State: ANDHRA PRADESH

Agriculture Contingency Plan for District: ANANTAPUR

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Region /Sub Region (ICAR)	Karnataka plateau Rayalaseema as inclusive Agro Ecological Sub Region (3.0)		
	Agro-Climatic Region (Planning Commission)	Southern Plateau and Hills Region (X)		
	Agro Climatic Zone (NARP)	Scare rainfall zone of Andhra Pradesh (AP-6)		
	List all the districts or part thereof falling under the NARP Zone	**Anantapur** (entire district) **Kurnool** (entire district)		
	Geographic coordinates of district	Latitude	Longitude	Altitude
		14^0 41' N	77^0 37' E	350 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Regional Agricultural Research Station, Nandyal		
	Mention the KVK located in the district	Reddipalli, Anatapur dist		
1.2	**Rainfall**	Average (mm)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	328	2nd week of June	2nd week of October
	NE Monsoon(Oct-Dec):	154	3rd week of week October	1st week of December
	Winter (Jan- March)	4		
	Summer (Apr-May)	74		
	Annual	560	-	-

1.3	**Land use pattern of the district** (latest statistics)	Geographical area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area (‘000 ha)	1913.0	197.0	121.2	9.0	51.9	9.7	183.5	142.7	84.3

1. 4	**Major Soils**	Area (‘000 ha)	Percent (%) of total
	1. Shallow red soils	934	78
	2. Black soils	239	20
	3. Others	23	2

1.5	**Agricultural land use**	Area (‘000 ha)	Cropping intensity %
	Net sown area	1113	106
	Area sown more than once	74	
	Gross cropped area	1187	

*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%

1.6	**Irrigation**	Area (‘000 ha)	Percent (%)	
	Net irrigated area	108.9		
	Gross irrigated area	137.4		
	Rainfed area	814.4		
	Sources of Irrigation	Number	Area (‘000 ha)	% area
	Canals		22.4	18.8
	Tanks		4.3	3.6
	Tube wells & filter points		91.0	76.3
	Lift irrigation			
	Other sources		1.5	1.3
	Total		119.3	100.0
	Pump sets			
	Micro-irrigation			
	Groundwater availability and use	No. of blocks	% area	Quality of water
	Over exploited	28	12	Normal
	Critical	12	8	Saline /Alkaline

	Semi- critical	9	15	Chloride
	Safe	NA	65	Fluoride
	Wastewater availability and use	1443.25	NA	

Area under major field crops & horticulture etc.

*If break-up data (irrigated, rainfed) is not available, give total area

1.7		**Major Field Crops cultivated**	**Area ('000 ha)***					
			Kharif		**Rabi**		**Summer**	**Total**
			Irrigated	**Rainfed**	**Irrigated**	**Rainfed**		
	1	Groundnut	-	822	18		-	840
	2	Bengalgram				**65**		65
	3	Sunflower		24	27		-	51
	4	Rice	26	-	15	-	-	41
	5	Redgram		33		---	-	33
	6	Sorghum	6			15	-	21
	7	Maize		5	**4**	**-**	-	9
	8	Cotton		4				4
	9	Ragi						
		Horticulture crops - Fruits	**Total area**					
		Horticulture crops - Fruits	**Total area**					
	1	Sweet orange	49.4					
	2	Mango	6.6					
	3	papaya	6.3					
	4	Banana	5.3					
		Horticultural crops - Vegetables	**Total area**					
	1	Tomato	4.69					
	2	Chillies	3.40					
		Horticultural crops flowers						
	1	Marigold	1.645					

1.8	**Livestock**	**Male (number)**	**Female (number)**	**Total (number)**
	Non descriptive Cattle (local low yielding)	385.3	335.0	720.3
	Crossbred cattle	10.8	86.4	97.2
	Non descriptive Buffaloes (local low yielding)	65.4	467.6	533.0
	Graded Buffaloes			
	Goat			909.4
	Sheep			3155.7
	Others (Camel, Pig, Yak etc.)			55.0
	Commercial dairy farms (Number)			

1.9	**Poultry**	**No. of farms**	**Total No. of birds (number)**
	Commercial		449.5
	Backyard		1698.8

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**	
		34		5		326	

Note : fallow the order as followed in crop area table and specify five major crops only

1.11	**Production and Productivity of major crops** (Average of last 5 years: 2004, 05,06, 07, 08)	**Kharif**		**Rabi**		**Summer**		**Total**	
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)
1	Groundnut	453	525	25	1336			478	543

2	Bengal gram			99	711			99	711
3	Paddy	82	3121	39	2594			121	2944
4	Red gram	13	381					13	381
5	Sunflower	11	446	13	609			24	538
Others									

1.11	**Major Horticultural crops**	**Kharif**		**Rabi**		**Summer**		**Total**	
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)
Fruits (Crops to be identified based on total acreage)									
1	Sweet Orange						90.8	13300	
2	Mango						157.5	8267	
3	Papaya						238.8	78667	
4	Banana						115.8	30000	
vegetables									
1	Tomato						49.0	19000	
2	Chillies						2.8	3264	
Horticultural crops flowers									
1	Marigold						9.7	800	

1.12	**Sowing window for 5 major crops (start and end of sowing period)**	Crop 1 (Specify the crop): Groundnut	Crop 2: Paddy	Crop 3: Bengalgram	Crop 4: Jowar	Crop 5: Sunflower
	Kharif- Rainfed	July 1st FN to Aug 1st week	---	---	Up to July 1st week (grain) Up to Mid Sep (fodder)	---
	Kharif-Irrigated	---	July 2nd FN-Aug 1st FN	---	---	---

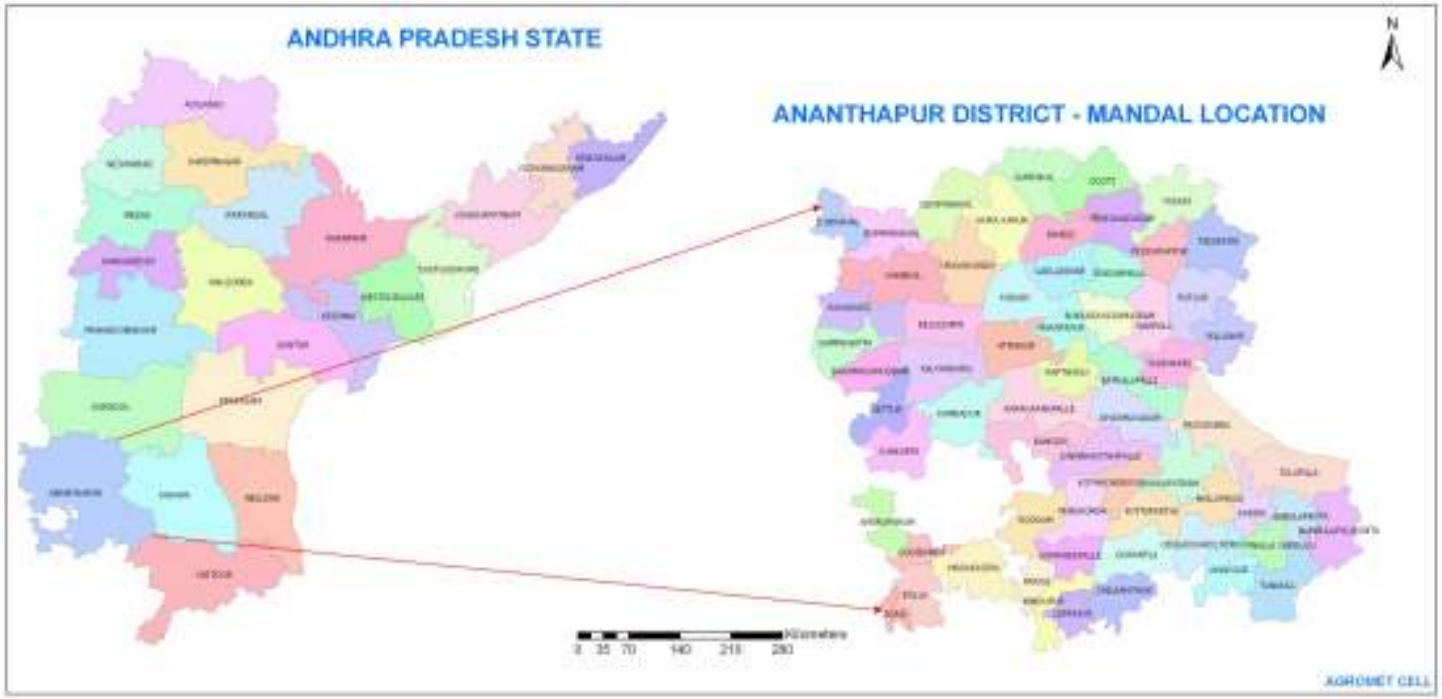
	Rabi- Rainfed	---	---	Oct 2nd FN- Nov 1st FN	---	Oct-Jan
	Rabi-Irrigated	Nov 15th –Dec 30th	Dec 1st week- Dec 30th	---	---	---

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			√
	High intense storms			√
	Cyclone			√
	Hail storm			√
	Heat wave			√
	Cold wave			√
	Frost			√
	Sea water inundation			√
	Pests and diseases (specify)	√		
		√		

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

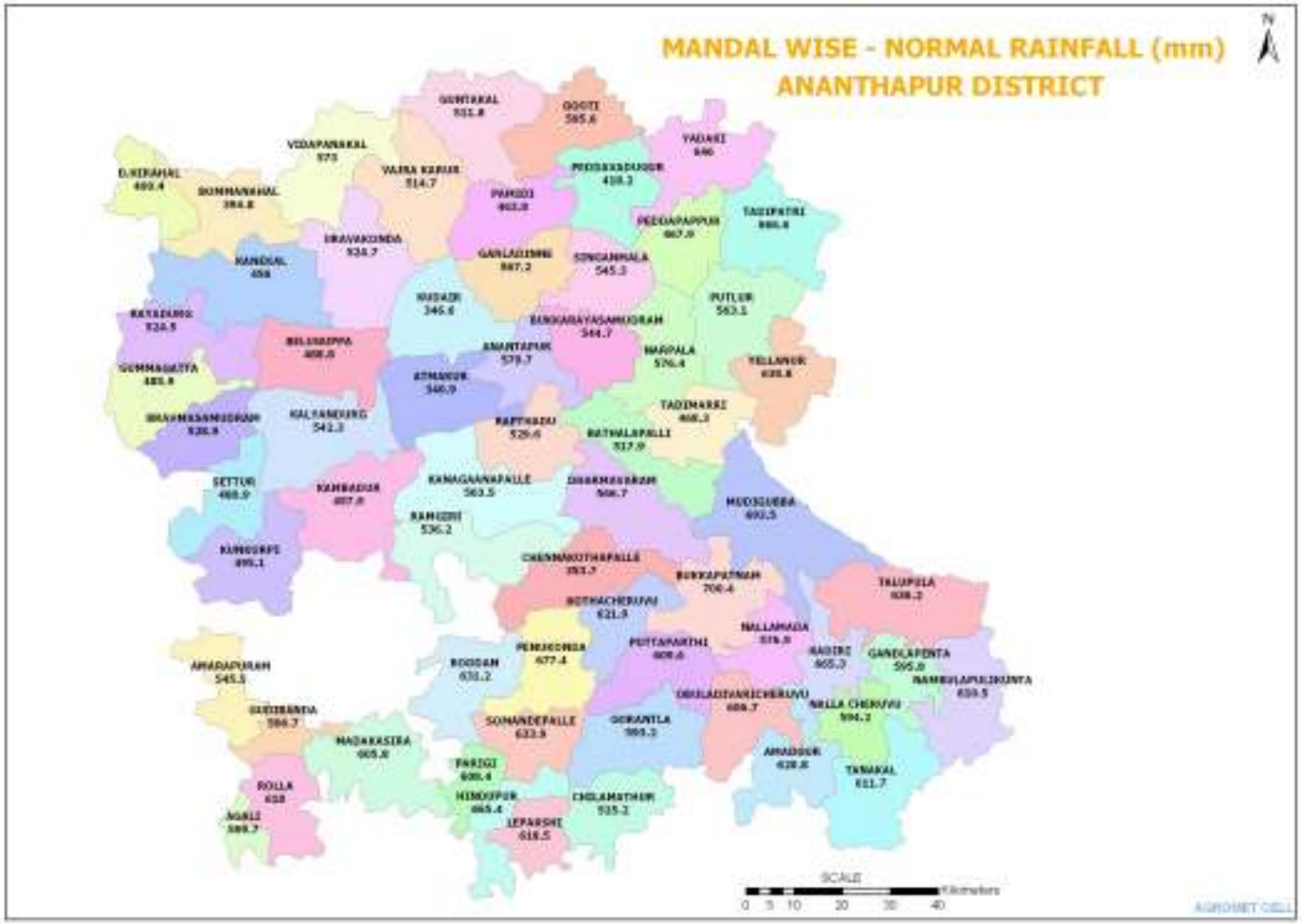
ANNEXURE-I

LOCATION MAP OF ANANTHAPUR WITH IN ANDHRA PRADESH

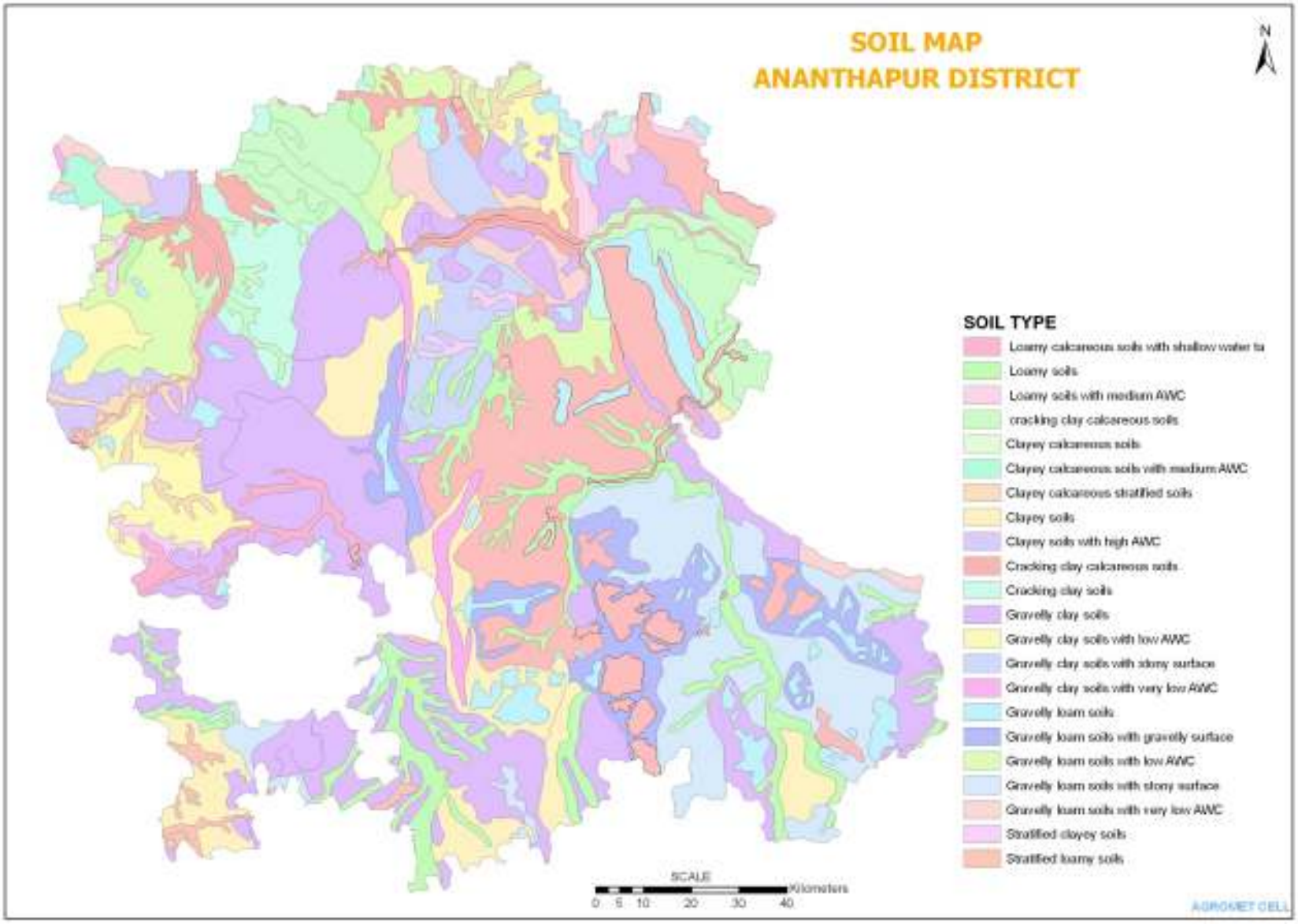


ANNEXURE-II

MEAN ANNUAL RAINFALL



ANNEXURE-III



2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks (Specify month) July 2nd FN	Shallow red soils	Groundnut + Redgram(LRG 30) intercropping (7:1)	No change, Redgram (LRG-30)	-	-
Delay by 4 weeks (Specify month) August 1st FN	Shallow red soils	Groundnut + Redgram (15:1) inter cropping			

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 6 weeks (Specify month) August 2nd FN	Shallow red soils	Groundnut + Redgram intercropping system	Pure crop of Jowar (CSH-9, 13, CSV-12, 13, NTJ1-3) / Pearl millet (ICTP 8203, ICMV-221, ICMH-451) / Cowpea / Greengram (MGG-295, LGG-107) / Sunflower (APSH11, KBSH1) / Setaria (Lepakshi, Krishnadevaraya)	Jowar / pearl millet are cut for fodder at 45 DAS and 65DAS and left for grains if rains are continued.	

Early season drought (delayed onset)	Major Farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 8 weeks (Specify month) September 1st FN	Shallow red soils	Groundnut + Redgram intercropping system	Pure crop of Jowar (fodder) PGH-1 & 2) / Pearlmillet (ICTP 8203, ICMV-221, ICMH-451) / Cowpea / Greengram (MGG-295, LGG-107) / Sunflower (Morden)	1. Jowar / Pearlmillet are cut for fodder at 45DAS and 65DAS and left for grains if rains are continued. 2. Top dressing of urea for millets (specify the dosage)..	-
September 2nd FN	Horse gram shallow aifinds		Only horsegram is recommended.	No fertilizer to crop is recommended to horsegram.	

Condition			Suggested Contingency measures		
Early season drought (Normal onset)	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil management**	**Remarks on Implementation**
15-20 days dry spell after sowing leading to poor germination/crop stand etc.)	Shallow red soils	Groundnut + Redgram	----	---	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell, > 2 consecutive weeks rainless (>2.5 mm) period	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil management**	**Remarks on Implementation**
At vegetative stage	Shallow red soils	Groundnut + Redgram	Protect the crop from Thrips which act as vectors for PBND and PSND, Chloripyriphos @ 2ml/L at 7-10 days interval	Mulching with groundnut shells is advised	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil management**	**Remarks on Implementation**
At reproductive stage	Shallow red soils	Groundnut + Redgram	Supplemental irrigation with harvested rain water in ponds (10 mm depth.) by using micro-irrigation (Sprinklers)		Digging of farm ponds may be encouraged under NREC

Condition			Suggested Contingency measures		
Terminal drought	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
	shallow red soils	Groundnut + Redgram	Supplemental irrigation with harvested rain water in ponds (10 mm depth) by using micro-irrigation.		Digging of farm ponds may be encouraged under NREC

2.1.2 Irrigated situation

(Note: provide agronomic measures in each table under irrigated situation)

Condition			Suggested Contingency measures		
	Major Farming situation	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delayed/ limited release of water in canals due to low rainfall	1. Red soils 2. Black soils 3.Tankfed areas	Paddy	ID crops like groundnut (oct 16th – Dec 31st) and Sunflower(Sep 1st FN-Jan 30th)		

Condition			Suggested Contingency measures		
	Major Farming situation	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Non release of water in canals under delayed onset of monsoon in catchment	Tail end areas	Groundnut and sunflower	Jowar / Greengram / Horsegram are recommended during September as rainfed crops.	---	

Condition			Suggested Contingency measures		
	Major Farming situation	**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	Tankfed red soils Tankfed black soils	Paddy	Sunflower and jowar are recommended.	---	

Condition			Suggested Contingency measures		
	Major Farming situation	**Crop/cropping system**	**Change in crop/ cropping system**	**Agronomic measures**	**Remarks on Implementation**
Insufficient groundwater recharge due to low rainfall	Bore well irrigated red soils and black soils	Groundnut Sunflower	No change	1. Timely sowing is advised 2. Irrigation at critical stages through Micro irrigation systems 3. Limited number of irrigations are suggested	
Any other condition (specify)					

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

Condition	**Suggested contingency measure**			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**
Groundnut	----	Drain excess water Timely plant protection measures are to be taken against LLS, rust and stem rot	Weather based advisory to be followed for harvesting.	1. Shifting of produce immediately after drying 2 Threshing on 5th day after harvest of groundnut crop.
Horticulture crops – Fruits				
Sweet Orange	• Drain the excess water as soon as possible. • Spray 1% KNO3 or Urea 2% solution 2-3 times. • Foliar spray of micronutrient mixture is also to be taken up. • Sand casting around the tree trunks should be removed up to the collar region of the tree to prevent fungal infections. • If the tree age is above eight years a booster dose of 500 g of Urea and 750 g MOP per tree should be applied. • .Wind damaged branches should be pruned using disinfected secaetures and cut	• Drain the excess water as soon as possible. • Spray 1% KNO3 or Urea 2% solution 2-3 times. • Foliar spray of micronutrient mixture is also to be taken up. • Sand casting around the tree trunks should be removed up to the collar region of the tree to prevent fungal infections. • If the tree age is above eight years a booster dose of 500 g of Urea and 750 g MOP per tree should be applied.	• Drain the excess water as soon as possible. • Harvest the mature fruits in a clear sunny day. .	• Store the fruits in well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible.

	endsmust be smeared with Bordeaux paste			
Mango	• Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times.	• Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times.	• Drain the excess water as soon as possible • Harvest the mature produce in a clear sunny day'	• Store the fruits in well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible.
Papaya	• Drain out the excess water • outbreak of any sucking past should be controlled using systemic insecticides • Water logging near trunk should be prevented • Drench the plants with copper fungicides to prevent collar rot	• Drain out the excess water • outbreak of any sucking pest should be controlled using systemic insecticides • Water logging near trunk should be prevented	• Drain out the excess water • Harvest the marketable fruits in a clear sunny day • out break of any sucking pests should be controlled by using systemic insecticides • Water logging near trunk should be prevented • Micronutrient deficiencies should be corrected by foliar sprays of Fe, Mg, Zn, Bo and Mn	• Store the fruits in well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible.
Banana	• Drain the excess water as soon as possible • Inter-cultivate the soil with gorru for aeration. • Spray 0.5 % KNO_3 or Urea 2% solution 2-3 times. • Topdressing of	• Drain the excess water as soon as possible • Spray 0.5 % KNO_3 or Urea 2% solution 2-3 times. • Topdressing of booster dose of 80 g MOP + 100 g Urea per plant at two to three times intervals. • If the age the plant is more than three months and less	• Drain the excess water as soon as possible • Harvest the marketable bunches in a clear sunny day. • Spray 0.5 % KNO_3 or Urea 2% solution 2-3 times	• Use ripening chambers for quick ripening • Market the produce as soon as possible.

	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.	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.	for quick development of immature bunches. • Staking with bamboos to prevent further lodging.	
Horticulture crops vegetables				
Tomato	• Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 12 kg MOP + 30 kg Urea per acre as soon as possible. • Gap filling may be taken up if the plants are two weeks old and sowing window is still available for the crop. • In case of severe damage (considered as complete economical loss), and the contingency period is between June to August, sowing of best	• Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 10 kg MOP + 30 kg Urea per acre as soon as possible.	• Drain the excess water as soon as possible • Harvest the marketable fruits in a clear sunny day'	• Store the harvested fruits in well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible.

	alternative crop must be taken up.			
Chillies	-do-	-do-	-do-	• Dry the pods on concrete floor immediately after the appearance of sunlight (or). • Use poly house solar driers for quick drying • Grade the pods and market as soon as possible. • Do not store such produce for long periods.
Horticulture crops flowers				
Mari gold	• Drain the excess water as soon as possible • Spray Urea 2% or 1% KNO3 solution 2-3 times.	• Drain the excess water as soon as possible • Spray Urea 2% or 1% KNO3 solution 2-3 times.	• Drain the excess water as soon as possible • Spray Urea 2% or 1% KNO3 solution 2-3 times. • Harvest the marketable flowers as soon as possible	• Store the flowers in well ventilated place temporarily before it can be marketed. • Market the flowers as soon as possible

2.3 Floods

Condition	**Suggested contingency measure**			
Transient water logging/ partial inundation1	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Horticulture crops – Fruits				
Sweet Orange	• Drain the excess water as soon as possible. • Spray 1% KNO3 or Urea 2% solution 2-3 times. • Plant protection measures may be taken for control of insect vectors and diseases.	• Drain the excess water as soon as possible. • Spray 1% KNO3 or Urea 2% solution 2-3 times. • Foliar spray of micronutrient mixture is also to be taken up. • Sand casting around the tree trunks should be removed up to the collar region of the tree to	• Drain the excess water as soon as possible. • Spray 1% KNO3 or Urea 2% solution 2-3 times. • Foliar spray of micronutrient mixture is also to be taken up. • Sand casting around	• 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.

		prevent fungal infections. • If the tree age is above eight years a booster dose of 500 g of Urea and 750 g MOP per tree should be applied.	the tree trunks should be removed up to the collar region of the tree to prevent fungal infections. • If the tree age is above eight years a booster dose of 500 g of Urea and 750 g MOP per tree should be applied.	
Mango	• Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times.	• Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times.	• Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times.	• 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.
Papaya	-do-	-do-	-do-	-do-
Banana	.	• Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times. • Topdressing of booster dose of 80 g MOP + 100 g Urea per plant in two to three 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.	• 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.	• 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				
Tomato	• Drain the excess water as soon as possible	• Drain the excess water as soon as possible • Spray Urea 2% solution 2-	• Drain the excess water as soon as possible	• Drain the excess water as soon as possible. • Harvest the mature

		3 times. • Topdressing of booster dose of 10 kg MOP + 30 kg Urea per acre as soon as possible.	• Spray Urea 2% solution once.	produce as soon as possible. • Store the produce in well ventilated place temporarily before it can be marketed. • Market the produce as soon as possible.
Chillies	• Drain the excess water as soon as possible	• Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible. • Gap filling may be taken up if the plants are two weeks old and sowing window is still available for the crop.	• Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible.	• Drain the excess water as soon as possible. • Dry the pods on concrete floor/ tarpaulins. • Spray any drying oil after the pods are free from surface moisture for quick drying. • use poly house solar driers for quick drying • Remove the pest and disease infected pods. • Market the produce as soon as possible.
Horticulture crops Flowers				
Marigold	• Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times.	• Drain the excess water from the field as early as possible. • Apply booster dose of nutrients to promote the growth	• Drain the excess water from the field as early as possible. • Apply booster dose of nutrients to promote the growth	• Drain the excess water from the field as early as possible. • Apply booster dose of nutrients to promote the growth • Take appropriate measures to check the soil borne pathogens and sucking pest complex. • Harvest the flowers and market immediately

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				
Sweet Orange	• Spray Carbendazim 1 g or COC 3g per litre to prevent spread of diseases • If the damage is severe, go for resowing.	• Tress fallen on ground may be lifted and earthed up • Manuring and plant protection measures have to be taken up. • Broken and damaged branches may be pruned and applied with Bordeaux paste	• Tress fallen on ground may be lifted and earthed up • Manuring and plant protection measures have to be taken up. • Broken and damaged branches may be pruned and applied with Bordeaux paste	• Drain the excess water as soon as possible. • Harvest the mature fruits as soon as possible. • Collect the fallen fruits and sell immediately or go for preparation of processed products. • If to store, store the produce in well ventilated place temporarily before it can be marketed. • Broken and damaged branches may be pruned and applied with Bordeaux paste
Mango	-do-	-do-	-do-	-do-
Papaya	• Drain the excess water as soon as possible and drench the plants with any copper fungicide to prevent collar rot	• Drain the excess water as soon as possible and drench the plants with any copper fungicide to prevent collar rot • Spray 1% KNO3 or Urea 2% solution 2-3 times.	• Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times.	• Drain the excess water as soon as possible. • Harvest the mature produce as soon as possible. • Store the produce in well ventilated place temporarily before it can be marketed. • Market the produce as soon as possible. • Collect the fallen fruits and sell immediately or go for preparation of processed products.

Banana		• Wind damaged plants should be pruned using disinfected secaetures and cut ends must be smeared with Bordeaux paste • Drain the excess water as soon as possible • The fallen tress may be cut leaving two suckers • Inter-cultivate the soil with gorru for 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.	• Wind damaged plants should be pruned using disinfected secaetures and cut ends must be smeared with Bordeaux paste • Drain the excess water as soon as possible • The fallen tress may be cut leaving two suckers • 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	• Wind damaged plants should be pruned using disinfected secaetures and cut ends must be smeared with Bordeaux paste • Drain the excess water as soon as possible. • Harvest the mature bunches as soon as possible. use ripening chambers for quick and uniform ripening • Store the harvested bunches in well ventilated place temporarily before it can be marketed. • Market the produce as soon as possible. • 3-4 foliar application of KNO3on immature/developing bunches and leaves at weekly intervals. • Staking with bamboo for support .
Horticulture crops vegetables				
Tomato	• Grow nursery on raised beds. • If damage is more go for resowing	• Uprooted plants may be lifted and earthed up • Drain the excess water as soon as possible • Gap filling must be done immaditeatly • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible.	• Uprooted plants may be lifted and earthed up • Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 15 kg MOP + 30 kg Urea per acre as soon as possible.	• Drain the excess water as soon as possible. • Harvest the mature produce as soon as possible. • Store the produce in well ventilated place temporarily before it can be marketed. • Market the produce as soon as possible.

		• If damage is more ,go for replanting		
Chillies	• Grow nursery on raised beds.	• Uprooted plants may be lifted and earthed up • Drain the excess water as soon as possible • Gap filling must be done immediately • 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.	• Uprooted plants may be lifted and earthed up • Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times. • Topdressing of booster dose of 15 kg MOP+ 30 kg Urea per acre as soon as possible.	• Drain the excess water as soon as possible. • Dry the pods on concrete floor/ tarpaulins immediately • use poly house solar driers for quick drying • Remove the pest and disease infected pods. .
Horticulture crops flowers				
Marigold	• Drain the excess water as soon as possible and drench the plants with any copper fungicide • Spray Urea 2% or 1% KNO_3 solution 2-3 times. • Gap filling must be done immediately • If damage is more ,go for replanting	• Drain the excess water as soon as possible and drench the plants with any copper fungicide Spray Urea 2% or 1% KNO_3 solution 2-3 times. • Gap filling must be done immediately If damage is more ,go for replanting	• Drain the excess water as soon as possible and drench the plants with any copper fungicide Spray Urea 2% or 1% KNO_3 solution 2-3 times. • Gap filling must be done i immediately • If damage is more ,go for replanting	• Drain the excess water as soon as possible. • Harvest the marketable flowers as soon as possible. • Store the produce in well ventilated place temporarily before it can be marketed. • Market the produce as soon as possible

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

2.5 Contingent strategies for Livestock, Poultry & Fisheries

General contingency measures for Livestock

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

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

2.5.1 Livestock Detailed Contingency strategies

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Drought			
Feed and Fodder availability	As chronically drought prone district, it 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) Silage:20-50 t Urea molasses mineral bricks (UMMB):50-100 t Hay:100-250 t Concentrates: 20-50 t Minerals and vitamin supplements mixture:1-5 t Establishment of silvi-pastoral system in CPRs with ***Stylosanthus hamata*** and ***Cenchrus ciliaris*** as grass with ***Leucaena leucocephala*** as tree component (or suggest suitable similar system to your district) Top dressing of N in 2-3 split doses @ 20-25 kg N/ha in common property resources (CPRs) like temple lands, panchyat lands or private property resources (PPRs) like waste and degraded lands with the monsoon pattern for higher biomass production Promote cultivation of short duration fodder crops of sorghum/bajra/maize(UP chari, MP chari, HC-136, HD-2, GAINT BAJRA, L-74, K-677, Ananad/African Tall, Kisan	Harvest and use biomass of dried up crops (Groundnut, jowar, ragi, Rice, maize, black gram, green gram, horsegram) material as fodder. Harvest the tree fodder (Neem, Subabul, Acasia, Pipal etc) and unconventional feeds resources available and use as fodder for livestock (LS). Available feed and fodder should be cut from CPRs and stall fed in order to reduce the energy requirements of the animals and supplemented with groundnut haulms. UMMB, hay, concentrates and vitamin & mineral mixture should be transported to the needy areas from the reserves at the district level initially and latter stages from the near by districts. Hay should be enriched with 2% Urea molasses solution or 1% common salt solution and fed to LS Herd should be split and supplementation (either groundnut haulms or concentrate mixture) should be given only to the highly productive and breeding animals Provision of emergency grazing/feeding (Cow-calf camps or other special arrangements to protect high productive & breeding stock) Motivate the farmers to mix the dry fodder with available kitchen waste or groundnut haulms while feeding Arrangements should be made for mobilization of small ruminants across the villages where no drought exits with subsidized road/rail transportation and temporary shelter provision for the shepherds Unproductive livestock should to be culled during severe	Concentrates supplementation should be provided to all the animals. The farmers may be advised to practice “flushing the stock” to recoup either with groundnut haulms or concentrate mixture Short duration fodder crops of should be sown in unsown and crop failed areas where no further routine crop sowing is not possible Supply of quality seeds of fodder varieties and motivating the farmers to cultivate at least 10% of their land holding for fodder production

	composite, Moti, Manjari, B1-7 and also sunhemp Chopping of fodder should be made as mandatory in every village through supply and establishment of good quality chaff cutters. Harvesting and collection of perennial vegetation particularly grasses which grow during monsoon Proper drying, bailing and densification of harvested grass from previous season Creation of permanent fodder, feed and fodder seed banks in all drought prone villages	drought Create transportation and marketing facilities for the culled and unproductive animals. Supply silage and or hay on subsidized rates to the farmers having high productive stock Subsidized loans should be provided to the livestock keepers	
Heat wave	As the district chronically prone to heat waves the following permanent measures are suggested 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	Allow the animals preferably early in the morning or late in the evening for grazing during heat waves Feed green fodder/silage / concentrates during day time and roughages / hay during night time in case of heat waves Put on the foggers / sprinkerlers during heat weaves and heaters during cold waves in case of high productive animals 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.	Feed the animals as per routine schedule Allow the animals for grazing (normal timings)
Health and Disease management	List out the endemic diseases (species wise) in the 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	Constitution of Rapid Action Veterinary Force Procurement of emergency medicines and medical kits Close observation of animals for heat stress symptoms	Conducting mass animal health camps Conducting fertility camps Mass deworming camps

	Husbandry) office in the district		
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	**During the event**	**After the event**
Drought			
Shortage of feed ingredients	Storing of house hold grain like maize, broken rice, bajra etc, in to use as feed in case of severe drought	Supplementation only for productive birds with house hold grain Supplementation of shell grit (calcium) for laying birds Culling of weak birds	Supplementation to all survived birds
Drinking water		Use water sanitizers or offer cool drinking water	
Health and disease management	Culling of sick birds. Deworming and vaccination against RD and fowl pox	Mixing of Vit. A,D,E, K and B-complex including vit C in drinking water (5ml in one litre water)	Hygiene and sanitation of poultry house Disposal of dead birds by burning / burying with lime powder in pit
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	Routine practices are followed

		per litre) In hot summer, add anti-stress probiotics in drinking water or feed (Reestobal etc., 10-20ml per litre)	

2.5.3 Contingency strategies for Fisheries: Not applicable for the district