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ACHARYA N.G. RANGA AGRICULTURAL UNIVERSITY



**AGRICULTURAL CONTINGENCY PLAN FOR
EAST GODAVARI DISTRICT**

Prepared by

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Regional Agricultural Research Station, MARUTERU - 534 122, West Godavari

State: ANDHRA PRADESH

Agriculture Contingency Plan for District: EAST GODAVARI

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 (12.1, 18.4)			
	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	Krishna, Guntur, West Godavari, major parts of East Godavari and parts of Prakasam			
	Geographic coordinates of district	Latitude	Longitude	Altitude	
		16° 58' 60"N	18° 46' 60" E	13m AMSL	
	Name and address of the concerned ZRS/ZARS/RARS/RRS/RRTTS	Regional Agricultural Research Station, Maruteru, West Godavari-534122			
Mention the KVK located in the district	CTRI KVK, Kalavalcherla, Rajahmundry, West Godavari district				
1.2	Rainfall (is it average , how many years pl mention, if last year, give year in brackets	Normal RF(mm)	Normal Rainy days (No)	Normal Onset (specify week and month)	Normal cessation (specify week and month)
	SW monsoon (June-Sept)	760.1	-	1 st week of June	2 nd week of October
	NE monsoon (Oct –Dec)	303.7	-	3 rd week of October	4 th week of December
	Winter (Jan-Feb)	19.7	-		
	Summer (Mar – May)	120.5	-		
	Annual	1204.0	-		

1.3	Land use pattern of the district	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	Net Area Sown	Fish Ponds
	Area in '000 hectares	1280.525	466.494	156.915	21.898	16.949	5.450	83.178	41.945	51.849	427.576	8.271

Source: Directorate of Economics & Statistics, Govt. of Andhra Pradesh, 2015-16

1.4	Major Soils (common names like shallow red soils etc)	Area ('000 ha)	Percent (%) of total
	1. Clay loamy soils	42	39
	2. Red sandy loams	17	16
	3. Sandy clay loams	48	45
1.5	Agricultural land use	Area (000' ha)	Cropping intensity %
	Net sown area	418.1	183.3
	Area sown more than once	348.4	
	Gross cropped area	766.5	

1.6	Irrigation	Area (000'ha)		
	Net irrigated area	277.8		
	Gross irrigated area	490.6		
	Rainfed area	140.3		
	Sources of irrigation	Number	Area (000'ha)	Percentage of total irrigated area
	Canals		180.9	61.6
	Tanks		36	12.3
	Open wells		-	
	Bore wells		64.5	22.0
	Tube wells and filter points			
	Lift irrigation			
	Micro irrigation			
	Other sources		12.0	4.1
	Total irrigated area		293.5	100.0
	Pump sets	20526		
	No. of tractors	4352		
	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 and horticulture etc (2008-09)

1.7	Major field crops cultivated	Area (000'ha)					
		<i>Kharif</i>		<i>Rabi</i>		<i>Summer</i>	<i>Total</i>
		Irrigated	Rainfed	Irrigated	Rainfed		
1	Paddy	231	9	170	-	-	410
2	Sugarcane	17	-	-	-		
3	Cotton	-	9	-	-	-	9
4	Greengram	-	-	-	-	44	44
5	Blackgram	-	-	-	-	32	32
	Horticulture crops – fruits	Total area					
1	Mango	19.2					
2	Banana	15.5					
3	Lemon	2.3					
	Horticulture crops –vegetables	Total area					
1	Tapioca	15.4					
2	Brinjal	3.2					
3	Bhendi	2.1					
4	Gourds	2.0					
5	Chillies	1.9					
	Plantation crops	Total area					
1	Coconut	49.7					
2	Cashew	33.6					
3	Oil palm	13.7					
	Fodder crops	Total area					
	Total fodder crop area						
	Grazing land						
	Sericulture						
	Others (specify)						

1.8	Livestock	Male (number)	Female (number)	Total (number)			
	Non descriptive Cattle (local low yielding)	82.3	118.6	200.9			
	Crossbred cattle	14.9	76.6	91.5			
	Non descriptive Buffaloes (local low yielding)	90.0	595.0	685.0			
	Graded Buffaloes						
	Goat			200.0			
	Sheep			146.3			
	Others (Camel, Pig, Yak etc.)			26.5			
	Commercial dairy farms (Number)						
1.9	Poultry	No. of farms	Total No. of birds (number)				
	Commercial		15965425				
	Backyard		1736498				
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)	
		22029	338	1194/3360	1106/118644	204 / 0	
	ii) Inland (Data Source: Fisheries Department)	No. Farmer owned ponds		No. of Reservoirs		No. of village tanks	
		1855		6		174	
	B. Culture						
		Water Spread Area (ha)	Yield (t/ha)	Production ('000 tons)			
	i) Brackish water (Data Source: MPEDA/ Fisheries Department)	3500	-	5.2			
ii) Fresh water (Data Source: Fisheries Department)	1681593	-	6.7				
Others		-	80.3				

1.11	Production and productivity of major crops (Average of last 3 years 2016-17, 2017-18 & 2018-19)	Kharif		Rabi		Summer		Total		
		Production (000't)	Productivity (kg/ha)	Production (000't)	Productivity (kg/ha)	Production (000't)	Productivity (kg/ha)	Production (000't)	Productivity (kg/ha)	Crop residue as fodder (000 tons)
Major Field Crops (Crops to be identified based on total acreage)										
1	Paddy	1268782	5695	1355466	8330	0	0	3936372	21038	
2	Maize	6402	8964	117657	11107	0	0	186090	30107	
3	Redgram	1888	851	103	980	0	0	2987	2747	
4	Greengram	253	873	11868	790	0	0	18181	2494	
5	Blackgram	4118	1056	19054	935	0	0	34758	2985	
6	Groundnut	35	1849	411	2073	0	0	668	5883	
7	Cotton	29362	2129	0	0	0	0	44042	3718	
8	Sugarcane	1013475	99133	874937	90385	0	0	2832617	284278	
9	Jowar	187	996	3184	1933	0	0	5058	4393	
10	Bajra	103	1329	0	0	0	0	155	2594	
11	Ragi	213	786	0	0	0	0	320	1554	
12	Minor Millets	148	677	0	0	0	0	222	1265	
13	Bengal gram	0	0	4480	2650	0	0	6721	3975	
14	Sesamum	202	566	2887	1275	0	0	4633	2763	
15	Turmeric	6992	33833	0	0	0	0	10488	77750	
16	Tobacco	1745	2300	8124	3517	0	0	14803	8725	
17	Sunflower	0	0	177	857	0	0	266	1545	
18	Horse gram	3	900	14	395	0	0	25	1942	
19	Cow gram	5	825	44	690	0	0	74	2273	
20	Chillies	933	2683	9422	4080	0	0	15533	10145	
Major horticultural crops										
Horticulture crops – Fruits										

1	Mango							158	8267	
2	Banana							463	30000	
3	Lemon							34	1.7	
Horticultural crops – Vegetables										
1	Tapioca							310	20167	
2	Brinjal							58	18667	
3	Bhendi							30	14333	
4	Gourds							27	13667	
5	Chillies							5.0	2750	
Spices and crops										
1	Coconut							0.7	-	
2	Cashew							21.1	627	
3	Oil palm							65.0	4667	

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Paddy	Sugarcane	Blackgram	Greengram	Cotton	Maize
	Kharif - rainfed	June 1 st week - July 1 st week	-	-	-	July 1 st fortnight – July 2 nd fortnight	-
	Kharif – irrigated	July 1 st week- July last week	-	-	-	-	June 1 st fortnight – July 2 nd fortnight
	Rabi – rainfed	-	-	March 2 nd week - March 3 rd week	March last week - April I week	-	-
	Rabi – irrigated	December 2 nd fortnight – January 1 st fortnight	January 1 st fortnight – March 1 st fortnight	-	-	-	November 2 nd fortnight – December 1 st fortnight

1.13	What is the major contingency the district is prone to?	Regular	Occasional	Never
	Drought		√	
	Flood	√		
	Cyclone	√		
	Hail storm			
	Heat wave			
	Cold wave			
	Frost			
	Sea water intrusion			
	Pests and diseases (specify)	<u>Rice:</u> Blast <u>Redgram:</u> Maruca and Helicoverpa Cotton: Sucking pest complex Blackgram : YMV		

1.14	Include Digital maps of the district for	Location map of the district within state as Annexure 1	Enclosed : Yes /No
		Mean annual rainfall as Annexure 2	Enclosed : Yes/No
		Soil map as Annexure 3	Enclosed : Yes/No



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 3 rd week)	Uplands-Rainfed	Paddy	No change	Paddy: BPT 5204, MTU 7029, MTU 1075, MTU 1061, MTU 1064, RP Bio-226, RGL 2537 Cotton: Private Hybrids	
	Agency area - Rainfed	Paddy			

Condition		Suggested contingency measures			
Early season drought (delayed onset)	Major farming situation	Normal crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on implementation
Delay by 4 weeks (July 1 st week)	Upland - Rainfed	Paddy	No change	Direct seeding can be taken up with short duration varieties under dry conditions and later converted to wet paddy after receipt of good rainfall Paddy: MTU 7029, MTU 1075, MTU 1061, MTU 1064	
		Cotton		-	
	Agency area – Rainfed	Paddy		Direct seeding can be taken up with short duration varieties under dry conditions and later converted to wet paddy after receipt of good rainfall.	

Condition		Suggested contingency measures			
Early season drought (delayed monsoon)	Major farming situation	Normal crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on implementation
Delay by 6 weeks (July 3 rd week)	Upland – Rainfed	Paddy	No change	Adopt direct seeding of paddy with short duration varieties by following proper weed management practices Paddy: MTU 7029, MTU 1075, MTU 1061, MTU 1064	
		Cotton		--	
	Agency area – Rainfed	Paddy		Adopt direct seeding of paddy with short duration varieties by following proper weed management 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 8 weeks (August 1 st week)	Upland – Rainfed	Paddy	Redgram (sole crop), Redgram + blackgram, Blackgram, Green gram.	Recommended package of practices Black gram: LBG 20, LBG 623, T 9, TBG 104, GBG 1 Green gram: LGG 407, IPM-2-14, WGG 42 Red gram: LRG 52, Durga, PRG 100	Source of seed: RARS, Maruteru and ARS, Peddapuram
		Cotton			
Agency area – Rainfed	Paddy				

Condition		Suggested contingency measures			
Early season drought (Normal onset)	Major farming situation	Normal crop/cropping system	Crop management	Soil nutrient and moisture conservation measures	Remarks on implementation
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Upland – Rainfed	Paddy	To prevent withering of nurseries, foliar application with 2% urea can be taken up	Instead of top dressing with N fertilizers, foliar application can be taken up for efficient use of N. any urea concentration may be given here	
		Cotton	Gap filling is to be taken up by pot watering 7-10 after sowing if the crop stand is poor	-	
	Agency area – Rainfed	Paddy	To prevent withering of nurseries, foliar application of 2% urea or 1 % water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21	Instead of top dressing with N fertilizers, foliar application can be taken up for efficient use of N	

Condition		Suggested contingency measures			
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5mm period))	Major farming situation	Normal crop/cropping system	Crop management	Soil nutrient and moisture conservation measures	Remarks on implementation
	Upland – Rainfed	Paddy	Spray Urea 2 % or KNO ₃ 1% or other water soluble fertilizers like 19-19-19,20-20-20,21-21-21 @ 1 % to supplement nutrition	Interculture operations	
		Cotton	1. Foliar application with 2% urea 2. Stem application of	Intercultivate periodically to conserve soil moisture	

			systemic insecticide to control sucking pests		
	Agency – Rainfed	Paddy	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		

Condition		Suggested contingency measures			
Mid season drought (long dry spells)	Major farming situation	Normal crop/ cropping system	Crop management	Soil nutrient and moisture conservation measures	Remarks on implementation
At reproductive stage	Upland – Rainfed	Paddy		Foliar application with 2%urea + MOP	
		Cotton		Frequent intercultivation to create soil mulch Spray urea 2% &KNO ₃ 1% to supplement nutrition	
	Agency-Rainfed	Paddy		Foliar application with 2%urea + MOP	

Condition		Suggested contingency measures			
Terminal drought	Major farming situation	Normal crop/ cropping system	Crop management	Rabi crop planning	Remarks on implementation
	Upland - Rainfed	Paddy	Foliar application with 2%urea + MOP to supplement nutrition	--	
		Cotton	Spray urea 2% urea or KNO ₃ Topping to prevent formation of new vegetative and reproductive flush		
	Agency area - Rainfed	Paddy	Foliar application of 2%urea + MOP		

2.1.2 Irrigated situation

Condition		Suggested contingency measures			
Delayed release of water in canals due to low rainfall	Major farming situation	Normal crop;/ cropping system	Change in crop/ Cropping system	Agronomic measures	Remarks on implementation
	Godavari Delta Tail End Areas	Paddy – Paddy - blackgram/greengram	Paddy-Paddy-Greengram	<ul style="list-style-type: none"> Over aged seedlings can be transplanted up to August Adopt closer spacing by planting 4-6 plants/hill Apply entire P and K and 2/3rd N as basal and remaining 1/3rd N as top dressing If nurseries are dried up, direct sown paddy can be taken up till August with short duration varieties (MTU 1153, MTU 1156, IR 64) If rabi rice harvesting is delayed, avoid blackgram in rice fallows. Instead, greengram or green manure crops can be taken up 	
	Godavari Delta Tail End Areas Saline / Alkaline soils	Paddy – Paddy – Blackgram / Greengram	Paddy – Paddy-Blackgram/Greengram		
		Paddy – Paddy-Blackgram/Greengram	Paddy-Paddy – blackgram /greengram.		
		Sugarcane	No change	<ul style="list-style-type: none"> Short or medium duration varieties of sugarcane need to be taken up Adopt recommended plant protection practices for control of shoot borer Adopt crop rotation with pulse crop 	

Condition		Suggested contingency measures			
Limited release of water in canals due to low rainfall	Major farming situation	Normal crop/ cropping system	Change in crop/cropping system	Agronomic measures	Remarks on implementation
	Godavari Delta Tail End Areas	Paddy-Paddy-pulses	Paddy – Blackgram /Greengram	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 fallows – Availability of seed of short duration varieties shall be ensured

				<p>Rice fallows</p> <ol style="list-style-type: none"> 1. Crops like Greengram, Blackgram, Jowar, Bajra etc. which require less water than Maize shall be grown 2. Short duration varieties of crops shall be selected. 3. In crops like Bajra, Jowar water conservation practices like inter cultivation, earthing up, Alternate row irrigation shall be practiced 4. Water loss during conveyance can be reduced by using PVC/Metallic pipes instead of running water in open field channels 	
	Godavari Delta Tail End Areas Saline / Alkaline soils	Paddy-Paddy-pulses	Paddy – Blackgram /Greengram	<p>Rabi</p> <ol style="list-style-type: none"> 1. Avoid paddy wherever irrigation water is insufficient 2. Blackgram can be taken up in rabi in rice fallows (mention as above) 	Rice fallows – Availability of seed of short duration varieties shall be ensured
	Godavari Delta – Middle and Upper Reaches	Paddy – Paddy-Blackgram/Greengram	Paddy - Blackgram	<p>Rice –</p> <ol style="list-style-type: none"> 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 <p>Rice fallows</p> <ol style="list-style-type: none"> 1. Crops like Greengram, Blackgram, Jowar, Bajra etc. which require less water than Maize shall be grown 2. Short duration varieties of crops shall be selected. 3. In crops like Bajra, Jowar water conservation practices like inter cultivation, earthing up, Alternate row irrigation shall be practiced 4. Water loss during conveyance can be reduced by using PVC/Metallic pipes instead of running water in open field channels 	Rice fallows – Availability of seed of short duration varieties shall be ensured

		Sugarcane	No change	<ol style="list-style-type: none"> 1. Short and medium duration sugarcane varieties 2. Adopt proper weed management practices 3. Avoid paddy in rabi, instead greengram can be taken up 	Source of sets: RARS, Anakapalli and ARS, Vuyyur
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Condition	Suggested contingency measures				
Non release of water in canals under delayed onset of monsoon in catchment (This situation arises only in rabi in the district)	Major farming situation	Normal crop/ cropping system	Change in crop/ cropping system	Agronomic measures	Remarks on implementation
	Godavari Delta Tail End Areas	Paddy-Paddy-pulse	Paddy – Blackgram /Greengram	<ul style="list-style-type: none"> • Avoid paddy in rabi • LBG 752 & PU 31 YMV tolerant blackgram varieties 	
	Godavari Delta Tail End Areas Saline / Alkaline soils	Paddy-Paddy-pulses	Paddy – Blackgram /Greengram	<ul style="list-style-type: none"> • Avoid paddy in rabi • YMV tolerant blackgram varieties n rice fallows 	
	Godavari Delta – Middle and Upper Reaches	Paddy – Paddy-Blackgram/Greengram	Paddy – Blackgram /Greengram	<ul style="list-style-type: none"> • Avoid paddy in rabi • YMV tolerant blackgram varieties can be taken up in rice fallows • Green manure crops should be incorporated into the soil at right stage and allow it to decompose 	
		Sugarcane – Paddy	Green manure-blackgram/greengram - sesame	<ul style="list-style-type: none"> • Pulse crop can be taken up in September first fortnight • After harvest of pulse crop, sesame can be taken in December 	

Condition	Suggested contingency measures				
Lack of inflows into tanks due to insufficient/delayed onset of monsoon	Major farming situation	Normal crop/ cropping system	Change in crop/ cropping system	Agronomic measures	Remarks on implementation
	Upland Yeluru other Reservoirs	Paddy – Paddy –pulse	Redgram/Greengram /Blackgram-Fallow	<ul style="list-style-type: none"> • If paddy nurseries are not taken up till August, pulses can be taken up in 1st week of September • Redgram can be raised as sole crop or intercropped with blackgram 	Seed production of pulse crop can be encouraged under NFSM

	Uplands - Tankfed	Paddy-Paddy-Pulse	Redgram/Greengram /Blackgram-Fallow	<ul style="list-style-type: none"> If paddy nurseries are not taken up till August, pulses can be taken up in 1st week of September Redgram can be raised as sole crop or intercropped with blackgram 	
		Sugarcane - Paddy	Sugarcane- pulses/sesame	<ul style="list-style-type: none"> Plant short duration varieties Adopt trash mulching to conserve moisture Spray 2% urea to withstand moisture stress 	

	Agency- Reservoirs	Paddy-Paddy-fallow	Redgram/Greengram /Blackgram-Fallow	<ul style="list-style-type: none"> If paddy nurseries are not taken up till August, pulses can be taken up in 1st week of September Redgram can be raised as sole crop or intercropped with blackgram 	
	Agency-Tankfed	Paddy-Paddy-fallow	Redgram/Greengram /Blackgram - Fallow	<ul style="list-style-type: none"> If paddy nurseries are not taken up till August, pulses can be taken up in 1st week of September Redgram can be raised as sole crop or intercropped with blackgram 	

Condition	Suggested contingency measures				
Insufficient groundwater recharge due to low rainfall	Major farming situation	Normal crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on implementation
	Uplands-borewells & lift irrigation	Paddy –Paddy –Pulse	Redgram/Greengram /Blackgram-Fallow	<ul style="list-style-type: none"> If paddy nurseries are not taken up till August, green gram& black gram can be taken up in 1st week of September Redgram can be raised as sole crop or intercropped with blackgram 	

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 and Heavy rainfall with high speed winds in a short span				
Crop	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Rice	1. Drain the excess water as early as possible 2. Apply 20 kg urea + 10 kg MOP /acre after draining excess water	1. Drain the excess water as early as possible 2. Apply 20 kg urea+ 15 kg MOP/acre after draining excess water	1. Drain the excess water as early as possible 2. Take up suitable plant protection measures in	1. Drain out water and spread sheaves loosely in field or field bunds where there is no water stagnation 2. Spray common salt at 3% on

	<p>3. Take up gap filling either with available nursery or by splitting the tillers from the surviving hills</p> <p>4. Take up proper weed control Measures</p> <p>5. Take up suitable plant protection Measures in anticipation of pest & disease outbreaks</p>	<p>3. Take up suitable plant protection Measures in anticipation of pest & disease outbreaks (BPH, Blast)</p>	<p>anticipation of pest & disease outbreaks</p>	<p>panicles to prevent sprouting and moulds</p> <p>3. Thresh after drying the sheaves properly</p> <p>4. Ensure proper grain moisture before storing (means drying)</p>
Cotton	<p>1. Drain the excess water as early as possible in black soils</p> <p>2. Apply 20 kg N + 10 kg K /ha after draining excess water</p> <p>3. Take up inter cultivation at optimum soil moisture condition to loosen and aerate the soil and to control weeds</p> <p>4. To spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 @ 1% to support nutrition</p> <p>5. Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals</p> <p>6. Take up timely control measures against sucking pests</p>	<p>1. Drain the excess water as early as possible</p> <p>2. Apply 20 kg N + 10 kg K /ha after draining excess water</p> <p>3. To spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition</p> <p>4. 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</p> <p>5. Take up timely control measures against sucking pests and bollworms.</p>	<p>1. Drain the excess water as early as possible</p> <p>2. To spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition</p> <p>3. Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% against boll not.</p> <p>4. Take up timely control measures against bollworms and whitefly</p>	<p>1. Dry the produce properly before baling and sending to market</p>
Blackgram	<p>1. Drain the excess water as early as possible</p> <p>2. Apply 4-5 kg N /acre after draining excess water</p> <p>3. Spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition</p> <p>5. Spray fungicides like Copper oxy</p>	<p>1. Drain the excess water as early as possible</p> <p>2. Apply 4-5 kg N /acre after draining excess water</p> <p>3. spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition</p> <p>4. Spray fungicides like Copper oxy</p>	<p>1. Drain the excess water as early as possible</p> <p>2. Allow the crop to dry completely before harvesting</p>	<p>1. Spread the bundles drenched in rain on field bunds or drying floors to quicken the drying</p> <p>2. Thresh the bundles after they are dried properly</p> <p>3. Dry the grain to proper moisture per cent before bagging and storing to prevent deterioration in quality during storage</p>

	chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals 6. Take up timely control measures against the outbreak of pests like <i>Spodoptera</i> etc.	chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals 5. Take up timely control measures against the out break of pests like <i>Maruca</i> .		
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Greengram	1. Drain the excess water as early as possible 2. Apply 4-5 kg N /acre after draining excess water 3. Spray KNO ₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition 5. Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals 6. Take up timely control measures against the out break of pests like <i>Spodoptera</i> etc.	1. Drain the excess water as early as possible 2. Apply 4-5 kg N /acre after draining excess water 3. spray KNO ₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition 4. Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals 5. Take up timely control measures against the out break of pests like <i>Maruca</i> .	1. Drain the excess water as early as possible 2. Allow the crop to dry completely before harvesting	. Spread the bundles drenched in rain on field bunds or drying floors to quicken the drying 2. Thresh the bundles after they are dried properly 3. Dry the grain to proper moisture per cent before bagging and storing to prevent deterioration in quality during storage
Maize	1. Drain the excess water as early as possible 2. Apply 20 kg N + 10 kg K /acre after draining excess water 3. Take up inter cultivation and at optimum soil moisture condition to loosen and aerate the soil and to control weeds 4. Earthen up the crop for anchorage 5. To spray KNO ₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition 6. Take up timely control measures for Fall army worm, Pink stem borer, sheath blight and Turcicum leaf blight	Same as above	1. Drain the excess water as early as possible 2. Allow the crop to dry completely before harvesting	1. Harvest the cobs after the they are dried up properly. Dry the grain to optimum moisture condition before storing
Sugarcane	1. Drain the excess water as early as possible 2. Apply 50 urea+ 50 kg MOP/acre	Grand Growth stage 1. Drain the excess water as	Formative Phase 1. Drain the excess water	Maturity stage Harvest the cane at appropriate time

	<p>after draining excess water</p> <p>3. Take up inter cultivation at optimum soil moisture condition to loosen and aerate the soil and to control weeds</p> <p>4. Adopt timely plant protection measures.</p>	<p>early as possible</p> <p>2. Apply 50 urea+ 50 kg MOP/acre after draining excess water</p> <p>3. Take up timely control measures against the out break of pests.</p>	<p>as early as possible</p> <p>2. Apply 50kg MOP/ acre in early season varieties and 50kg urea +50 kg MOP in mid season and late season varieties</p> <p>3. Take up timely plant protection measures</p>	
Horticulture				
Cashew	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO₃ or Urea 2% solution 2-3 times. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO₃ or Urea 2% solution 2-3 times. 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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.
Mango	Same as above	Same as above	Same as above	Same as above
Banana	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Inter-cultivate the soil with gorru for aeration. • Spray 0.5 % KNO₃ or Urea 2% solution 2-3 times. • Topdressing of booster dose of 80 g MOP + 100 g Urea per plant at two to three times intervals. • Gap filling may be taken up if the plants are two weeks old and sowing window is still available for the crop. • If the age of the plant is less than three months and submergence up to three feet better to replant the garden. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 0.5 % KNO₃ or Urea 2% solution 2-3 times. • Topdressing of booster dose of 80 g MOP + 100 g Urea per plant at two to three times intervals. • If the age the plant is more than three months and less than seven months allow one sword sucker for ratoon and take up fertilization at monthly intervals for four months. • Staking with bamboos to prevent further lodging. 		
Lemon	<ul style="list-style-type: none"> • Drain the excess water as soon as possible. • Spray 1% KNO₃ or Urea 2% solution 2-3 times. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible. 		

	<ul style="list-style-type: none"> • 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. • Plant protection measures may be taken for control of insect vectors and diseases. • Soil drenching with Bordeaux mixture/COC to avoid fungal infections. 	<ul style="list-style-type: none"> • 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. • Plant protection measures may be taken for control of insect vectors and diseases. • Soil drenching with Bordeaux mixture/ Continuum Of Care to avoid Fungal infections. 		
Horticulture vegetables				
Tapioca	<ol style="list-style-type: none"> 1. Drain the excess water as soon as possible 2. Spray Urea 2% solution 2-3 times. 3. Topdressing of booster dose of 10 kg MOP + 30 kg Urea per acre as soon as possible. 	<ol style="list-style-type: none"> 1. Drain the excess water as soon as possible 2. Spray Urea 2% solution 2-3 times. 3. Topdressing of booster dose of 10 kg MOP + 30 kg Urea per acre as soon as possible. 	<ol style="list-style-type: none"> 1. Drain the excess water as soon as possible 2. Spray Urea 2% solution once. 	<ol style="list-style-type: none"> 1. Drain the excess water as soon as possible. 2. Harvest mature tubers when conditions come to normal. 3. Store the produce in well-ventilated place temporarily before it can be marketed. 4. Market the tubers as soon as possible.
Brinjal	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 12 kg MOP + 30 kg Urea per acre as soon as possible. • Gap filling may be taken up if the plants are two weeks old and sowing window is still available for the crop. • In case of severe damage (considered as complete economical loss), and the 	Same as above	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Harvest the marketable fruits in a clear sunny day' 	<ul style="list-style-type: none"> • Store the harvested fruits in well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible.

	contingency period is between June to August, resowing with the same crop or sowing of best alternative crop must be taken up.			
Bhendi	<ul style="list-style-type: none"> • 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 July resown the same crop or further delayed go for alternate crop 	Same as above	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray Urea 2% solution once. 	Same as above
Gourds	<ul style="list-style-type: none"> • 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, sowing of best alternative crop must be taken up. 	Same as above	Same as above	<ul style="list-style-type: none"> • 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.
Chillies	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Harvest the matured fruits in a clear sunny day. 	<ul style="list-style-type: none"> • 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.
Horticulture spice & plantation				

Oil palm and Coconut	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Drain the excess water as soon as possible Apply booster dose of NPK fertilizers 	<ul style="list-style-type: none"> Drain the excess water as soon as possible Apply booster dose of NPK fertilizers <p>Harvest the mature nuts as soon as possible.</p>	<ul style="list-style-type: none"> Store the produce in well ventilated place temporarily before it can be marketed Market the nuts as soon as possible.
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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 & leaf spots - Need based plant protection measures to be initiated	Jassids, <i>Spodoptera</i> , Wilt, root rot and leaf spots - Need based plant protection measures to be initiated	Dusky cotton bug, Grey mildew - Need based plant protection measures to be initiated	Dry the seed cotton properly after picking and store it under shade in aerated place
Sugarcane	ESB, root grub and mealy bug – Need based plant protection measures to be initiated	Internode borer, mealy bug and root grub – Need based plant protection measures to be initiated	Top shoot borer, scale and smut- need based plant protection measures to be initiated	-
Blackgram	<i>Spodoptera</i> - Need based plant protection measures to be initiated	<i>Maruca</i> caterpillar Leaf spots, Powdery mildew - Need based plant protection measures to be initiated	Powdery mildews, rust - Need based plant protection measures to be initiated	Dry the grain to optimum seed moisture content (8 %) to avoid damage in storage
Greengram	<i>Spodoptera</i> - Need based plant protection measures to be initiated	<i>Maruca</i> caterpillar, Leaf spots, Powdery mildew - Need based plant protection measures to be initiated	Powdery mildews, rust - Need based plant protection measures to be initiated	Dry the grain to optimum seed moisture content (8 %) to avoid damage in storage
Maize	-	Fall army worm, Jassids, Wilt and Stalk rot may increase due to unseasonal rains - need based plant protection measures to be initiated	Post flowering Stalk rots may aggravate if unseasonal rains occurs	Same as above

2.3 Floods

Condition	Transient water logging/ partial inundation ¹			
	Suggested contingency measure ^o			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Rice	1. Drain the excess water at the	1. Drain excess water at the earliest	1. Drain the excess water at the	1. Drain water .Spread sheaves

	<p>earliest</p> <ol style="list-style-type: none"> 2. Apply booster dose of 20 kg urea/acre after drain outing 3. Take up proper weed control measures 	<ol style="list-style-type: none"> 2. Take up gap filling either with available nursery or by splitting the tillers from the surviving hills 3. Apply a booster dose of 20 kg urea/acre +15kg MOP /acre after drain out 4. Take up need based plant protection measures 	<p>earliest</p> <ol style="list-style-type: none"> 2. Take up need based plant protection measures 	<p>loosely in field or field bunds where there is no water stagnation</p> <ol style="list-style-type: none"> 2. Spray common salt at 3% on panicles to prevent germination and spoilage of straw from moulds 3. Thresh after drying the sheaves properly 4. Ensure proper grain moisture before storing
Cotton	<ol style="list-style-type: none"> 1. Drain the excess water at the earliest 2. Take up the gap filling at the earliest 3. Inter cultivate at optimum field moisture condition 4. Apply 20 kg N + 10 kg K /acre after draining excess water 5. Spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition 6. Take up plant protection measures against possible pests and disease incidence 	<ol style="list-style-type: none"> 1. Drain the excess water at the earliest 2. Inter cultivate at optimum field moisture condition 3. Apply 20 kg N+ 10 kg K/acre after draining excess water 4. To spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition 5. Spray micronutrients two times at 7-10 days interval 6. Take up plant protection measures against possible pests and disease incidence 	<ol style="list-style-type: none"> 1. Drain the excess water at the earliest 2. spray KNO₃ 1 % or water soluble fertilizers @ 1% to support nutrition 3. Take up plant protection measures against possible pests and disease incidence 	<ol style="list-style-type: none"> 1. Kapas picking should be done carefully to prevent admixtures with waste plant material
Maize	<ol style="list-style-type: none"> 1. Drain out the excess water at the earliest 2. Takeup weed control either mechanically or through weedicides 3. Intercultivation and earthing up to be done 4. Apply 20 kg N + 10 kg K /acre after draining excess water 5. Take up plant protection measures against possible pests and disease incidence 	<ol style="list-style-type: none"> 1. Drain out the excess water at the earliest 2. Takeup weed control either mechanically or through weedicides 3. Intercultivation and earthing up to be done 4. Apply 20 kg N + 10 kg K /acre after draining excess water 5. Take up plant protection measures against possible pests and disease incidence 	<ol style="list-style-type: none"> 1. Drain out the excess water at the earliest 2. Take up plant protection measures against possible pests and disease incidence 	<ol style="list-style-type: none"> 1. To drain out the excess water at the earliest 2. Cob picking to be done after they are dried fully
Sugarcane	<ol style="list-style-type: none"> 1. Drain the excess water at the 	Grand growth stage	Formative stage	Maturity stage

	<p>earliest</p> <p>2. Inter cultivate at optimum field moisture condition</p> <p>3. Apply 50 kg urea + 50kg MOP/acre after draining excess water</p>	<p>1. Drain the excess water at the earliest</p> <p>2. Inter cultivate at optimum field moisture condition</p> <p>3. Earthing up and propping by trash twisting is to be taken up to provide anchorage to plants</p> <p>4. Apply 50 kg urea + 50kg MOP/acre after draining excess water</p>	<p>1. Drain the excess water at the earliest</p> <p>2. Earthing up and propping by trash twisting is to be taken up to provide anchorage to plants</p> <p>3. Apply 50 kg urea + 50kg MOP/acre in late season and mid season varieties, 50 kg MOP /acre in early varieties after draining excess water</p> <p>4. Take up plant protection measures against possible pests and disease incidence</p>	<p>1. Drain the excess water at the earliest</p> <p>2. Harvest the crop when the field condition permits</p>
Horticulture fruits				
Cashew	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times. 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times. 	<ul style="list-style-type: none"> • 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.
Banana	.	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times. • Stake the plants with bamboos to 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible. • Harvest the mature bunches as soon as possible. • Use ripening chambers for quick

		<p>MOP + 100 g Urea per plant in two to three splits at monthly intervals.</p> <ul style="list-style-type: none"> • 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. 	prevent further lodging.	<p>and uniform ripening</p> <ul style="list-style-type: none"> • Store the harvested bunches in well-ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible.
Lemon	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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. • Plant protection measures may be taken for control of insect vectors and diseases. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO₃ or Urea 2% solution 2-3 times. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible. • Harvest the mature produce as soon as possible. • Store the produce in well-ventilated place temporarily before it can be marketed. • Market the produce as soon as possible.
Horticulture vegetables				
Tapioca	<ul style="list-style-type: none"> • Drain the excess water as soon as possible 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray Urea 2% solution once. 	<ul style="list-style-type: none"> • 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.

	<ul style="list-style-type: none"> • Drain the excess water as soon as possible 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray Urea 2% solution once. 	<ul style="list-style-type: none"> • 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.
Bhendi		<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray Urea 2% solution once. 	<ul style="list-style-type: none"> • 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		<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray Urea 2% solution once. • 	<ul style="list-style-type: none"> • 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.

Chillies	<ul style="list-style-type: none"> • Drain the excess water as soon as possible 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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.
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Horticulture spices & plantation crops

Oil palm & Coconut	<ul style="list-style-type: none"> • Planting should be done on mounts or bunds • Drainage system, suited to local conditions may be provided to remove surplus water from root • Relief drains [shallow] channels are opened at places where water accumulates and connected with main drain to remove water from the surface 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Apply booster dose of NPK fertilizers 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Apply booster dose of NPK fertilizers 	<ul style="list-style-type: none"> • Harvest the mature nuts as soon as possible. • Market the produce as soon as possible.
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Condition - Continuous submergence for more than 2 days

	Suggested contingency measures ^o			
Rice	<ol style="list-style-type: none"> 1. Top dressing with 20 kg urea per acre immediately after recede of flood water 2. Adopt weed control through mechanical or Chemical measures 	<ol style="list-style-type: none"> 1. Drain the excess water at the earliest 2. 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 3. Apply 20 kg urea+ 10 kg MOP /acre after draining excess water 4. Proper weed control measures to be taken up 	<ol style="list-style-type: none"> 1. Drain the excess water at the earliest 2. Take up need based plant protection measures 	<ol style="list-style-type: none"> 1. Drain water spread sheaves loosely in field or field bunds where there is no water stagnation 2. Spray common salt at 3% on panicles to prevent germination and spoilage of straw from moulds 3. Thresh after drying the sheaves properly 4. Ensure proper grain moisture before

		4. Timely plant protection measures for pest and disease out break		storing
Cotton	<ol style="list-style-type: none"> 1. Mortality is most likely hence resowing to be taken up 2. Select short duration hybrids 3. Adopt closer spacing of 90X45 or 90X30 cm 	<ol style="list-style-type: none"> 1. To drain the excess water at the earliest 2. Apply 20 kg N + 10 kg K /acre after draining excess water 3. Spray micronutrient mixture for 2 to 3 times at an interval of 7-10 days 4. Spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition 5. Intercultivate to smother weeds and to loosen and aerate the soil 6. Need based plant protection measures to be taken up 	<ol style="list-style-type: none"> 1. Drain the excess water at the earliest 2. Spray micronutrient mixture for 2 to 3 times at an interval of 7-10 days 3. Spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition 4. Need based plant protection measures to be taken up 	<ol style="list-style-type: none"> 1. Drain the water as early as possible 2. Kapas picking should be done carefully to avoid admixtures with plant waste
Sugarcane	<ol style="list-style-type: none"> 1. Drain excess water at the earliest 2. Apply 50 kg urea + 50kg MOP/acre after draining excess water 3. Adopt proper plant protection measures 	<ol style="list-style-type: none"> 1. Take up inter cultivation to smother the weeds and to aerate the soil 2. Earthing up is to be taken up to provide anchorage to plants 3. Apply 50 kg urea + 50kg MOP/acre after draining excess water 	<ol style="list-style-type: none"> 1. Drain excess water from field 2. Earthing up is to be taken up to provide anchorage to plants 3. Apply 50 kg urea + 50kg MOP/acre in late and mid season varieties and 50 kg MOP per acre in early season varieties after draining excess water <p>Need based plant protection measures to be taken up</p>	<ol style="list-style-type: none"> 1. Drain excess water as early as possible 2. Harvest the crop at appropriate time
Horticulture				
Cashew	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO₃ or Urea 2% solution 2-3 times. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO₃ or Urea 2% solution 2-3 times. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO₃ or Urea 2% solution 2-3 times. 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Drain the excess water as soon as possible 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO₃ or Urea 2% solution 2-3 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible.

	<ul style="list-style-type: none"> •Spray 1% KNO₃ or Urea 2% solution 2-3 times. 	times.	<ul style="list-style-type: none"> •Spray 1% KNO₃ or Urea 2% solution 2-3 times. 	<ul style="list-style-type: none"> •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.
Banana	.	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO₃ or Urea 2% solution 2-3 times. • Topdressing of booster dose of 80 g MOP + 100 g Urea per plant in two to three splits at monthly intervals. • If the age the plant is more than three months and less than seven months allow one sword sucker for ratoon and take up fertilization at monthly intervals for four months. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO₃ or Urea 2% solution 2-3 times. • Stake the plants with bamboos to prevent further lodging. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible. • Harvest the mature bunches as soon as possible. • Use ripening chambers for quick and uniform ripening • Store the harvested bunches in well-ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible.
Lemon	<ul style="list-style-type: none"> •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. 	<ul style="list-style-type: none"> •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. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO₃ or Urea 2% solution 2-3 times. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible. • Harvest the mature produce as soon as possible. • Store the produce in well-ventilated place temporarily before it can be marketed. • Market the produce as soon as possible.
Horticulture vegetables				
Tapioca	<ul style="list-style-type: none"> •Drain the excess water as soon as possible 	<ul style="list-style-type: none"> •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. 	<ul style="list-style-type: none"> •Drain the excess water as soon as possible •Spray Urea 2% solution once. 	<ul style="list-style-type: none"> •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.

				<ul style="list-style-type: none"> •Market the produce as soon as possible.
Brinjal	<ul style="list-style-type: none"> •Drain the excess water as soon as possible 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray Urea 2% solution once. 	<ul style="list-style-type: none"> • 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.
Bhendi		<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray Urea 2% solution once. 	<ul style="list-style-type: none"> • 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		<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray Urea 2% solution once. 	<ul style="list-style-type: none"> • 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.
Chillies	<ul style="list-style-type: none"> • Drain the excess water as soon as possible 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible. • Dry the pods on concrete floor/ tarpaulins. • Spray any drying oil after the pods are

		<p>possible.</p> <ul style="list-style-type: none"> • Gap filling may be taken up if the plants are two weeks old and sowing window is still available for the crop. 	15 kg MOP + 30 kg Urea per acre as soon as possible.	<p>free from surface moisture for quick drying.</p> <ul style="list-style-type: none"> • Use poly house solar driers for quick drying • Remove the pest and disease infected pods. • Market the produce as soon as possible
Horticulture spices & plantation crops				
Oil palm and Coconut	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Apply booster dose of NPK fertilizers 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Apply booster dose of NPK fertilizers 	<ul style="list-style-type: none"> • Harvest the mature nuts as soon as possible. • Market the produce as soon as possible.

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

Condition	Suggested contingency measure			
	Seedling/nursery stage	Vegetative stage	Reproductive stage	At harvest stage
Heat wave	NA	NA	NA	NA
Cold wave				
Frost				
Hailstorm				
Cyclone				

Sugarcane	<ol style="list-style-type: none"> 1. Drain out the excess water at the earliest 2. Inter cultivate at optimum field moisture condition 3. Apply 50 kg urea + 50kg MOP/acre after draining excess water 	<ol style="list-style-type: none"> 1. Drain out the excess water at the earliest 2. Inter cultivate at optimum field moisture condition 3. Earthing up and propping by trash twisting is to be taken up to provide anchorage to plants 4. Apply 50 kg urea + 50kg MOP/acre after draining excess water 5. Take up plant protection measures against possible pests and disease incidence 	<ol style="list-style-type: none"> 1. Drain out the excess water at the earliest 2. Earthing up and propping by trash twisting is to be taken up to provide anchorage to plants 3. Apply 50 kg urea + 50kg MOP/acre in late and mid season varieties and 50kg MOP /acre in early varieties after draining excess water 4. Take up plant protection measures against possible pests and disease incidence 	<ol style="list-style-type: none"> 1. Drain out the excess water at the earliest 2. Harvest the crop when the field condition permits
Rice	<ol style="list-style-type: none"> 1. To drain out the excess water at the earliest 2. Apply booster dose of 0.2 kg N/40 m² 3. Spray micronutrients like Zn, Fe 2-3 times at 4 -5 days interval 4. Takeup proper weed control measures 	Same as in previous column	<ol style="list-style-type: none"> 1. To drain out the excess water at the earliest 2. Takeup need based plant protection measures 3. Lodged plants to be lifted and tied together to make them stand erect 	<ol style="list-style-type: none"> 1. Drain out water spread sheaves loosely in field or field bunds where there is no water stagnation 2. Spray common salt at 3% to prevent germination of seed and spoilage of straw from moulds 3. Thresh after drying the sheaves properly 4. Ensure proper grain moisture before storing
Horticulture fruits				
Cashew	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO₃ or Urea 2% solution 2-3 times. • Prevent spread of diseases. • Provide support to the young plants 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Tress fallen on ground may be lifted and earthed up • Broken and damaged branches may be pruned and applied with Bordeaux paste 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Tress fallen on ground may be lifted and earthed up • Broken and damaged branches may be pruned and applied with Bordeaux paste 	<ul style="list-style-type: none"> • 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		<ul style="list-style-type: none"> • Trees fallen on ground may be lifted and earthed up • Manuring and plant protection measures have to be taken up. • Broken and damaged branches may 	<ul style="list-style-type: none"> • Tress fallen on ground may be lifted and earthed up • Manuring and plant protection measures have to be taken up. 	<ul style="list-style-type: none"> • 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

		be pruned and applied with Bordeaux paste		place temporarily before it can be marketed.
Banana		<ul style="list-style-type: none"> • Wind damaged plants should be pruned using disinfected secateurs and cut ends must be smeared with Bordeaux paste • Drain the excess water as soon as possible • The fallen tress may be cut leaving two suckers • Inter-cultivate the soil with gorru for aeration. • Spray 0.5 % 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. 	<ul style="list-style-type: none"> • Wind damaged plants should be pruned using disinfected secateurs and cut ends must be smeared with Bordeaux paste • Drain the excess water as soon as possible • The fallen tress may be cut leaving two suckers • Topdressing of booster dose of 80 g MOP + 100 g Urea per plant at two to three times intervals • Mature bunches on the completely damaged plants be covered with Leaves and harvested with in 15-20days 	<ul style="list-style-type: none"> • Wind damaged plants should be pruned using disinfected secateurs and cut ends must be smeared with Bordeaux paste • Drain the excess water as soon as possible. • Harvest the mature bunches as soon as possible. • Use ripening chambers for quick and uniform ripening • Store the harvested bunches in well-ventilated place temporarily before it can be marketed. • Market the produce as soon as possible. • 3-4 foliar application of KNO₃ on immature/developing bunches and leaves at weekly intervals. • Staking with bamboo for support
Lemon	<ul style="list-style-type: none"> • If the damage is severe, go for resowing. 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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.
Tapioca	<ul style="list-style-type: none"> • Uprooted plants may be lifted and earthed up • Gap filling must be done immediately • If damage is more, go for replanting 	<ul style="list-style-type: none"> • Uprooted plants may be lifted and earthed up • Drain the excess water as soon as possible • Spray Urea 2% or KNO₃ 1% solution once. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Harvest the marketable tubers in a clear sunny day 	<ul style="list-style-type: none"> • Harvest the tubers in a clear sunny day • Store the harvested tubers in well-ventilated place temporarily before it can be marketed. • Market the tubers as soon as possible.

	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray Urea 2% solution once. 			
Brinjal	<ul style="list-style-type: none"> • Grow nursery on raised beds. • If damage is more go for replanting 	<ul style="list-style-type: none"> • Uprooted plants may be lifted and earthed up • Drain the excess water as soon as possible • Gap filling must be done immediately • Spray Urea 2% solution 2-3 times. • If damage is more go for replanting 	<ul style="list-style-type: none"> • Uprooted plants may be lifted and earthed up • Drain the excess water as soon as possible • Gap filling must be done immediately • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 12 kg MOP + 30 kg Urea per acre as soon as possible. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible. • Harvest the mature produce as soon as possible. • Store the produce in well-ventilated place temporarily before it can be marketed. • Market the produce as soon as possible. • Collect the fruits and sell immediately or go for preparation of processed products.
Bhendi		<ul style="list-style-type: none"> • 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. • If damage is more, go for resowing 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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		<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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.

		<ul style="list-style-type: none"> In case of severe damage (considered as complete economical loss), and the contingency period is between June to August, go for resowing 		
Chillies	<ul style="list-style-type: none"> Grow nursery on raised beds. 	<ul style="list-style-type: none"> Uprooted plants may be lifted and earthed up Drain the excess water as soon as possible Gap filling must be done immediately If damage is more go for replanting Spray Urea 2% solution 2-3 times. Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible. 	<ul style="list-style-type: none"> Uprooted plants may be lifted and earthed up Drain the excess water as soon as possible Spray Urea 2% solution 2-3 times. Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible. 	<ul style="list-style-type: none"> Drain the excess water as soon as possible. Dry the pods on concrete floor/ tarpaulins immediately use poly house solar driers for quick drying Remove the pest and disease infected pods.
Horticulture spices & plantation crops				
Oil palm and Coconut	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Drain the excess water as soon as possible Twisted leaves may be cut and removed Apply booster dose of NPK fertilizers The palms have fallen with root system still having contact with the soil, they need to be brought to position and provided with soil mound and support 	<ul style="list-style-type: none"> Drain the excess water as soon as possible Hanging bunches may be provided with supports wherever possible Apply booster dose of NPK fertilizers The palms have fallen with root system still having contact with soil they need to be brought to position and provided with soil mound & support 	<ul style="list-style-type: none"> Twisted leaves may be cut and removed Hanging bunches may be provided with supports wherever possible Harvest the mature nuts as soon as possible. Market the produce as soon as possible.

Extreme event type	Suggested contingency measure ^r			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Cold wave				
Rice	<ol style="list-style-type: none"> 1. Irrigate field during night and drain out during day in alternate days to avoid cold injury 2. Mulching with paddy straw/ polythene sheets 3. Apply excess dose of 0.5 kg P₂O₅/40 sq. m 4. Spray micronutrients like Zn, Fe 2-3 times at 4 -5 days interval 5. Take up proper weed control measures 6. Take up plant protection measures against possible pests and disease incidence 	<ol style="list-style-type: none"> 1. Irrigate field during night and drain out during day in alternate days to avoid cold 2. Take up gap filling either with available nursery/by splitting the tillers from the surviving hills if the gaps are < 30% if more go for replanting 3. Apply 20 kg N + 10 kg K /acre after draining of water 4. Take up proper weed control measures 5. Take up plant protection measures against possible pests and disease incidence 	<ol style="list-style-type: none"> 1. Irrigate field during night and drain out during day in alternate days to avoid cold injury 2. Apply 20 kg N + 10 kg K /acre after draining of water 3. Take up plant protection measures against possible pests and disease incidence 	N/A

2.5 Contingency strategies for livestock, poultry & fisheries

2.5.1 General contingency plan for Livestock

Before the event	During the event	After the event
Feed and fodder availability		
<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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		

<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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		
<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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 Detailed Contingent strategies for Livestock, Poultry & Fisheries

	Suggested contingency measures		
	Before the event	During the event	After the event
Drought			
Feed and Fodder availability	<p>Available paddy straw and sugar cane tops should be properly stored for future use.</p> <p>Chopping of fodder should be made as mandatory in every village through supply and establishment of good quality chaff cutters.</p> <p>Harvesting and collection of perennial vegetation particularly grasses which grow during monsoon</p> <p>Proper drying, bailing and densification of harvested grass from previous season</p> <p>Creation of permanent fodder, feed and fodder seed banks in all drought prone areas</p>	<p>Harvest and use biomass of dried up crops especially Rice material as fodder.</p> <p>Harvest the tree fodder (Neem, Subabul, Acacia, Pipal etc) and unconventional feeds resources available and use as fodder for livestock (LS).</p> <p>Available feed and fodder should be cut from CPRs and stall fed in order to reduce the energy requirements of the animals</p> <p>Hay should be transported to the needy areas from the near by districts in case of mild drought</p> <p>Advise the farmers about the practice of mixing available kitchen waste with dry fodder while feeding</p>	<p>Short duration fodder crops of sorghum/bajra/maize(UP chari, MP chari, HC-136, HD-2, GAIN T BAJRA, L-74, K-677, Ananad/African Tall, Kisan composite, Moti, Manjari, B1-7 should be sown in unsown and crop failed areas where no further routine crop sowing is not possible</p>
Cyclone	<p>Harvest all the possible wetted grain (Rice/back gram/green gram etc) and use as animal feed.</p> <p>As the district is chronically prone for cyclone, arrange for storing minimum required quantity of hay (25-50 kg) and concentrates (10-25 kg) per animal in farmer's / LS keepers house/ shed for feeding during cyclone.</p> <p>Stock of anti-diarrheal drugs and electrolytes should be made available for emergency transport</p> <p>Don't allow the animals for grazing in case of early forewarning (EFW) of cyclone</p> <p>Incase of EFW of severe cyclone, shift the animals to safer places.</p>	<p>Treatment of the sick, injured and affected animals through arrangement of mobile emergency veterinary hospitals / rescue animal health workers.</p> <p>Diarrhea out break may happen. Health camps should be organized</p> <p>In severe cases un-tether or let loose the animals</p> <p>Arrange transportation of highly productive animals to safer place</p> <p>Spraying of fly repellants in animal sheds</p>	<p>Repair of animal shed</p> <p>Deworm the animals through mass camps</p> <p>Vaccinate against possible disease outbreaks like HS, BQ, FMD and PPR</p> <p>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</p> <p>Bleach / chlorinate (0.1%) drinking water or water resources</p> <p>Collect drowned crop material, dry it and store for future use</p> <p>Sowing of short duration fodder crops in unsown and water logged areas when crops are damaged and no chance to replant</p> <p>Application of urea (20-25kg/ha) in the inundated areas and CPR's to enhance the bio mass production.</p>
Floods	<p>In case of early forewarning (EFW), harvest all the crops (Rice/back gram/green gram) that can be useful as fodder in future (store</p>	<p>Transportation of animals to elevated areas</p> <p>Stall feeding of animals with stored hay and concentrates</p> <p>Proper hygiene and sanitation of the animal shed</p>	<p>Repair of animal shed</p> <p>Bring back the animals to the shed</p> <p>Cleaning and disinfection of the shed</p>

	properly) Don't allow the animals for grazing if severe floods are forewarned As regularly flood prone district, arrange for storing minimum required quantity of hay (25-50kg) and concentrates (25kgs) per animals in farmer / LS keepers house / shed for feeding animals during floods 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	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 de-wormers Vaccination against possible disease outbreaks 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.
Health and Disease management	List out the endemic diseases (species wise) in that district and store vaccines for those diseases Timely vaccination (as per enclosed vaccination schedule) against all endemic diseases Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district	Constitution of Rapid Action Veterinary Force Procurement of emergency medicines and medical kits Rescue of sick and injured animals and their treatment	Conducting mass animal health camps Conducting fertility camps Mass deworming camps
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)	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
Hemorrhagic septicemia (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
Hemorrhagic septicemia (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 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 lime 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 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)

2.5.3 Fisheries/ Aquaculture:

	Suggested contingency measures		
	Before the event	During the event	After the event
1) Drought			
A. Capture			
Inland			
(i) Shallow water depth due to insufficient rains/inflow	Stocking of advanced 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 sanitizers.	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	Stocking of salinity tolerant fish / shrimp,	Frequent change of water with fresh water	Frequent draining of the pond with fresh

up in ponds / change in water quality	application of geolites and other buffers		water, removal of top layers
(iii) Any other			
2) Floods			
A. Capture			
Marine	No intervention	No intervention	No intervention
Inland			
(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 Hemorrhagic septicemia. Addition of antibiotics like Chloro Tetra Cycline or Oxy Tetra Cycline to the feed to control 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 riveting 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 Hemorrhagic septicemia. Addition of antibiotics like Chloro Tetra Cycline or Oxy Tetra Cycline to the feed to control 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 warnings 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			

(i) Compensation 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) Damage to 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) Damage to houses/huts	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 minimize 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 minimize escape of fish along with surplus water	Compensatory stocking of seed
(ii) Changes in water quality (fresh water / brackish water ratio)	Recirculation water to replenish and ensure sufficient dissolved oxygen levels in the pond. Maintenance of salinity levels by pumping in water from creeks.	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 minimize 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 from being damaged
(vi) Any other			
4. Heat wave and cold wave			
A. Capture			
Inland	Monitoring dissolved oxygen levels	Monitoring dissolved oxygen levels	No intervention
B. Aquaculture			
(i) Changes in pond	Reduction of biomass by partial harvest in	Avoidance of fishing	Compensatory stocking of seed and

environment (water quality)	the event of heat as the DO levels will be very low.		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			