.6ml/lt or Acephate 1.5 gm/lt In case of lodging staking of 3-4 hills may done	Spraying of 5% salt solution to prevent germination and discolouration of grain

Groundnut	Drain out the water as early as possible Inter cultivation as soon as possible for quick evaporation of excess moisture. Spraying with Poly feed 500gm/acre to correct nutrient deficiencies and enhance growth Spraying with carbendiazm 1gm /+ Mancozeb 3gm/lt as prophylactic measure against fungal diseases.	Drain out the water as early as possible Pests like Spodoptera may attack the crop . control measures like Thiodicarb 1gm/lt may be sprayed Spraying with carbendiazm 1gm /+ Mancozeb 3gm/lt as prophylactic measure against fungal diseases.	Drain out the water as early as possible . Spraying with carbendiazm 1gm /+ Mancozeb 3gm/lt as prophylactic measure against fungal diseases. Harvesting may be planned in case of advanced maturity stage.	Drain out the water as early as possible. Pluck the pods from plants and dry.
Mesta	Drain out water Spray 2% urea +1% Potash Incase of foot and stem rot occurrence Drench and spray the crop with COC 3gm/lt	Drain out the water as early as possible. In case of lodging lift the crop and stake the crop.	Drain out the water Harvesting may be planned in case of advanced maturity stage.	Use the excess water for retting process. Stack the sticks vertically To enhance retting of basal portion.
Horticulture crops – Fruits				
Mango	• Drain the excess water as soon as possible • Spray 1% KNO_3 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% KNO_3 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 • Harvest the mature produce in a clear sunny day' • Wind damaged branches should be pruned using disinfected secatures and cut ends must be smeared with Bordeaux paste	• Store the fruits in well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible. • Grade the damaged or infected fruits. • Store the graded fruits in well ventilated place temporarily before it can be marketed.
Horticulture crops vegetables				
Chillies	• Drain the excess water as soon	• Drain the excess	• Drain the excess water as	• Dry the pods on

	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.	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.	soon as possible • Harvest the matured fruits in a clear sunny day.	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.
Spices and Plantation crops				
Areca nut , Oil palm and Coconut	• Planting should be done on mounts or bunds • Drainage system, suited to local conditions may be provided to remove surplus water from root zone • Relief drains [shallow] channels are opened at places where water accumulates and connected with main drain to remove water from the surface	• Drain the excess water as soon as possible • Apply booster dose of NPK fertilizers	• Drain the excess water as soon as possible • .Apply booster dose of NPK fertilizers • Harvest the mature nuts as soon as possible.	• Store the produce in well ventilated place temporarily before it can be market • Market the nuts as soon as possible.
Cashew	• 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-	• Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times.	• Separate seed from the fruits and dry the seeds separately. • Store the fruits in

		3 times.	• Harvest the mature fruits as soon as possible	well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible or use for the preparation of processed products.
Outbreak of pests and diseases due to unseasonal rains				
Paddy	Pests like Leaf folder and swarming caterpillar may emerge so monitor the pest and control measures like spraying of chloripyriphos 2.5 ml/lt or car tap hydrochloride 2gm/lt may be taken up	Monitor incidence of BPH and initiate Control measures for BPH Bufrofizin 1.6ml/lt or Acephate 1.5 gm/lt Spraying shpuld be done in evening times only.	Control measures for BPH Spraying of Bufrofizin 1.6ml/lt or Acephate 1.5 gm/lt Climbing cut worm incidence should be monitored and spray with Chloropyriphos 2.5ml+Dichlorovas1ml/lt	-
Groundnut	Spraying with carbendiazm 1gm /+ Mancozeb 3gm/lt as prophylactic measure against fungal diseases	Pests like Spodoptera may attack the crop . control measures like Thiodicarb 1gm/lt may be sprayed Spraying with carbendiazm 1gm /+ Mancozeb 3gm/lt as prophylactic measure against fungal diseases	Spraying with carbendiazm 1gm /+ Mancozeb 3gm/lt as prophylactic measure against fungal diseases. Harvesting may be planned in case of advanced maturity stage .	Pluck the pods from plants and dry

Mesta	Incase of foot and stem rot occurrence Drench and spray the crop with COC 3gm/lt	Incase of foot and stem rot occurrence Drench and spray the crop with COC 3gm/lt		Use the excess water for retting process. Stack the sticks vertically To enhance retting of basal portion.

2.3 Floods

Condition	**Suggested contingency measure[o]**			
Transient water logging/ partial inundation[1]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**

Paddy	Drain out excess water and Apply a booster dose of 2-2.5kg of urea and 1.5kg of MOP per 10 cents nursery hasten the growth of nursery	Drain out excess water and Apply a booster dose of 20-25kg of urea and 15kg of MOP per acre hasten the establishment and promote more tillering Pests like Leaf folder and swarming caterpillar may emerge so monitor the pest and control measures like spraying of chloripyriphos 2.5 ml/lt or car tap hydrochloride 2gm/lt may be taken up.	Drain out excess water Monitor incidence of BPH and initiate Control measures for BPH Bufrofizin 1.6ml/lt or Acephate 1.5 gm/lt Spraying shpuld be done in evening times only	Drain out excess water Spray 5% salt solution on paddy sheaves If the paddy crop lost, fodder shortage would be severe, so fodder crops like pillipesara, cowpea, etc may be grown Plan for rabi crops like oilseed and pulses
Groundnut	Drain out the water as early as possible. Spary with 1% urea. Zinc sulphate sparyaing 2gm /lt Spraying with carbendiazm 1gm /+ Mancozeb 3gm/lt as prophylactic measure against fungal diseases	Drain out the water as early as possible. Spary with 1% urea. Zinc sulphate sparyaing 2gm /lt Spraying with carbendiazm 1gm /+ Mancozeb 3gm/lt as prophylactic measure against fungal diseases	Drain out the water as early as possible Spraying with carbendiazm 1gm /+ Mancozeb 3gm/lt as prophylactic measure against fungal diseases. Harvesting may be planned in case of advanced maturity stage .	Drain out the water as early as possible. Pluck the pods from plants and dry
Mesta	Drain out excess water Resowing may be done in case of loss of crop Spray 2% urea +1% Potash Incase of foot and stem rot occurrence Drench and spray the crop with COC 3gm/lt	Drain out excess water Apply a booster dose of 20-25kg of urea and 15kg of MOP per acre or Spray 2% urea +1% Potash Incase of foot and stem rot occurrence Drench and spray the crop with COC 3gm/lt	Drain out the water as early as possible. Harvesting may be planned in case of advanced maturity stage	Use the excess water for retting process. Stack the sticks vertically To enhance retting of basal portion.
Horticulture crops – Fruits				

Mango	• Drain the excess water as soon as possible • Spray 1% KNO_3 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% KNO_3 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 • Harvest the mature produce in a clear sunny day' • Wind damaged branches should be pruned using disinfected secatures and cut ends must be smeared with Bordeaux paste	• Store the fruits in well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible. • Grade the damaged or infected fruits. • Store the graded fruits in well ventilated place temporarily before it can be marketed.
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.
Spices and Plantation crops				

Areca nut , Oil palm and Coconut	• Planting should be done on mounts or bunds • Drainage system, suited to local conditions may be provided to remove surplus water from root zone • Relief drains [shallow] channels are opened at places where water accumulates and connected with main drain to remove water from the surface	• Drain the excess water as soon as possible • Apply booster dose of NPK fertilizers	• Drain the excess water as soon as possible • .Apply booster dose of NPK fertilizers • Harvest the mature nuts as soon as possible.	• Store the produce in well ventilated place temporarily before it can be market • Market the nuts as soon as possible.
Cashew	• 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. • Harvest the mature fruits as soon as possible	• Separate seed from the fruits and dry the seeds separately. • Store the fruits in well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible or use for the preparation of processed products.
Continuous submergence for more than 2 days[2]				

Paddy	Drain out excess water and Apply a booster dose of 2-2.5kg of urea and 1.5kg of MOP per 10 cents nursery hasten the growth of nursery Re sowing of nurseries with medium to short duration Varieties . Areas prone to water logging Swarna or chaitanya may grown ,as these varieties withstand submergence for about one week	Drain out excess water and Apply a booster dose of 20-25kg of urea and 15kg of MOP per acre hasten the establishment and promote more tillering Survived hills are to be split into individual tillers and used for gap filling. Swarna and chaitanya withstand submergence for about one week and survive with 2-3 tillers Pests like Leaf folder and swarming caterpillar may emerge so monitor the pest and control measures like spraying of chloripyriphos 2.5 ml/lt or car tap hydrochloride 2gm/lt may be taken up.	Drain out excess water and apply booster dose of Nitrogen to recoup the growth Monitor incidence of BPH and initiate Control measures for BPH Bufrofizin 1.6ml/lt or Acephate 1.5 gm/lt Spraying shpuld be done in evening times only	Drain out excess water Spray 5% salt solution on paddy sheaves If the paddy crop lost, fodder shortage would be severe, so fodder crops like pillipesara, cowpea, etc may be grown
Groundnut	Drain out the water as early as possible. Spraying witrbendiazm 1gm /lt as prophylactic measure against fungal diseases	Drain out the water as early as possible. Spary with 1% urea. Zinc sulphate sparyaing 2gm /lt Spraying witrbendiazm 1gm /lt as prophylactic measure against fungal diseases	Drain out the water as early as possible	Drain out the water as early as possible. Pluck the pods from plants and dry
Mesta	Drain out excess water Resowing may be done in case of loss of crop Spray 2% urea +1% Potash Incase of foot and stem rot occurrence Drench and spray the crop with COC 3gm/lt	Drain out excess water Apply a booster dose of 20-25kg of urea and 15kg of MOP per acre or Spray 2% urea +1% Potash Incase of foot and stem rot occurrence Drench and spray the crop with COC 3gm/lt	Drain out the water as early as possible. Harvesting may be planned in case of advanced maturity stage	Use the excess water for retting process. Stack the sticks vertically To enhance retting of basal portion.
Horticulture crops – Fruits				

Mango	• Drain the excess water as soon as possible • Spray 1% KNO_3 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% KNO_3 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 • Harvest the mature produce in a clear sunny day' • Wind damaged branches should be pruned using disinfected secatures and cut ends must be smeared with Bordeaux paste	• Store the fruits in well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible. • Grade the damaged or infected fruits. • Store the graded fruits in well ventilated place temporarily before it can be marketed.
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.
Spices and Plantation crops				

Areca nut Oil palm, Coconut	• Planting should be done on mounts or bunds • Drainage system, suited to local conditions. may be provided to remove surplus water from root zone • Relief drains [shallow] channels are opened at places where water accumulates and connected with main drain to remove water from the surface	• Drain the excess water as soon as possible • Apply booster dose of NPK fertilizers	• Drain the excess water as soon as possible • Apply booster dose of NPK fertilizers	• Harvest the mature nuts as soon as possible. • Market the produce as soon as possible.
Cashew	• 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.
Sea water intrusion[3]				
Paddy	Drain out excess water and Apply a booster dose of 2-2.5kg of urea and 1.5kg of MOP per 10 cents nursery hasten the growth of	Drain out excess water and Apply a booster dose of 20-25kg of urea and 15kg of MOP and Gypsum200kg per acre hasten the	Drain out excess water Monitor incidence of BPH and initiate Control	Drain out excess water

	nursery Re sowing of nurseries with medium to short duration Varieties . Areas prone to **Sea water intrusion** Somasila or Swarnamukhi may grown ,as these varieties have tolerance to salinity	establishment and promote more tillering Survived hills are to be split into individual tillers and used for gap filling. Pests like Leaf folder and swarming caterpillar may emerge so monitor the pest and control measures like spraying of chloripyriphos 2.5 ml/lt or car tap hydrochloride 2gm/lt may be taken up.	measures for BPH Bufrofizin 1.6ml/lt or Acephate 1.5 gm/lt Spraying shpuld be done in evening times only	If the paddy crop lost, fodder shortage would be severe, so fodder crops like pillipesara, cowpea, etc may be grown

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

Extreme event type	**Suggested contingency measure[r]**			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave				
Cold wave				
Frost				
Hailstorm				
Cyclone				
Paddy	Drain out excess water Incase of loss of plant population Survived hills are to be split into individual tillers and use for gap filling. Apply a booster dose of 20-25kg of urea and 15kg of MOP per acre hasten the establishment and promote more tillering Pests like Leaf folder and swarming caterpillar may emerge so monitor the pest and control measures like spraying of chloripyriphos 2.5 ml/lt or car tap hydrochloride 2gm/lt may be taken	Drain out excess water Monitor incidence of BPH and initiate Control measures for BPH Bufrofizin 1.6ml/lt or Acephate 1.5 gm/lt Spraying shpuld be done in evening times only. In case of lodging staking of 3-4 hills may done	Drain out excess water. Control measures for BPH Spraying of Bufrofizin 1.6ml/lt or Acephate 1.5 gm/lt In case of lodging staking of 3-4 hills may done	Spraying of 5% salt solution to prevent germination and discolouration of grain

	up.			
Groundnut	Drain out the water as early as possible Inter cultivation as soon as possible for quick evaporation of excess moisture. Spraying with Poly feed 500gm/acre to correct nutrient deficiencies and enhance growth Spraying with carbendiazm 1gm /+ Mancozeb 3gm/lt as prophylactic measure against fungal diseases.	Drain out the water as early as possible Pests like Spodoptera may attack the crop . control measures like Thiodicarb 1gm/lt may be sprayed Spraying with carbendiazm 1gm /+ Mancozeb 3gm/lt as prophylactic measure against fungal diseases.	Drain out the water as early as possible . Spraying with carbendiazm 1gm /+ Mancozeb 3gm/lt as prophylactic measure against fungal diseases. Harvesting may be planned in case of advanced maturity stage.	Drain out the water as early as possible. Pluck the pods from plants and dry.
Mesta	Drain out water Spray 2% urea +1% Potash Incase of foot and stem rot occurrence Drench and spray the crop with COC 3gm/lt	Drain out the water as early as possible. In case of lodging lift the crop and stake the crop.	Drain out the water Harvesting may be planned in case of advanced maturity stage.	Use the excess water for retting process. Stack the sticks vertically To enhance retting of basal portion.
Horticulture crops – Fruits				
Mango	• Drain the excess water as soon as possible • Spray 1% KNO_3 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% KNO_3 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 • Harvest the mature produce in a clear sunny day' • Wind damaged branches should be pruned using disinfected secatures and cut ends must be smeared with Bordeaux paste	• Store the fruits in well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible. • Grade the damaged or infected fruits. • Store the graded fruits in well ventilated place temporarily before it can be marketed.
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.
Spices and Plantation crops				
Areca nut , Oil palm and Coconut	• Planting should be done on mounts or bunds • Drainage system, suited to local conditions may be provided to remove surplus water from root zone • Relief drains [shallow] channels are opened at places where water accumulates and connected with main drain to remove water from the surface	• Drain the excess water as soon as possible • Apply booster dose of NPK fertilizers	• Drain the excess water as soon as possible • .Apply booster dose of NPK fertilizers • Harvest the mature nuts as soon as possible.	• Store the produce in well ventilated place temporarily before it can be market • Market the nuts as soon as possible.
Cashew	• 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. • Harvest the mature	• Separate seed from the fruits and dry the seeds separately. • Store the fruits in well ventilated

			fruits as soon as possible	place temporarily before it can be marketed. • Market the fruits as soon as possible or use for the preparation of processed products.

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1.1 Livestock

General contingency plans:

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	***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, panchyat lands or private property resources (PPRs) like waste and degraded lands with the monsoon pattern for higher biomass production Promote 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 and also sunhemp Chopping of fodder should be made as mandatory in every village through supply and establishment of good quality chaff cutters. Establishment of backed yard cultivation of para grass with drain water from bath room/washing area 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	Harvest and use biomass of dried up crops (Rice, Maize, Horse gram, Groundnut, black gram, sun hemp) 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 needy areas from the reserves at the district level initially and latter stages from the near by districts. All the sugar cane tops and 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) Motivate the farmers to mix the dry fodder with available kitchen waste while feeding Arrangements should be made for mobilization of small ruminants across the villages 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	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 of should be sown in 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

		keepers	
Cyclone	Harvest all the possible wetted grain (rice/maize etc) and sugar cane tops and use as animal feed. Motivate the farmers to store a minimum quantity of hay (25-50 kg) and concentrates (10-25 kg) per animal in farmer's / LS keepers house/ shed for feeding the animals during cyclone. Stock of anti-diarrheal drugs and electrolytes should be made available for emergency transport Don't allow the animals for grazing in case of early forewarning (EFW) of cyclone Incase of EFW of severe cyclone, shift the animals to safer places.	Treatment of the sick, injured and affected animals through arrangement of mobile emergency veterinary hospitals / rescue animal health workers. Diarrhea out break may happen. Health camps should be organized In severe cases un-tether **or** let loose the animals Arrange transportation of highly productive animals to safer place Spraying of fly repellants in animal sheds	Repair of animal shed Deworm the animals through mass camps Vaccinate against possible disease out breaks like HS, BQ, FMD and PPR Proper dispose 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 Bleach / chlorinate (0.1%) drinking water or water resources Collect drowned crop material, dry it and store for future use Sowing of short duration fodder crops in unsown and water logged areas when crops are damaged and no chance to replant Application of urea (20-25kg/ha) in the inundated areas and CPR's to enhance the bio mass production.
Floods	In case of early forewarning (EFW), harvest all the crops (Maize, Rice, Horse gram, Groundnut) that can be useful as fodder in future (store	Transportation of animals to elevated areas Stall feeding of animals with stored hay and concentrates	Repair of animal shed Bring back the animals to the shed Cleaning and disinfection of the shed

	properly) and also sugar cane tops Don't allow the animals for grazing if severe floods are forewarned Motivate the farmers to store a minimum required quantity of hay (25-50kg) and concentrates (25kgs) per animals in farmer / LS keepers house / shed for feeding animals during floods 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	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	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.

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)	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 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 line powder in pit Disposal of poultry manure to prevent protozoal problem Supplementation of coccidiostats in feed Vaccination against RD
Cyclone			
Shortage of feed ingredients	In case of EFW, shift the birds to safer place Storing of house hold grain like maize, broken rice, bajra etc, Culling of weak birds	Use stored feed as supplement Don't allow for scavenging Protect from thunder storms	Routine practices are followed
Drinking water		Use water sanitizers or offer cool drinking water	
Health and disease management	In case of EFW, add antibiotic powder in drinking water to prevent any disease outbreak	Sanitation of poultry house Treatment of affected birds Prevent water logging surrounding the sheds Assure supply of electricity	Disposal of dead birds by burning / deep burying with lime powder in pit Disposal of poultry manure to prevent protozoal problem

		Sprinkle lime powder (5-10g per square feet) to prevent ammonia accumulation due to dampness	Supplementation of coccidiostats in feed Vaccination against Ranikhet Disease (0.5ml S/c)
Heat wave and cold wave	**NA**		

2.5.3 Fisheries/ Aquaculture:

	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
1) Drought			
A. Capture			
Marine	No intervention	No intervention	No intervention
Inland			
(i) Shallow water depth due to insufficient rains/inflow	Stocking of advnced fingerlings in half or even less than the normal stocking density or stocking of common carp seed	Immediate harvesting or decreasing the density commensurate with the water quantity.	De weeding and deepening of tank to ensure retention of water for a longer period and provision of employment under MGNREGP
(ii) Changes in water quality	Regular monitoring of water quality parameters and application of geolites, soil probiotics, etc to maintain water qaulity	Immediate harvesting or changing the water quality by application of sanitisers.	Removal of top layer, deep ploughing of tank and application of lime
(iii) Any other			
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	Crop holiday or going for stocking of yearlings by reducing the density according to availability of water	Harvesting of fish and leaving the pond fallow till next season	Removal of top layer, deep ploughing of tank and application of lime
(ii) Impact of salt load build up in	Stocking of salinity tolerant fish /	Frenquent change of water with	Frequent draining of the pond with

ponds / change in water quality	shrimp, application of geolites and other buffers	fresh water	fresh water, removal of top layers
(iii) Any other			
2) Floods			
A. Capture			
Marine	No intervention	No intervention	No intervention
Inland			
(i) Average compensation paid due to loss of human life	Shifting the people from low lying areas to relief camps	Deployment of specially trained persons for rescue operations by providing life bouys, jackets, ropes, boats, etc	Payment sufficient ex-gratia to the families
(ii) No. of boats / nets/damaged	Shifting and relocating boats and nets to safer places when warnings are issued, to avoid fishing, etc	Shifting and relocating boats and nets to safer places	Assessment of damages to boats and nets and provision of boats and nets for restoration of livelihoods
(iii) No.of houses damaged	Avoidance of construction of houses in flood prone ares, construction of pucca houses at elevated places,	Shifting of people by relief boats to the relief camps	Assessment of damages to houses and provision of compensation in case of partial damage and sanction house under existing schemes
(iv) Loss of stock	Avoidance of surface species like catla, silver carp since they are vulnerable in tanks prone to floods, erection of nets across the spill way or just beyond it	Erection of nets at spill ways	Taking up compensatory stocking
(v) Changes in water quality		When dissolved oxygen levels go down, aerators, recirculation of water, etc are to be attempted to maintain DO levels, going for partial harvest, etc	
(vi) Health and diseases	Sometimes there may be heavy	There may be break out of	Removal of weeds, top layer of

	accumulation of nutrients and organic matter.	Heamorrhagic septicimea. Addition of antibiotics like Chloro Tetra Cycline or Oxy Tetra Cycline to the feed to constrol the disease	soil, deep ploughing of tank and application of lime, exposing to sun light
B. Aquaculture			
(i) Inundation with flood water	Raising and rivetting the bunds, construction of spill way to release excess water, erection of nets to avoid escape of fish	Continuous pumping of excess water, erection of nets low lying areas	Strengthening of bunds, excavating channels along the sides of the ponds for free escape of water
(ii) Water continuation and changes in water quality		When dissolved oxygen levels go down, aerators, recirculation of water, etc are to be attempted to maintain DO levels, going for partial harvest, etc	
(iii) Health and diseases	Sometimes there may be heavy accumulation of nutrients and organic matter.	There may be break out of Heamorrhagic septicimea. Addition of antibiotics like Chloro Tetra Cycline or Oxy Tetra Cycline to the feed to constrol the disease	Removal of weeds, top layer of soil, deep ploughing of tank and application of lime, exposing to sun light
(iv) Loss of stock and inputs (feed, chemicals etc)	Advance erection of nets, strengthening of bunds where they are prone to breaches, harvesting or reducing the density	Suspension of feeding, application of organic manures	Compensatory stocking, assessment of values and payment of subsidy on inputs
(v) Infrastructure damage (pumps, aerators, huts etc)	Insuring pond, accessories, etc., Shifting of aerators, pumps soon after warnigs are issued	Relocating pumps, aerators to elevated places	Assessment of damages and provision of them on subsidy
(vi) Any other			
3. Cyclone / Tsunami			
A. Capture			

Marine			
(i) Average compensation paid due to loss of fishermen lives	Avoidance of fishing, preventing fishermen from venturing into sea, carrying of safety equipment and VHF sets, shifting fishermen from vulnerable areas to relief camps, etc	To ensure the return of fishing boats on long voyages, provision of information on such boats to coast Guard	Payment sufficient ex-gratia to the families
(ii) Avg. no. of boats / nets/damaged	Avoidance of fishing when warnings are issued, shifting of boats and nets to safe places	Shifting and relocating boats and nets to safer places	Assessment of damages to boats and nets and provision of boats and nets for restoration of livelihoods
(iii) Avg. no. of houses damaged	Avoidance of houses in Coastal Regulation Zone, designing of houses to withstand impact of turbulent wind and water	Shifting of people by relief boats to the relief camps	Assessment of damages to houses and provision of compensation in case of partial damage and sanction house under existing schemes
Inland	Erection of protective nets acroos the surplus weir to prevent fish loss due to overflows	Continuous monitoring to prevent or minimise escape of fish along with surplus water	Compensatory stocking of seed
B. Aquaculture			
(i) Overflow / flooding of ponds	The design of the pond must be in such a manner as to bail out surplus water and to prevent loss of stanidng crop	Continuous monitoring to prevent or minimise escape of fish along with surplus water	Compensatory stocking of seed
(ii) Changes in water quality (fresh water / brackish water ratio)	Recircualtion water to repleish and ensure sufficient dissolved oxygen levels in the pond. Maintenance of salinity levels by pumping in water from creecks.	Continuation of the same process.	Restoration of physical and chemical parameters
(iii) Health and diseases	Removal of stress causing factors to maintain the health of the	Removal of stress causing factors to maintain the health of	Restoration of physical and chemical parameters

	animal	the animal	
(iv) Loss of stock and inputs (feed, chemicals etc)	Preventive nets must be erected to minimise loss of stock	Continuation of the same process.	Compensatory stocking of seed
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)	Pumps, aerators, etc must be protected by moving them to safe locations	To avoid use of aerators, pumps and other appliances	Overhauling of the eqipment to prevent from being damaged
(vi) Any other			
4. Heat wave and cold wave			
A. Capture			
Marine	Avoidance of fishing	Avoidance of fishing	No intervention
Inland	Monitoring dissolved oxygen levels	Monitoring dissolved oxygen levels	No intervention
B. Aquaculture			
(i) Changes in pond environment (water quality)	Reduction of biomass by partial harvest in the event of heat as the DO levels will be very low.	Avoidance of fishing	Compensatory stocking of seed and restoration of all physical and chemical parameters
(ii) Health and Disease management	Removal of stress causing factors to maintain the health of the animal	Removal of stress causing factors to maintain the health of the animal	Compensatory stocking of seed and restoration of all physical and chemical parameters
(iii) Any other			