State: ANDHRA PRADESH

Agriculture Contingency Plan for District: NALGONDA

1.0 District Agriculture profile					
1.1	**Agro-Climatic/Ecological Zone**				
	Agro Ecological Sub Region (ICAR)	South Telangana plateau and eastern ghat, hot dry semiarid AESR (7.2)			
	Agro-Climatic Region (Planning Commission)	Southern plateau & hill region (X)			
	Agro Climatic Zone (NARP)	Southern Telangana Zone (AP-5)			
	List all the districts or part thereof falling under the NARP Zone	Mahabubnagar, Ranga Reddy, parts of Medak, Nalgonda and Warangal			
	Geographic coordinates of district	Latitude	Longitude	Altitude	
		17º 10'	79º 30'	169 m	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	RARS, Palem, Mahabubnagar District-509215			
	Mention the KVK located in the district	Gaddipally (Village), Garidepally (Mandal) , Nalgonda (dt)			
1.2	**Rainfall**	Normal RF(mm)	Normal Rainy days (no)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	562.1	-	2nd week of June	2nd week October
	NE Monsoon(Oct-Dec):	139.8	-	2nd week of October	1st week of December
	Winter (Jan- March)	14.1	-	-	-
	Summer (Apr-May)	37.4	-	-	-
	Annual	753.3	-	-	-

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)	1424.0	83.7	114.8	65.9	29.4	7.7	122.1	320.9	168.2

1. 4	**Major Soils (common names like shallow red soils etc.,)**	**Area ('000 ha)**	**Percent (%) of total**
	1. Black cotton soil	128.2	9
	2. Dubba soil (Loamy sands)	669.3	47
	3. Red soil (Chalka soil)	626.6	44
1.5	**Agricultural land use**	Area ('000 ha)	Cropping intensity %
	Net sown area	467.5	127.1
	Area sown more than once	126.8	
	Gross cropped area	594.3	

1.6	**Irrigation**	Area (‘000 ha)		
	Net irrigated area	235.6		
	Gross irrigated area	348.8		
	Rainfed area	231.9		
	Sources of Irrigation	Number	Area (‘000 ha)	Percentage of total irrigated area
	Canals		76.9	30.5
	Tanks		15.0	5.9
	Open wells			
	Bore wells		149.3	59.3
	Lift irrigation			
	Micro-irrigation			
	Other sources		10.7	4.2
	Total Irrigated Area		251.9	100.0
	Pump sets	139937		
	No. of Tractors			
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils	(%) area	
	Over exploited			
	Critical			
	Semi- critical			
	Safe			
	Wastewater availability and use			
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

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

1.7		**Major Field Crops cultivated**	**Area ('000 ha)**					
			Kharif		**Rabi**		**Summer**	**Total**
			Irrigated	**Rainfed**	**Irrigated**	**Rainfed**		
	1	Paddy	163.0		147.7			310.7
	2	Cotton		106.2				106.2
	3	Greengram	43.9					43.9
	4	Castor		39.4				39.4
	5	Redgram		37.5				37.5
	6	Groundnut		15.2	16.6			31.8
		Total						**569.6**
		Horticulture crops – Fruits	**Irrigated**		**Rainfed**		**Total area**	
	1	Orange&Batavian					62.2	
	2	Mango					16.1	
	3	lemon					12.5	
		Horticultural crops – Vegetables					**Total area**	
	1	Bhendi					1.7	
		Total fodder crop area					18.8	
		Grazing land						
		Sericulture etc						
		Others (Specify)						

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Non descriptive Cattle (local low yielding)	291.5	237.3	528.8
	Crossbred cattle	3.4	11.2	14.6
	Non descriptive Buffaloes (local low yielding)	177.3	643.2	820.5
	Graded Buffaloes			
	Goat			507.4
	Sheep			1914.1
	Others (Camel, Pig, Yak etc.)			40.7

	Commercial dairy farms (Number)								
1.9	**Poultry**	**No. of farms**			**Total No. of birds ('number)**				
	Commercial				3449537				
	Backyard				2347716				
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**			
		49		7		572			
	B. Culture								
		Water Spread Area (ha)		**Yield (t/ha)**		**Production ('000 tons)**			
	i) **Brackish water** (Data Source: MPEDA/ Fisheries Department)	-		0.000		0			
	ii) **Fresh water** (Data Source: Fisheries Department)	78		0.004		0.322			
	Others					27.852			

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)										
Crop 1	Paddy	516	3166	474	3207	---	---	990	3183	
Crop 2	Cotton	228	365	---	---	---	---	228	365	

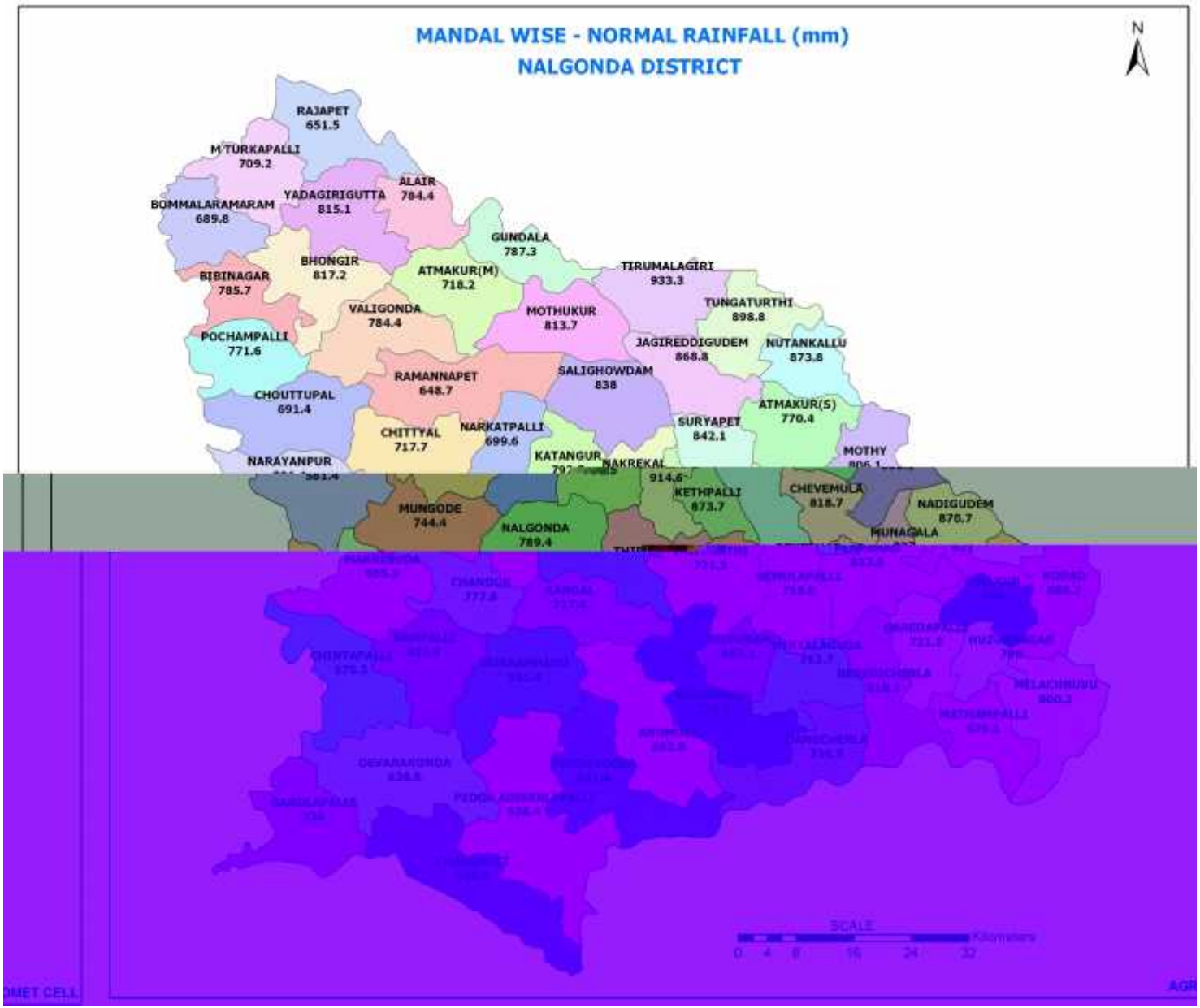
Crop 3	Castor	20	501	---	---	---	---	20	501	
Crop 4	Redgram	18	487	---	---	---	---	18	487	
Crop 5	Green gram	18	406	---	---	---	---	18	406	
Others										
Major Horticultural crops (Crops to be identified based on total acreage)										
	Horticulture crops - Fruits									
1	Orange&Batavian							782.2	12372	
2	Mango							133.4	8267	
3	lemon							184.1	14667	
	Horticultural crops - Vegetables									
1	Bhendi							24.5	14333	

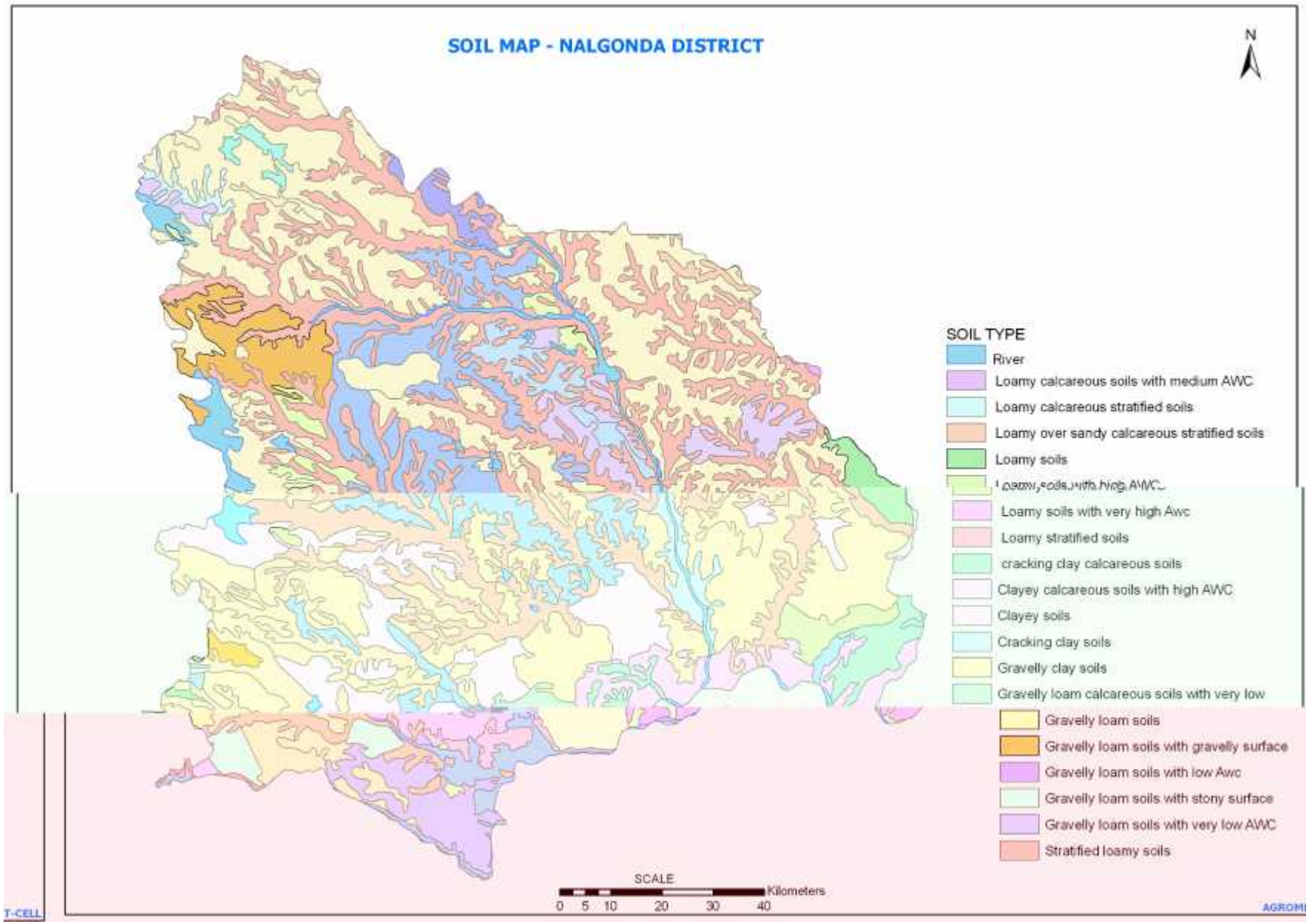
1.12	**Sowing window for 5 major field crops (start and end of normal sowing period)**	**Paddy**	**Cotton**	**Castor**	**Red gram**	**Green gram**
	Kharif- Rainfed	---	July 1st fortnight – July 2nd fortnight	4th Week of June to 2nd week of July	4th Week of June to 2nd week of July	2nd FN of June
	Kharif-Irrigated	2nd FN of June to 2nd FN of July	---	---	---	---
	Rabi- Rainfed	---	---	---	September 1st fortnight – October 1st fortnight	---
	Rabi-Irrigated	December 2nd fortnight – January 1st fortnight	---	---	1st FN of Oct	---

1.13	**What is the major contingency the district is prone to?**	Regular	occasional	Never
	Drought	√		
	Flood			√

	Cyclone			√
	Hail storm			√
	Heat wave			√
	Cold wave		√	
	Frost			√
	Sea water intrusion			√
	Pests and diseases	Rice: Blast Redgram: Maruca and Helicoverpa Cotton: Sucking pest complex Blackgram : YMV		

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


MANDAL WISE - NORMAL RAINFALL (mm)
NALGONDA DISTRICT
N
RAJAPET
651.5
M.TURKAPALLI
709.2
BOMMALARAMARAM
689.8
YADAGIRIGUTTA
815.1
ALAIR
784.4
GUNDALA
787.3
BHONGIR
817.2
BIBINAGAR
785.7
ATMAKUR(M)
718.2
TIRUMALAGIRI
933.3
VALIGONDA
784.4
MOTHUKUR
813.7
TUNGATURTHI
898.8
POCHAMPALLI
771.6
JAGIREDDIGUDEM
868.8
NUTANKALLU
873.8
RAMANNAPET
648.7
SALIGHOWDAM
838
CHOUTTUPAL
691.4
ATMAKUR(S)
770.4
CHITTYAL
717.7
NARKATPALLI
699.6
SURYAPET
842.1
KATANGUR
NAKREKAL
914.6
MOTHY
NARAYANPUR
KETHPALLI
873.7
CHEVEMULA
818.7
NADIGUDEM
876.7
MUNAGALA
MUNGODE
744.4
NALGONDA
789.4
SCALE
Kilometers
0 4 8 16 24 32


SOIL MAP - NALGONDA DISTRICT
N
SOIL TYPE
River
Loamy calcareous soils with medium AWC
Loamy calcareous stratified soils
Loamy over sandy calcareous stratified soils
Loamy soils
Loamy soils with very high Awc
Loamy stratified soils
cracking clay calcareous soils
Clayey calcareous soils with high AWC
Clayey soils
Cracking clay soils
Gravelly clay soils
Gravelly loam calcareous soils with very low
Gravelly loam soils
Gravelly loam soils with gravelly surface
Gravelly loam soils with low Awc
Gravelly loam soils with stony surface
Gravelly loam soils with very low AWC
Stratified loamy soils
SCALE
Kilometers
0 5 10 20 30 40

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system[c]**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks (June 4rd week)	Shallow Red-chalka Soils	Cotton	No change		
		Redgram +Greengram			
		Castor			
	Medium black soils	Cotton			
		Redgram			
		Greengram			

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 4 weeks **(July 2nd week week)**	Shallow Red-chalka Soils	Cotton	No change	Adopt closer spacing for cotton (90x60 cm) and redgram 150 cm.	
		Red gram			
		Castor			
		Greengram			
	Medium balck soils	Cotton			
		Red gram			
		Greengram			

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 6 weeks (July 3rd Week)	Shallow Red-Chalka Soils	Cotton	No change	Adopt closer spacing for cotton (90x45 cm)	
		Redgram	Redgram + Greengram (5:1)		
		Castor	No change		
		Greengram			
	Medium – Heavy soils	Cotton		Adopt closer spacing of 90 x 60 and 90 x 45 cm. .	
		Redgram	Redgram + Greengram (5:1)		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation[e]**
Delay by 8 weeks (August 2st week)	Shallow Red-Chalka Soils	Cotton	Repalce with crops like Castor, Jowar, Bajra, Ragi, Sunflower and Horsegram and Cowpea.	Follow recommended package of practices of these crops	
		Redgram	No change	Adopt reduced row spacing from 180 cm to 120 cm	
		Castor	No change	Adopt reduced row spacing 90X30 cm	
		Greengram	Replace with Horsegram and Cowpea		Linkage with NFSM for seed supply.
	Medium – Heavy soils	Cotton	Replace with Sunflower		
		Redgram	No change	Adopt reduced row spacing 180 cm to 120 cm	

Condition			Suggested Contingency measures		
Early season drought **(Normal onset)**	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Shallow Red-Chalka Soils	Cotton	Gap filling to be done by pot watering 7- 10 days after sowing if crop stand is poor	Intercultivation	
		Redgram, Castor, Greengram			
	Medium – Heavy soils	Cotton	Gap filling to be done by pot watering 7- 10 days after sowing if crop stand is poor		
		Redgram (sole crop)			
		Greengram	-	-	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At vegetative stage	Shallow Red-Chalka Soils	Cotton	Sucking pest (Jassid) management with stem application of insecticides 1:4 or 1:20(Imidacloprid)	1. Interculture 2. Spray 2 % urea solution or 1 % water soluble fertilizers like 19-19-19 / 20-20-20/ 21-21-21	
		Redgram (sole crop)		Intercultivation Spray 2 % urea solution or 1 % water soluble fertilizers like 19-19-19 / 20-20-20/ 21-21-21	

		Castor		Adopt nipping to allow main spike to develop Intercultivation Spray 2 % urea solution or 1 % water soluble fertilizers like 19-19-19 / 20-20-20/ 21-21-21	
		Greengarm		Spray 2 % urea solution or 1 % water soluble fertilizers like 19-19-19 / 20-20-20/ 21-21-21	
	Medium – Heavy soils	Cotton	Sucking pest management with stem application	Intercultivation Spray 2 % urea solution or 1 % water soluble fertilizers like 19-19-19 / 20-20-20/ 21-21-21	
		Redgram (sole crop)		Intercultivation Spray 2 % urea solution or 1 % water soluble fertilizers like 19-19-19 / 20-20-20/ 21-21-21	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At reproductive stage	Shallow Red-Chalka Soils	Cotton	Sucking pest management with stem application	35 kg urea + 15 kg MOP as top dressing Intercultivation to create soil mulch to conserve moisture. Give Supplemental irrigation (5cm) if available	Introduce farm ponds (NREGA) to store rain water. Recycle stored water through low lift pumps.
		Redgram	Leaf roller and *Maruca* - spray Chlorpyriphos @ 2.5 ml + Dichlorvos @ 1 ml per litre of water	--	
		Castor	Nipping of auxiliary buds to allow the main spike to mature	Intercultivation Foliar spray of urea 2 % or KNO_3 1% or other water soluble fertilizers 1 % to supplement nutrition	
		Greengarm	-	Spray urea - 2 % or KNO_3 1% or other water soluble fertilizers 1 % to supplement nutrition	
	Medium – Heavy soils	Cotton, Redgram	-	Intercultivation Spray urea - 2 % or KNO_3 1% or other water soluble fertilizers 1 % to supplement nutrition	

Condition			Suggested Contingency measures		
Terminal drought	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
	Shallow Red-Chalka Soils	Cotton, Redgram	Topping to prevent formation of new vegetative and reproductive flush	Spray urea - 2 % or KNO_3 1% or other water soluble fertilizers 1 % to supplement nutrition	
		Castor	Nipping of axiliary buds to allow the main spike to mature	Foliar spray of urea 2 % or KNO_3 1% or other water soluble fertilizers 1 % to supplement nutrition	
		Greengram	Select the varieties with short duration if terminal drought is a common phenomenon in the region (LGG-460, MGG-348)	Spray urea - 2 % or KNO_3 1% or other water soluble fertilizers 1 % to supplement nutrition	
	Medium – Heavy soils	Cotton, Redgram	Topping to prevent formation of new vegetative and reproductive flush Supplemental irrigation if available	Spray urea - 2 % or KNO_3 1% or other water soluble fertilizers 1 % to supplement nutrition	

2.1.2 Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delayed release of water in canals due to low rainfall	Red Soils/Black Soils – Canal irrigated (NSP Command)	Paddy	Greengram - Rice	Greengram preceding rice. Cultivate medium and short duration varieties like Tellahamsa, JGL-384, MTU-1010 and IR-64.	

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
				Transplant aged seedling with recommended management practices of aged seedlings.	

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Limited release of water in canals due to low rainfall	Red Soils/Black Soils – Canal irrigated (NSP Command	Green manure - Rice	1. No change (or) 2. Greengram /Sunflower		

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Non release of water in canals under delayed onset of monsoon in catchment	Red Soils/Black Soils – Canal irrigated (NSP Command	Green manure - Rice	Rainfed crops like, Jowar, Bajra, Ragi, castor Sunflower and fodder	If Green manure crops sown it should be incorporated in to the soil	

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Red Soils/Black Soils – Canal irrigated (NSP Command)	Rice	Greengram - Rice	1. Greengram preceding rice. 2.Medium and short duration varieties like Tellahamsa, JGL-384, MTU-1010 and IR-64. 3. Transplant aged seedling	

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
				with recommended management practices of aged seedlings. 4. Direct seeding with short and medium duration varieties.	

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	Red chalka soil (non command)	Rice (bore well)	Rainfed crops like Greengram, Jowar, Cator crops		

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 (or) high speed winds in a short span				
Crop	**Suggested contingency measure at different stages of crop**			
	Vegetative stage	**Flowering stage**	**Crop maturity stage**	**Post harvest**
Rice	1. Drain excess water as early as possible 2. Apply 10 kg N + 10 kg K /acre after draining excess water 3. Take up gap filling either with available nursery or by splitting the tillers from the surviving hills 4. Take up weed control Measures 5. Take up suitable plant protection measures	1. Drain excess water as early as possible 2. Apply 10 kg N + 10 kg K /acre after draining excess water 3. Take up suitable plant protection measures in anticipation of pest & disease out breaks(Spray COC 3 g/l or mancozeb 2.5g/l to avoid incidence of false smut)	1. Drain excess water as early as possible 2. Take up suitable plant protection measures in anticipation of pest & disease out breaks(Spary Hexaconazole 2ml/l or Carbendazim 1 g/l to avoid brown spot or grain discolouration) (Spary Hexaconazole 2ml/l or Carbendazim 1 g/l to avoid brown spot or grain discolouration)	1. Drain out water and spread sheaves loosely in field or field bunds where there is no water stagnation 2. Spray common salt at 3% on panicles to prevent germination and spoilage of straw from fungus 3. Thresh after drying the sheaves properly 4. Ensure proper grain moisture (Specify %) before storing

Cotton	1. Drain the excess water as early as possible 2. Apply 20 kg N + 10 kg K /acre after draining excess water 3. Take up inter cultivation at optimum soil moisture condition to loosen and aerate the soil and to control weeds 4. To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 @ 1% to support nutrition 5. Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals 6. Take up timely control measures against the out break of pests like Spodoptera, Helicoverpa etc.	1. Drain the excess water as early as possible 2. Apply 20 kg N + 10 kg K /acre after draining excess water 3. To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition 4. Spray fungicides like copper oxy chloride 0.3 % or carbendazim 0.1 % or mancozeb 0.25% two to three times by rotating the chemicals 5. Take up timely control measures against the out break of pests like Spodoptera, Helicoverpa etc.	1. Drain the excess water as early as possible 2. Spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition 3. Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals 4. Take up timely control measures against the out break of pests like Spodoptera, Helicoverpa etc.	1. Dry the produce properly before packing and sending to market
Redgram	1. Drain excess water as early as possible 2. Apply 20 kg N + 10 kg K /acre after draining excess water 3. Take up inter cultivation at optimum moisture condition to loosen and aerate the soil and to control weeds 4. To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition 2. Lift the lodged plants if any and firm up the soil around the base of the stem 3. Apply 4-5 kg N /acre after draining excess water	1. Drain excess water as early as possible 2. To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition 3. Take up timely control measures against the out break of pests like Spodoptera, Helicoverpa etc. 4. Lift the lodged plants if any and firm up the soil around the base of the stem 5. Apply 4-5 kg N /acre after draining excess water	1. Drain excess water as early as possible 2. Allow the crop to dry completely before harvesting 2. Harvest the crop as soon as the field condition permits and transport to drying floor	1. Spread the bundles drenched in rain on field bunds or drying floors to quicken the drying 2. Thresh the bundles after they are dried properly 3. Dry the grain to proper moisture per cent before bagging and storing to prevent deterioration in quality during storage
Castor	1. Drain excess water as	1. Drain excess water as	1. Drain excess water as	1. Spread the harvested

	early as possible 2. Apply 20 kg of N and 10 Kg of K /acre after draining excess water 3. To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition 4. Spray fungicide Carbendazim 0.1 % two to three times. 5. Take up timely control measures against the out break of pests like *Spodoptera* etc.	early as possible 2. Apply 20 kg of N and 10 Kg of K /acre after draining excess water 3. To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition 4. Spray fungicide Carbendazim 0.1 % two to three times. 5. Take up timely control measures against the out break of pests like *Spodoptera* etc.	early as possible 2. Allow the crop to dry completely before harvesting 3. Spray fungicide Carbendazim 0.1 %	capsule heaps drenched in rain on drying floors to quicken the drying 2. Dry the capsules properly to proper moisture per cent before bagging and storing to prevent deterioration in quality during storage
Greengram	1. Drain the excess water as early as possible 2. Apply 4-5 kg N /acre after draining excess water 3. To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition 5. Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals 6. Take up timely control measures against the out break of pests like *Spodoptera* etc.	-do-	1. Drain excess water as early as possible 2. Allow the crop to dry completely before harvesting	1. Spread the bundles drenched in rain on field bunds or drying floors to quicken the drying 2. Thresh the bundles after they are dried properly 3. Dry the grain to proper moisture per cent before bagging and storing to prevent deterioration in quality during storage
Horticulture crops - Fruits				
Orange &Batavian	• 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	• 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		

	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 endsmust be smeared with Bordeaux paste	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. • Wind damaged branches should be pruned using disinfected secaetures and cut endsmust be smeared with Bordeaux paste	• Drain the excess water as soon as possible • Spray 1% KNO3 or Urea 2% solution 2-3 times.		
lemon	• 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 endsmust be smeared with	• 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.		

	Bordeaux paste			
Horticultural crops - Vegetables				
Bhendi	• 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 alternative crop must be taken up. • Intercultivate the soil with gorru for better aeration • Spray ferrous sulphate 20g + citric acid 5g in 10 lit of water twice at weekly intervals	• 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.	• Drain the excess water as soon as possible • Spray Urea 2% solution once.	• 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.
Outbreak of pests and diseases due to unseasonal rains				
Crop	**Suggested contingency measure**			
Rice	Stem rot and Sheath blight - need based plant protection measures to be initiated based on incidence levels	BPH, Blast, Sheath blight incidence may increase due to unseasonal rains - need based plant protection measures to be taken up	Climbing cutworm and neck blast can occur	Discoloration of grain due to fungal incidence, proper drying recommended.
Cotton	Jassids, Wilt and root rot, Bacterial leaf blight - Need based plant protection measures to be initiated	Jassids, *Spodoptera*, Wilt and root rot, Bacterial leaf blight, Grey mildew - Need based plant protection measures to be taken up	Dusky cotton bug, Grey mildew - Need based plant protection measures to be taken up	Dry the seed cotton properly after picking and store it under shade in aerated place
Redgram	Wilt and root rot - Need based plant protection measures to be initiated	Wilt and root rot. Need based plant protection measures to be taken up	Wilt and root rot. Need based plant protection measures to be taken up	Dry the grain to optimum seed moisture content (8 %) to avoid damage in storage

Castor	Jassids, wilt, Bihar hairy caterpillar, Castor semi looper , and spodoptera – - Need based plant protection measures to be initiated	Botrytis, Wilt, Bihar hairy caterpillar, Castor grey rot, semi looper, capsule borer and Spodoptera - Need based plant protection measures to be taken up	Grey rot, Capsule borer, Botrytis, and wilt- Need based plant protection measures to be taken up	Dry the capsule to optimum moisture content (9-10 %) to avoid damage in storage
Greengram	Spodoptera - Need based plant protection measures to be initiated	Spodoptera, Leaf spots, Powdery mildew - Need based plant protection measures to be taken up	Spodoptera, Rust - Need based plant protection measures to be taken up	Dry the grain to optimum seed moisture content (8 %) to avoid damage in storage

2.3 Floods

Condition	**Transient water logging/ partial inundation[1] (or) Continuous submergence for more than 2 days**			
	Suggested contingency measure[o]			
Crop	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Rice	1. Drain out excess water at the earliest 2. Apply booster dose of 0.2 kg N/40 sq. m 3. Spray micronutrients like Zn, Fe two to three times at 4 -5 days interval 4. Takeup proper weed control measures	1. Drain out excess water at the earliest 2. Take up gap filling either with available nursery or by splitting the tillers from the surviving hills 3.Apply a booster dose of 20 kg N/acre 4. Spray $ZnSO_4$ 0.2 % if it is less than 45 days after transplanting 5. Takeup need based plant protection measures	1. Drain out excess water at the earliest 2. Takeup need based plant protection measures	1. Drain out water. 2.Spread sheaves loosely in field or field bunds where there is no water stagnation 3. Spray common salt at 3% on panicles to prevent germination and spoilage of straw from moulds 4. Thresh after drying the sheaves properly 5. Ensure proper grain moisture before storing
Cotton	• Drain the excess water as early as possible in black soils • Apply 20 kg N + 10 kg K /ha after draining excess water • Take up inter cultivation at optimum soil moisture condition to loosen and aerate the soil and to control weeds	• Drain the excess water as early as possible • Apply 20 kg N + 10 kg K /ha after draining excess water • To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition	• Drain the excess water as • early as possible • To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition • Spray fungicides like	• Dry the produce properly before baling and sending to market

	• To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 @ 1% to support nutrition • Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals • Take up timely control measures against sucking pests	• Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals to control Bacterial leaf blight, wilt alternaria leaf spot and grey mildew • Take up timely control measures against sucking pets and bollworms.	Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% against boll not. • Take up timely control measures against bollworms and whitefly	
Redgram	• Drain the excess water as early as possible • Apply 20 kg N + 10 kg K /acre after draining excess water • Take up inter cultivation at optimum soil moisture status to loosen and aerate the soil and to control weeds • To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition	• Drain the excess water as early as possible • To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition • Take up timely control measures against possible outbreak of pod borer complex, maruca , Helicovera etc.	• Drain the excess water as early as possible • Allow the crop to dry completely before harvesting	• Spread the bundles drenched in rain on field bunds or drying floors to quicken the drying • Thresh the bundles after they are dried properly • Dry the grain to proper moisture per cent before bagging and storing to prevent deterioration in quality during storage
Castor	1. Drain out excess water at the earliest 2. Inter cultivate at optimum field moisture condition 3. Apply 20 kg N/acre after draining excess water	1. Drain out excess water at the earliest 2. Inter cultivate at optimum field moisture condition 3. Apply 20 kg N/acre after draining excess water	1. Drain out excess water at the earliest 2. Take up plant protection measures against possible pests and disease incidence	1. Drain out excess water at the earliest 2. Harvest the crop when the field condition permits 3. Drying of capsules should be done on elevated places like filed bunds or drying floors
Greengram	1. Drain out excess water at the earliest 2. Takeup the gap filling at the earliest 3. Takeup weed control either	1. Drain out excess water at the earliest 2. Takeup weed control either	1. Drain out excess water at the earliest 2. Apply 4-5 kg N/acre after	1. Drain out excess water at the earliest 2. Harvest the crop after the

	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	mechanically or through weedicides 3. Apply 4-5 kg N/acre after draining excess water 4. To spray KNO_3 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	draining excess water 3. To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition 4. Take up plant protection measures against possible pest and disease incidence	fields are dried up
Horticulture crops - Fruits				
Orange & Batavian	• 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 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. • 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 as soon as possible. • Store the fruits in well ventilated place temporarily before it can be marketed. • Market the fruits as soon as possible.
Mango	-do-			
Lemon				
Horticulture vegetables				
Bhendi		• Drain the excess water as soon as possible • Spray Urea 2% solution 2-3 times.	• Drain the excess water as soon as possible • Spray Urea 2% solution once.	• Drain the excess water as soon as possible. • Harvest the mature produce as soon as

		• Topdressing of booster dose of 10 kg MOP + 30 kg Urea per acre as soon as possible. • Gap filling may be taken up if the plants are two weeks old and sowing window is still available for the crop. • In case of severe damage (considered as complete economical loss), and the contingency period is between June to August, go for resowing		possible. • Store the produce in well ventilated place temporarily before it can be marketed. • Market the produce as soon as possible.

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

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Cold wave				
Paddy (Rabi)	1. Apply Phosphorus fertilizer in the form as SSP to nursery bed. 2. Water management – Let off water during evenings and irrigate during morning hours 3. Cover the nursery with Polythene sheet during night hours.	1. Apply Phosphorus fertilizer in the form as SSP to main field. 2. Apply 20 Kg ZnSo4 per acre and if deficiency noticed foliar application of 0.2% ZnSo4 2-3 times at weekly intervals. 3. Water management – Let off water during evenings and irrigate during morning hours.	----	----
Cyclone				
Rice	1. To drain out the excess water at the earliest 2. Apply booster dose of 0.2 kg N/40 sq. m 3. Spray micronutrients like Zn, Fe 2-3 times at 4 -5 days interval 4. Take up weed control.	1. To drain out the excess water at the earliest 2.Apply booster dose of 20 kg N/Acre 3. Spray $ZnSO_4$ 0.2 % if it is less than 45 days after transplanting 4. Takeup need based plant protection measures	1. To drain out the excess water at the earliest 2. Takeup need based plant protection measures 3. Lodged plants to be lifted and tied together to make them erect	1. Drain out water spread sheaves loosely in field or field bunds where there is no water stagnation 2. Spray common salt at 3% to prevent germination of seed and spoilage of straw from moulds 3. Thresh after drying the sheaves properly 4. Ensure proper grain moisture before storing
Cotton	1. To drain out the excess water at the earliest 2. Inter cultivate at optimum field moisture condition 3. Apply 20 kg N + 10 kg K /acre after draining excess water	1. To drain out excess water at the earliest 2. Inter cultivate at optimum field moisture condition 3. Earhting up to be done to provide anchorage to plants 4. Apply 20 kg N + 10 kg K /acre after draining excess water	1. To drain out excess water at the earliest 2. To spray KNO_3 @1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 @ 1% to support nutrition 3. Earhting up to be done to provide anchorage to plants	1. Kapas picking should be done carefully to prevent admixtures with waste plant material

		5. To spray KNO_3@1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 @ 1% to support nutrition 6. Spray of micronutrients two times at 7-10 days interval 7. Take up plant protection measures against possible pests and disease incidence	4. Spray of micronutrients two times at 7-10 days interval 5. Take up plant protection measures against possible pests and disease incidence	
Redgram	1. To drain out excess water at the earliest 2. Inter cultivate at optimum field moisture condition 3. Apply 4-5 kg N/acre after draining excess water	1. To drain out excess water at the earliest 2. Inter cultivate at optimum field moisture condition 3. Apply 4-5 kg N/acre after draining excess water	1. To drain out excess water at the earliest 2. To spray $KNO_{3@}$ 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 @ 1% to support nutrition 3. Take up plant protection measures against possible pests and disease incidence	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
Castor	1. To drain out excess water at the earliest 2. Inter cultivate at optimum field moisture condition 3. Apply 20 kg N and 10 Kg MOP /acre after draining excess water	1. To drain out excess water at the earliest 2. Inter cultivate at optimum field moisture condition 3. Apply 20 kg N and 10 Kg of MOP /acre after draining excess water	1. To drain out excess water at the earliest 2. Take up plant protection measures against possible pests and disease incidence	1. To drain out the excess water at the earliest 2. Harvest the crop when the field condition permits 3. Drying of capsules should be done on elevated places like filed bunds or drying floors
Greengram	1. To drain out 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	1. To drain out 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 KNO_3 @1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 @ 1% to support nutrition 5. Take up plant protection measures against possible pests and disease incidence	1. To drain out excess water at the earliest 2. Apply 4-5 kg N/acre after draining excess water 3. To spray KNO_3 @1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 @ 1% to support nutrition 4. Take up plant protection measures against possible pests and disease incidence	1. Drain out the excess water at the earliest 2. Harvest the crop after the fields are dried up
Horticulture crops - Fruits				

Orange & Batavian	• 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-			
Lemon				
Horticulture crops - vegetables				
Bhendi		• 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 alternative crop must be taken up. • Intercultivate the soil with gorru for better aeration • Spray ferrous sulphate 20g + citric acid 5g in 10 lit of water twice at	• 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. • Spray ferrous sulphate 20g + citric acid 5g in 10 lit of water twice at weekly intervals	• 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

		weekly intervals		

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

General contingency measures

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

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

2.5.1 Detailed Contingent strategies for Livestock

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Drought			
Feed and Fodder availability	Establishment of silvi-pastoral system in CPRs with ***Stylosanthus hamata*** and ***Cenchrus ciliaris*** as grass with ***Leucaena leucocephala*** as tree component Top dressing of N in 2-3 split doses @ 20-25 kg N/ha in common property resources (CPRs) like temple lands, panchyat lands or private property resources (PPRs) like waste and degraded lands with the monsoon pattern for higher biomass production Promote cultivation of short duration fodder crops of	Harvest and use biomass of dried up crops (Paddy, groundnut, greengram, jowar, bajra, ragi and 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	Concentrates supplementation should be provided to all the animals. The farmers may be advised to practice "flushing the stock" to recoup Short duration

	sorghum/bajra/maize(UP chari, MP chari, HC-136, HD-2, GAINT BAJRA, L-74, K-677, Ananad/African Tall, Kisan composite, Moti, Manjari, B1-7 and also sunhemp Chopping of fodder should be made as mandatory in every village through supply and establishment of good quality chaff cutters. Harvesting and collection of perennial vegetation particularly grasses which grow during monsoon Proper drying, bailing and densification of harvested grass from previous season Creation of permanent fodder, feed and fodder seed banks in all drought prone villages	UMMB, hay, concentrates and vitamin & mineral mixture should be transported to the needy areas from the reserves at the district level initially and latter stages from the near by districts. Hay should be enriched with 2% Urea molasses solution or 1% common salt solution and fed to LS Herd should be split and supplementation should be given only to the highly productive and breeding animals Provision of emergency grazing/feeding (Cow-calf camps or other special arrangements to protect high productive & breeding stock) Motivate the farmers to mix the dry fodder with available kitchen waste 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 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	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
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	Constitution of Rapid Action Veterinary Force Procurement of emergency medicines and medical kits	Conducting mass animal health camps Conducting fertility

	schedule) against all endemic diseases Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district	Performing ring vaccination (8 km radius) in case of any outbreak Restricting movement of livestock in case of any epidemic Close observation of animals for heat symptoms	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	**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 cool drinking water	

Health and disease management	Culling of sick birds. Deworming and vaccination against RD and fowl pox	Mixing of Vit. A,D,E, K and B-complex including vit C in drinking water (5ml in one litre water)	Hygienic and sanitation of poultry house Disposal of dead birds by burning / burying with lime powder in pit

2.5.1 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
1) Drought			
A. Capture			
Inland			
(i) Shallow water depth due to insufficient rains/inflow	Stocking of advnced fingerlings in half or even less than the normal stocking density or stocking of common carp seed	Immediate harvesting or decreasing the density commensurate with the water quantity.	De weeding and deepening of tank to ensure retention of water for a longer period and provision of employment under MGNREGP
(ii) Changes in water quality	Regular monitoring of water quality parameters and application of geolites, soil probiotics, etc to maintain water qaulity	Immediate harvesting or changing the water quality by application of sanitisers.	Removal of top layer, deep ploughing of tank and application of lime
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	Crop holiday or going for stocking of yearlings by reducing the density according to availability of water	Harvesting of fish and leaving the pond fallow till next season	Removal of top layer, deep ploughing of tank and application of lime
(ii) Impact of salt load build up in ponds / change in water quality	Stocking of salinity tolerant fish / shrimp, application of geolites and other buffers	Frenquent change of water with fresh water	Frequent draining of the pond with fresh water, removal of top layers
2) Floods			
A. Capture			
Inland			
(i) Average compensation paid due to loss of human life	Shifting the people from low lying areas to relief camps	Deployment of specially trained persons for rescue operations by providing life bouys, jackets, ropes, boats, etc	Payment sufficient ex-gratia to the families

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

chemicals etc)	of bunds where they are prone to breaches, harvesting or reducing the density	of organic manures	of values and payment of subsidy on inputs
(v) Infrastructure damage (pumps, aerators, huts etc)	Insuring pond, accessories, etc., Shifting of aerators, pumps soon after warnigs are issued	Relocating pumps, aerators to elevated places	Assessment of damages and provision of them on subsidy
4. Heat wave and cold wave			
A. Capture			
Inland	Monitoring dissolved oxygen levels	Monitoring dissolved oxygen levels	No intervention
B. Aquaculture			
(i) Changes in pond environment (water quality)	Reduction of biomass by partial harvest in the event of heat as the DO levels will be very low.	Avoidance of fishing	Compensatory stocking of seed and restoration of all physical and chemical parameters
(ii) Health and Disease management	Removal of stress causing factors to maintain the health of the animal	Removal of stress causing factors to maintain the health of the animal	Compensatory stocking of seed and restoration of all physical and chemical parameters