State: ANDHRA PRADESH

Agriculture Contingency Plan for District: VIZIANAGARAM

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 (18.4)			
	Agro-Climatic Region (Planning Commission)	East Coast plain and hill region (XI)			
	Agro Climatic Zone (NARP)	North Coastal Zone , RARS, Anakapalle & High Altitude and Tribal Zone, RARS, Chintapalli (AP-2)			
	List all the districts or part thereof falling under the NARP Zone	Srikakulam, Vizianagaram, Visakhapatnam parts of East Godavari and Khammam			
	Geographic coordinates of district It is of district head quarters ?	Latitude	Longitude	Altitude	
		17^0 7' N	83^0 25' E	73 m	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	RARS, Anakapalle, Visakhapatnam Dist and RARS, Chintapalli, Visakhapatnam			
	Mention the KVK located in the district	KVK, Rastakuntubai, GL Puram Mandal, Vizianagarm Dist-			
1.2	**Rainfall (Mean of last 10 years)(is it mean of several years or of last year, in any case mention period or year)**	Normal RF(mm)	Normal Rainy days (no)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	692.0		1^{st} week of June	2^{nd} week of October
	NE Monsoon(Oct-Dec):	246.0		2^{nd} week of October	End of the December
	Winter (Jan- Feb)	26.0		-	-
	Summer (March-May)	167.0		-	-

	Annual	1131.0		-	-

1.3	**Land use pattern of the district** (latest statistics)	Geographical Area	Forest area	Land under non-agricultural use	Permanent Pastures & other grazing lands	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area ('000 ha)	653.9	119.3	77.6	4.9	3.8	6.3	73.9	20.5	24.4

1. 4	**Major Soils**	**Area ('000 ha)**	**Percent (%) of total**
	1. Red Sandy loams	119.5	37
	2 .Red Sandy clay loams	80.8	25
	3. Red Loamy sandy soils	71.1	22
	4. Clay loam	25.8	8
	5. Sandy soils	16.2	5
	6. Clay	9.7	3
1.5	**Agricultural land use**	Area ('000 ha)	Cropping intensity %
	Net sown area	311.6	132.4
	Area sown more than once	100.9	
	Gross cropped area	412.5	

1.6	**Irrigation (2007-08)**	Area ('000 ha)		
	Net irrigated area	147.0		
	Gross irrigated area	172.0		
	Rainfed area	164.6		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area

	Canals		46.6	30.8
	Tanks		80.8	53.4
	Open wells		25.1	13
	Bore wells (tube wells)		19.1	12.6
	Lift irrigation		1.5	1
	Micro-irrigation (other sources)		4.3	2
	Other sources		4.2	2
	Total Irrigated Area		191	
	Pump sets			
	No. of Tractors			
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils	(%) area	
	Over exploited			
	Critical			
	Semi- critical			
	Safe			
	Wastewater availability and use			
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

Area under major field crops & horticulture etc. (2007-08)

1.7		**Major Field Crops cultivated**	**Area ('000 ha)**					
			Kharif		***Rabi***		**Summer**	**Total**
			Irrigated	**Rainfed**	**Irrigated**	**Rainfed**		
	1	Paddy		124.0		3.4		**127.4**
	3	Ground nut		32.5		4.0		36.0
	4	Mesta		27.9		-		27.9
	8	Greengram		1.2		22.6		23.8
	2	Sugarcane		22.0		-		22.0
	9	Black gram		1.3		17.9		19.2
	5	Sesamum		16.1		0.7		16.8
	6	Maize		7.32		8.5		15.8
	10	Cotton		10.2		-		10.2
	7	Ragi		3.3		1.5		4.8
		Horticulture crops - Fruits	**Total area**					
	1	Mango	37.4					
	2	Cashew	22.9					
		Horticultural crops - Vegetables	**Total area**					
	1	Brinjal	1.1					

		Plantation crops	**Total area**
	1	Arecanut	7.2
	2	Oil palm	4.1
	3	Coconut	3.1
		Fodder crops	**Total area**
	1	Fodder crops	0.8
		Total fodder crop area	
		Grazing land	
		Sericulture etc	0.1
		Others (Specify)	

1.8	**Livestock**	**Male (number)**	**Female (number)**	**Total (number)**
	Non descriptive Cattle (local low yielding)	150.4	134.9	285.4
	Crossbred cattle	42.8	127.8	170.7
	Non descriptive Buffaloes (local low yielding)	63.6	194.6	258.3
	Graded Buffaloes			
	Goat			207.1
	Sheep			379.7
	Others (Camel, Pig, Yak etc.)			31.16
	Commercial dairy farms (Number)			
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('numbers)**	
	Commercial		586773	

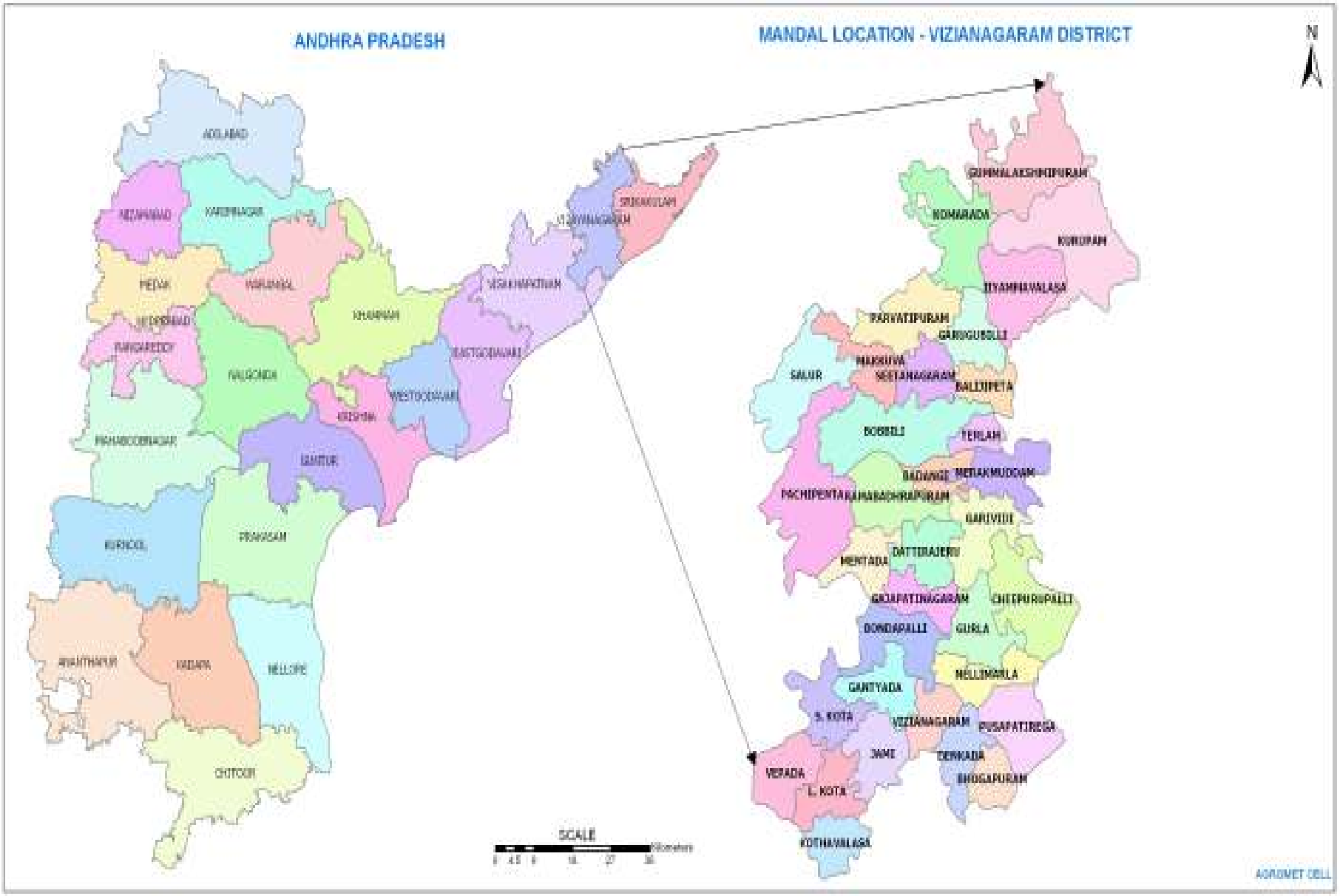
	Backyard				1966729		
1.10	**Fisheries** (Data source: Chief Planning Officer)						
	A. Capture						
	i) Marine (Data Source: Fisheries Department)	**No. of fishermen**	**Boats**		**Nets**		**Storage facilities (Ice plants etc.)**
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
		3312	6	122 / 511	1 / 31370	97 / 0	4 / 0
	ii) Inland (Data Source: Fisheries Department)	**No. Farmer owned ponds**		**No. of Reservoirs**		**No. of village tanks**	
				7		203	
	B. Culture						
		Water Spread Area (ha)		**Yield (t/ha)**		**Production ('000 tons)**	
	i) **Brackish water** (Data Source: MPEDA/ Fisheries Department)	12		-		0.035	
	ii) **Fresh water** (Data Source: Fisheries Department)	-		-		0.700	
	Others	-		-		18.011	

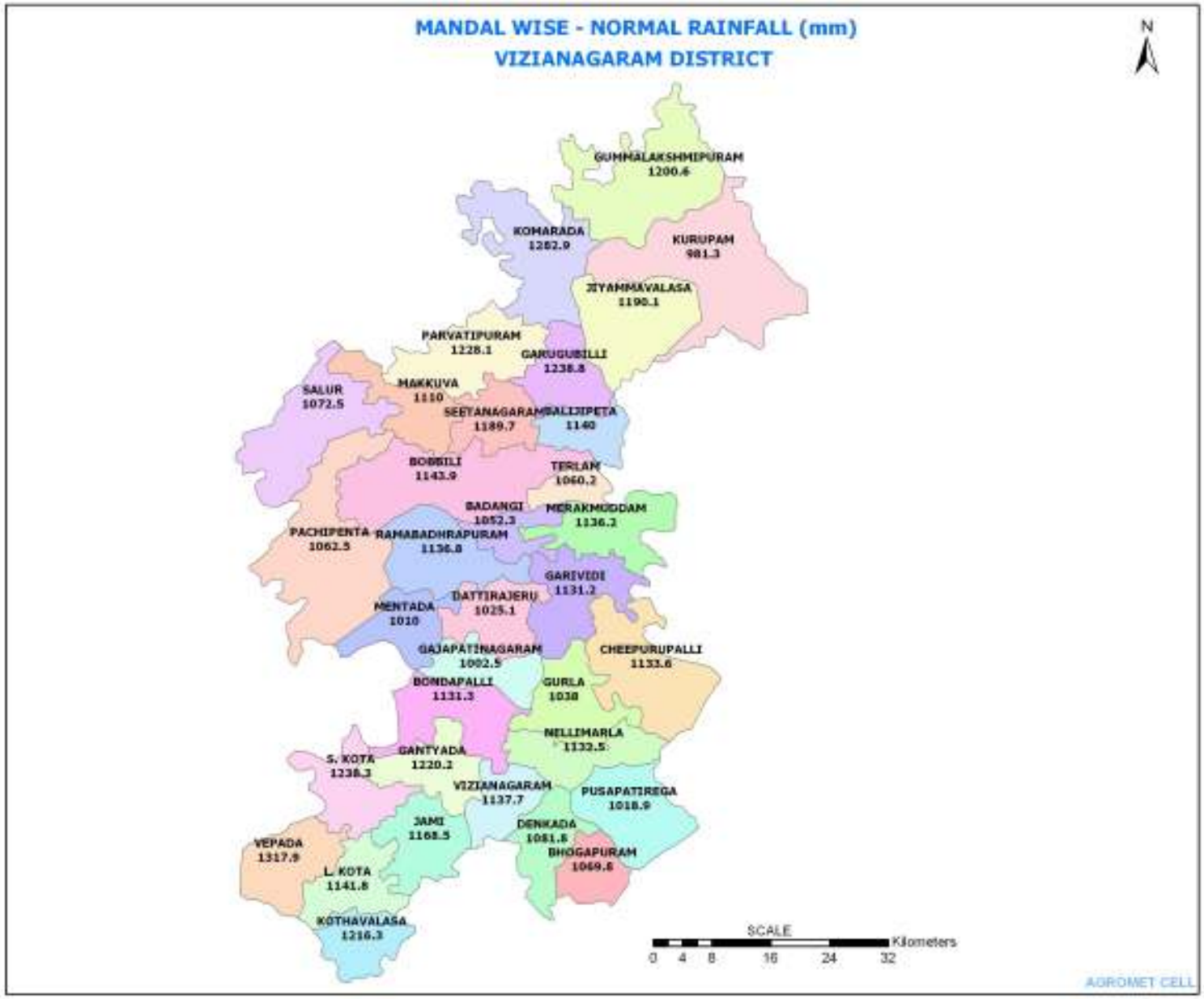
1.11	**Production and Productivity of major crops** (Average of last 5 years: 2004,05,06, 07, 08)	**Kharif**		**Rabi**		**Summer**		**Total**		**Crop residue as fodder** (‘000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
Major Field crops (Crops to be identified based on total acreage)										
1	Paddy	406.7	3452	8.4	4080	-	-	415.1	3766	
2	Sugarcane	978.8	62820	-	-	-	-	978.8	62820	
3	Groundnut	32.1	824	7.2	1867	-	-	39.3	1346	
4	Mesta	66.4	1561	-	-	-	-	66.4	1561	
5	Sesamum	1.9	111	0.9	298	-	-	2.9	205	
6	Maize	17.0	3982	40.6	6494	-	-	57.6	5238	
Major Horticultural crops										
Horticultural crops- fruits										
1	Mango							30.9	8267	
2	Cashew							14326	627	
Horticultural crops - Vegetables										
1	Brinjal							19.5	18667	
Plantation crops										
1	Arecanut							215.9	30000	
2	Oil palm							20.1	4667	

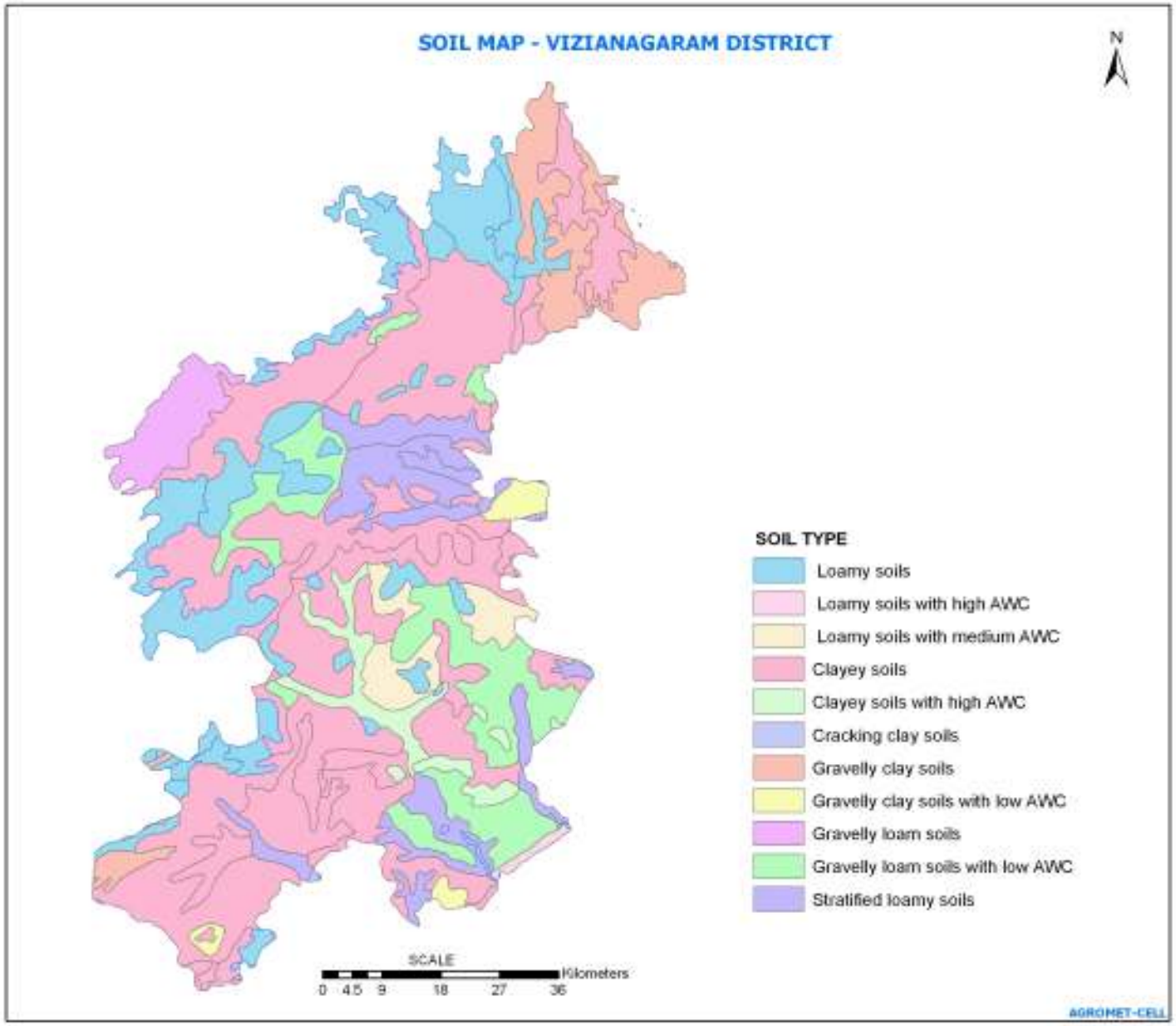
1.12	**Sowing window for 5 major field crops (start and end of normal sowing period)**	Paddy	Groundnut	Maize	Sugarcane	Mesta
	Kharif- Rainfed	June 1st fortnight to Aug 1 st fortnight	June 1st fortnight to July 1st fortnight	June 1st fortnight to July 2nd fortnight	June 1st fortnight to July 1st fortnight	June f1st fortnight to july 1st fortnight
	Kharif-Irrigated	June 1st fortnight to July 2nd fortnight	June 1st fortnight to July 1st fortnight	June 1st fortnight to July 2nd fortnight	June 1st fortnight to July 1st fortnight	-
	Rabi- Rainfed	-	-	-		Feb 1st FN to March 1st FN*
	Rabi-Irrigated	Nov 2nd fortnight – January 1st fortnight	Oct 2nd fortnight to Jan 1st fortnight	Octr 2nd fortnight – Jan 1st fortnight	Dec 2nd fortnight to Feb 1st fortnight	-

1.13	**What is the major contingency the district is prone to?**	Regular	Occasional	None
	Drought		√ (2009-10)	
	Flood			√
	Cyclone		√ (2010-11)	
	Hail storm			√
	Heat wave			√
	Cold wave			√
	Frost			√
	Sea water intrusion			√
	Pests and diseases (specify)		√ (2010-11)	

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


ANDHRA PRADESH
MANDAL LOCATION - VIZIANAGARAM DISTRICT
N
ADILABAD
NIZAMABAD
KARIMNAGAR
MEDAK
WARANGAL
KHAMMAM
RANGAREDDY
NALGONDA
MAHABOOBNAGAR
GUNTUR
KURNOOL
PRAKASAM
ANANTHAPUR
KADAPA
NELLORE
CHITTOOR
SRIKAKULAM
VIZIANAGARAM
VISAKHAPATNAM
EASTGODAVARI
WESTGODAVARI
KRISHNA
GUMMALAKSHMIPURAM
KONDAKA
KURUPAM
PARVATIPURAM
GARUGUBILLI
PAKALA
SEETANAGARAM
SALUR
BALIJIPETA
BOBBILI
TERLAM
BADVANGI
METAKAMUDDAM
PACHIPENTA
RAJAMAHENDRAPURAM
GARIVIDI
MENTADA
DATTIRAJERU
GAJAPATINAGARAM
CHEEPURUPALLI
BONDAPALLI
GURLA
NELLIMARLA
GANTYADA
S. KOTA
VIZIANAGARAM
PUSAPATIREGA
JAMI
DENKADA
VERADA
L. KOTA
BHOGAPURAM
KOTHAVALASA
SCALE
AGROMET CELL


MANDAL WISE - NORMAL RAINFALL (mm)
VIZIANAGARAM DISTRICT
N
GUMMALAKSHMIPURAM
1200.6
KOMARADA
1282.9
KURUPAM
981.3
JIYAMMAVALASA
1190.1
PARVATIPURAM
1228.1
GARUGUBILLI
1238.8
MAKKUVA
1110
SALUR
1072.5
SEETANAGARAM
1189.7
BALIJIPETA
1140
BOBBILI
1143.9
TERLAM
1060.2
BADANGI
1052.3
MERAKMUDDAM
1136.2
PACHIPENTA
1062.5
RAMABADHRAPURAM
1136.8
GARIVIDI
1131.2
DATTIRAJERU
1025.1
MENTADA
1010
GAJAPATINAGARAM
1002.5
CHEEPURUPALLI
1133.6
BONDAPALLI
1131.3
GURLA
1038
NELLIMARLA
1133.5
S. KOTA
1238.3
GANTYADA
1220.2
VIZIANAGARAM
1137.7
PUSAPATIREGA
1018.9
JAMI
1168.5
DENKADA
1081.8
VEPADA
1317.9
BHOGAPURAM
1069.8
L. KOTA
1141.8
KOTHAVALASA
1216.3
SCALE
Kilometers
0 4 8 16 24 32
AGROMET CELL


SOIL MAP - VIZIANAGARAM DISTRICT
N
SOIL TYPE
Loamy soils
Loamy soils with high AWC
Loamy soils with medium AWC
Clayey soils
Clayey soils with high AWC
Cracking clay soils
Gravelly clay soils
Gravelly clay soils with low AWC
Gravelly loam soils
Gravelly loam soils with low AWC
Stratified loamy soils
SCALE
Kilometers
0 4.5 9 18 27 36
AGROMET-CELL

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks (June 3rd week)*	Rainfed Red sandy loam soils	Mesta	No Change		
		Ground nut			
	Rainfed sandy clay loam soils	Mesta			
		Groundnut			
		Cotton			
		Redgram			

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 first week)	Rainfed Red sandy loam soils	Mesta	Sole Maize, Mesta + Maize inter crop at 2:1, sole Green gram, Ragi sole crop		
		Groundnut	No change		
		Redgram	No change	Closer spacing 150cm	
	Rainfed sandy clay loam soils	Mesta	Sole Maize, Mesta + Maize (2:1), sole Black gram, Ragi sole crop		
		Ground nut	No change		
		Cotton		Closer spacing	
		Red gram		Closer spacing from 180 to 150.	

Condition			**Suggested Contingency measures**

Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 6 weeks (July 3 rd week)	Rainfed Red sandy loam soils	Mesta	Sole Ragi/Greengram/ Blackgram/ Sesamum	One hoeing at 15 DAS for weed control & moisture conservation	High yielding YMV resistant pulse seeds must producede & marketed by APSSDC
		Groundnut	Groundnut- Redgram (7:1)		
	Rainfed sandy clay loam soils	Mesta	Sole Ragi/Maize/ Blackgram/ Sesamum		
		Groundnut	Groundnut- Redgram (7:1)		
		Cotton	No change		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8 weeks (August 1st week)	Rainfed Red sandy loam soils	Mesta	Sole Ragi/Maize/Greengram	Under late planted condition seed treatment with insecticide (Imidacloprid)+Fungicide (Carbandizm) must be taken for better germination and protection from pests & diseases during early stages.One hoeing at 15 DAS for weed control & moisture conservation	High yielding YMV resistant pulse seeds from APSSDC
		Ground nut			
	Rainfed sandy clay loam soils	Mesta			
		Ground nut			
		Cotton	No change	Closer spcing, One hoeing at 15 DAS for weed control & moisture conservation	

Condition			Suggested Contingency measures		
Early season drought **(Normal onset)**	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measues**	**Remarks on Implementation**
	Rainfed Red sandy	Mesta	No change	Inter cultivation (soil mulch) to	

Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	loam soils		(If population is <50% resowing with same crop may be taken up.)	conserve moisture Foliar spray of 2% urea to supplement nutrition	
		Ground nut	No change (if plant population is <50%, re-sowing with Maize/ green gram/Ragi may be take up)	Foliar spray of 2% urea to supplement nutrition	
		Red gram (sole crop)	Gap filling to be done at 9 to 10 days after sowing when the crop stand is poor. If population id <50 % take up re-sowing with closer spacing.	Inter cultivation to be done after 2 weeks of sowing to conserve soil moisture Foliar spray of 2% urea twice with in 10 days to supplement nutrition	

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At vegetative stage	Rainfed Red sandy loam soils	Mesta	As above	Spray 2 % urea solution or 1 % water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 Inter cultivation to conserve soil moisture	
		Groundnut		as above	
	Rainfed sandy clay loam soils	Mesta			
		Groundnut			
		Cotton			
		Sugarcane		Spray KNO_3 on foliage twice at week interval.	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measues**	**Remarks on Implementation**
At reproductive stage	Rainfed Red sandy loam soils	Mesta	50% flowering	-do-	
		Ground nut	Life saving irrigation		
	Rainfed sandy clay loam soils	Mesta	50% flowering		
		Ground nut	Protective irrigation		
		Cotton			

Condition			Suggested Contingency measures		
Terminal drought	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
	Rainfed Red sandy loam soils	Mesta	-	Horse gram/ Green gram	
		Ground nut	Harvest at Physiological maturity Life saving irrigation if possible. Spray of antitranspirants.	Horse gram/ green gram seed is kept ready	
	Rainfed sandy clay loam soils	Mesta	-	Greengram/ Bengal gram/sesame	
		Ground nut	Harvest at Physiological maturity Life saving irrigation		
		Cotton	Spray urea - 2 % or KNO_3 1% or other water soluble fertilizers 1 % to supplement nutrition Life saving irrigation		

2.1.2 Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delayed release of water in canals due to low rainfall	Canal fed Red sandy loam soils	Rice - Maize/Green gram/ Groundnut/Ragi/Gingelly (Medium duration paddy varieties like Sonamashuri, Vijetha, Sambamashuri, Swarna)	No change long duration varieties of rice which suit for over - aged seedling transplanting like RGL 11414, RGL2537 (If nursery damaged, go for resowing of nursary with short duration varieties like NLR 34449, MTU 1010, Jaya, Pushkala	1. Careful nursery management. (If nursery damaged, go for resowing of nursary with short duration varieties) 2. Selection of suitable variety 3. Close planting (44 hills/m^2) 4. Adopt preventive control measures for diseases like gallmidge. 5. Seedling treatment with chloripyriphos to prevent early stage pests. 6. Nursary treatment with 1.6kg Carbofuron 3G per 10 cents nursery. 7. During Rabi season select greengram varieties like LGG 460, 410, ML 267, LBG which are early maturing and suitable for delayed sowings	Seed source ARS Ragolu
		Rice- Rice (Medium duration paddy varieties like Sonamashuri, Vijetha, Sambamashuri, Swarna)			
	Canal fed sandy clay loam soils	Rice - Maize/black gram/ gingilly/ groundnut/ Ragi (Medium duration paddy varieties like Sonamashuri, Vijetha, Sambamashuri, Swarna)			
		Rice- Rice (Medium duration paddy varieties like Sonamashuri, Vijetha, Sambamashuri, Swarna)	No change (If nursery damaged, go for resowing of nursary with short duration varieties like NLR 34449, MTU 1010, Jaya, Pushkala		

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Limited release of water in canals due to low rainfall	Canal fed Red sandy loam soils	Rice – Maize/ groundnut/ green gram/Ragi / Gingilly	Rice- ID crops like Greengram/ground nut/ ragi)/ Sesamum	**Rice –** 1. Aerobic Rice ((MTU 1001) SRI method 2. Improved water management practices 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	1. Availability of seed of short duration varieties shall be ensured 2. Facilities like micro irrigation systems – Sprinkler and Drip can be extended to the farmers 3.Availability of conoveeders, supply of markers for SRI cultivation
		Rice- Rice (Medium durationpaddy varieties like Sonamashuri, Vijetha, Sambamashuri, Swarna)	Rice- i.d crops like groundnut/green gram/Ragi/Gingilly (If nursery damaged, go for resowing of nursary with short duration varieties like NLR 34449, MTU 1010, Jaya, Pushkala		
	Canal fed sandy clay loam soils	Rice – Maize/ groundnut/ black gram /gingilly	Rice – black gram/ black gram/gingilly		
		Rice- Rice (Medium duration paddy varieties like Sonamashuri, Vijetha, Sambamashuri, Swarna)	Rice- ID crops like groundnut/green gram/Ragi/Sesamum		

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Non release of water in canals under delayed onset of monsoon in catchme	Canal fed sandy loam soils	Rice - Maize/green gram/ groundnut/ Ragi/gingilly (Medium duration paddy varieties like Sonamashuri, Vijetha, Sambamashuri, Swarna)	Ragi/Greengram/Sesamum/Horsegram	Seed treatment with fungicides Suitable weed management (chemical or mechanical) At least one hoeing / intercultivation to conserve moisture *During Rabi* season if water is available , Maize/ ground nut or select Ragi (Chaitanya, Bharati, Ratnagiri etc) or greengram varieties like LGG 460, 410, ML 267, LBG which are early maturing and suitable for delayed sowings	As above
		Rice- Rice (Medium duration paddy varieties like Sonamashuri, Vijetha, Sambamashuri, Swarna)	As above		
	Canal fed sandy clay loam soils	Rice - Maize/black gram/ groundnut/ Ragi/gingilly (Medium duration paddy varieties like Sonamashuri, Vijetha, Sambamashuri, Swarna)	Ragi/Blackgram/Sesamum/Horsegram		

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Tank fed red sandy loam soils	Rice - green gram/ groundnut/ Ragi/Gingilly	Ragi/Greengram/Sesamum/Horsegram		
	Tank fed sandy clay loam soils	Rice - Blackgram/ Groundnut/ Ragi/Sesamum			

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Insufficient groundwater recharge due to low rainfall	Tubewell/ openwell fed Red sany loam/ clay loam	Surgarcane	No change	Skip row irrigation Microirrigation to conserve water	
		Rice- Vegetables	No change	As above	
		Rice - Maize			

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

Condition	Suggested contingency measure			
Continuous high rainfall in a short span leading to water logging Heavy	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**

rainfall with high speed winds in a short span				
Paddy	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 gap filling either with available nursery or by splitting the tillers from the surviving hills 4. Take up proper weed control Measures	1. Drain the excess water as early as possible 2. Apply 30 kg Urea + 15 kg MOP /acre after draining excess water 3. Take up suitable plant protection Measures in anticipation of pest & disease out breaks 4.If crop lodged lift the hills 5. take 3-4 hills together	1. Drain the excess water as early as possible 2. Take up suitable plant protection measures in anticipation of pest & disease out breaks, epecially for BPH. 3. For non dormant varieties like Sambamashuri, Jaya , spray 5% salt solution on earheads to prevent germination.	1. Drain out water and spread sheaves loosely in field or field bunds where there is no water stagnation 2. Spray common salt at 5% 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
Mesta	1. Drain the excess water as early as possible 2. Apply 20 kg N + 10 kg K /acre after draining excess water	1. Drain the excess water as early as possible 2. Spray COC or Metalaxyl for protection against Foot & stem rot disease.	-	1. Arrange the Mesta stakes in upright position 2. After the event Transfer the stakes to water bodies for retting.
Ground nut	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%	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. Incorporate. Gypsum 200 kg/ acre at flowering. 5. Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25%	1. Drain the excess water as early as possible 2. Harvest the produce at opt soil moisture	1.Shift the produce for safer places. 2.Dry the grain to optimum moisture condition before storing
Sugarcane	1. Drain the excess water as	-	1. Drain the excess water as	1.Shift the produce for safer

	early as possible 2. Apply 30kg Urea + 20 kg MOP/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. Carry out wrapping & propping		early as possible 2. Take up suitable plant protection measures in anticipation of pest & 3. Carry out wrapping & propping .	places. 2. Transfer the canes to factory as early as possible. 3prepare jiggery at the earliest
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. Earthenup 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 Pink stem borer, sheath blight and Turcicum leaf blight	1. Drain the excess water as early as possible 2. Apply 20 kg N + 10 kg K /acre after draining excess water 3. To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition 4. Take up timely control measures for sheath blight and post flowering stalk rots	1. Drain the excess water as early as possible 2. Allow the crop to dry completely before harvesting	1.Shift the produce for safer places. 2.. Dry the grain to optimum moisture condition before storing
Redgram	1. Drain the excess water as early as possible 2. Apply 20 kg Urea + 10 kg MOP/acre or spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition	1. Drain the excess water as early as possible 2. Spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition 3. Take up timely control measures against the out break of pests like Spodoptera,	1. Drain the excess water as early as possible 2. Allow the crop to dry completely before harvesting	1. 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

	after draining excess water 3. Take up inter cultivation at optimum soil moisture status to loosen and aerate the soil and to control weeds	Helicoverpa etc.		prevent deterioration in quality during storage
Horticulture				
Mango	Drain the excess water as soon as possible Spray 1% KNO3 or Urea 2% solution 2-3 times. Wind damaged branches should be pruned using disinfected secatures and cut ends must be smeared with Bordeaux paste	Drain the excess water as soon as possible Spray 1% KNO3 or Urea 2% solution 2-3 times. Wind damaged branches should be pruned using disinfected secatures and cut ends must be smeared with Bordeaux paste	Drain the excess water as soon as possible Harvest the mature produce in a clear sunny day' Wind damaged branches should be pruned using disinfected secatures and cut ends must be smeared with Bordeaux paste	Store the fruits in well ventilated place temporarily before it can be marketed. Market the fruits as soon as possible. Grade the damaged or infected fruits. Store the graded fruits in well-ventilated place temporarily before it can be marketed.
Horticultural crops - Vegetables				

Brinjal	1. Drain the excess water as soon as possible 2. Spray Urea 2% solution 2-3 times. 3. Topdressing of booster dose of 12 kg MOP + 30 kg Urea per acre as soon as possible. 4. Gap filling may be taken up if the plants are two weeks old and sowing window is still available for the crop. 5. 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.	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. 4. Spray COC 30 g in 10 liters of water, 2-3 times against leaf spots	1. Drain the excess water as soon as possible 2. Harvest the marketable fruits in a clear sunny day 3. Spray captan or mancozeb 0.3% to prevent fruit rot	1. Store the harvested fruits in well ventilated place temporarily before it can be marketed. 2. Market the fruits as soon as possible.
Spice & Plantation crops				

Areca nut and Oil palm, Coconut	• Planting should be done on mounts or bunds • Drainage system, suited to local conditions may be provided to remove surplus water from root zone • Relief drains [shallow] channels are opened at places where water accumulates and connected with main drain to remove water from the surface	• Drain the excess water as soon as possible • Apply booster dose of NPK fertilizers	• Drain the excess water as soon as possible • Apply booster dose of NPK fertilizers • Harvest the mature nuts as soon as possible.	• Store the produce in well ventilated place temporarily before it can be market • Market the nuts as soon as possible.
Outbreak of pests and diseases due to unseasonal rains				
Paddy	Stem borer, Blast, leaf folder, 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	Neck blast and cuworm are the expected problems. Needful protection measures may be taken up	Cyclonic rains arte expected at harvest. Careful observation of weather data useful in decision making. Dry the grain to optimum seed moisture content (10-12 %) to avoid damage in storage
Mesta	Mealybug & sucking pests , Foot & stem rot are major problems. Recommended protection measures are to be followed.	-	-	-
Groundnut	Sucking pests, Spodoptera , root grub- Need based plant protection measures to be initiated	Stem rot, Wilt, Spodoptera, cercospera Leaf spots, - Need based plant protection measures to be initiated	Spodoptera, Rust, Wilt - Need based plant protection measures to be initiated	Dry the grain to optimum seed moisture content (8 %) to avoid damage in storage
Sugarcane	Early shoot borer, termites, smut and other virus carrying sucking	-	-	Harvest the canes close to ground and transfer to

	insects - need based plant protection operations			Factory or Jaggery crusher as early as possible.
Cotton	Jassids, Wilt and root rot, Bacterial leaf blight - Need based plant protection measures to be initiated	Jassids, *Spodoptera*, Wilt and root rot, Bacterial leaf blight, Grey mildew - 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
Maize	Stem borer- whorl application of carbofuran granules.	Jassids, Wilt and Stalk rot	Post flowering Stalk rots may aggravate if unseasonal rains occurs	Dry the grain to optimum seed moisture content (8 %) to avoid damage in storage
Horticulture				
Mango	Needful measures to prevent the incidence of Hoppers, thrips, Mealy bug, Anthracnose, Mallformation	Needful measures to prevent the incidence of Hoppers, thrips, Mealy bug, Anthracnose, Mallformation & stone weivil	-	Harvested produce may be packed/ processed scientifically to avert post harvest damages.
Brinjal				
Arecanut& Coconut				

2.3 Floods

Condition	**Suggested contingency measure**			
Transient water logging/ partial inundation	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Continuous submergence for more than 2 days	-NA-	-NA-	-NA-	-NA-
Sea water intrusion	-NA-	-NA-	-NA-	-NA-

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

Extreme event type	**Suggested contingency measure**			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave	-NA-			

Cold wave				
Frost				
Hailstorm				
Cyclone				
Paddy	1. Drain out the excess water at the earliest 2. Apply booster dose of 0.2 kg N/40 sq. m 3. Spray micronutrients like Zn, Fe at 4 -5 days interval	1. Drain out the excess water at the earliest 2. Take up gap fillings if any. 3.Apply booster dose of 20 kg N/Acre 4. Spray $ZnSO_4$ 0.2 % if it is less than 45 days after transplanting 5. Takeup need based plant protection measures	1. 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	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 dried after cyclone. 4. Ensure proper grain moisture before storing
Sugarcane	1. Drain out the excess water at the earliest 2. Take-up the gap filling . 3. Apply 20-30 kg N + 10 kg K /acre to supplement nutrition. 4. Weed control by mechanical or by herbicides. 5. Need based plant protectin measures.	1. Drain out the excess water at the earliest 2. Wrapping & propping to support the canes. 3. Apply 20 kg N + 10 kg K /acre after draining excess water. 4. Weed control by mechanical or by herbicides. 4.Need based plant protection measures.	-	Harvest the canes close to ground and transfer to Factory or Jaggery crusher as early as possible.
Mesta	1.Drain the field as early as possible 2. If mortality is more than 30 % go for re-sowing with closer spacing. 3. Take up necessary plant protecting measures.	1. Drain out the excess water at the earliest 2. Apply 20 kg N + 10 kg K /acre after draining excess water 3. Lodged plants to be lifted and tied together to make them stand erect 4. Intercultivate to smother weeds and to loosen and aerate the soil 5. Need based plant protection measures to be taken up	1. Drain out the excess water at the earliest 2. Lodged plants to be lifted and tied together to make them stand erect	1.Erect the mesta stakes upright 2.After leaf shedding transfer to water bodies for retting

Groundnut	1. Drain out the excess water at the earliest 2. Take-up the gap filling at the earliest 4. Apply 4-5 kg N/acre after draining excess water 5. Take up plant protection measures against possible pests and disease incidence	1. Drain out the excess water at the earliest 2. Apply 4-5 kg N/acre after draining excess water 3. spray KNO_3 1 % or Urea 2%water soluble fertilizers like 19-19- or 19, 20-20-20, 21-21-21 at 1% to support nutrition 4. Take up plant protection measures against possible pests and disease incidence 5. incorporate. Gypsum 200 kg/ acre at flowering.	1. drain out the excess water at the earliest 2. spray KNO_3 1 % or 2% Urea to support nutrition 4. Take up plant protection measures against possible pests and disease incidence	1.Drain the field immediately. 2. Harvest the produce after the event. 3. Dry the pods to safe moisture level to prevent storage pests.
Maize	1. Drain out the excess water at the earliest 2. Intercultivation and earthing up to be done 3. Apply 20 kg N + 10 kg K /acre after draining excess water 4. Take up plant protection measures against possible pests and disease incidence	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	1. Drain out the excess water at the earliest 2. Take up plant protection measures against possible pests and disease incidence	1. Drain out the excess water at the earliest 2. Cob picking to be done after they are dried fully
Horticultural crops- fruits				
Mango	If the damage is severe, go for resowing	1. Trees fallen on ground may be lifted and earthed up 2. Manuring and plant protection measures have to be taken up. 3. Broken and damaged branches may be pruned and applied with Bordeaux paste	1. Tress fallen on ground may be lifted and earthed up 2. Manuring and plant protection measures have to be taken up. 3. Broken and damaged branches may be pruned and applied with Bordeaux paste	1. Drain the excess water as soon as possible. 2. Harvest the mature fruits as soon as possible. 3. Collect the fallen fruits and sell immediately or go for preparation of processed products. 4. If to store, store the produce in well-ventilated place temporarily before it can be marketed. 5. Broken and damaged branches may be pruned and applied with Bordeaux paste

Horticultural crops - Vegetables				
Brinjal	Grow nursery on raised beds. Drench the nursery beds with COC 3 g per litre to prevent damping off If damage is more go for replanting	1. Uprooted plants may be lifted and earthed up 2. Drain the excess water as soon as possible 3. Gap filling must be done immaditeatly 4. Spray Urea 2% solution 2-3 times. 5. Topdressing of booster dose of 12 kg MOP + 30 kg Urea per acre as soon as possible. 6. If damage is more go for replanting	1. Uprooted plants may be lifted and earthed up 2. Drain the excess water as soon as possible 3. Gap filling must be done immaditeatly 4. Spray Urea 2% solution 2-3 times. 5. Topdressing of booster dose of 12 kg MOP + 30 kg Urea per acre as soon as possible.	1. Drain the excess water as soon as possible. 2. Harvest the mature produce as soon as possible. 3. Store the produce in well-ventilated place temporarily before it can be marketed. 4. Market the produce as soon as possible. 5. Collect thefruits and sell immediately or go for preparation of processed products.
Spices & Plantation crops				
Cashew	1. Drain the excess water as soon as possible 2. Spray 1% KNO3 or Urea 2% solution 2-3 times. 3. Provide support to the young plants	1. Drain the excess water as soon as possible 2. Tress fallen on ground may be lifted and earthed up 3. Broken and damaged branches may be pruned and applied with Bordeaux paste	1. Drain the excess water as soon as possible 2. Tress fallen on ground may be lifted and earthed up 3. Broken and damaged branches may be pruned and applied with Bordeaux paste	1. Drain the excess water as soon as possible. 2. Harvest the mature produce as soon as possible. 3. Store the produce in well ventilated place temporarily before it can be marketed. 4. Market the produce as soon as possible.
Areca nut and Oil palm, Coconut	1. Planting should be done on mounts or bunds 2. Drainage system suited to local conditions may be provided to remove surplus water from root zone 3. Relief drains [shallow] channels are opened at places where water accumulates and connected with main drain to remove water from the	1. Drain the excess water as soon as possible 2. Twisted leaves may be cut and removed 3. Apply booster dose of NPK fertilizers 4. 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	1. Drain the excess water as soon as possible 2. Hanging bunches may be provided with supports wherever possible. Apply booster dose of NPK fertilizers 3. The palms have fallen with root system still having contact with soil they need to be brought to position and provided with soil mound and support	1. Twisted leaves may be cut and removed 2. Hanging bunches may be provided with supports wherever possible 3. Harvest the mature nuts as soon as possible. 4. Market the produce as soon as possible.

	surface			

2.5 Contingent strategies for Livestock, Poultry & Fisheries

General contingency measures for Livestock

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

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

2.5.1 Detailed Contingency strategies for Livestock

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Drought			
Feed and Fodder availability	Establishment of silvi-pastoral system in CPRs with ***Stylosanthus hamata*** and ***Cenchrus ciliaris*** as grass with ***Leucaena leucocephala*** as tree component Top dressing of N in 2-3 split doses @ 20-25 kg N/ha in common property resources (CPRs) like temple lands, panchyat lands or private property resources (PPRs) like waste and degraded lands with the monsoon pattern for higher biomass production Promote cultivation of short duration fodder crops of	Harvest and use biomass of dried up crops (Rice, Maize, Horse gram, Groundnut, black gram, sun hemp) material as fodder. Harvest the tree fodder (Neem, Subabul, Acasia, Pipal etc) and unconventional feeds resources available and use as fodder for livestock (LS). Available feed and fodder should be cut from CPRs and stall fed in order to reduce the energy requirements of the animals	Concentrates supplementation should be provided to all the animals. The farmers may be advised to practice "flushing the stock" to recoup Short duration fodder

	sorghum/bajra/maize(UP chari, MP chari, HC-136, HD-2, GAINT BAJRA, L-74, K-677, Ananad/African Tall, Kisan composite, Moti, Manjari, B1-7 and also sunhemp Chopping of fodder should be made as mandatory in every village through supply and establishment of good quality chaff cutters. Establishment of backed yard cultivation of para grass with drain water from bath room/washing area Harvesting and collection of perennial vegetation particularly grasses which grow during monsoon Proper drying, bailing and densification of harvested grass from previous season Creation of permanent fodder, feed and fodder seed banks in all drought prone villages	UMMB, hay, concentrates and vitamin & mineral mixture should be transported to the needy areas from the reserves at the district level initially and latter stages from the near by districts. All the sugar cane tops and hay should be enriched with 2% Urea molasses solution or 1% common salt solution and fed to LS Herd should be split and supplementation should be given only to the highly productive and breeding animals Provision of emergency grazing/feeding (Cow-calf camps or other special arrangements to protect high productive & breeding stock) Motivate the farmers to mix the dry fodder with available kitchen waste while feeding Arrangements should be made for mobilization of small ruminants across the villages where no drought exits with subsidized road/rail transportation and temporary shelter provision for the shepherds Unproductive livestock should to be culled during severe drought Create transportation and marketing facilities for the culled and unproductive animals Supply silage and or hay on subsidized rates to the farmers having high productive stock Subsidized loans should be provided to the livestock keepers	crops of should be sown in unsown and crop failed areas where no further routine crop sowing is not possible Supply of quality seeds of fodder varieties and motivating the farmers to cultivate at least 10% of their land holding for fodder production

Cyclone	Harvest all the possible wetted grain (rice/maize etc) and sugar cane tops and use as animal feed. Motivate the farmers to store a minimum quantity of hay (25-50 kg) and concentrates (10-25 kg) per animal in farmer's / LS keepers house/ shed for feeding the animals during cyclone. Stock of anti-diarrheal drugs and electrolytes should be made available for emergency transport Don't allow the animals for grazing in case of early forewarning (EFW) of cyclone Incase of EFW of severe cyclone, shift the animals to safer places.	Treatment of the sick, injured and affected animals through arrangement of mobile emergency veterinary hospitals / rescue animal health workers. Diarrhea out break may happen. Health camps should be organized In severe cases un-tether **or** let loose the animals Arrange transportation of highly productive animals to safer place Spraying of fly repellants in animal sheds	Repair of animal shed Deworm the animals through mass camps Vaccinate against possible disease out breaks like HS, BQ, FMD and PPR Proper dispose of the dead animals / carcasses by burning / deep burying (4-8 feet) with lime powder (1kg for small ruminants and 5kg for large ruminants) in pit Bleach / chlorinate (0.1%) drinking water or water resources Collect drowned crop material, dry it and store for future use Sowing of short duration fodder crops in unsown and water logged areas when crops are damaged and no chance to replant Application of urea (20-25kg/ha) in the

			inundated areas and CPR's to enhance the bio mass production.
Floods	In case of early forewarning (EFW), harvest all the crops (Maize, Rice, Horse gram, Groundnut) that can be useful as fodder in future (store properly) and also sugar cane tops Don't allow the animals for grazing if severe floods are forewarned Motivate the farmers to store a minimum required quantity of hay (25-50kg) and concentrates (25kgs) per animals in farmer / LS keepers house / shed for feeding animals during floods Arrangement for transportation of animals from low lying area to safer places and also for rescue animal health workers to get involve in rescue operations	Transportation of animals to elevated areas Stall feeding of animals with stored hay and concentrates Proper hygiene and sanitation of the animal shed In severe floods, un-tether or let loose the animals Emergency outlet establishment for required medicines or feed in each village Spraying of fly repellants in animal sheds	Repair of animal shed Bring back the animals to the shed Cleaning and disinfection of the shed Bleach (0.1%) drinking water / water sources Deworming with broad spectrum dewormers Vaccination against possible disease out breaks like HS, BQ, FMD and PPR Proper disposable of the dead animals / carcasses by burning

			/ deep burying (4-8 feet) with lime powder (1kg for small ruminants and 5kg for large ruminants) in pit Drying the harvested crop material and proper storage for use as fodder.

3 <u>Vaccination programme for cattle and buffalo:</u>

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

4 **Vaccination schedule in small ruminants (Sheep & Goat)**

Disease	**Season**
Foot and mouth disease (FMD)	Preferably in winter / autumn
Peste des Petits Ruminants (PPR)	Preferably in January
Black quarter (BQ)	May / June

Enterotoxaemia (ET)	May
Haemorrhagic septicaemia (HS)	March / June
Sheep pox (SP)	November

2.5.2 Poultry

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

Drinking water		Use water sanitizers or offer cool drinking water	
Health and disease management	In case of EFW, add antibiotic powder (Terramycin/Ampicilline/ Ampiclox etc., 10g in one litre) in drinking water to prevent any disease outbreak	Prevent water logging surrounding the sheds through proper drainage facility Assure supply of electricity by generator or solar energy or biogas Sprinkle lime powder to prevent ammonia accumulation due to dampness	Sanitation of poultry house Treatment of affected birds Disposal of dead birds by burning / burying with line powder in pit Disposal of poultry manure to prevent protozoal problem Supplementation of coccidiostats in feed Vaccination against RD
Cyclone			
Shortage of feed ingredients	In case of EFW, shift the birds to safer place Storing of house hold grain like maize, broken rice, bajra etc, Culling of weak birds	Use stored feed as supplement Don't allow for scavenging Protect from thunder storms	Routine practices are followed
Drinking water		Use water sanitizers or offer cool drinking water	
Health and disease management	In case of EFW, add antibiotic powder in drinking water to prevent any disease outbreak	Sanitation of poultry house Treatment of affected birds Prevent water logging surrounding the sheds Assure supply of electricity Sprinkle lime powder (5-10g per square feet) to prevent ammonia accumulation due to dampness	Disposal of dead birds by burning / deep burying with lime powder in pit Disposal of poultry manure to prevent protozoal problem Supplementation of coccidiostats in feed Vaccination against Ranikhet Disease (0.5ml S/c)

Heat wave and cold wave	NA

2.5.3 Fisheries/ Aquaculture**:**

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
1) Drought			
A. Capture			
Inland			
(i) Shallow water depth due to insufficient rains/inflow	Stocking of advnced fingerlings in half or even less than the normal stocking density or stocking of common carp seed	Immediate harvesting or decreasing the density commensurate with the water quantity.	De weeding and deepening of tank to ensure retention of water for a longer period and provision of employment under MGNREGP
(ii) Changes in water quality	Regular monitoring of water quality parameters and application of geolites, soil probiotics, etc to maintain water qaulity	Immediate harvesting or changing the water quality by application of sanitisers.	Removal of top layer, deep ploughing of tank and application of lime
(iii) Any other			
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	Crop holiday or going for stocking of yearlings by reducing the density according to availability of water	Harvesting of fish and leaving the pond fallow till next season	Removal of top layer, deep ploughing of tank and application of lime
(ii) Impact of salt load build up in ponds / change in water quality	Stocking of salinity tolerant fish / shrimp, application of geolites and other buffers	Frenquent change of water with fresh water	Frequent draining of the pond with fresh water, removal of top layers
(iii) Any other			
2) Floods			
A. Capture			

Marine	No intervention	No intervention	No intervention
Inland			
(i) Average compensation paid due to loss of human life	Shifting the people from low lying areas to relief camps	Deployment of specially trained persons for rescue operations by providing life bouys, jackets, ropes, boats, etc	Payment sufficient ex-gratia to the families
(ii) No. of boats / nets/damaged	Shifting and relocating boats and nets to safer places when warnings are issued, to avoid fishing, etc	Shifting and relocating boats and nets to safer places	Assessment of damages to boats and nets and provision of boats and nets for restoration of livelihoods
(iii) No.of houses damaged	Avoidance of construction of houses in flood prone ares, construction of pucca houses at elevated places,	Shifting of people by relief boats to the relief camps	Assessment of damages to houses and provision of compensation in case of partial damage and sanction house under existing schemes
(iv) Loss of stock	Avoidance of surface species like catla, silver carp since they are vulnerable in tanks prone to floods, erection of nets across the spill way or just beyond it	Erection of nets at spill ways	Taking up compensatory stocking
(v) Changes in water quality		When dissolved oxygen levels go down, aerators, recirculation of water, etc are to be attempted to maintain DO levels, going for partial harvest, etc	
(vi) Health and diseases	Sometimes there may be heavy accumulation of nutrients and organic matter.	There may be break out of Heamorrhagic septicimea. Addition of antibiotics like Chloro Tetra Cycline or Oxy Tetra Cycline to the feed to constrol the disease	Removal of weeds, top layer of soil, deep ploughing of tank and application of lime, exposing to sun light
B. Aquaculture			
(i) Inundation with flood water	Raising and rivetting the bunds, construction of spill way to release excess water, erection of nets to avoid escape of fish	Continuous pumping of excess water, erection of nets low lying areas	Strengthening of bunds, excavating channels along the sides of the ponds for free escape of water

(ii) Water continuation and changes in water quality		When dissolved oxygen levels go down, aerators, recirculation of water, etc are to be attempted to maintain DO levels, going for partial harvest, etc	
(iii) Health and diseases	Sometimes there may be heavy accumulation of nutrients and organic matter.	There may be break out of Heamorrhagic septicimea. Addition of antibiotics like Chloro Tetra Cycline or Oxy Tetra Cycline to the feed to constrol the disease	Removal of weeds, top layer of soil, deep ploughing of tank and application of lime, exposing to sun light
(iv) Loss of stock and inputs (feed, chemicals etc)	Advance erection of nets, strengthening of bunds where they are prone to breaches, harvesting or reducing the density	Suspension of feeding, application of organic manures	Compensatory stocking, assessment of values and payment of subsidy on inputs
(v) Infrastructure damage (pumps, aerators, huts etc)	Insuring pond, accessories, etc., Shifting of aerators, pumps soon after warnigs are issued	Relocating pumps, aerators to elevated places	Assessment of damages and provision of them on subsidy
(vi) Any other			
3. Cyclone / Tsunami			
A. Capture			
Marine			
(i) Average compensation paid due to loss of fishermen lives	Avoidance of fishing, preventing fishermen from venturing into sea, carrying of safety equipment and VHF sets, shifting fishermen from vulnerable areas to relief camps, etc	To ensure the return of fishing boats on long voyages, provision of information on such boats to coast Guard	Payment sufficient ex-gratia to the families
(ii) Avg. no. of boats / nets/damaged	Avoidance of fishing when warnings are issued, shifting of boats and nets to safe places	Shifting and relocating boats and nets to safer places	Assessment of damages to boats and nets and provision of boats and nets for restoration of livelihoods
(iii) Avg. no. of houses damaged	Avoidance of houses in Coastal Regulation Zone, designing of houses to withstand impact of turbulent wind	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

	and water		under existing schemes
Inland	Erection of protective nets acroos the surplus weir to prevent fish loss due to overflows	Continuous monitoring to prevent or minimise escape of fish along with surplus water	Compensatory stocking of seed
B. Aquaculture			
(i) Overflow / flooding of ponds	The design of the pond must be in such a manner as to bail out surplus water and to prevent loss of stanidng crop	Continuous monitoring to prevent or minimise escape of fish along with surplus water	Compensatory stocking of seed
(ii) Changes in water quality (fresh water / brackish water ratio)	Recircualtion water to repleish and ensure sufficient dissolved oxygen levels in the pond. Maintenance of salinity levels by pumping in water from creecks.	Continuation of the same process.	Restoration of physical and chemical parameters
(iii) Health and diseases	Removal of stress causing factors to maintain the health of the animal	Removal of stress causing factors to maintain the health of the animal	Restoration of physical and chemical parameters
(iv) Loss of stock and inputs (feed, chemicals etc)	Preventive nets must be erected to minimise loss of stock	Continuation of the same process.	Compensatory stocking of seed
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)	Pumps, aerators, etc must be protected by moving them to safe locations	To avoid use of aerators, pumps and other appliances	Overhauling of the eqipment to prevent from being damaged
(vi) Any other			
4. Heat wave and cold wave			
A. Capture			
Marine	Avoidance of fishing	Avoidance of fishing	No intervention
Inland	Monitoring dissolved oxygen levels	Monitoring dissolved oxygen levels	No intervention
B. Aquaculture			
(i) Changes in pond environment (water quality)	Reduction of biomass by partial harvest in the event of heat as the DO	Avoidance of fishing	Compensatory stocking of seed and restoration of all physical and

	levels will be very low.		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			