

State: ANDHRA PRADESH

Agriculture Contingency Plan for District: KHAMMAM

1.0 District Agriculture profile					
1.1	Agro-Climatic/Ecological Zone				
	Agro Ecological Sub Region (ICAR)	North Telangana Plateau, hot moist semi arid ESR (7.2)			
	Agro-Climatic Region (Planning Commission)	Southern Plateau Hills Region (X)			
	Agro Climatic Zone	Northern Telangana Zone (AP-4)			
	List all the districts or part thereof falling under the NARP Zone	Warangal, Khammam and Medak			
	Geographic coordinates of district	Latitude	Longitude	Altitude	
		16 ^o 45' and 18 ^o 35' N	79 ^o 47' and 81 ^o 47' E		
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Regional Agricultural Research Station, Warangal			
	Mention the KVK located in the district	Krishi Vigyan Kendra, Wyr, Khammam district			
1.2	Rainfall	Normal RF(mm)	Normal Rainy days (no) (2008-09)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	872	49	First week of June	2 nd week of October
	NE Monsoon(Oct-Dec):	101	7	Third week of October	Last week of December
	Winter (Jan- March)	13	1	-	-
	Summer (Apr-May)	72	3	-	-

Annual	1059	60	-	-
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1.3	Land use pattern of the district (latest statistics)	Geographical Area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area (000ha)	1602.9	759.4	129.0	38.1	15.0	19.7	88.9	68.7	30.9

1.4	Major Soils (common names like shallow red soils etc.,)	Area (*000 ha)	Percent (%) of total
	Red Chalka Soils	192	43
	Black Soils	129	29
	Dubba Soils	125	28
	Saline soils	3	0.7
	Alkaline soils	1	0.2
	Others (specify):		
1.5	Agricultural land use	Area (*000 ha)	Cropping intensity %
	Net sown area	453.4	109.7
	Area sown more than once	44.0	
	Gross cropped area	497.4	

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	197.0		
	Gross irrigated area	225.9		
	Rainfed area	256.4		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals		69.8	34.3
	Tanks		42.2	20.7
	Open wells		43	17.6
	Bore wells		72.2	35.5
	Lift irrigation schemes		14	5.73
	Micro-irrigation		-	-
	Other sources		7	2.86
	Total Irrigated Area		242	
	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	Safe		
	Wastewater availability and use			
	Ground water quality			
*over-exploited: ground water utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

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

1.7		Major Field Crops cultivated	Area ('000 ha)					
			<i>Kharif</i>		<i>Rabi</i>		Summer	Total
			<i>Irrigated</i>	<i>Rainfed</i>	<i>Irrigated</i>	<i>Rainfed</i>		
1	Paddy	150	-	32	-		182	
2	Cotton	20	98.5		-		119	
3	Maize	30	16	11	10		67	
4	Greengram	-	21	-	5		26	
5	Redgram		15	-	0.8		16	
	Horticulture crops - Fruits	Total area ('000 ha)						
1	Mango	47.23						
2	Banana	2.86						
	Horticultural crops - Vegetables	Total area						
1	Chillies	245.58						
2	Cucumber	1.72						
3	Tomato	1.14						
	Plantation & spice crops	Total area						
1	Cashew	9.99						
2	Oil palm	3.37						
3	Turmeric	1.43						

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)			
	Non descriptive Cattle (local low yielding)	355.5	400.0	755.5			
	Crossbred cattle	1.4	2.4	3.9			
	Non descriptive Buffaloes (local low yielding)	133.2	632.9	766.2			
	Graded Buffaloes						
	Goat			629.6			
	Sheep			461.8			
	Others (Camel, Pig, Yak etc.)			32.94			
	Commercial dairy farms (Number)						
1.9	Poultry	No. of farms	Total No. of birds (number)				
	Commercial		137238				
	Backyard		2663892				
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)	
		No. Farmer owned ponds	No. of Reservoirs		No. of village tanks		

	ii) Inland (Data Source: Fisheries Department)	463	2	295
B. Culture				
		Water Spread Area (ha)	Yield (t/ha)	Production ('000 tons)
	i) Brackish water (Data Source: MPEDA/ Fisheries Department)	-	0.000	
	ii) Fresh water (Data Source: Fisheries Department)	633	0.000	0.277
	Others			15.752

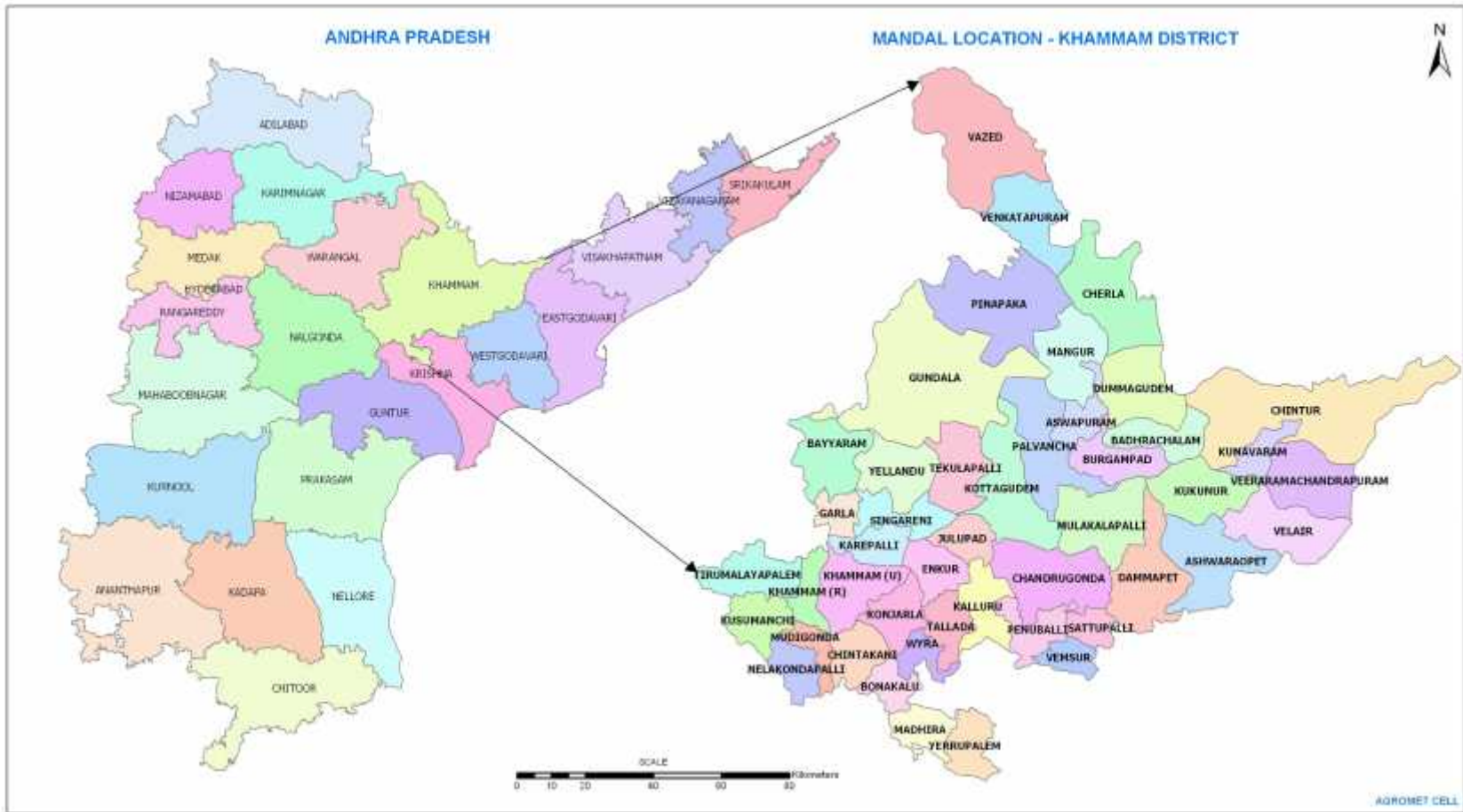
1.11	Production and Productivity of major crops (Average of last 5 years: 2004,05,06, 07, 08)	Kharif		Rabi		Summer		Total		Crop residue as fodder ('000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
Major Field crops (Crops to be identified based on total acreage)										
1	Paddy	659	4375	136	4250	-	-	795	4312	-
2	Cotton	208	1750	-	-	-	-	208	1750	
3	Green gram	5.2	244	3.88	790	-	-	9.38	517	
4	Maize	79.8	4172	90.43	4200	-	-	170.23	4186	
5	Redgram	17.4	1125	0.56	725	-	-	17.96	925	
	Others									
Major Horticultural crops (Crops to be identified based on total acreage)										
Horticulture crops - Fruits										
1	Mango							391.085	8267	
2	Banana									
Horticultural crops - Vegetables										
1	Chillies							67.482	2750	
2	Cucumber							32.353	18667	
3	Tomato							21.698	19000	
Plantation & spice crops										
1	Cashew							6.272	627	
2	Oil palm							15.791	4667	
	Turmeric							1.709	6200	

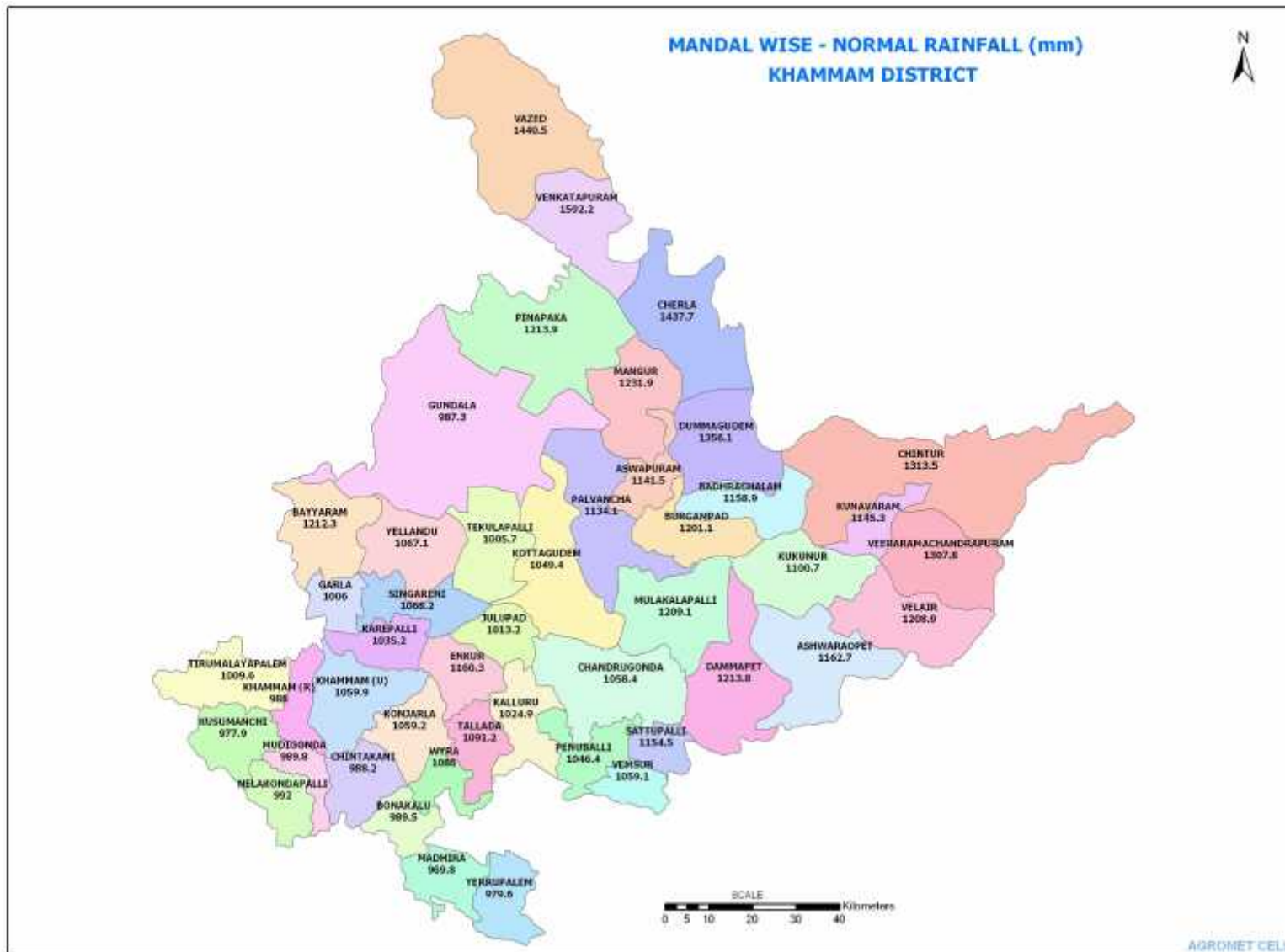
1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Paddy	Cotton	Redgram	Green gram	Maize
	Kharif- Rainfed	-	June 1 st fortnight – July 2 nd fortnight	June 1 st fortnight – July 2 nd fortnight	June 1 st fortnight- July 1 st fortnight	June 1 st fortnight – August 1 st fortnight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

1.13	What is the major contingency the district is prone to? (Tick mark and mention years if known during the last 10 year period)	Regular	Occasional	None
	Drought		√	
	Flood		√	
	Cyclone		√	
	Hail storm			
	Heat wave			
	Cold wave			
	Frost			
	Sea water intrusion			
	Pests and diseases (specify)	Rice – BPH & Blast Cotton – Sucking pest complex	Yellow Mosaic Virus in Green gram & Black gram (In recent years)	
	Others			

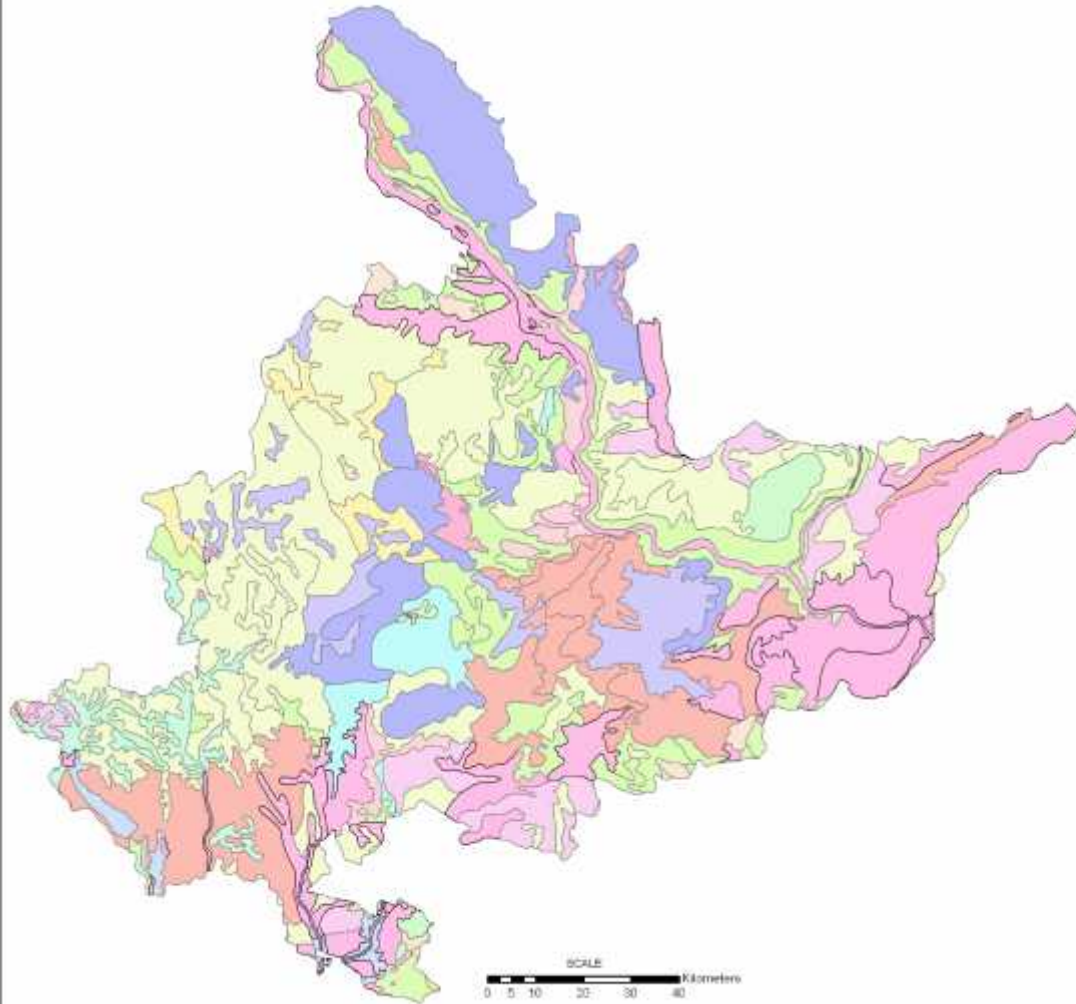
1.14	Include Digital maps of the district for	Location map of district within State as Annexure I	Enclosed: Yes / No
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		Mean annual rainfall as Annexure 2	Enclosed: Yes / No
		Soil map as Annexure 3	Enclosed: Yes / No





SOIL MAP - KHAMMAM DISTRICT



SOIL TYPE

-  Loamy over sandy calcareous stratified soils
-  Loamy soils
-  Loamy soils with very high Awc
-  Loamy stratified soils
-  cracking clay calcareous soils
-  Calcareous clay soils
-  Clayey soils
-  Clayey soils with high AWC
-  Gravelly clay soils
-  Gravelly clay soils with low AWC
-  Gravelly clay soils with very low AWC
-  Gravelly loam soils
-  Gravelly loam soils with very low AWC
-  Loamy calcareous soils
-  Stratified loamy soils

Source: NBSSLUP

AGROMET-CELL

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

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 (June 3 rd week)	Black soils – Rainfed	Cotton	No change		-
		Greengram			
		Maize			
		Redgram			
	Light soils - Rainfed	Redgram	No change		
		Greengram			
Maize					

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 (July 1 st week)	Black soils – Rainfed	Cotton	No change		-	
		Redgram				
		Maize				
		Greengram				
	Light soils - Rainfed	Redgram	No change			Closer inter row spacing of 150 cm
		Green gram				
Maize						

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 6 weeks (July 3 rd week)	Black soils – Rainfed	Cotton	No change	Adopt closer spacing of 90x45 or 90x60cms-	-
		Redgram	No change (Grow Medium duration varieties like Laxmi, PRG-158)	Reduce row spacing 180 cm to 120 cm	
		Greengram	Red gram	Closer spacing of 120 cm (Medium duration varieties like Laxmi, PRG-158)	
		Maize	No change	Grow short duration hybrids	
	Light soils – Rainfed	Redgram	No change	Closer inter row spacing of 150 cm	
		Maize	No change	-	
		Greengram	Red gram	Closer inter row spacing of 120 cm (Medium duration varieties like Laxmi, PRG-158)	

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 8 weeks (August 1 st week)	Black soils – Rainfed	Cotton	No change	Adopt closer spacing of 90X30 cm	-
		Redgram	No change	Reduce row spacing 180 cm to 120 cm	
		Maize	No change		
		Greengram	Red gram	Closer spacing of 120 cm (Medium duration varieties like Laxmi, PRG-158)	
	Light soils - Rainfed	Redgram	No change	Reduce row spacing 180 cm to 120 cm	
		Maize	Redgram	-do-	-do-
		Greengram	Red gram	Reduce row spacing 180 cm to 120 cm (Growing of varieties like Laxmi, PRG-158)	-

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Early season drought (Normal onset)					
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop	Black soils – Rainfed	Cotton	Gap filling with the seedlings of 7- 10 days age grown in pots if the crop stand is poor Spray 2 % urea solution or 1% Potassium nitrate solution	Take up intercultivation	-
		Redgram	Gap filling by sowing seeds at	Take up inter	

stand etc.			9 to 10 days after sowing if the crop stand is poor Foliar spray of 2% urea to supplement nutrition	cultivation	
		Greengram	If crop stand is poor, go for resowing with the same variety	Take up Inter-cultivation 2 weeks after sowing If plant stand is good foliar spray of 2% urea to supplement nutrition	
		Maize	Gap filling by sowing seeds within one week	Foliar spray of 2% urea solution during drought period	
	Light soils - Rainfed	Redgram	Same as above	Same as above	
		Greengram	Same as above	Same as above	
		Maize	Same as above	Same as above	

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	Black soils – Rainfed	Cotton	Spray 2 % urea solution	Intercultivation	-
		Redgram	Spray 2 % urea solution	Do as above	
		Greengram	Spray Urea solution 2%		
		Maize	Spray 2% urea solution		
	Light soils - Rainfed	Redgram	Spray 2 % urea solution		
		Greengram	Spray Urea solution 2%		
		Maize	Spray 2% urea solution		

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)					
At reproductive stage	Black soils – Rainfed	Cotton	Spray urea - 2 % or KNO ₃ 1% or other water soluble fertilizers 1 % to supplement nutrition	If possible , take up intercultivation to create soil mulch to conserve moisture	-
		Redgram	Spray urea - 2 % or other water soluble fertilizers 1 % to supplement nutrition		
		Greengram	Harvest for fodder purpose		
		Maize	Spray 2% urea	Supplementary irrigation if available from farm ponds / small tanks may be recommended	
	Light soils - Rainfed	Redgram (sole crop)	Spray urea - 2 % or other water soluble fertilizers 1 % to supplement nutrition	-	
		Greengram	Harvest for fodder purpose		
		Maize	Spray 2% urea	Supplementary irrigation if available from farm ponds / small tanks may be recommended	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Rabi Crop planning	Remarks on Implementation
Terminal drought					
	Black soils – Rainfed	Cotton	Spray urea - 2 % or KNO ₃ 1% or other water soluble fertilizers 1 % to supplement nutrition	-	-

			Topping to prevent formation of new vegetative and reproductive flush		
		Redgram	Spray 2% urea		
		Greengram	Harvest for fodder purpose		
		Maize	Spray 2% urea	Supplementary irrigation if available from farm ponds / small tanks may be recommended	
	Light soils - Rainfed	Redgram	As above	-	
		Greengram	Harvest for fodder purpose		
		Maize	Spray 2% urea		

2.1.2 Irrigated situation

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall	Black soils / Light soils – Canal irrigated	Green Manure (Dhaincha/greengram) - Rice-Rice	Green Manure (Dhaincha/greengram) - Rice-Rice	Incorporate green manure crop (Dhaincha/greengram) and Grow medium duration rice varieties Management of over aged seedlings in nursery Direct seeding of rice (MTU1010,JGL-1798)	
			Rice/Blackgram/Maize/Chickpea/Redgram	Grow medium duration	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
				rice varieties Management of over aged seedlings in nursery Direct seeding of rice (MTU1010,JGL-1798)	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in canals due to low rainfall	Black soils – Canal irrigated	Green manure – Rice – Rice	Rice – Blackgram	Rice –1. Adopt alternate wetting and drying up to Primordial Initiation stage to save water 2. Irrigate up to a depth of 3 – 5 cm from Primordial Initiation to maturity 3. Take up effective weed control measures	
			Greengram / Blackgram, Jowar/Maize	Short duration varieties of crops shall be selected Intercultivation, Earthing up	-

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
				Alternate row irrigation shall be practices	
	Light soils – Canal irrigated (NSP Command)	Rice – Rice	Rice – Greengram/Blackgram/Jowar/ Fodder	-	
			Redgram + Green gram/Jowar (1:7)	-do-	

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 under delayed onset of monsoon in catchment	Black soils – Canal irrigated	Green manure – Rice – Rice	Rainfed crops like red gram/Maize Jowar in September	Green manure (Green gram, Dehinja) crops should be incorporated in to the soil at right stage and allow it to decompose Sowing of Maghi Jowar from September second fortnight onwards Maize, Red gram, Sesamum, Sunflower can be grown as rabi crops from September on wards	

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
	Light soils – Canal irrigation (NSP)	Greengram/Green manure – Rice	Sow early rabi crops like blackgram or red gram under rain fed conditions	Limited irrigations may be provided at critical stages	-

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 –light soils	Paddy	ID crops like Vegetables(Bhendi, Cucumber)/Maize + redgram (1:2), blackgram	-	-

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	Well and bore well irrigated –Black soils	Chilli/Cotton	Maize + Red gram (2:1) under ID condition	-	-
Any other condition (specify)					

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

Condition - Continuous high rainfall in a short span leading to water logging				
Crop	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
1.Rice	1.Excess water from the field to be drained out	1.Excess water from the field to be drained out	1. Drain the excess water as early as possible	1. Drain out water and spread sheaves loosely in

	<p>2. A booster dose of 20-25kg urea and 15 Kg MOP per acre is to be applied to hasten the establishment and promote more tillering.</p> <p>3. Proper weed control measures should be adopted</p> <p>..</p>	<p>2. A booster dose of 20-25kg urea and 15 Kg MOP per acre is to be applied to hasten the establishment.</p> <p>.</p>		<p>field and paddy sheaves threshed immediately</p> <p>2. Spray common salt at 5% on panicles to prevent germination and spoilage of straw from moulds</p> <p>3. Ensure proper grain moisture before storing</p>
2. Cotton	<p>1. Excess water from the field to be drained out</p> <p>2. Immediately after the soil comes to condition, inter culture with gorru and apply a booster dose of 30 kg urea+ 15 kg MOP per acre. Delay in interculture may harm the crop.</p> <p>.</p>	<p>1. Drain the excess water as early as possible</p> <p>2. Apply 30 kg N + 15 kg K /acre after draining excess water</p> <p>3. Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals</p>	<p>1. Drain the excess water as early as possible</p> <p>2. Spray KNO₃ 1 % water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition</p> <p>3. Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals</p> <p>.</p>	<p>1. Dry the produce properly before packing and sending to market</p>
3. Redgram	<p>1. Excess water from the field to be drained out</p> <p>2. Apply 20 kg urea + 15 kg MoP /acre after draining excess water</p> <p>3. Take up inter cultivation at optimum soil moisture condition to loosen and aerate the soil and to control weeds</p>	<p>1. Drain the excess water as early as possible</p> <p>2. To spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition</p> <p>.</p>	<p>1. Drain the excess water as early as possible</p> <p>2. Allow the crop to dry completely before harvesting</p>	<p>1. Harvest the pods quickly with forewarning of cyclonic storms wherever possible</p> <p>2. Spread the bundles drenched in rain on field bunds or drying floors to quicken the drying</p> <p>3. Thresh the bundles after they are dried properly</p> <p>4. Dry the grain to proper moisture per cent before bagging and storing to prevent deterioration in quality during storage</p>
4. Green gram	<p>1. Drain the excess water as</p>	<p>1. Drain the excess water as</p>	<p>1. Drain the excess water as</p>	<p>1. Harvest the pods quickly with the</p>

	<p>early as possible</p> <p>2. Apply 4-5 kg N /acre after draining excess water</p> <p>3. Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals</p> <p>4</p>	<p>early as possible</p> <p>2. Apply 4-5 kg N /acre after draining excess water</p> <p>3. Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals</p>	<p>early as possible</p> <p>2. Allow the crop to dry completely before harvesting</p>	<p>forewarning of cyclonic storms wherever possible</p> <p>2. Thresh the bundles after they are dried properly</p> <p>3. Dry the grain to proper moisture per cent before bagging and storing to prevent deterioration in quality during storage</p>
5. Maize	<p>1. Drain the excess water as early as possible</p> <p>2. Apply 20 kg N + 10 kg K /acre after draining excess water</p> <p>3. Take up inter cultivation and at optimum soil moisture condition to loosen and aerate the soil and to control weeds</p> <p>4. Earthenup the crop for anchorage</p> <p>5. To spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition</p> <p>.</p>	<p>1. Drain the excess water as early as possible</p> <p>2. Apply 20 kg N + 10 kg K /acre after draining excess water</p> <p>3. To spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition</p>	<p>1. Drain the excess water as early as possible</p> <p>2. Allow the crop to dry completely before harvesting</p>	<p>1. Harvest the cobs after the they are dried up properly. Dry the grain to optimum moisture condition before storing</p>
Horticulture				
Horticulture crops – Fruits				
Mango	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO₃ or Urea 2% solution 2-3 times. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO₃ or Urea 2% solution 2-3 times. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Harvest the mature produce in a clear sunny day' 	<ul style="list-style-type: none"> • Store the fruits in well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible.
Banana	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Inter-cultivate the soil with 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 0.5 % KNO₃ or Urea 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Harvest the marketable 	<ul style="list-style-type: none"> • Use ripening chambers for quick ripening

	<p>gorru for aeration.</p> <ul style="list-style-type: none"> • Spray 0.5 % KNO₃ or Urea 2% solution 2-3 times. • Topdressing of booster dose of 80 g MOP + 100 g Urea per plant at two to three times intervals. • Gap filling may be taken up if the plants are two weeks old and sowing window is still available for the crop. • If the age of the plant is less than three months and submergence up to three feet better to replant the garden. 	<p>2% solution 2-3 times.</p> <ul style="list-style-type: none"> • Topdressing of booster dose of 80 g MOP + 100 g Urea per plant at two to three times intervals. • If the age the plant is more than three months and less than seven months allow one sword sucker for ratoon and take up fertilization at monthly intervals for four months. • Staking with bamboos to prevent further lodging. 	<p>bunches in a clear sunny day.</p> <ul style="list-style-type: none"> • Spray 0.5 % KNO₃ or Urea 2% solution 2-3 times for quick development of immature bunches. • Staking with bamboos to prevent further lodging. 	<ul style="list-style-type: none"> • Market the produce as soon as possible.
Horticulture crops vegetables				
Chillies	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible. • Gap filling may be taken up if the plants are two weeks old and sowing window is still available for the crop. • In case of severe damage (considered as complete economical loss), and the contingency period is between June to August, sowing of best alternative crop must be taken up. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Harvest the matured fruits in a clear sunny day. 	<ul style="list-style-type: none"> • Dry the pods on concrete floor immediately after the appearance of sunlight (or). • Use poly house solar driers for quick drying • Grade the pods and market as soon as possible. • Do not store such produce for long periods.
Cucumber	<ul style="list-style-type: none"> • Drain the excess water as soon as possible 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible 	<ul style="list-style-type: none"> • Drain the excess water as soon as

	<ul style="list-style-type: none"> • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 10 kg MOP + 30 kg Urea per acre as soon as possible. • Gap filling may be taken up if the plants are two weeks old and sowing window is still available for the crop. • In case of severe damage (considered as complete economical loss), and the contingency period is between June to August, sowing of best alternative crop must be taken up. 	<ul style="list-style-type: none"> • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 10 kg MOP + 30 kg Urea per acre as soon as possible. 	<ul style="list-style-type: none"> • Spray Urea 2% solution once. 	<p>possible.</p> <ul style="list-style-type: none"> • Harvest the mature produce as soon as possible. • Store the produce in well ventilated place temporarily before it can be marketed. • Market the produce as soon as possible.
Tomato	-do-	-do-	-do-	-do-
Spices and Plantation crops				
Cashew	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO₃ or Urea 2% solution 2-3 times. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO₃ or Urea 2% solution 2-3 times. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO₃ or Urea 2% solution 2-3 times. • Harvest the mature fruits as soon as possible 	<ul style="list-style-type: none"> • Separate seed from the fruits and dry the seeds separately. • Store the fruits in well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible or use for the preparation of processed products..
Oil Palm	<ul style="list-style-type: none"> • Planting should be done on mounts or bunds • Drainage system, suited to local conditions may be 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Apply booster dose of NPK 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Apply booster dose of NPK 	<ul style="list-style-type: none"> • Store the produce in well ventilated place temporarily before it can be market

	<p>provided to remove surplus water from root zone</p> <ul style="list-style-type: none"> Relief drains [shallow] channels are opened at places where water accumulates and connected with main drain to remove water from the surface 	fertilizers	<p>fertilizers</p> <ul style="list-style-type: none"> Harvest the mature nuts as soon as possible. 	<ul style="list-style-type: none"> Market the nuts as soon as possible.
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. 	<ul style="list-style-type: none"> Drain the excess water as soon as possible Spray Urea 2% or 1% KNO₃ solution 2-3 times. 	<ul style="list-style-type: none"> Drain the excess water as soon as possible Harvest the rhizomes when field comes to normal 	<ul style="list-style-type: none"> Dry the rhizomes on concrete floor or use boilers (if available) for processing immediately Grade and separate the rotten and mould affected rhizomes. Pack the dried material in gunny bags disinfected with safe insecticides Store in a well ventilated rooms
Condition - Heavy rainfall with high speed winds in a short span²				
1. Rice	Same as above	Same as above	Same as above	Same as above
2. Cotton	Same as above	Same as above	Same as above	Same as above
3. Redgram	Same as above	Same as above	Same as above	Same as above
4. Greengram	Same as above	Same as above	Same as above	Same as above
5. Maize	Same as above	Same as above	Same as above	Same as above

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

	<p>as possible</p> <ul style="list-style-type: none"> • Spray 1% KNO₃ or Urea 2% solution 2-3 times. 	<p>as possible</p> <ul style="list-style-type: none"> • Spray 1% KNO₃ or Urea 2% solution 2-3 times. 	<p>soon as possible</p> <ul style="list-style-type: none"> • Spray 1% KNO₃ or Urea 2% solution 2-3 times. 	<p>as soon as possible.</p> <ul style="list-style-type: none"> • Harvest the mature produce as soon as possible. • Store the produce in well ventilated place temporarily before it can be marketed. • Market the produce as soon as possible.
Oil Palm	<ul style="list-style-type: none"> • Planting should be done on mounts or bunds • Drainage system, suited to local conditions. may be provided to remove surplus water from root zone • Relief drains [shallow] channels are opened at places where water accumulates and connected with main drain to remove water from the surface 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Apply booster dose of NPK fertilizers 	<ul style="list-style-type: none"> • .Drain the excess water as soon as possible • .Apply booster dose of NPK fertilizers 	<ul style="list-style-type: none"> • Harvest the mature nuts as soon as possible. • Market the produce as soon as possible.
Turmeric	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO₃ or Urea 2% solution 2-3 times. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO₃ or Urea 2% solution 2-3 times. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO₃ or Urea 2% solution 2-3 times. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible. • Harvest the mature produce as soon as possible. • Store the produce in well ventilated place temporarily before it

				<p>can be marketed.</p> <ul style="list-style-type: none"> Market the produce as soon as possible.
Condition - Outbreak of pests and diseases due to unseasonal rains				
1. Rice	Blast, Stem rot and Sheath blight - need based plant protection measures to be initiated based on incidence levels Soon after cyclone the rodent population tend to increase- monitor rodents and adopt community rodent management practices	BPH, Blast, Sheath blight incidence may increase due to unseasonal rains - need based plant protection measures to be initiated	Climbing cutworm and neck blast	-
2. Cotton	Sucking pests, Wilt and root rot, Bacterial leaf blight - Need based plant protection measures to be initiated	Jassids, <i>Spodoptera</i> , 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	-
3. Redgram	<i>Spodoptera</i> , wilt and root rot - Need based plant protection measures to be initiated	<i>Spodoptera</i> , Wilt and root rot- Need based plant protection measures to be initiated	-	Dry the grain to optimum seed moisture content to avoid damage in storage
4. Green gram	<i>Spodoptera</i> and leaf spots- Need based plant protection measures to be initiated	<i>Spodoptera</i> , Leaf spots, Powdery mildew - Need based plant protection measures to be initiated	<i>Spodoptera</i> - Need based plant protection measures to be initiated	Dry the grain to optimum seed moisture content to avoid damage in storage
5. Maize	<i>Spodoptera</i> -Need based plant protection measures to be initiated	Bacterial stalk rot- Need based plant protection measures to be initiated	Post flowering Stalk rots – Need based plant protection measures to be initiated	Dry the grain to optimum seed moisture content to avoid damage in storage
Horticulture				

2.3 Floods

Condition	Transient water logging/ partial inundation ¹			
	Suggested contingency measure ^o			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
1. Rice	1.Excess water from the field to be drained out as early as possible	<ol style="list-style-type: none"> To drain out the excess water at the earliest Immediately after the water recedes apply a booster dose of 20kg Urea+15kg MOP application, preferably in the mud followed by light irrigation after 24 hrs. If mortality of hills takes and field is patchy, gap filling with split tillers is recommended along with application of booster dose of 20kg urea and 15kg MOP Take-up need based plant protection measures 	<ol style="list-style-type: none"> To drain out the excess water at the earliest Takeup need based plant protection measures 	<ol style="list-style-type: none"> Drain out water .Spread sheaves loosely in field or field bunds where there is no water stagnation Spray common salt at 5% on panicles to prevent germination and spoilage of straw from moulds Thresh after drying the sheaves properly Ensure proper grain moisture before storing Grow varieties having seed dormancy in flood prone areas
2. Cotton	<ol style="list-style-type: none"> Excess water from the field to be drained out as early as possible Take up the gap filling at the earliest Immediately after the soil comes to condition, intercultivate with gorru and apply a booster dose of 30kg urea+15kg MOP per acre. Delay in interculture may harm the crop Take up plant protection measures against possible pests and disease incidence 	<ol style="list-style-type: none"> To drain out the excess water at the earliest Inter cultivate at optimum field moisture condition Immediately after the soil comes to condition, intercultivate with gorru and apply a booster dose of 30kg urea+15kg MOP per acre. In water logged areas, spray with 2% urea+1% MgSo₄ followed by Annabhedhi 5g+citric acid 0.5g/l Spray and also drench with copper oxychloride 0.3% 	<ol style="list-style-type: none"> To drain out the excess water at the earliest To spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition Take up plant protection measures against possible pests and disease incidence 	<ol style="list-style-type: none"> Kapas picking should be done carefully to prevent admixtures with waste plant material

3. Redgram	<ol style="list-style-type: none"> 1. To drain out the excess water at the earliest 2. Takeup the gap filling at the earliest 3. Inter cultivate at optimum field moisture condition 4. Apply 4-5 kg N/acre after draining excess water 	<ol style="list-style-type: none"> 1. To drain out the excess water at the earliest 2. Takeup the gap filling at the earliest 3. Inter cultivate at optimum field moisture condition 4. Apply 4-5 kg N/acre after draining excess water 	<ol style="list-style-type: none"> 1. To drain out the excess water at the earliest 2. To spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition 3. Take up plant protection measures against possible pests and disease incidence 	<ol style="list-style-type: none"> 1. To drain out the excess water at the earliest 2. Harvest the crop when the field condition permits 3. Drying of bundles should be done on elevated places like filed bunds or drying floors
4. Green gram	<ol style="list-style-type: none"> 1. To drain out the excess water at the earliest 2. Take up the gap filling at the earliest 3. Takeup weed control either mechanically or through weedicides 4. Apply 4-5 kg N/acre after draining excess water 5. Take up plant protection measures against possible pests and disease incidence 	<ol style="list-style-type: none"> 1. To drain out the excess water at the earliest 2. Takeup weed control either mechanically or through weedicides 3. Apply 4-5 kg N/acre after draining excess water 4. To spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition 5. Take up plant protection measures against possible pests and disease incidence 	<ol style="list-style-type: none"> 1. To drain out the excess water at the earliest 2. Apply 4-5 kg N/acre after draining excess water 3. To spray KNO₃ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition 4. Take up plant protection measures against possible pests and disease incidence 	<ol style="list-style-type: none"> 1. Drain out the excess water at the earliest 2. Harvest the crop after the fields are dried up
5. Maize	<ol style="list-style-type: none"> 1. To 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 	<ol style="list-style-type: none"> 1. To 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 	<ol style="list-style-type: none"> 1. To drain out the excess water at the earliest 2. Take up plant protection measures against possible pests and disease incidence 	<ol style="list-style-type: none"> 1. To drain out the excess water at the earliest 2. Cob picking to be done after they are dried fully

Condition - Continuous submergence for more than 2 days ²				
	Suggested contingency measure ^o			
1. Rice	<ol style="list-style-type: none"> 1. Top dressing with 0.2 kg N/40 sq.m immediately after recede of flood water 2. Spray of ZnSO₄, FeSO₄ to correct micronutrient deficiencies 3. Weed control through mechanical or Chemical measures 	<ol style="list-style-type: none"> 1. To drain out the excess water at the earliest 2. Take up gap filling either with available nursery or by splitting the tillers from the surviving hills if the gaps are < 30% if more go for replanting 3. Apply 20 kg N + 10 kg K /acre after draining excess water 4. Proper weed control measures to be taken up 4. Timely plant protection measures for pest and disease out break 	<ol style="list-style-type: none"> 1. To drain out the excess water at the earliest 2. Takeup need based plant protection measures 	<ol style="list-style-type: none"> 1. Drain out water spread sheaves loosely in field or field bunds where there is no water stagnation 2. Spray common salt at 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 5. Grow varieties having seed dormancy

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

Extreme event type	Suggested contingency measurer			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Cyclone				
Horticulture crops – Fruits				
Mango	<ul style="list-style-type: none"> • If the damage is severe, go for resowing 	<ul style="list-style-type: none"> • Trees fallen on ground may be lifted and earthed up • Manuring and plant protection measures have to be taken up. • Broken and damaged branches may be pruned and applied with Bordeaux paste 	<ul style="list-style-type: none"> • Tress fallen on ground may be lifted and earthed up • Manuring and plant protection measures have to be taken up. • Broken and damaged branches may be pruned and applied with Bordeaux paste 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible. • Harvest the mature fruits as soon as possible. • Collect the fallen fruits and sell immediately or go for preparation of processed products. • If to store, store the produce in well ventilated place temporarily before it

				<ul style="list-style-type: none"> can be marketed. Broken and damaged branches may be pruned and applied with Bordeaux paste
Banana		<ul style="list-style-type: none"> Wind damaged plants should be pruned using disinfected secateurs and cut ends must be smeared with Bordeaux paste Drain the excess water as soon as possible The fallen tress may be cut leaving two suckers Inter-cultivate the soil with gorru for aeration. Spray 0.5 % KNO₃ or Urea 2% solution 2-3 times. Topdressing of booster dose of 80 g MOP + 100 g Urea per plant at two to three times intervals. Gap filling may be taken up if the plants are two weeks old and sowing window is still available for the crop. If the age of the plant is less than three months and submergence up to three feet better to replant the garden. 	<ul style="list-style-type: none"> Wind damaged plants should be pruned using disinfected secateurs and cut ends must be smeared with Bordeaux paste Drain the excess water as soon as possible The fallen tress may be cut leaving two suckers Topdressing of booster dose of 80 g MOP + 100 g Urea per plant at two to three times intervals Mature bunches on the completely damaged plants be covered with Leaves and harvested with in 15-20days 	<ul style="list-style-type: none"> Wind damaged plants should be pruned using disinfected secateurs and cut ends must be smeared with Bordeaux paste Drain the excess water as soon as possible. Harvest the mature bunches as soon as possible. use ripening chambers for quick and uniform ripening Store the harvested bunches in well ventilated place temporarily before it can be marketed. Market the produce as soon as possible. 3-4 foliar application of KNO₃ on immature/developing bunches and leaves at weekly intervals. Staking with bamboo for support
Horticulture crops vegetables				
Chillies	<ul style="list-style-type: none"> Grow nursery on raised beds. 	<ul style="list-style-type: none"> Uprooted plants may be lifted and earthed up 	<ul style="list-style-type: none"> Uprooted plants may be lifted and earthed up 	<ul style="list-style-type: none"> Drain the excess water as soon as possible.

		<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Gap filling must be done immediately • If damage is more go for replanting Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible. 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible. 	<ul style="list-style-type: none"> • Dry the pods on concrete floor/ tarpaulins immediately • use poly house solar driers for quick drying • Remove the pest and disease infected pods.
Cucumber		-do-	-do-	-do-
Tomato	-do-	-do-	-do-	-do-
Spices and Plantation crops				
Cashew	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Spray 1% KNO₃ or Urea 2% solution 2-3 times. • Provide support to the young plants 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Tress fallen on ground may be lifted and earthed up • Broken and damaged branches may be pruned and applied with Bordeaux paste 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Tress fallen on ground may be lifted and earthed up • Broken and damaged branches may be pruned and applied with Bordeaux paste 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible. • Harvest the mature produce as soon as possible. • Store the produce in well ventilated place temporarily before it can be marketed. • Market the produce as soon as possible.
Oil Palm	<ul style="list-style-type: none"> • Planting should be done on mounts or bunds • Drainage system suited to local conditions. may be provided to remove surplus water from root zone 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Twisted leaves may be cut and removed • Apply booster dose of NPK fertilizers • The palms have fallen with root system still 	<ul style="list-style-type: none"> • Drain the excess water as soon as possible • Hanging bunches may be provided with supports wherever possible .Apply booster dose of NPK fertilizers 	<ul style="list-style-type: none"> • Twisted leaves may be cut and removed • Hanging bunches may be provided with supports wherever possible • Harvest the mature nuts as soon as

	<ul style="list-style-type: none"> Relief drains [shallow] channels are opened at places where water accumulates and connected with main drain to remove water from the surface 	<p>having contact with the soil ,they need to be brought to position and provided with soil mound and support</p>	<ul style="list-style-type: none"> .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 	<p>possible.</p> <ul style="list-style-type: none"> Market the produce as soon as possible.
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. 	<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. 	<ul style="list-style-type: none"> Drain the excess water as soon as possible. Harvest the rhizomes when field comes to normal Use boilers and polishers for processing Remove and separate the rotten and mould affected rhizomes. Cook and dry the rhizomes as soon as possible.

Khammam district experience moderate floods and moderate heat wave conditions and sporadic droughts of severe nature

General contingency plans

General contingency plans

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

<p>1. Procure and stock emergency medicines and vaccines for important endemic diseases of the area</p> <p>2. All the stock must be immunized for endemic diseases of the area</p> <p>3. Carry out deworming to all young stock</p> <p>4. Keep stock of bleaching powder and lime</p> <p>5. Carry out Butax spray for control of external parasites</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. Keep close watch on the health of the stock</p> <p>2. Sick animals must be isolated and treated Separately.</p> <p>3. Carry out deworming and spraying to all animals entering into relief camps</p> <p>4. Clean the animal houses regularly and apply disinfectants.</p> <p>5. Safe and hygienic disposal of dead animal carcasses</p> <p>6. Organize with community daily lifting of dung from relief camps</p>	<p>1. keep close surveillance on disease outbreak.</p> <p>2. Undertake the vaccination depending on need</p> <p>3. Keep the animal houses clean and spray disinfectants</p>
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Detailed Contingent strategies for Livestock, Poultry & Fisheries

	Suggested contingency measures		
	Before the event	During the event	After the event
Drought			

<p>Feed and Fodder availability</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 mandals 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</p> <p>Chopping of fodder should be made as mandatory in every village through supply and establishment of good quality chaff cutters.</p> <p>Avoid burning of 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>Harvest and use biomass of dried up crops (Paddy, Maize, green gram etc.,) 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 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>Subsidized loans should be provided to the livestock keepers</p>	<p>Concentrates supplementation should be provided to all the animals.</p> <p>Short duration fodder crops of should be sown in unsown and crop failed areas where no further routine crop sowing is not possible</p>
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Cyclone	NA		
Floods	<p>In case of early forewarning (EFW), harvest all the crops (Maize,/Rice/green gram) that can be useful as fodder in future (store properly)</p> <p>Don't allow the animals for grazing if severe floods are forewarned</p> <p>In regularly flood villages, arrange for storing minimum required quantity of hay (25-50kg) and concentrates (25kgs) per animals in farmer / LS keepers house / shed for feeding animals during floods</p> <p>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</p>	<p>Transportation of animals to elevated areas</p> <p>Stall feeding of animals with stored hay and concentrates</p> <p>Proper hygiene and sanitation of the animal shed</p> <p>In severe floods, un-tether or let loose the animals</p> <p>Emergency outlet establishment for required medicines or feed in each village</p> <p>Spraying of fly repellants in animal sheds</p>	<p>Repair of animal shed</p> <p>Bring back the animals to the shed</p> <p>Cleaning and disinfection of the shed</p> <p>Bleach (0.1%) drinking water / water sources</p> <p>Deworming with broad spectrum dewormers</p> <p>Vaccination against possible disease out breaks like HS, BQ, FMD and PPR</p> <p>Proper disposal of the dead animals / carcasses by burning / deep burying (4-8 feet) with lime powder (1kg for small ruminants and 5kg for large ruminants) in pit</p> <p>Drying the harvested crop material and proper storage for use as fodder.</p>
Heat wave	<p>In mandals which are chronically prone to heat waves the following permanent measures are suggested</p> <ol style="list-style-type: none"> i) Plantation of trees like Neem, Pipal, Subabul around the shed ii) Spreading of husk/straw/coconut leaves on the roof of the shed iii) Water sprinklers / foggers in the animal shed iv) Application of white reflector paint on the roof to reduce thermal radiation effect 	<p>Allow the animals preferably early in the morning or late in the evening for grazing during heat waves</p> <p>Feed green fodder/silage / concentrates during day time and roughages / hay during night time in case of heat waves</p> <p>Put on the foggers / sprinklers during heat waves and heaters during cold waves in case of high productive animals</p> <p>In severe cases, vitamin 'C' (5-10ml per litre) and electrolytes (Electral powder @ 20g per litre) should be added in water during severe heat waves.</p>	<p>Feed the animals as per routine schedule</p> <p>Allow the animals for grazing (normal timings)</p>

Health and Disease management	List out the endemic diseases (species wise) in that district and store vaccines for those diseases Timely vaccination (as per enclosed vaccination schedule) against all endemic diseases Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district	Constitution of Rapid Action Veterinary Force Procurement of emergency medicines and medical kits Performing ring vaccination (8 km radius) in case of any outbreak Restricting movement of livestock in case of any epidemic Rescue of sick and injured animals and their treatment	Conducting mass animal health camps Conducting fertility camps Mass deworming camps
Insurance	Encouraging insurance of livestock	Listing out the details of the dead animals	Submission for insurance claim and availing insurance benefit Purchase of new productive animals
Drinking water	Identification of water resources Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals)	Restrict wallowing of animals in water bodies/resources	Bleach (0.1%) drinking water / water sources Provide clean drinking water

Vaccination programme for cattle and buffalo:

Disease	Age and season at vaccination
Anthrax	In endemic areas only, Feb to May
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 fresh drinking water	Give sufficient water as per the bird's requirement

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 lime powder in pit Disposal of poultry manure to prevent protozoal problem Supplementation of coccidiostats in feed Vaccination against RD
Cyclone	NA		

Heat wave			
Shelter/environment management	Provision of proper shelter with good ventilation	In severe cases, foggers/water sprinklers/wetting of hanged gunny bags should be arranged Don't allow for scavenging during mid day	Routine practices are followed
Health and disease management	Deworming and vaccination against RD and fowl pox	Supplementation of house hold grain Provide cool and clean drinking water with electrolytes and vit. C (5-10 ml per litre) In hot summer, add anti-stress probiotics in drinking water or feed (Reestobal etc., 10-20ml per litre)	Routine practices are followed

^a based on forewarning wherever available