

State: ANDHRA PRADESH

Agriculture Contingency Plan for District: RANGAREDDY

1.0 District Agriculture profile					
1.1	Agro-Climatic/Ecological Zone				
	Agro Ecological Sub Region (ICAR)	South Telangana Plateau and Easternghat, Hot dry semi arid AESR (7.2)			
	Agro-Climatic Region (Planning Commission)	Southern Plateau and hill regions (X)			
	Agro Climatic Zone (NARP)	Southern Telangana Zone (AP-5)			
	List all the districts or part thereof falling under the NARP Zone* (*>50% area falling under in the zone)	Ranga Reddy, Mahabubnagar parts of Medak, Warangal and Nalgonda.			
	Geographic coordinates of district	Latitude	Longitude	Altitude	
		16°30 '0"– 18°20'0" N	77°30'0" – 79°30'0" E		
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Regional Agricultural Research Station, Palem, Mahabubnagar Dist.			
	Mention the KVK located in the district with full address	Krishi Vigyan Kendra, (CRIDA), Hayatnagar, Hyderabad, 500 059, Andhra Pradesh			
	Name and address of the nearest Agromet Field unit (AMFU, IMD) for agro-advisories in the zone	Agromet Cell, Rajendrangar, Hyderabad 500 030			
1.2	Rainfall	Normal RF(mm)	Normal Rainy days (number)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	637		2 nd week of June	2 nd week of October
	NE Monsoon(Oct-Dec):	123		2 nd week of October	End of December
	Winter (Jan- Feb)	10		-	-
	Summer (Mar-May)	67		-	-
	Annual	838		-	-

1.3	Land use pattern of the district (latest statistics)(2005-2006)	Geographical area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area ('000 ha)	749.3	73.1	101.7	33.0	20.0	6.4	27.6	218.0	63.6

1.4	Major Soils (common names like shallow red soils etc.,)	Area ('000 ha)	Percent (%) of total
	1. Red soils	125.0	51%
	2. Black cotton soil	98.0	40%
	3. Dubba soils	22.0	9%
	Others (specify):		
1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	203.0	112.7
	Area sown more than once	25.7	
	Gross cropped area	228.7	

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	53.3		
	Gross irrigated area	69.8		
	Rainfed area	149.7		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals		0.6	1.2
	Tanks		1.7	3.2
	Open wells		12.7	15.3

	Bore wells		50.2	92.6
	Lift irrigation		0.8	1.0
	Micro-irrigation		-	-
	Other sources		2.3	2.7
	Total Irrigated Area		83.4	
	Pump sets		40.9	
	No. of Tractors		1.9	
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils	(% area)	
	Over exploited	12	35.6	
	Critical	2	6.2	
	Semi- critical	8	22.6	
	Safe	15	35.6	
	Wastewater availability and use	-	-	
	Ground water quality		-	
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

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

1.7		Major Field Crops cultivated	Area ('000 ha)					
			Kharif		Rabi		Summer	Total
			Irrigated	Rainfed	Irrigated	Rainfed		
1	Rice	18.3		12.1			30.4	
2	Redgram		29.7				29.7	
3	Jowar		15.1		6.7		21.8	
4	Maize		20.8		0.7		21.5	
5	Cotton		16.2				16.2	
6	Chickpea				7.4		7.4	
7	Groundnut				6.8		6.8	
	Horticulture crops - Fruits				Total area			
1	Mango				5.85			
2	Orange&Batavian				3.09			
3	Grapes				2.16			

	4	Guava	2.15
		Horticultural crops - Vegetables	Total area
	1	Tomato	6.14
	2	Chillies	1.59
	3	Brinjal	1.33
	4	Bhendi	1.21
	5	Greens	1.05
		Flower crops	Total area
	1	Marigold	1.59
		Plantation crops	Total area
	1	Turmeric	4.46

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)	161.6	117.3	279.0
	Crossbred cattle	4.6	19.3	24.0
	Non descriptive Buffaloes (local low yielding)	42.6	224.9	267.5
	Graded Buffaloes			
	Goat			386.8
	Sheep			590.1
	Others (Camel, Pig, Yak etc.)			15.12
	Commercial dairy farms (Number)			
1.9	Poultry	No. of farms	Total No. of birds (number)	
	Commercial		13318033	
	Backyard		781243	
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)	
ii) Inland (Data Source: Fisheries Department)	No. Farmer owned ponds		No. of Reservoirs		No. of village tanks	
	1		10		215	
B. Culture						
		Water Spread Area (ha)		Yield (t/ha)		Production ('000 tons)
i) Brackish water (Data Source: MPEDA/ Fisheries Department)		-		-		0
ii) Fresh water (Data Source: Fisheries Department)		1		-		0
Others				-		5.517

1.11 Production and Productivity of major crops (Average of last 5 years: 2004, 05, 06, 07, 08)

1.11	Name of crop	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	Rice	55.75	2736	34.3	2541			90.0	2608	
2	Redgram	23.25	578	---				23.2	578	
3	Maize	88.3	2776	3.3	4843			91.6	3579	
4	Jowar	27	1588	13.5	964			40.5	1191	
5	Chickpea			6.3	1138			6.3	1138	
6	Groundnut				1728					
7	Cotton									
Major Horticultural crops										
Fruits										
1	Mango							48.5	8237	
2	Orange & Batavian							41.2	13300	
3	Grapes							45.5	21000	
4	Guava							30.9	14333	
Vegetables										
1	Tomato							116.9	19000	
2	Chillies							4.4	2750	
3	Brinjal							24.9	18667	
4	Bhendi							17.5	14333	
5	Greens							9.9	9333	
Flower crops										
1	Marigold							3.7	6167	
Spice crops										
1	Turmeric							27.7	6200	
Others										

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Redgram	Maize	Jowar	Rice	Cotton
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	Kharif- Rainfed	June 1 st to Upto July 2 nd fortnight	June 1 st to July 1 st fortnight	May Last week to June last week		June 1 st to July 2 nd fortnight
	Kharif-Irrigated		June 1 st to July 2 nd fortnight	-	May Last week to Aug- 1 st week	June 1 st to Aug 1 st fortnight
	Rabi- Rainfed		Oct 2 nd to Dec 1 st fortnight			-
	Rabi-Irrigated			Sept 2 nd to Oct 1 st fortnight	Nov 1 st to Jan 1 st fortnight	-

1.13	What is the major contingency the district is prone to? (Tick mark and mention years if known during the last 10 year period)			
		Regular	Occasional	None
	Drought	√		
	Flood			√
	Cyclone			√
	Hail storm	√		
	Heat wave			√
	Cold wave		√	
	Frost			√
	Sea water intrusion			√
	Pests and diseases (specify)		<u>Rice:</u> BPH, False smut, Panicle mite <u>Cotton:</u> Leaf spots, Black arm, Grey mildew <u>Groundnut:</u> Stem necrosis <u>Redgram:</u> Sterility mosaic, Maruca pod borer <u>Castor :</u> Botrytis	
	Others (Fog)		√	

1.14	Include Digital maps of the district for	Location map of 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



2.0 Strategies for weather related contingencies

2.1 Drought

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 2 weeks (4 th week of June)*	Rainfed- Black Soils	Cotton	No change	-	
		Redgram			
		Redgram + Sorghum /Maize (1:2)			
		Jowar / Maize - Vegetables (carrot, Tomato) / Chickpea/ safflower			
	Rainfed – Red Soils	Redgram.			
		Redgram + Sorghum /Maize (1:2)			
Castor / Jowar / Maize sole crop					

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 4 weeks (2 nd week of July)	Rainfed – Black Soils	Cotton	No change		
		Redgram			
		Redgram + Sorghum /Maize (1:2)	Sole Redgram		
		Jowar / Maize - Vegetables (carrot, Tomato) / Chickpea / safflower	Vegetables		
	Rainfed - Red Soils	Redgram	No change		
		Redgram + Sorghum /Maize (1:2)	Sole Redgram		
		Castor / Jowar/ Maize sole	Maize/castor sole crop		

		crop			
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Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)	Rainfed – Black Soils	Cotton	No change	Adopt closer spacing from 150/120 cm to 90 cm	
		Redgram			
		Redgram + Sorghum /Maize (1:2)	Redgram		
	Sorghum /Vegetables (carrot, beet root) / chickpea)/Maize/Safflower	Vegetables/Chickpea			
	Rainfed – Red Soils	Redgram	No change (Maruti, Lakshmi, PRG158)		
		Redgram intercropped with Jowar/Castor	Redgram		
Castor/Jowar/Maize		Castor (Kranti, Haritha)			

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures			
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation	
Early season drought (delayed onset)	Rainfed – Black Soils	Cotton		Adopt closer spacing of 90 x 30 cm		
		Redgram				
		Redgram + Sorghum /Maize (1:2)	Sole Redgram (Maruti, Lakshmi, PRG 158 etc)			
	Maize/Jowar/Vegetables (carrot, beet root) / Chickpea	Fallow – Rabi crops Chickpea/ Safflower / Tomato/ Wheat etc in rabi				
	Rainfed – Red Soils	Redgram	No change (Maruti, Lakshmi, PRG158)			Reduce row space from 120 cm to 90 cm
		Redgram intercrop with jowar/castor	Redgram can be grown as sole crop			
Castor		No change	Adopt close spacing			

			(Kranti, Haritha)	from 90 x 45 cm	
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2.1.1 Rainfed situation (prolonged dry spell)

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Rainfed- Black Soils	Cotton	Gap filling with the same cultivar and pot watering to get proper germination	Intercultivation to conserve soil moisture at 15-20 days after germination	
		Redgram	If population is low, take up resowing		
		Sorghum / Maize - Vegetables (carrot, Tomato) / Chickpea / safflower	Seedlings raised in polythene covers may be planted		
		Redgram intercrop with Jowar/ Maize			
	Rainfed – Red Soils	Redgram.	If population is low, take up resowing		
		Castor			
		Maize			
		Jowar			
		Redgram intercrop with Sorghum / Maize			

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)					
At vegetative stage	Rainfed- Black Soils	Cotton	Management of sucking pests (Stem application with Imidachloprid @ 1:20 dilution in water Foliar application of 2% urea	Frequent Intercultivation Application 30kg urea and 15kg MOP after receipt of rains	
		Redgram	-		
		Maize/ Maize	Foliar application of 2% urea		

		Jowar / Maize - Vegetables (carrot, Tomato) / Chickpea / safflower	or 1% potassium nitrate		
	Rainfed – Red Soils	Redgram.	Intercultivation		
		Castor			
		Maize/ Jowar	Foliar application of 2% urea or 1% potassium nitrate		
		Redgram intercropped with Jowar/ Maize			

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measure	Remarks on Implementation
At flowering/ fruiting stage	Rainfed- Black Soils	Cotton	Foliar application of 2% urea or 1% potassium nitrate	Intercultivation to create soil mulch	
		Redgram			
		Maize/ Jowar			
		Jowar / Maize - Vegetables (carrot, Tomato) / Chickpea / safflower			
	Rainfed – Red Soils	Redgram	As above Nipping of auxiliary buds to allow the main spike to mature		
		Castor			
		Maize/ Jowar	Foliar application of 2% urea or 1% potassium nitrate		
		Redgram intercropped with Jowar/ Maize	Removal of intercrop and saving the main crop with foliar application of 2% urea or 1% potassium nitrate		

Condition			Suggested Contingency measures		
Terminal drought	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning	Remarks on Implementation
	Rainfed- Black Soils	Cotton	Foliar application of 2% urea or 1% potassium nitrate		
		Redgram			
		Maize/ Jowar			

		Jowar / Maize - Vegetables (carrot, Tomato) / Chickpea / safflower	Topping to prevent formation of new vegetative and reproductive flush		
	Rainfed – Red Soils	Redgram.			
		Castor	Nipping of auxiliary buds to allow the main spike to mature		
		Maize/ Jowar	Foliar application of 2% urea or 1% potassium nitrate		
		Redgram intercropped with Jowar/ Maize	Harvest Sorghum / Maize at physiological maturity		

2.1.2 Irrigated situation

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall	Irrigation – Musi sewage. (Did not arise)	Rice – Rice / Para grass.	Rice for seed production (or) Growing non food crops like Jatropa, etc.	-	-
	Light soils – Medium irrigation projects.	Rice – Rice / Groundnut/ Pulses.	Green manure – Rice		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in canals due to low rainfall	Light soils – Medium irrigation projects.	Rice – Rice / Groundnut / Pulses	Rice – Groundnut/pulses/ Maize/ Vegetables (or) Castor/Cotton/Chillies/sole crops.	Follow SRI cultivation Short duration rice varieties (MTU 1010, Tellahamsa, NLR 34449, Kharimnagar samba etc)	-

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals	Light soils – Medium irrigation	Rice – Rice/Groundnut/ Pulses	Castor/Cotton/Chillies/sole crops	-	-

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
under delayed onset of monsoon in catchment	projects.		Redgram intercropped with maize.		

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	Red soils under tank-fed irrigation	Rice - Rice	Green manure – Rice – sunflower/ groundnut/ vegetables	<p>1. Use Tellahamsa, Sambamasuri, Pothana, Erramallelu etc varieties in case of aged nurseries</p> <p>2. In case of aged nurseries follow closer spacing, transplant 4-5 seedlings/hill and apply 70 per cent of recommended N fertilizer as basal</p> <p>3. In case of delayed sowings follow direct sowing of rice with drum seeder</p> <p>4. Grow short duration varieties like MTU 1010 in case of delayed sowings</p> <p>5. Adopt management practices for blast if BPT 5204 was grown</p> <p>6. Follow effective weed control measures with herbicides for direct sowing</p>	
		Rice - Groundnut	Green manure – Rice – sunflower/ groundnut/ vegetables. Green manure – Rice-Fodder jowar		
	Black soils under tank-fed irrigation	Rice - Rice	Green manure – Rice – Groundnut/ Maize/ Sunflower / vegetables		
		Rice - Groundnut	Green manure - Rice - Groundnut		

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agonomic measures	Remarks on Implementation
				7. Follow recommended cold management measures in case of rabi nurseries.	

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agonomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	Black soils– with wells & Bore wells	Rice – Maize / vegetables (Tomato, Brinjal, carrot, onion, sweet potato etc)	No change	Adopt drip irrigation for maize, vegetables	
		Rice – Rice	Rice followed by zero tillage maize, castor etc or vegetables	Grow short duration rice varieties like MTU 1010, Tellahamsa	
	Red soils – with Bore wells	Rice – Groundnut/ sunflower / vegetables	No change	Follow direct seeding of rice with drum seeder	
		Rice - Rice	Rice – groundnut/ vegetables	Use herbicides recommended for effective weed management	
		Orchards (mango, Sweet orange, Guava etc)	No change		
Any other condition (specify)			Adopt drip irrigation for maize, vegetables		

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				
Rice/ Vegetables	1. Remove water from field during evenings and irrigate the fields during morning. 2. Cover the nurseries with	1. Remove water from field during evenings and irrigate the fields during morning. 2. Grow cold tolerant varieties	--	---

	polythene sheet 3. Apply single super phosphate	of rice / vegetables. Apply 20kg N and 10 kg K /acre		
Frost	-			
Hailstorm	-			
Horticulture	-			
Cyclone				
Horticulture crops - Fruits				
Mango	If the damage is severe, go for resowing	Trees fallen on ground may be lifted and earthed up Manuring and plant protection measures have to be taken up. Broken and damaged branches may be pruned and applied with Bordeaux paste		
Orange & Batavian				
Grapes	Provide support to the young vines Drain the excess water as soon as possible Spray micronutrient mixtures 2-3 times.	Wind damaged branches should be pruned using disinfected secateurs and cut ends must be smeared with Bordeaux paste Drain the excess water as soon as possible Spray micronutrient mixtures 2-3 times.		
Guava	Drain the excess water as soon as possible Spray 1% KNO ₃ or Urea 2% solution 2-3 times. Provide support to the young plants.	Wind damaged branches should be pruned using disinfected secateurs and cut ends must be smeared with Bordeaux paste Drain the excess water as soon as possible Spray 1% KNO ₃ or Urea 2% solution 2-3 times.		

Horticultural crops - Vegetables				
Tomato, Chillies	<p>Grow nursery on raised beds.</p> <p>If damage is more go for resowing</p>	<p>Uprooted plants may be lifted and earthed up</p> <p>Drain the excess water as soon as possible</p> <p>Gap filling must be done immediately</p> <p>Spray Urea 2% solution 2-3 times</p> <p>Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible</p> <p>If damage is more, go for replanting</p> <p>Spray Urea 2% solution 2-3 times.</p>		
Brinjal	<p>Grow nursery on raised beds. Drench the nursery beds with COC 3 g per liter to prevent damping off</p> <p>If damage is more go for replanting</p>	<p>Uprooted plants may be lifted and earthed up</p> <p>Drain the excess water as soon as possible</p> <p>Gap filling must be done immediately</p> <p>Spray Urea 2% solution 2-3 times.</p> <p>Topdressing of booster dose of 12 kg MOP + 30 kg Urea per acre as soon as possible.</p> <p>If damage is more go for replanting</p>		

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 		
Horticulture crops - flowers				
Mari gold	<ul style="list-style-type: none"> • Drain the excess water as soon as possible and drench the plants with any copper fungicide • Spray Urea 2% or 1% KNO₃ solution 2-3 times. • Gap filling must be done immediately • If damage is more ,go for replanting 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible and drench the plants with any copper fungicide Spray Urea 2% or 1% KNO₃ solution 2-3 times. • Gap filling must be done immediately If damage is more ,go for replanting 		
Horticulture spices & Plantation				
Turmeric		<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray Urea 2% or 1% KNO₃ followed by Ferrous Sulphate 0.5% + Citric Acid 0.1 % solution 2-3 times. • Topdressing of booster dose of 40 kg MOP + 50 kg Urea along with 250 kg of Neem Cake per acre as soon as possible. • In case of severe damage (considered as complete economical loss or if inundation is more than for four days), and the 		

		contingency period is between June to August, sowing of best alternative crop must be taken up.		
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Contingent strategies for Livestock, Poultry & Fisheries

General contingency plans for drought in Ranga Reddy:

	Suggested contingency measures		
	Before the event ^s	During the event	After the event
Drought			
Feed and fodder availability	<ol style="list-style-type: none"> 1.Promoting green fodder production in contingency plans 2.Conserving fodder by silage / hay making Individually or on community basis 3.Conserve crop residues 4. Conserve forest grass on community Basis or by govt. 5.Preparing complete diets and storing in strategic locations 6. Organize procurement of dry fodders / complete diets from surplus areas 7. Organize fodder banks and feed banks 8. Procure sufficient quantities of mineral Mixture 9.Capacity building and preparedness 	<ol style="list-style-type: none"> 1.Organise relief camps for large ruminants 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 	<ol style="list-style-type: none"> 1.Capacity building to stake holders on drought mitigation in livestock sector 2. Promote fodder cultivation. 3.Promote selvi-pasture production. 4. Flushing the stock to recoup 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 	<ol style="list-style-type: none"> 1.Regular supply of clean drinking water to all tanks constructed for the purpose 	<ol style="list-style-type: none"> 1.Hand over the maintenance of the structures to

	<p>in relief camp locations</p> <p>2. Plan for sufficient number of tanks for water transportation</p> <p>3. Identify bore wells which can sustain demand.</p> <p>4. Procure sufficient quantities of water Sanitizers</p>	<p>2. Cleaning the tanks in regular intervals</p> <p>3. Add water sanitizers</p>	<p>Panchayats</p> <p>2. Sensitize the farming community about importance of clean drinking water</p>
<p>Health and disease Management</p>	<p>1. Identify all unproductive and weak stock and advise for culling before hand</p> <p>2. Healthy and productive stock may be immunized for endemic diseases of the area</p> <p>3. Carry out deworming to all young stock</p> <p>4. Carry out Butax spray for control of external parasites</p> <p>5. Stockpile vaccines and emergency Medicines</p> <p>6. Identify the Clinical staff and trained paravets and indent for their services as per schedules</p> <p>7. Identify the volunteers who can serve in need of emergency</p>	<p>1. Closely observe the general health of the livestock</p> <p>2. Carry out deworming and spraying to all animals entering into relief camps</p> <p>3. Feeding watering areas must be always kept clean</p> <p>4. Organise with community to lift the dung daily which can be used in their fields.</p> <p>5. Attend to the sick animals immediately and separate them from the camp</p> <p>6. Spot decisions are required in Emergencies. Vets must be available round the clock</p>	<p>1. Vaccinate the stock as per the vaccination schedule.</p> <p>2. Deworming and spraying for control of external parasites must be carried out.</p>

2.5 Details of Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event	During the event	After the event
Drought			
Feed and Fodder availability	<p>In chronically drought prone districts should have reserves of the following at any point of the year for mobilization to the needy areas (for feeding 5000 ACU (maintenance ration) for about 1-3 weeks period)</p> <p>Silage:20-50 t</p> <p>Urea molasses mineral bricks (UMMB):50-100 t</p> <p>Hay:100-250 t</p> <p>Concentrates: 20-50 t</p> <p>Minerals and vitamin supplements mixture:1-5 t</p> <p>Establishment of silvi-pastoral system in CPRs with <i>Stylosanthus hamata</i> and <i>Cenchrus ciliaris</i> as grass with <i>Leucaena leucocephala</i> as tree component (or suggest suitable similar system to your district)</p> <p>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</p> <p>In chronically drought prone districts promote cultivation of 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 and also sunhemp</p> <p>Chopping of fodder should be made as mandatory in every village through supply and establishment of good</p>	<p>Harvest and use biomass of dried up crops (Sorghum, Bajra, Maize, Rice, Wheat, Horse gram, Groundnut) material as fodder.</p> <p>Harvest the tree fodder (Neem, Subabul, Acasia, 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>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 hay should be enriched with 2% Urea molasses solution or 1% common salt solution and fed to LS</p> <p>Herd should be split and supplementation should be given only to the highly productive and breeding animals</p> <p>Provision of emergency grazing/feeding (Cow-calf camps or other special arrangements to protect high productive & breeding stock)</p> <p>Available kitchen waste should be mixed with dry fodder while feeding</p> <p>Arrangements should be made for mobilization of small ruminants across the districts where no drought exits with subsidized road/rail</p>	<p>Concentrates supplementation should be provided to all the animals.</p> <p>The farmers may be advised to practice “flushing the stock” to recoup</p> <p>Short duration fodder crops should be sown in unsown and crop failed areas where no further routine crop sowing is not possible</p> <p>Supply of quality seeds of fodder varieties and motivating the farmers to cultivate at least 10% of their land holding for fodder production</p>

	<p>quality chaff cutters.</p> <p>Establishment of backyard production of Azolla in chronically fodder short districts</p> <p>Establishment of backed yard cultivation of para grass with drain water from bath room/washing area</p> <p>Avoid burning of wheat straw and maize stover</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>transportation and temporary shelter provision for the shepherds</p> <p>Unproductive livestock should to be culled during severe drought</p> <p>Create transportation and marketing facilities for the culled and unproductive animals</p> <p>Supply silage and or hay on subsidized rates to the farmers having high productive stock</p> <p>Subsidized loans should be provided to the livestock keepers</p>	
Health and Disease management	<p>List out the endemic diseases (species wise) in that district and store vaccines for those diseases</p> <p>Timely vaccination (as per enclosed vaccination schedule) against all endemic diseases</p> <p>Procurement of emergency medicines and medical kits</p> <p>Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district</p>	<p>Carryout deworming to all animals entering into relief camps</p> <p>Identification and quarantine of sick animals</p> <p>Constitution of Rapid Action Veterinary Force</p> <p>Performing ring vaccination (8 km radius) in case of any outbreak</p> <p>Restricting movement of livestock in case of any epidemic</p> <p>Rescue of sick and injured animals and their treatment</p>	<p>Conducting mass animal health camps</p> <p>Conducting fertility camps</p> <p>Mass deworming camps</p> <p>Farmers should be advised to breed their milch animals during July-September so that the peak milk production does not coincide with mid summer</p> <p>Keeping vigil on disease outbreak</p>
Insurance	<p>Encouraging insurance of livestock</p>	<p>Listing out the details of the dead animals</p>	<p>Submission for insurance claim and availing insurance benefit</p> <p>Purchase of new productive animals</p>
Drinking water	<p>Identification of water resources</p> <p>Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking</p>	<p>Restrict wallowing of animals in water bodies/resources</p>	<p>Bleach (0.1%) drinking water / water sources</p> <p>Provide clean drinking water</p>

	water for animals) Construction of drinking water tanks in herding places/village junctions/relief camp locations		
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Vaccination programme for cattle and buffalo:

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

Vaccination schedule in small ruminants (Sheep & Goat)

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

2.5.2 Poultry

	Suggested contingency measures		
	Before the event ^a	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 sanitizer 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

^a based on forewarning wherever available

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 sanitisers.	Removal of top layer, deep ploughing of tank and application of lime
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	Crop holiday or going for stocking of yearlings by reducing the density according to availability of water	Harvesting of fish and leaving the pond fallow till next season	Removal of top layer, deep ploughing of tank and application of lime
(ii) Impact of salt load build up in ponds / change in water quality	Stocking of salinity tolerant fish / shrimp, application of geolites and other buffers	Frequent change of water with fresh water	Frequent draining of the pond with fresh water, removal of top layers
2) Floods			
A. Capture			
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 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 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 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
3. Cyclone / Tsunami			
A. Capture			
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

(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	
(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	
(iv) Loss of stock and inputs (feed, chemicals etc)	Preventive nets must be erected to minimise loss of stock	Continuation of the same process.	Compensatory stocking of seed
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)	Pumps, aerators, etc must be protected by moving them to safe locations	To avoid use of aerators, pumps and other appliances	Overhauling of the equipment to prevent from being damaged
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	
B. Aquaculture			
(i) Changes in pond environment (water quality)	Reduction of biomass by partial harvest in the event of heat as the DO levels will be very low.	Avoidance of fishing	Compensatory stocking of seed and restoration of all physical and chemical parameters
(ii) Health and Disease management	Removal of stress causing factors to maintain the health of the animal	Removal of stress causing factors to maintain the health of the animal	