State: ANDHRA PRADESH

Agriculture Contingency Plan for District: GUNTUR

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 eco region (7.3, 7.2)			
	Agro-Climatic Region (Planning Commission)	East Coast plain and hill region (XI)			
	Agro Climatic Zone (NARP)	Krishna – Godavari Zone, (AP-1)			
	List all the districts or part thereof falling under the NARP Zone	Guntur, Krishna, Prakasam			
	Geographic coordinates of district	Latitude	Latitude	Altitude	
		$15^0$18'0" -16°50'0" N	15°18'0" -16°50'0" E	32m MSL	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Regional Agricultural Research Station, Lam , Guntur-522 034			
	Mention the KVK located in the district	NG Ranga Krishi Vigyan Kendra, Vinayashram, Kavuru, Cherukupalli (Mandal), Guntur District 522 034			

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):	545	36	1st week of June	2nd week of October
	NE Monsoon(Oct-Dec):	251	10	3rd week of October	4th week of December
	Winter (Jan- Feb)	14	1	-	-
	Summer (Mrch-May)	71	2	-	-
	Annual	881	51	-	-

1.3	**Land use pattern of the district (latest statistics)**	**Geographical Area**	**Forest area**	**Land under non-agricultural use**	**Permanent pastures**	**Cultivable wasteland**	**Land under Misc. tree crops and groves**	**Barren and uncultivable land**	**Current fallows**	**Other fallows**

	Area (‘000 ha)	1139.1	161.9	156.8	18.9	31.0	32.3	34.4	41.5	38.4

Guntur district experience moderate floods. Moderate drought and mild cyclones in coastal areas

General contingency plans

1. 4	**Major Soils (common names like shallow red soils etc.,)**		**Area (‘000 ha)**	**Percent (%) of total**
	1. Black Cotton Soils		491	72
	2. Red Soils		116	17
	3. Coastal Sandy Soils		61	9
	4. Alluvial Soils		14	2
	Others (specify):			
1.5	**Agricultural land use**		**Area (‘000 ha)**	**Cropping intensity %**
	Net sown area		597.0	134.6
	Area sown more than once		206.6	
	Gross cropped area		803.6	
1.6	**Irrigation**		**Area (‘000 ha)**	
	Net irrigated area		373.6	
	Gross irrigated area		427.2	
	Rainfed area		223.4	
	Sources of Irrigation	Number	Area (‘000 ha)	Percentage of total irrigated area
	Canals		305.7	79.2

	Tanks		4.1	1.1
	Open wells			
	Bore wells		62.2	16.1
	Lift irrigation			
	Micro-irrigation			
	Other sources		14.1	3.7
	Total Irrigated Area		386.2	100.0
	Pump sets			
	No. of Tractors			
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils	(%) area	
	Over exploited	1	5 villages in Bollapalli mandal out of 57 mandals as per the latest survey	
	Critical	-	-	
	Semi- critical	-	-	
	Safe	56	-	
	Wastewater availability and use	Satisfactory	-	
	Ground water quality	Satisfactory		
	*over-exploited: ground water utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%			

Area under major field crops & horticulture etc. (2009-10)

1.7		Major Field Crops cultivated	Area (‘000 ha)					
			Kharif		*Rabi*		Summer	Total
			Irrigated	Rainfed	Irrigated	Rainfed		
	1	Paddy	191	_	122	_	_	313
	2	Cotton	_	152	_	_	_	152
	3	Maize	_	1	74			75
	4	Blackgram	_	_	_	64	_	64
	5	Redgram	_	31	_	_	_	19
		Horticulture crops - Fruits	Total area(‘000 ha)					
	1	Banana	5.5					
	2	Lemon	2.3					
	3	Orange & Batavian	2.2					
	4	Papaya	1.1					
	5	Mango	1.1					
		Horticultural crops - Vegetables	Total area(‘000 ha)					
	1	Chillies	53.2					

	2	Bhendi	17.2
	3	Gourds	16.2
	4	Cucumber	15.7
	5	Brinjal	14.7
		Spices and Plantation crops	Total area(‘000 ha)
	1	Turmeric	4.2
		Medicinal and Aromatic crops	
		Plantation crops	
		Fodder crops	
		Total fodder crop area	
		Grazing land	
		Sericulture etc	
		Others (Specify)	

1.8	**Livestock**	**Male (‘000)**	**Female (‘000)**	**Total (‘000)**
	Non descriptive Cattle (local low yielding)	76.6	50.9	127.5
	Crossbred cattle	0.6	4.3	4.9
	Non descriptive Buffaloes (local low yielding)	160.5	1039.6	1200.1
	Graded Buffaloes			
	Goat			282.7

	Sheep			722.3
	Others (Camel, Pig, Yak etc.)			24.4
	Commercial dairy farms (Number)			
1.9	Poultry	No. of farms	Total No. of birds (‘000)	
	Commercial		4527.5	
	Backyard		1532.0	

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)	
		6680	150	490 / 900	484 / 21909	533 / 267	19 / 0
	ii) Inland (Data Source: Fisheries Department)	No. Farmer owned ponds		No. of Reservoirs		No. of village tanks	
		316		2		65	
	B. Culture						
		Water Spread Area (ha)		Yield (t/ha)		Production (‘000 tons)	
	i) Brackish water (Data Source: MPEDA/ Fisheries Department)	1890		-		5.7	
	ii) Fresh water (Data Source: Fisheries Department)	760		-		0.9	

	Others		-	41.7

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 (Crops to be identified based on total acreage)										
1	Paddy	690	3620	418	3420	-	-	1188	3520	
2	Cotton	515	578	-	-	-	-	515	578	
3	Blackgram	-	-	18	659	-	-	18	659	
4	Maize	4	4000	533	7224	-	-	537	5612	
5	Redgram	29	917	-	-	-	-	29	917	
Fruits (Crops to be identified based on total acreage)										
1	Banana							166.91	30000	
2	Lemon							35.679	14667	
3	Orange & Batavian							30.21	13300	
4	Papaya							91.832	78667	
5	Mango							9.73	8267	
vegetables										
1	Chillies							148.89	2750	
2	Bhendi							24.63	14333	
3	Gourds							22.731	13667	
4	Cucumber							25.1212	16000	
5	Brinjal							26.78	18667	
Flower Crops										
Spices and Plantation crops										
1	Turmeric							26.51	6200	
Other										

s										
Major Horticultural crops (Crops to be identified based on total acreage)										

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	**Paddy**	**Cotton**	**Redgram**	**Blackgram**	**Maize**
	Kharif- Rainfed	-	July 1st fortnight – July 2nd fortnight	June 1st fortnight – July 2nd fortnight	-	-
	Kharif-Irrigated	June 1st fortnight – July 2nd fortnight	July 1st fortnight – July 2nd fortnight	-	-	-
	Rabi- Rainfed	-	-	September 1st fortnight – October 1st fortnight	October 2nd fortnight – November 1st fortnight	-
	Rabi-Irrigated	December 2nd fortnight – January 1st fortnight	-	October 2nd fortnight	November 2nd fortnight – December 1st frotnight	November 2nd fortnight – December 1st fortnight

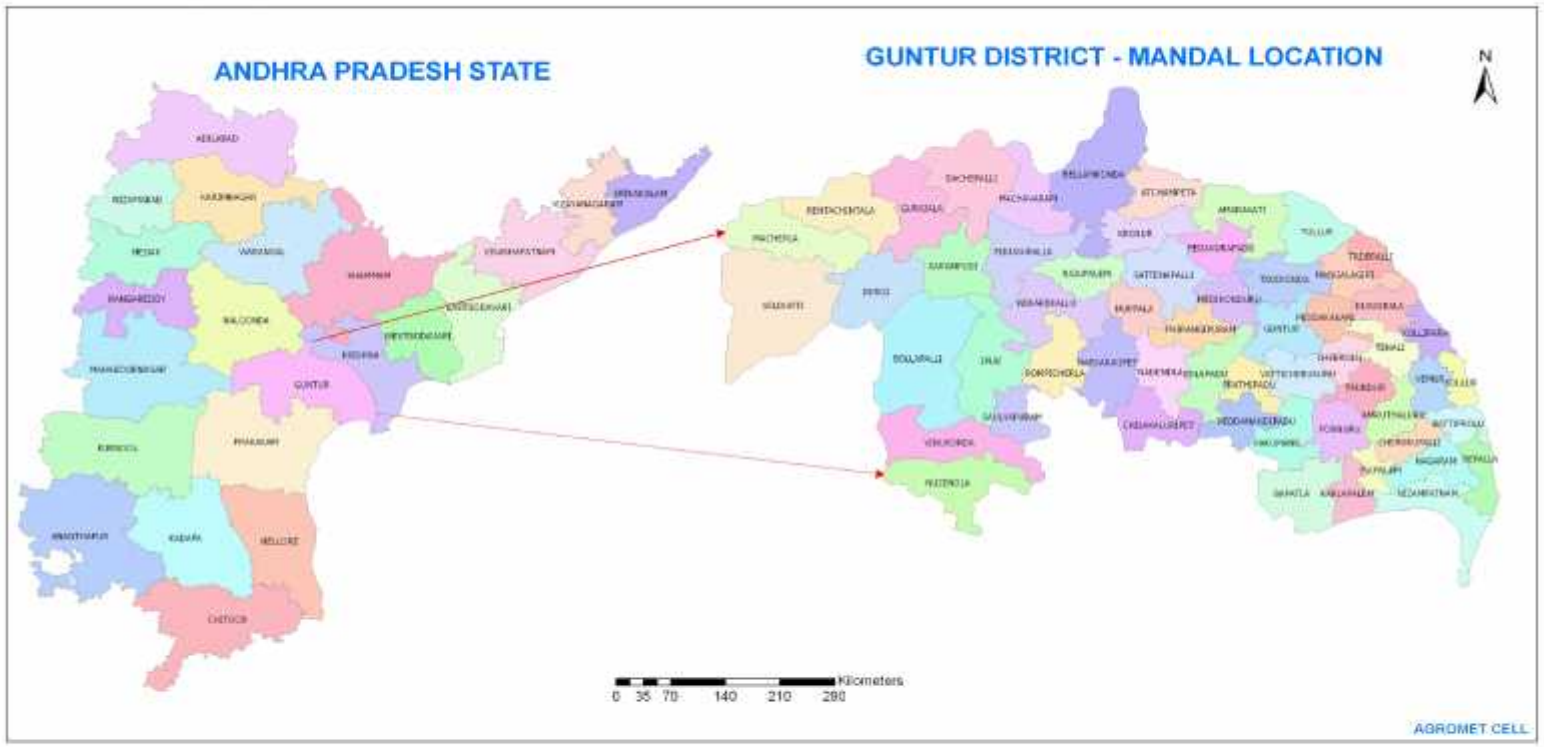
1.13	What is the major contingency the district is prone to? (Tick mark and mention years if known during the last 10 year period)	Regular	Occasional	None
	Drought		√	
	Flood		√	
	Cyclone	√		
	Hail storm			

	Heat wave			
	Cold wave			
	Frost			
	Sea water intrusion			
	Pests and diseases (specify)	Rice: Blast Redgram: Maruca and Helicoverpa Cotton: Sucking pest complex Castor: Botrytis Blackgram : YMV		
	Others (Fog)		√	

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

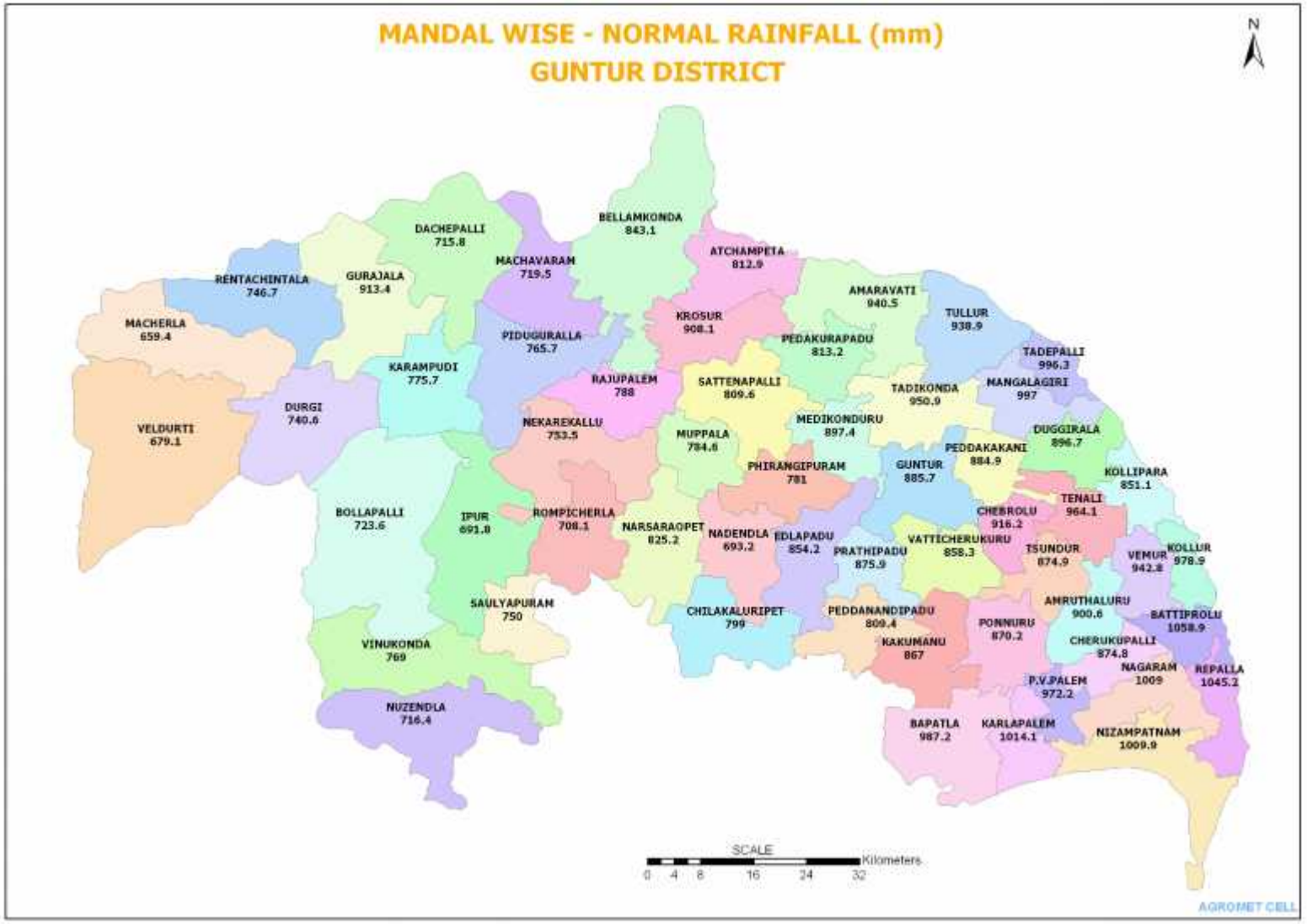
ANNEXURE-I

LOCATION MAP OF GUNTUR WITH IN ANDHRA PRADESH

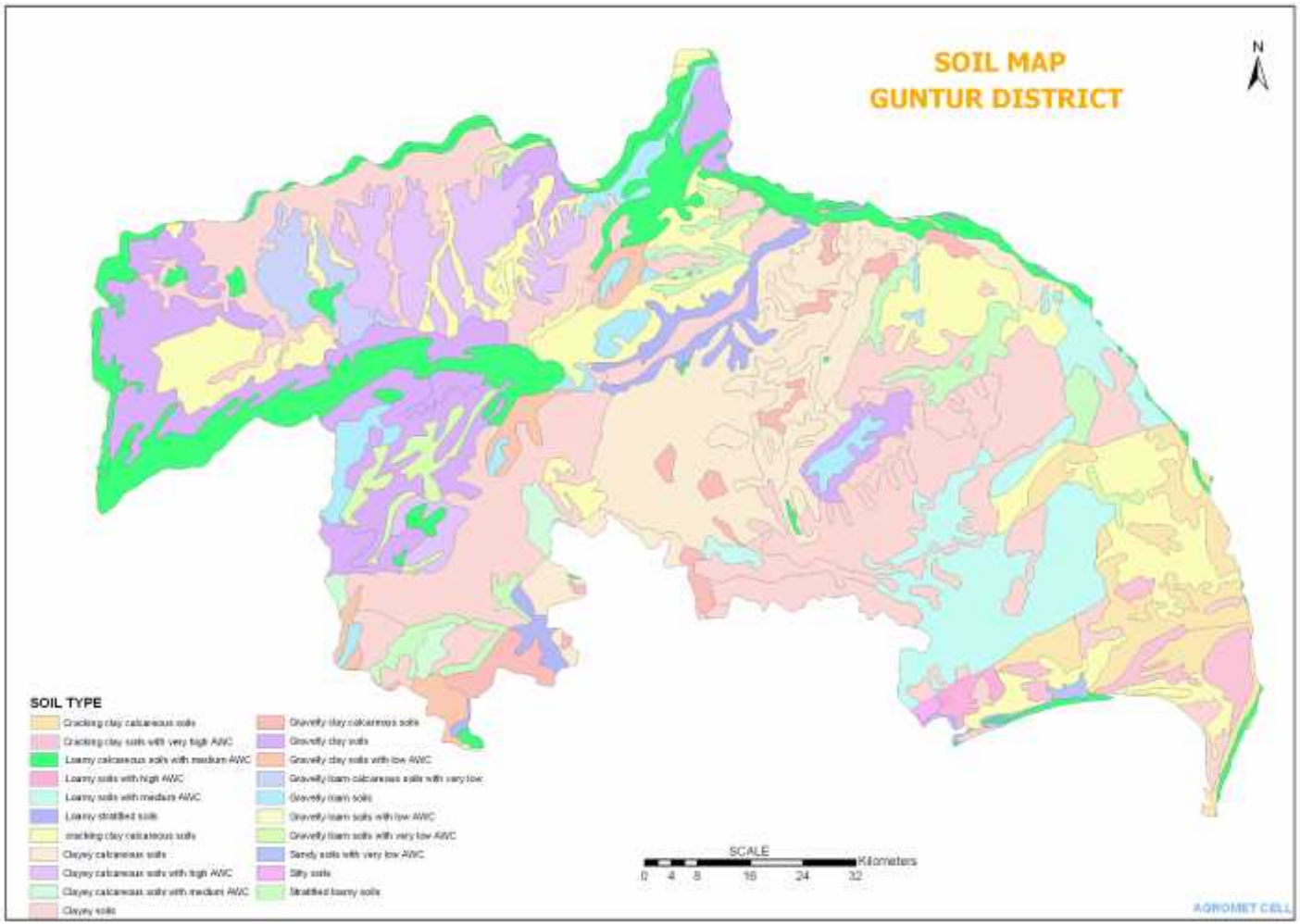


ANNEXURE-II

MEAN ANNUAL RAINFALL



ANNEXURE-III



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 (3rd week of June)	Black soils (Medium deep) – Rainfed	Cotton	No change	Normal practices	-
	Red soils (Medium deep)- Rainfed	Cotton			
		Redgram (Sole crop)			
		Redgram + Greengram/Bajra (1:5/1:2)			

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 4 weeks (July 1st week)	Black soils(Medium deep) – Rainfed	Cotton	No change	Normal practices	
	Red soils(Medium deep) - Rainfed	Cotton		-do-	
		Redgram (Sole crop)		Reduce row spacing 180 cm to 150 cm	

		Redgram+Greengram/Bajra (1:5/1:2)		Normal practices	-
Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 6 weeks (July 3rd week)	Black soils(Medium deep) – Rainfed	Cotton	No change		
	Red soils(Medium deep) - Rainfed	Cotton		Adopt closer spacing of 90X45 cm	
		Redgram (Sole crop)		Reduce row spacing from180 cm to 150 cm	
		Redgram+Greengram/Bajra (1:5/1:2)		Normal spacing	
		Castor		Adopt a closer spacing of 90X45 cm	

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8 weeks (August 1st week)	Black soils(Medium deep) – Rainfed	Cotton	No change	Adopt closer spacing of 90 x 30 cm	

	Red soils (Medium deep) - Rainfed	Cotton		Adopt closer spacing of 75X30 cm. Top dressing of fertilizer at 20 days interval	
		Redgram (Sole crop)		Reduce row spacing 180 cm to 120 cm	
		Redgram + Greengram / Bajra (1:5/1:2)	Sole crop Redgram		
		Castor	No change	Adopt closer spacing of 90X30 cm	

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.	Black soils – Rainfed	Cotton	Gap filling to be done by pot watering 7- 10 days after sowing when the crop stand is poor	When the crop is two weeks old adopt inter-cultivation to conserve moisture Spray 2 % urea solution or 1 % water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 to supplement nutrition	-
	Red soils - Rainfed	Cotton			
		Redgram (sole crop)		Intercultivation to be done after 2 weeks of sowing to conserve soil	
		Redgram+Greengram/Bajra			

		Castor		moisture Foliar spray of 2% urea to supplement nutrition	
Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At vegetative stage	Black soils – Rainfed	Cotton	Spray 2 % urea or 1% KNO_3 solution or 1 % water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21	Frequent intercultivation at 7-10 days interval	
	Red soils - Rainfed	Cotton			
		Redgram (sole crop)			
		Redgram+Greengram/Bajra	Harvest intercrops as fodders if chances of grain yield are poor Suppliment the nutrients to the main crop through foliar spray		
		Castor	Spray 2 % urea solution or 1 % water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 Adopt nipping to allow main spike to develop		

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	Black soils – Rainfed	Cotton	Spray 2 % urea - or 1% KNO_3 or other water soluble fertilizers 1 % to supplement nutrition	Intercultivation to create soil mulch to conserve moisture	-
	Red soils - Rainfed	Cotton	Spray urea - 2 % or KNO_3 1% or other water soluble fertilizers like 19-19-19,20-20-20-20,21-21-21- 1 % to supplement nutrition	Intercultivation to create soil mulch to conserve moisture. Supplemental irrigation, if available	
		Redgram (sole crop)		Intercultivation	
		Redgram+Greengram/Bajra			
		Castor	Nipping of auxiliary buds to allow the main spike to mature Foliar spray of urea 2 % or KNO_3 1% or other water soluble fertilizers 1 % to supplement nutrition		

Condition			**Suggested Contingency measures**		
Terminal drought	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
	Black soils -Rainfed	Cotton	Spray urea - 2 % or KNO_3 1% or other water soluble fertilizers 19-19-19,20-20-20-20,21-21-21 - 1% to supplement nutrition Topping to prevent formation of new vegetative and reproductive flush Supplemental irrigation if available	-	-
	Red soils - Rainfed	Cotton	Spray urea - 2 % or KNO_3 1% or other water soluble fertilizers 1% to supplement nutrition Topping to prevent formation of new vegetative and reproductive flush		
		Redgram (sole crop)	Spray urea - 2 % or KNO_3 1% or other water soluble fertilizers 19-19-19,20-20-20-20,21-21-21 - 1 % to supplement nutrition Varieties like PRG 158, ASHA with medium duration are to be promoted if terminal drought is a common phenomenon		
		Redgram+Greengram/Bajra			
		Castor	Nipping of auxiliary buds to allow the main spike to mature Foliar spray of urea 2 % or KNO_3 1% or other water soluble fertilizers 19-19-19,20-20-20-20,21-21-21 -1 % to supplement nutrition		

2.1.2 Irrigated situation

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall	Black soils – Canal irrigated (KWD)	Green manure – Rice – Blackgram/Maize	Green manure – Rice – Greengram/Blackgram/Maize	Adopt preventive control measures for rice blast During Rabi season select Blackgram varieties like LBG 20, LBG 752, LBG 708, LBG 709 which are early maturing and suitable for delayed sowings Greengram can be grown in rice fallows under late sown conditions Rice fallows: Blackgram - short duration varieties	Seed multiplication of required pulse varieties can be planned and produced during early rabi season in Upland farming situation in the district Linkage with NFSM

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
	Red Soils/Black Soils – Canal irrigated (NSP Command)	Green gram – Rice – Greengram/Maize/Blackgram/Fodder	No change	Avoid growing rice varieties like BPT 5204 as they are highly susceptible to blast disease under delayed season Select varieties like NLR 34449, NLR 3041, NLR 145, JGL 384 etc. which are resistant to blast and suitable for mid kharif season If BPT 5204 is grown adopt special package for given for plant protection	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	**Agronomic measures**	**Remarks on Implementation**
Limited release of water in canals due to low rainfall	Black soils – Canal irrigated (KWD)	Green manure – Rice – Blackgram/Maize	Green manure – Rice – Black gram/Greengram/ Jowar/Bajra Aerobic rice	Rice – 1. Adopt alternate wetting and drying upto primordial 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 as the problem of weeds is more under alternate wetting and drying method of irrigation	Rice - Farmers should be careful in weed management as weeds are the major threat to crop under alternate wetting and drying method of irrigation. They should be properly educated and trained in use of suitable chemical and mechanical control measures
				Rice fallows 1. Crops like maize which require more water should be avoided 2. Crops like Greengram, Blackgram, Jowar, Bajra etc. which require less water than Maize may be grown 3. Short duration varieties of crops should be selected.	Rice fallows – 1. Availability of seed of short duration varieties should be ensured through linkage with NFSM 2. Micro irrigation systems – Sprinkler and Drip under different government schemes may be extended.

				4. Water saving micro irrigation systems like Sprinkler irrigation for Grengram and Blackgram may be followed 5. In crops like Bajra and Jowar, water conservation practices like inter cultivation, earthing up, alternate row irrigation may be practiced 6. Water loss in open field channels during conveyance can be reduced by using PVC/metallic pipes.	
	Black soils/Red soils – Canal irrigated (NSP Command)	Greengram – Rice – Blackgram/Greengram/Maize/Fodder	1. Green manure – Rice – Greengram/Blackgram/Jowar/ 2. Bajra/Fodder	For rice and rice fallow crops the agronomic measures as suggested for the above farming situation shall be followed	
			3. Redgram + Greengram/ Bajra/ Jowar	Proper drainage facilities should be created to take up cropping systems as suggested	
			4. Cotton (Wherever drainage facilities available)	Proper drainage facilities should be created to take up cropping systems as suggested	

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	Black soils – Canal irrigated (KWD)	NA			
	Black soils/Red soils – Canal irrigation (NSP)				

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		NA			

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		NA			
Any other condition (specify)					

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

Condition - Continuous high rainfall in a short span leading to water logging				
Crop	**Suggested contingency measure**			
	Vegetative stage	**Flowering stage**	**Crop maturity stage**	**Post harvest**
Rice	• Drain the excess water as early as possible • Apply 20 kg N + 10 kg K /ha after draining excess water • Take up gap filling either with • available nursery or by splitting the tillers from the surviving hills • Take up proper weed control • measures • Take up suitable plant protection measures against pest & disease	• Drain the excess water as early as possible • Apply 20 kg N + 10 kg K /ha after draining excess water • Take up suitable plant protection • Measures for BPH • Rodents: Fumigate the burrow with luminium phosphide 2 pellets of 0.6 g per burrow. Poison bait with bromadiolone • False smut: Spray Carbendzism 1.0g or COC 2.5g at weekly	• Drain the excess water as early as possible • Take up suitable plant protection measures against grain fest and disceases • Cut worm: SprayChlorpyriphos 2.5 ml or DDVP 1.0 ml or Endosulfan 2.0 ml • Rodents :Fumigate the burrow with aluminium phosphide 2 pellets of 0.6 g per burrow. Poison bait with bromadiolone	• Drain out water and spread sheaves loosely in the field or field bunds where there is no water stagnation • Stack the sheaves • Spray common salt 5% on panicles to prevent germination and spoilage of straw from moulds • Thresh after drying the sheaves properly

	outbreaks • Leaf folder: Spray Chlorpyriphos@2.5ml or Acephate 1.5g or Cartaphydrochloride 2.0g / l or apply 8.0kg Cartaphydrochloride granuals per acre. • Sheath blight: Apply recommended nitrogen in 3-4 splits. Spray Propiconazole 1.0 ml or Hexaconazole 2.0 ml or validamycin 2.0 ml /l at 15 days interval based on need. • Blast : remove weeds on the bunds Spray Tricyclozole 0.6/ml or Edifenphos 1.0 ml • Bacterial leaf blight: Avoide application of excess Nitrogen.	interval • Sheath blight: Apply recommended nitrogen in 3-4 splits. Spray Propiconazole 1.0 ml or Hexaconazole 2.0 ml or validamicin 2.0 ml /lt at 15 days interval • Blast : remove weeds on the bunds Spray Tricyclozole 0.6ml or Edifenphos 1.0 ml • Bacterial leaf blight: Nitrogen management		• Ensure proper grain moisture before storing • Application of 40 - 60 kg/content <8% common salt per acre on sheaves if water is not receded • Application of 30 – 40 kg common salt in layer while heaping.
Cotton	• Drain the excess water as early as possible in black soils • Apply 20 kg N + 10 kg K /ha after draining excess water • Take up inter cultivation at optimum soil moisture condition to loosen and aerate the soil and to control weeds • To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 @ 1% to support nutrition • Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals	• Drain the excess water as early as possible • Apply 20 kg N + 10 kg K /ha after draining excess water • To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition • Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals to control Bacterial leaf blight, wilt alternaria leaf spot and grey mildew • Take up timely control measures against sucking pets and	• Drain the excess water as • early as possible • To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition • Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% against boll not. • Take up timely control measures against bollworms and whitefly	• Dry the produce properly before baling and sending to market

	• Take up timely control measures against sucking pests	bollworms.		
Redgram	• Drain the excess water as early as possible • Apply 20 kg N + 10 kg K /acre after draining excess water • Take up inter cultivation at optimum soil moisture status to loosen and aerate the soil and to control weeds • To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition	• Drain the excess water as early as possible • To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition • Take up timely control measures against possible outbreak of pod borer complex, maruca , Helicovera etc.	• Drain the excess water as early as possible • Allow the crop to dry completely before harvesting	• Spread the bundles drenched in rain on field bunds or drying floors to quicken the drying • Thresh the bundles after they are dried properly • Dry the grain to proper moisture per cent before bagging and storing to prevent deterioration in quality during storage
Blackgram	• Drain the excess water as early as possible • Apply 4-5 kg N /acre after draining excess water • To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition • Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals • Take up timely control measures against sucking pets whitefly that transmits YMV	• Drain the excess water as early as possible • Apply 4-5 kg N /acre after draining excess water • To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition • Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% • Take up timely control measures against the outbreak of pests like *Spodoptera* etc.	• Drain the excess water as • early as possible • Allow the crop to dry completely before harvesting	• Spread the bundles drenched in rain on field bunds or drying floors to quicken the drying • Thresh the bundles after they are dried properly • Dry the grain to proper moisture per cent before bagging and storing to prevent deterioration in quality during storage
Maize	• Drain the excess water as early as	• Drain the excess water as early as	• Drain the excess water as	• Harvest the cobs after the they are dried up

	possible • Apply 20 kg N + 10 kg K /haafter draining excess water • Take up inter cultivation and at optimum soil moisture condition to loosen and aerate the soil and to control weeds • Earthenup the crop for anchorage • Spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition • Take up timely control measures for Pink stem borer, sheath blight and Turcicum leaf blight	possible • Apply 20 kg N + 10 kg K /ha after draining excess water • Spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition • Take up timely control measures for sheath blight and post flowering stalk rots	• early as possible • Allow the crop to dry completely before harvesting	properly. Dry the grain to optimum moisture condition before storing
Horticulture crops – Fruits				
Horticulture crops vegetables				
Spices and Plantation crops				
Condition - Heavy rainfall with high speed winds in a short span				
Rice	Measures similar to above given for heavy rainfall situation as above	In addition to the above measures lift the lodged hills and tie them together to keep them erect	In addition to the above measures, lift the lodged plants and tie them together keep erect	In addition t the above measures, for water lagging take up measures to minimize blowing away of produce due to high velocity winds.
Cotton	In addition to the measures for removing excess water, Lift the fallen plants if any and firm up the soil around the base of the	Lift the fallen plants if any and firm up the soil around the base of the stem Bacterial leaf blight: Spray	Similar measures as in water lagged situation. Additional by pick the net cotton at the earliest	Dry the produce under sun before sending to market

	stem	plantomycin 16g per acre		
Redgram	Lift the lodged plants if any and firm up the soil around the base of the stem Apply 4-5 kg N /acre after draining excess water	Lift the lodged plants if any and firm up the soil around the base of the stem Takeup timely pest control measures for pod borers and wilt	Harvest the pods from uprooted plants as soon as the field condition permits and transport to drying floor	Dry the produce under sun before thrashing and sending to market.
Blackgram	Similar measure as in water lagged situation as above.	Similar measure as in water lagged situation as above.	Harvest the crop as soon as the field condition permits	Dry the produce under sun before sending to market
Maize	Drain out the excess water from the field as early as possible Earthing-up for better anchorage	Drain out the excess water from the field as early as possible	Drain out the excess water from the field as early as possible Allow the crop to dry completely before harvesting	Harvest the cobs after they are dried up properly. Dry the grain to optimum moisture condition before storing
Horticulture				
Horticulture crops vegetables				
Horticulture crops flowers				
Spices and Plantation crops				
Condition - Outbreak of pests and diseases due to unseasonal rains				
Rice	Stem rot and Sheath blight - need based plant protection measures to be initiated based on incidence levels	BPH, Blast, Sheath blight incidence may increase due to unseasonal rains - need based plant protection measures to be initiated	Climbing cutworm and neck blast	-
Cotton	Jassids, Wilt and root rot, Bacterial leaf blight - Need based plant	Jassids, *Spodoptera*, Wilt and root rot, Bacterial leaf blight, Grey	Dusky cotton bug, Grey mildew - Need based plant protection	Dry the seed cotton properly after picking

	protection measures to be initiated	mildew - Need based plant protection measures to be initiated	measures to be initiated	and store it under shade in aerated place
Redgram	Wilt and root rot - Need based plant protection measures to be initiated	Wilt and root rot. Need based plant protection measures to be initiated	-	
Blackgram	Spodoptera - Need based plant protection measures to be initiated	Spodoptera, Leaf spots, Powdery mildew - Need based plant protection measures to be initiated	Spodoptera, Rust - Need based plant protection measures to be initiated	
Maize	-	Jassids, Wilt and Stalk rot	Post flowering Stalk rots may aggravate , if unseasonal rains occurs	
Outbreak of pests and diseases due to unseasonal rains				
Banana	• Need based plant protection measures to be done immediately	• Need based plant protection measures to be done immediately	• Need based plant protection measures to be done immediately	• Need based plant protection measures to be done immediately
Lemon Orange& Batavian Papaya Mango	• Control pest diseases in an holistic approach with proper plant protection chemicals • Adoption of IPM and IDM practices	• Control pest diseases in an holistic approach with proper plant protection chemicals • Adoption of IPM and IDM practices	• Control pest diseases in an holistic approach with proper plant protection chemicals • Adoption of IPM and IDM practices	• Control pest diseases in an holistic approach with proper plant protection chemicals • Adoption of IPM and IDM practices
Horticulture crops vegetables				
Chillies Bhendi Gourds & Cucumbur	• Control pest diseases in an holistic approach with proper plant protection chemicals • Adoption of IPM and IDM practices	• Control pest diseases in an holistic approach with proper plant protection chemicals • Adoption of IPM and IDM practices	• Control pest diseases in an holistic approach with proper plant protection chemicals • Adoption of IPM and IDM practices	• Control pest diseases in an holistic approach with proper plant protection chemicals • Adoption of

Brinjal				IPM and IDM practices
Spices & Plantation crops				
Turmeric	• Gap filling to replace rotten seedlings.	• Control pest diseases in an holistic approach with proper plant protection chemicals • Adoption of IPM and IDM practices • Protect against rhizome fly and rot	• Control pest diseases in an holistic approach with proper plant protection chemicals • Adoption of IPM and IDM practices • Protect against rhizome fly and rot	• Drain the excess water as soon as possible. • Dry the rhizomes on elevated concrete floor immediately after the appearance of sunlight. Mix thoroughly and periodically for quick and uniform drying of surface moisture. • Remove and separate the rotten and mould affected rhizomes. • Cook and dry the rhizomes as soon as possible. • Store the produce in wellventilated place in gunny bags treated with safe fungicides and insecticides before it can be marketed.

2.3 Floods

Condition	Transient water logging/ partial inundation and Continuous submergence for more than 2 days			
	Suggested contingency measure			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Rice	To drain out the excess water at the earliest 2. Apply booster dose of 0.2 kg N/40 sq. m Spray micronutrients like Zn, Fe two to three times at 4 -5 days interval Take up proper weed control measures	To drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors Apply a booster dose of 20 kg N/acre Spray $ZnSO_4$ 0.2 % if it is less than 45 days after transplanting Take up need based plant protection measures Timely plant protection measures for pest and disease out break Take up gap filling either with available nursery or by splitting the tillers from the surviving hills if the gaps are < 30% if more go for replanting	To drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors Take up need based plant protection measures	Drain out water .Spread sheaves loosely in field or field bunds where there is no water stagnation by farming drainage channels if there is a gradient and if not by using motors Spray common salt at % on panicles to prevent germination and spoilage of straw from moulds Thresh after drying the sheaves properly Ensure proper grain moisture before storing
Cotton	To drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors Take up the gap filling at the earliest	To drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors Inter cultivate at optimum field moisture condition Apply 20 kg N + 10 kg K /ha after draining excess water	To drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors 5 To spray KNO_3 1 % or	Kapas picking should be done carefully to prevent admixtures with waste plant material

	Inter cultivate at optimum field moisture condition Apply 20 kg N + 10 kg K /ha after draining excess water To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition Take up plant protection measures against possible pests and disease incidence Select short duration hybrids Adopt closer spacing of 90X45 or 90X30 cm	To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition Spray of micronutrients two times at 7-10 days interval Take up plant protection measures against possible pests and disease incidence	water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition Take up plant protection measures against possible pests and disease incidence	
Redgram	To drain out the excess water at the earliest Takeup the gap filling at the earliest Inter cultivate at optimum field moisture condition Apply 4-5 kg N/acre after draining excess water	To drain out the excess water at the earliest Takeup the gap filling at the earliest Inter cultivate at optimum field moisture condition Apply 4-5 kg N/acre after draining excess water	To drain out the excess water at the earliest To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition Take up plant protection measures against possible pests and disease incidence	To drain out the excess water at the earliest Harvest the crop when the field condition permits Drying of bundles should be done on elevated places like filed bunds or drying floors
Blackgram	To drain out the excess water at the earliest Take up the gap filling at the earliest	To drain out the excess water at the earliest Takeup weed control either mechanically or through	To drain out the excess water at the earliest Apply 4-5 kg N/acre after draining excess water	Drain out the excess water at the earliest Harvest the crop after the fields are dried up

	Takeup weed control either mechanically or through weedicides Apply 4-5 kg N/acre after draining excess water Take up plant protection measures against possible pests and disease incidence	weedicides Apply 4-5 kg N/acre after draining excess water To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition Take up plant protection measures against possible pests and disease incidence	To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition Take up plant protection measures against possible pests and disease incidence	
Maize	To drain out the excess water at the earliest Takeup weed control either mechanically or through weedicides Intercultivation and earthing up to be done Apply 20 kg N + 10 kg K /acre after draining excess water Take up plant protection measures against possible pests and disease incidence	To drain out the excess water at the earliest Takeup weed control either mechanically or through weedicides Intercultivation and earthing up to be done Apply 20 kg N + 10 kg K /acre after draining excess water Take up plant protection measures against possible pests and disease incidence	To drain out the excess water at the earliest Take up plant protection measures against possible pests and disease incidence	To drain out the excess water at the earliest Cob picking to be done after they are dried fully
Horticulture				
Horticulture crops – Fruits				
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	• 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	• Drain the excess water as soon as possible. • Harvest the mature bunches as soon as possible. • use ripening chambers for quick and uniform ripening

		plant in two to three splits at monthly 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 fertilization at monthly intervals for four months.	further lodging.	• Store the harvested bunches in well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible.
Lemon	• 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 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.
Orange & Batavian	• 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	• 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	• 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.

		years a booster dose of 500 g of Urea and 750 g MOP per tree should be applied. • Plant protection measures may be taken for control of insect vectors and diseases.	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. • Plant protection measures may be taken for control of insect vectors and diseases	
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.
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.	
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	• 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

		the plants are two weeks old and sowing window is still available for the crop.		
Bhendi	• 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.	• 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. • pots	• 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.
Gourds & Cucumbur		• 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. • 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, go for resowing	• 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.
Brinjal	• Drain the excess water	• Drain the excess water as soon	• Drain the excess water as	• Drain the excess water as soon as possible.

	as soon as possible	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. • Spray COC 30 g in 10 liters of water, 2-3 times against leaf spots	soon as possible • Spray Urea 2% solution once.	• 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.
Spices and Plantation crops				
Turmeric		• Drain the excess water as soon as possible • Spray Urea 2% or 1% KNO3 solution 2-3 times. • Spray Propiconazole 1 ml per litre of water, 2-3 times against the occurrence of leaf spots. • Soil drenching with COC 3g or redomil 2g in 1 lit of water to prevent rhizome rot • Spray ferrous sulphate 20g + citric acid 5g in 10 lit of water twice at weekly intervals	• Drain the excess water as soon as possible • Spray Urea 2% or 1% KNO3 solution 2-3 times. • Spray Propiconazole 1 ml per litre of water, 2-3 times against the occurrence of leaf spots. • Soil drenching with COC 3g or redomil 2g in 1 lit of water to prevent rhizome rot • Spray ferrous sulphate 20g + citric acid 5g in 10 lit of water twice at weekly intervals	• Drain the excess water as soon as possible. • Dry the rhizomes on concrete floor immediately after the appearance of sunlight. Mix thoroughly and periodically for quick and uniform drying of surface moisture. • Use boilers and polishers for processing • Remove and separate the rotten and mould affected rhizomes. • Cook and dry the rhizomes as soon as possible.

Condition -				
	Suggested contingency measure			
Rice				

Cotton		• To drain out the excess water at the earliest • Apply 20 kg N + 10 kg K /ha after draining excess water • Spray micronutrient mixture for 2 to 3 times at an interval of 7-10 days • To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition • Intercultivate to smother weeds and to loosen and aerate the soil • Need based plant protection measures to be taken up	• To drain out the excess water at the earliest • Spray micronutrient mixture for 2 to 3 times at an interval of 7-10 days • To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition • Need based plant protection measures to be taken up	• Drain out the water as early as possible • To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition • Kapas picking should be done carefully to avoid admixtures with plant waste
Redgram	• Takeup gap filling if the gaps are < 30 % and if more take up resowing • After gap filling take up inter cultivation to smother the weeds and to aerate the soil • Apply 20 kg N + 10 kg K /ha after draining excess water	• After gap filling take up inter cultivation to smother the weeds and to aerate the soil • Apply 20 kg N + 10 kg K /ha after draining excess water	• Drain out excess water form the field • Apply 20 kg N + 10 kg K /ha after draining excess water • Need based plant protection measures to be taken up	• Drain out excess water as early as possible • Dry the bundles on field bunds and drying floors
Blackgram	• To drain out the excess water at the earliest • Takeup gap filling if the gaps are < 30 % and if more take up resowing • Apply 4-5 kg N /ha after	• To drain out the excess water at the earliest • Apply 4-5 kg N /ha after draining excess water • To spray KNO_3 1 % or water soluble fertilizers like 19-19-	• To drain out the excess water at the earliest • To spray KNO_3 @1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-	• To drain out the excess water at the earliest • Dry the bundles on field bunds and drying floors • Dry the grain to optimum moisture content before

	draining excess water	19, 20-20-20, 21-21-21 at 1% to support nutrition • Proper weed control measures to be taken up • Need based plant protection measures to be taken up	21 @ 1% to support nutrition • Need based plant protection measures to be taken up	storage
Maize	• To drain out the excess water at the earliest • Re sow the crop if mortality is > 15 % • Apply 20 kg N + 10 kg K /ha after draining excess water	• To drain out the excess water at the earliest • Apply 20 kg N + 10 kg K /ha after draining excess water • Intercultivate to smother weeds and to loosen and aerate the soil • To spray $KNO_{3\ @}$ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 @ 1% to support nutrition • Need based plant protection measures to be taken up	• To drain out the excess water at the earliest • Apply 20 kg N + 10 kg K /ha after draining excess water • To spray KNO_3 @1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 @ 1% to support nutrition • Need based plant protection measures to be taken up	• To drain out the excess water at the earliest • Pick the cobs and dry them properly before threshing • Dry the grain to optimum moisture content before storage or marketing

Horticulture				
Horticulture crops – Fruits				
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	• 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	• Drain the excess water as soon as possible. • Harvest the mature bunches as soon as possible. • use ripening chambers for quick and uniform

		splits at monthly 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 fertilization at monthly intervals for four months.	further lodging.	ripening • Store the harvested bunches in well ventilated place temporarily before it can be marketed. • Market the fruits as soon 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. • Soil drenching with Bordeaux mixture/COC to avoid fungal infections	• 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.
Orange & Batavian	• 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. • Soil drenching with	• 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. • Spray 1% KNO3 or Urea 2% solution 2-3 times. • Foliar spray of micronutrient mixture is also to be taken up.	• 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.

	Bordeaux mixture/COC to avoid fungal infections.	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. • Plant protection measures may be taken for control of insect vectors and diseases.	• 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. • Plant protection measures may be taken for control of insect vectors and diseases.	• Market the fruits as soon as possible.
Papaya	-Do-	-Do-	-Do-	• -Do-
Mango	-Do-	-Do-	-Do-	• -Do-
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.
Bhendi	• 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.	• 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.
Gourds & Cucumbur		• 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. • 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, go for resowing	• 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.
Brinjal	• Drain the excess water as soon as possible	• Drain the excess water as soon as possible • Spray Urea 2% solution 2-3	• Drain the excess water as soon as possible • Spray Urea 2%	• Drain the excess water as soon as possible. • Harvest the mature produce as soon as

		times. • Topdressing of booster dose of 10 kg MOP+ 30 kg Urea per acre as soon as possible.	solution once.	possible. • Store the produce in well-ventilated place temporarily before it can be marketed. • Market the produce as soon as possible.
Spices and Plantation crops				
Turmeric		• 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. • Dry the rhizomes on concrete floor immediately after the appearance of sunlight. Mix thoroughly and periodically for quick and uniform drying of surface moisture. • Use boilers and polishers for processing • Remove and separate the rotten and mould affected rhizomes. • Cook and dry the rhizomes as soon as possible.
Sea water intrusion				

2.4 Extreme events: Heat wave(√) / Cold wave/Frost/ Hailstorm /Cyclone (√)

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave				
Horticulture				
Horticulture crops - Fruits				
Mango, Orange & Batavia, Lemon and Papaya	• Cover the newly planted plants with dry leaves • Increase the frequency of irrigation.	• Mulch the plant basins with dried leaves • Increase the frequency of irrigation	• Increase the frequency of irrigation. • Provide irrigation at critical stages	• Harvest the fruits either in the morning or in the evening • Use ripening chambers for getting quality fruits
Banana				
Horticultural crops - Vegetables				
Vegetable & Flowers	• Provide shade to the newly planted /seedlings • Irrespective of stage increase the frequency of irrigation. • Use mulches • Add bulky organic manures at the time of last ploughing	• Harvest either in the morning or in the evening		
Turmeric, Oilpam & Betelvine		• Provide light irrigation • Delay the harvesting		
Cold wave				
Frost				

Hailstorm				
Cyclone				
Rice	• To drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors • Apply booster dose of 0.2 kg N/40 sq. m • Spray micronutrients like Zn, Fe 2-3 times at 4 -5 days interval • 4. Takeup proper weed control measures	• To drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors • Apply booster dose of 20 kg N/Acre • Spray $ZnSO_4$ 0.2 % if it is less than 45 days after transplanting • Takeup need based plant protection measures	• To drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors • Takeup need based plant protection measures • Lodged plants to be lifted and tied together to make them stand erect	• Drain out water spread sheaves loosely in field or field bunds where there is no water stagnation • Spray common salt at 5% to prevent germination of seed and spoilage of straw from moulds • Thresh after drying the sheaves properly • Ensure proper grain moisture before storing
Cotton	• To drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors • Inter cultivate at optimum field moisture condition • Apply 20 kg N + 10 kg K /acre after draining excess water	• To drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors • Inter cultivate at optimum field moisture condition • Earhting up to be done to provide anchorage to plants • Apply 20 kg N + 10 kg K /acre after draining excess water • To spray KNO_3@1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 @ 1% to support nutrition • Spray of micronutrients two times at 7-10 days interval	• To drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors • To spray KNO_3 @1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 @ 1% to support nutrition • Earhting up to be done to provide anchorage to plants • Spray of micronutrients two times at 7-10 days	• Kapas picking should be done carefully to prevent admixtures with waste plant material

		• Take up plant protection measures against possible pests and disease incidence	interval • Take up plant protection measures against possible pests and disease incidence	
Redgram	• To drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors • Inter cultivate at optimum field moisture condition • Apply 4-5 kg N/acre after draining excess water	• To drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors • Inter cultivate at optimum field moisture condition • Apply 4-5 kg N/acre after draining excess water	• To drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors • To spray $KNO_{3@}$ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 @ 1% to support nutrition • Take up plant protection measures against possible pests and disease incidence	• To drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors • Harvest the crop when the field condition permits • Drying of bundles should be done on elevated places like filed bunds or drying floors
Blackgram	• To drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors • Takeup weed control either mechanically or through weedicides • Apply 4-5 kg N/acre after draining excess water	• To drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors • Takeup weed control either mechanically or through weedicides • Apply 4-5 kg N/acre after draining excess water • To spray KNO_3 @1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 @ 1% to support	• To drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors • Apply 4-5 kg N/acre after draining excess water • To spray KNO_3 @1 % or water soluble fertilizers like 19-19-	• Drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors • Harvest the crop after the fields are dried up

		nutrition • Take up plant protection measures against possible pests and disease incidence	19, 20-20-20, 21-21-21 @ 1% to support nutrition • Take up plant protection measures against possible pests and disease incidence	
Maize	• To drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors • Intercultivation and earthing up to be done • Apply 20 kg N + 10 kg K /ha after draining excess water • Take up plant protection measures against possible pests and disease incidence	• To drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors • Takeup weed control either mechanically or through weedicides • Intercultivation and earthing up to be done • Apply 20 kg N + 10 kg K /ha after draining excess water • Take up plant protection measures against possible pests and disease incidence	• To drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors • Take up plant protection measures against possible pests and disease incidence	• To drain out the excess water at the earliest by farming drainage channels if there is a gradient and if not by using motors • Cob picking to be done after they are dried fully
Horticulture				
Horticulture crops – Fruits				
Banana		• Wind damaged plants should be pruned using disinfected secaetures 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	• Wind damaged plants should be pruned using disinfected secaetures 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	• Wind damaged plants should be pruned using disinfected secaetures 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

		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.	• 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	• 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 KNO3on immature/developing bunches and leaves at weekly intervals. • Staking with bamboo for support .
Lemon Orange & Batavian Papaya Mango	• 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
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	• Uprooted plants may be lifted and earthed up • Drain the excess water as soon as possible • Spray Urea 2% solution	• Drain the excess water as soon as possible. • Dry the pods on concrete floor/ tarpaulins immediately • Use poly house solar driers for quick

		• 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.	2-3 times. • Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible.	drying • Remove the pest and disease infected pods. .
Bhendi		• 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 12 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 12 kg MOP + 30 kg Urea per acre as soon as possible..	• 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.
Gourds & Cucumbur		• 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. • 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, go for resowing	• 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 as soon as possible. • Store the produce in well-ventilated place temporarily before it can be marketed. • Market the produce as soon as possible.
Brinjal	• Grow nursery on raised beds. • If damage is more go for replanting	• Uprooted plants may be lifted and earthed up • Drain the excess water as soon as possible	• Uprooted plants may be lifted and earthed up • Drain the excess water as soon as possible	• Drain the excess water as soon as possible. • Harvest the mature produce as soon as possible.

		• Gap filling must be done immaditeatly • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 12 kg MOP + 30 kg Urea per acre as soon as possible. • If damage is more go for replanting	• Gap filling must be done immaditeatly • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 12 kg MOP + 30 kg Urea per acre as soon as possible. • Spray COC 30 g in 10 liters of water, 2-3 times against leaf spots.	• Store the produce in well-ventilated place temporarily before it can be marketed. • Market the produce as soon as possible. • Immediately or go for preparation of processed products.
Spices and Plantation crops				
Turmeric		• Drain the excess water as soon as possible • Spray Urea 2% or 1% KNO3 followed by Ferrous Sulphate 0.5% + Citric Acid 0.1 % solution 2-3 times. • Topdressing of booster dose of 40 kg MOP + 50 kg Urea along with 250 kg of Neem Cake per acre as soon as possible. • In case of severe damage (considered as complete economical loss or if inundation is more than for four days), 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% or 1% KNO3 followed by Ferrous Sulphate 0.5% + Citric Acid 0.1 % solution 2-3 times. • Topdressing of booster dose of 40 kg MOP + 50 kg Urea along with 250 kg of Neem Cake per acre as soon as possible.	• Drain the excess water as soon as possible. • Harvest the rhizomes when field comes to normal • Use boilers and polishers for processing • Remove and separate the rotten and mould affected rhizomes. • Cook and dry the rhizomes as soon as possible.

2.5 Detailed Contingency strategies for Livestock, Poultry & Fisheries

	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, 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. • 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, Bajra, 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. 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	• 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

		• 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 keepers	
Cyclone	• Harvest all the possible wetted grain (rice/maize/greengram/blackgram 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 (rice/maize/greengram/blackgram) that can be useful as fodder in future (store 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	• Transportation of animals to elevated areas • Stall feeding of animals with stored hay and concentrates • Proper hygiene and sanitation of the animal shed • In severe floods, un-tether or let loose the animals • Emergency outlet establishment for required medicines or feed in each village • Spraying of fly repellants in animal sheds	• Repair of animal shed • Bring back the animals to the shed • Cleaning and disinfection of the shed • Bleach (0.1%) drinking water / water sources • Deworming with broad spectrum dewormers • Vaccination against possible disease out breaks like HS, BQ, FMD and PPR • Proper disposable of the dead animals / carcasses by burning / deep burying (4-8 feet) with lime powder (1kg for small ruminants and 5kg for large ruminants) in pit • Drying the harvested crop material and proper storage for use as fodder.
Heat & Cold wave	NA		

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, 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, 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	• 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

		accumulation due to dampness	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 • Sprinkle lime powder (5-10g per square feet) to prevent ammonia accumulation due to dampness	• Disposal of dead birds by burning / deep burying with lime powder in pit • Disposal of poultry manure to prevent protozoal problem • 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	**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 quality	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 ponds / change in water quality	Stocking of salinity tolerant fish / shrimp, application of geolites and other buffers	Frequent change of water with fresh water	Frequent draining of the pond with 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 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

B. Aquaculture			
(i) Inundation with flood water	Raising and rivetting the bunds, construc-tion 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 across 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 standing 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 animal	Removal of stress causing factors to maintain the health of the animal	Restoration of physical and chemical parameters
(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 Equipment to prevent f rom being damage
(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			