State: ODISHA

Agriculture Contingency Plan for District: CUTTACK

1.0 District Agriculture profile					
1.1	**Agro-Climatic/Ecological Zone**				
	Agro Ecological Sub Region (ICAR)	Eastern Ghats hot moist sub-humid eco-sub-region(12.2)			
	Agro-Climatic Zone (Planning Commission)	East coast plain and hill region (XI)			
	Agro Climatic Zone (NARP)	East and south Eastern Coastal Plain Zone (OR -4)			
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Kendrapada,Khurda,Jagatsinghpur,parts of Cuttack,Puri,Nayagarh and parts of Ganjam			
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude	
		20° 03' to 20° 40'	84° 58' to 86° 20'	23.5m	
	Name and address of the concerned RRTTS	RRTTS, Bhubaneswar			
	Mention the KVK located in the district with address	KVK, Santhapur, At/Po-Uchapada, Via-Kotashai, Cuttack , Pin- 754 002			
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	CRRI,Cuttack-753006			
1.2	**Rainfall**	**Normal RF(mm)**	**Normal Rainy days (number)**	**Normal Onset (specify week and month)**	**Normal Cessation (specify week and month)**
	SW monsoon (June-Sep):	1389.42	49.0	June 2nd week	Sept. last week
	NE Monsoon(Oct-Dec):	207.68	8.0	Oct. last week	Dec. 2nd week
	Winter (Jan- Feb.)	36.08	2.9	Jan 3rd week	March last week
	Summer (March-May)	91.34	6.1	April 1st week	May last week
	Annual	1724.52	66.0		

***Source – SREP, ATMA Cuttack 2008-09**

1.3	Land use pattern of the district (latest statistics)	Geographical area	Cultivated 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)	393	157	79	10	11	10	11	10	31	1

*** Source -Orissa Agril. Statistic 2008-09**

1. 4	Major Soils (common names like red sandy loam deep soils (etc.,)*	Area ('000 ha)	Percent (%) of total
	Alluvial Red Laterite	98.82	52.56
	Laterite Alluvial	35.60	18.94
	Alluvial Laterite	23.88	12.70
	Red Laterite Alluvial	20.50	10.90
	Alluvial	09.20	04.89

*** mention colour, depth and texture (heavy, light, sandy, loamy, clayey etc) and give vernacular name, if any, in brackets *Source -SREP ATMA Cuttack 2008-09**

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	157	**197**
	Area sown more than once	164	
	Gross cropped area	309	

***Source- Orissa Agricultural statistic 2008-09**

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	97.43		
	Gross irrigated area	149.6		
	Rainfed area	59.57		
	Sources of Irrigation	**Number**	**Area ('000 ha)**	**Percentage of total irrigated area**
	Canals		81.58	72.05
	Tanks		-	-
	Open wells		2.60	2.30

	Bore wells		-	
	Lift irrigation schemes		19.14	16.91
	Micro-irrigation		-	
	Other sources (Water harvesting structure)		9.90	8.74
	Total Irrigated Area		113.22	
	Pump sets		*Source – SREP ATMA & line Dept.	
	No. of Tractors			
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	**No. of blocks/ Tehsils**	**(%) area**	**Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)**
	Over exploited	Nil	Nil	
	Critical	3		
	Semi- critical	3		
	Safe	8		
	Wastewater availability and use	Nil		
	Ground water quality			
***over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%**				

***Source- Orissa Agricultural statistic 2008-09 & SREP ATMA Cuttack 2008-09**

1.7 Area under major field crops & horticulture (as per latest figures) (year 2008-09)

1.7	**Major field crops cultivated**	**Area ('000 ha)**							
		Kharif			*Rabi*			Summer	
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		Grand total
	Paddy	88.34	40.06	128.4	4.66	-	4.66		133.06
	Black gram	-	1.35	1.35	1.98	44.3	46.28		47.63

	Greengram	-	0.31	0.31	11.34	28.25	39.59		39.90
	Groundnut	-	0.70	0.70	-	8.30	8.30		9.00
	Sugarcane	-	-	-	2.63	-	2.63		2.63
	Jute	-	1.76	1.76	-	-	-		1.76

***Source – Orissa Agril. Statisstic2008-09**

	Horticulture crops - Fruits	**Area ('000 ha)**
		Total
	Mango	3.08
	Cashewnut	1.87
	Banana	0.60
	Citrus	0.47
	Guava	0.18
	Horticulture crops - Vegetables	**Total**
	Chilli	3.89
	Potato	1.05
	Onion	0.92
	Sweet Potato	0.65
	Other vegetable	21.46
	Medicinal and Aromatic	**Total**

	crops	
	Amlla	
	Aloevera	
	Plantation crops	**Total**
	Coconut	4.91
	Cashew	187
	Eg., industrial pulpwood crops etc.	
	Fodder crops	Total
	Total fodder crop area	
	Grazing land	10375
	Sericulture etc	
	Others (specify)	

***Source- SREP ATMA Cuttack 2008-09**

1.8	**Livestock**	**Total ('000)**
	Non descriptive Cattle (local low yielding)	505.18
	Improved cattle	103.58
	Crossbred cattle	-
	Non descriptive Buffaloes (local low yielding)	44.91
	Descript Buffaloes	-
	Goat	278.11
	Sheep	88.34

	Others (Camel, Pig, Yak etc.)	2.62					
	Commercial dairy farms (Number)						
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**				
	Commercial		988.33				
	Backyard						
1.10	**Fisheries (Data source: Chief Planning Officer)**	***Source- SREP ATMA , Cuttack 2008-09 & Dept. of AH**					
	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**		
	B. Culture						
			Water Spread Area (ha)		**Yield (t/ha)**	**Production ('000 tons)**	
	i) Brackish water (Data Source: MPEDA/ Fisheries Department)						
	ii) Fresh water (Data Source: Fisheries Department)		**2615.19**		**2.72**	**3.117MT**	
	Others						

***Source: SREP ATMA, Cuttack 2008-09 & Dept. of fishery**

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

1.11	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder (‘000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
Major Field crops (Crops to be identified based on total acreage)										
	Paddy	198.41	1490	9.83	2147			208.24	1818.5	
	Blackgram	0.5	430	26.73	525			27.31	477.5	
	Greengram	-	-	19.2	485			15.85	1625.5	
	Groundnut	1.03	1465	14.82	1786			19.20	485	
	Sugarcane	-	-	174.2	55655			174.2	55655	
	Jute	16.3	1667	-	-			16.3	1667	
Major Horticultural crops (Crops to be identified based on total acreage)										
	Potato			**12.44**	**11798**			12.44	11798	
	Onion			6.64	7217			6.64	7217	
	Sweet potato	3.52	8000	1.81	8619			5.33	8200	
	Chilli	1.35	804	1.97	883			3.32	849	
	Garlic			2.61	3145			2.61	3145	
Others										

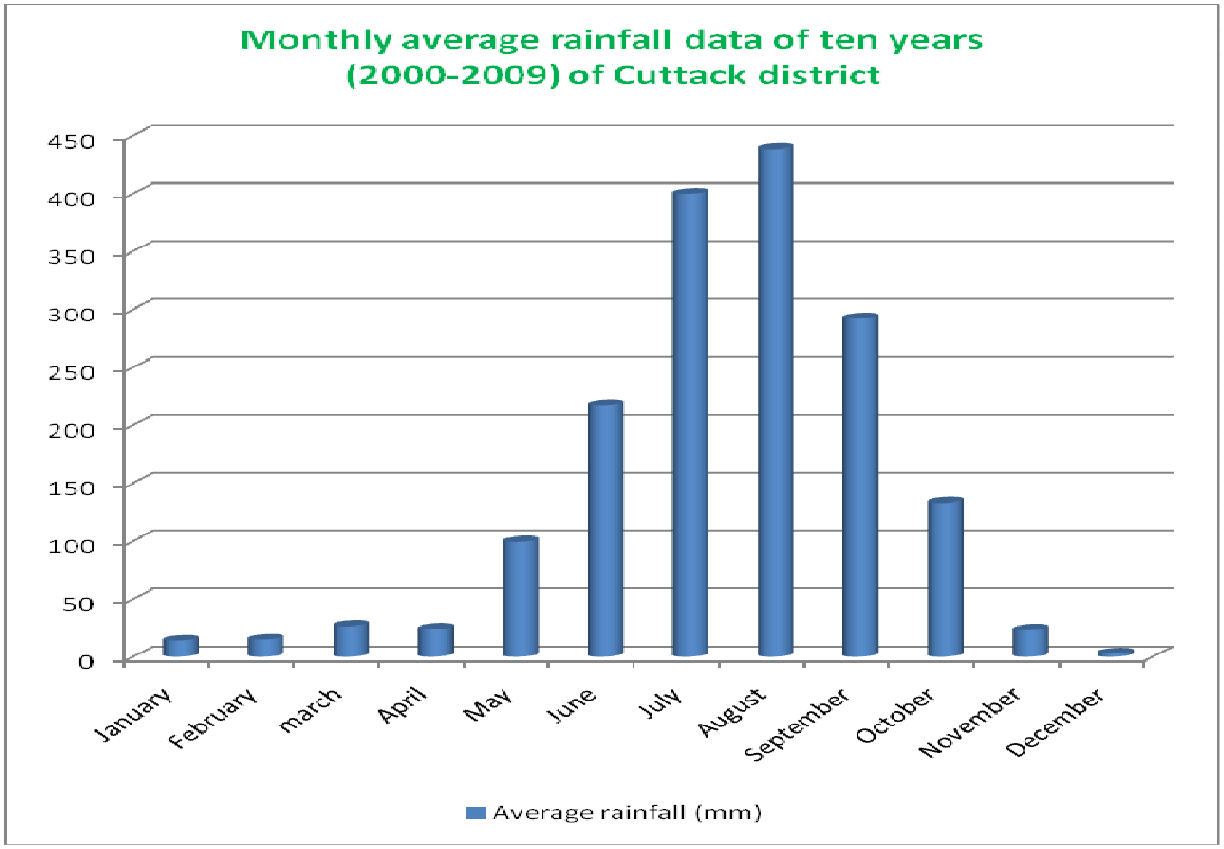
***Source : Orissa Agril. Statistic 2008-09**

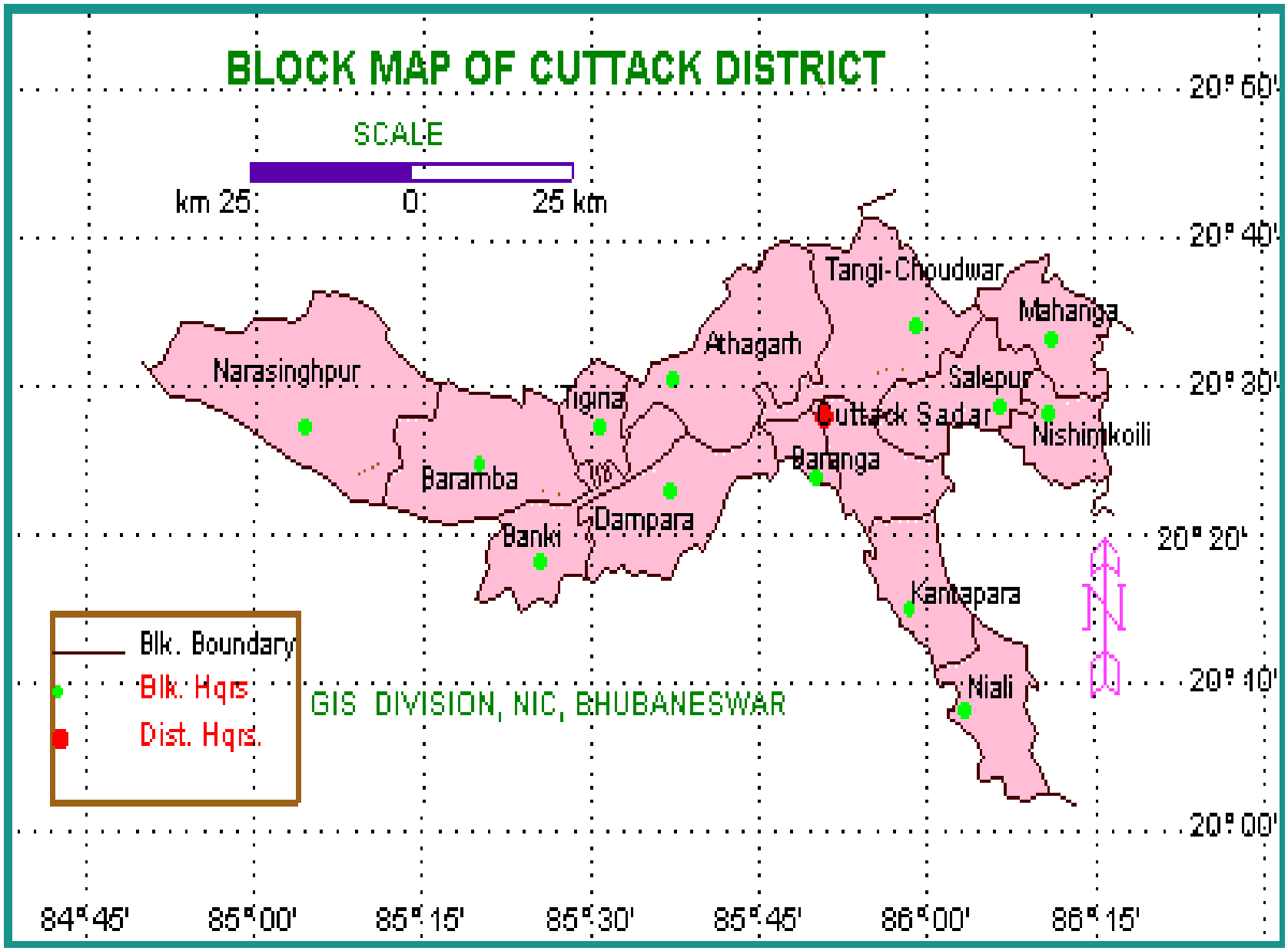
1.12	**Sowing window for 5 major field crops (start and end of normal sowing period)**	**Paddy**	**Blackgram**	**Greengram**	**Groundnut**	**Sugarcane**
	Kharif- Rainfed	May June	June-July	-	June-July	-
	Kharif-Irrigated	June – July	June-July	-	June-July	-
	Rabi- Rainfed	-	Dec – Dec	Nov – Dec	Nov – Dec	-
	Rabi-Irrigated	Dec – Jan	Jan – Jan	Nov – Nov	Nov – Nov	Dec -Feb

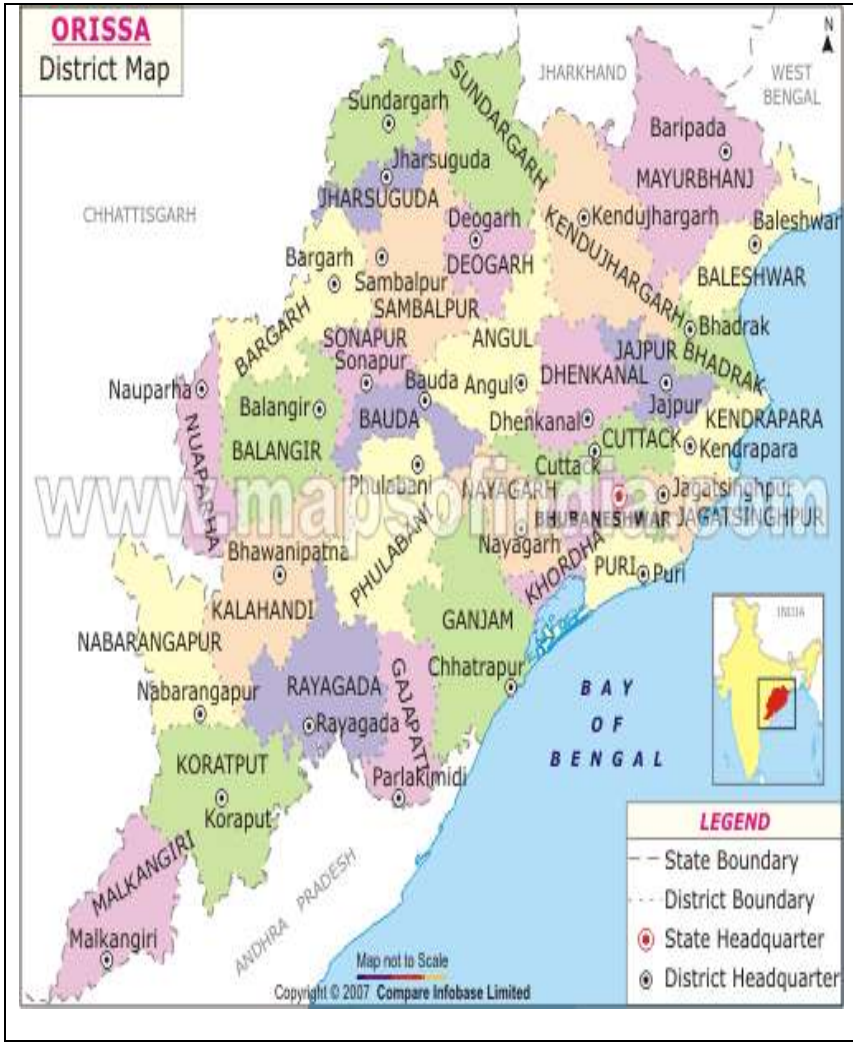
1.13	**What is the major contingency the district is prone to? (Tick mark)**	**Regular**	**Occasional**	**None**
	Drought		√	
	Flood		√	
	Cyclone		√	
	Hail storm		√	
	Heat wave	√		
	Cold wave			√
	Frost			√
	Sea water intrusion			
	Pests and disease outbreak (specify) Tobacco leaf eating cater pillar in greengram, sheath blight & blast in paddy	√	√	
	Sheath blight in paddy		√	
	Blast in paddy	√		
	Others (specify)			

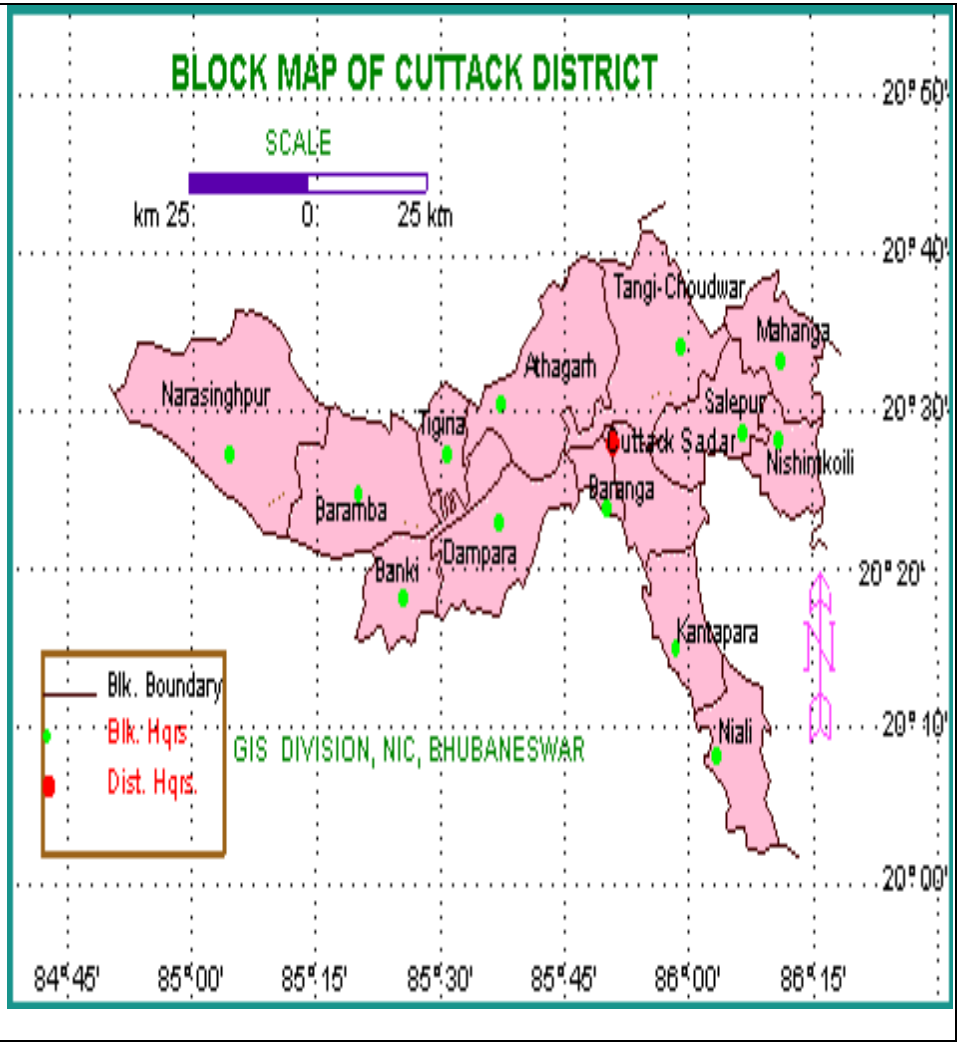
1.14	**Include Digital maps of the district for**	**Location map of district within State as Annexure I**	**Enclosed**
		Mean annual rainfall as Annexure 2	**Enclosed**

Figure 1 - Average Monthly Rainfall of Cuttack District




BLOCK MAP OF CUTTACK DISTRICT
SCALE
km 25
0
25 km
Tangi-Choudwar
Mahanga
Athagarh
Narasinghpur
Salepur
Tigiria
Cuttack Sadar
Nischintkoili
Baramba
Baranga
Dampara
Banki
Kantapara
Niali
Blk. Boundary
Blk. Hqrs.
Dist. Hqrs.
GIS DIVISION, NIC, BHUBANESWAR
N
20° 60'
20° 40'
20° 30'
20° 20'
20° 10'
20° 00'
84° 45'
85° 00'
85° 15'
85° 30'
85° 45'
86° 00'
86° 15'


ORISSA
District Map
JHARKHAND
WEST BENGAL
CHHATTISGARH
Sundargarh
Jharsuguda
JHARSUGUDA
Deogarh
DEOGARH
Bargarh
Sambalpur
SAMBALPUR
SONAPUR
Sonapur
Bauda
BAUDA
Balangir
BALANGIR
Nauparha
Phulabani
Bhawanipatna
KALAHANDI
NABARANGAPUR
Nabarangapur
RAYAGADA
Rayagada
KORATPUT
Koraput
MALKANGIRI
Malkangiri
ANDHRA PRADESH
Parlakimidi
GANJAM
Chhatrapur
Nayagarh
NAYAGARH
Cuttack
CUTTACK
Dhenkanal
DHENKANAL
ANGUL
Angul
Kendujhargarh
KENDUJHARGARH
Baripada
MAYURBHANJ
Baleshwar
BALESHWAR
Bhadrak
BHADRAK
JAJPUR
Jajpur
KENDRAPARA
Kendrapara
Jagatsinghpur
JAGATSINGHPUR
BHUBANESHWAR
PURI
Puri
KHORDHA
PHULABANI
NUAPARHA
BARGARH
SUNDARGARH
BAY OF BENGAL
Map not to Scale
Copyright © 2007 Compare Infobase Limited
LEGEND
State Boundary
District Boundary
State Headquarter
District Headquarter


BLOCK MAP OF CUTTACK DISTRICT
SCALE
km 25
0
25 km
Tangi-Choudwar
Mahanga
Athagarh
Narasinghpur
Tigiria
Salepur
Cuttack Sadar
Nischintkoili
Baramba
Baranga
Dampara
Banki
Kantapara
Niali
Blk. Boundary
Blk. Hqrs.
Dist. Hqrs.
GIS DIVISION, NIC, BHUBANESWAR
20° 50'
20° 40'
20° 30'
20° 20'
20° 10'
20° 00'
84° 45'
85° 00'
85° 15'
85° 30'
85° 45'
86° 00'
86° 15'

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] including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks (July 1st week)	Red laterite rain fed	Paddy - fallow	Paddy(Hira, Jaldidhan, Anjali, Vandana, Sneha	• Summer ploughing, inter tillage, conservation furow, in-situ rain water harvest / conservation • Strengthening of field bunds in paddy , weeding and hoeing within 20 days to provide dust mulch	NFSM, CLDP IWMP, RKVY, ISOPOM,
		Maize - Fallow	Maize (Kiran,Pratap, VL-16)	• Rain water harvesting and recycling • Life saving irrigation when needed	
	High rainfall light laterite	Maize - Fallow	Maize (Kiran,VL-16, Pratap)	➢ Summer ploughing, inter tillage, conservation furrow for in-situ rain water conservation ➢ Strengthening field bunds ➢ Apply lime @ 5.0qtl + 5.0 ton FYM per ha ➢ Sowing across the slope, ridge and furrow planting	
		Groundnut - Fallow	Groundnut (Devi, smruti)	➢ Broad bed and furrow planting in groundnut ➢ Hoeing within 20days to provide soil mulch and weeding ➢ Life saving irrigation as needed ➢ Application of Oxiflurofen @ 200gm/ha as PE spray or post emergence spray of Quizalofop Ethyle @ 0.05kg ai/ha to groundnut for weed control	NFSM, CLDP IWMP, RKVY, ISOPOM OCTMP, OCTMP

		Brinjal – Fallow	Brinjal(Green star)	➢ Hoeing weeding and ridging ➢ Organic mulch to brinjal	
	Rainfed alluvium	Paddy - Blackgram	➢ Paddy (Pooja ,Ranidhan, Gayatri for low land and Naveen, MTU 1001 for medium land) ➢ Blackgram (PU 30,PU 35)	➢ Strengthening field bunds , in-situ moisture conservation ➢ Raising bund height in paddy ➢ Blocking drainage holes ➢ Community nursery raising and transplanting 3-4 seedlings per hill	
		Jute - Blackgram	➢ Jute (Naveen, Basudev, JRO 524 ,Baladev) -Blackgram (PU 30,PU 35)	➢ weed control, thinning and 2% urea solution spray to jute Basal K & Bo application	
	Medium rainfall river valley alluvium	Paddy – Groundnut	➢ Paddy (Lalata, Naveen, Swarna, Pratikhya) – Groundnut (Devi,Smruti,TMV-2)	➢ Strengthening field bunds , in-situ moisture conservation ➢ Raising bund height in paddy ➢ Higher seed rate to direct seeded paddy ➢ Community nursery raising and transplanting 3-4 seedling per hill ➢ Blocking drainage hole	
		Jute – Groundnut	➢ Jute (Naveen, Basudev) - Groundnut (Devi,Smruti,TMV-2)	➢ weed control, thining and 2% urea solution spray to jute ➢ Basal K & Bo application	
	low laying flood prone	Local paddy	Paddy (Pooja, Varsadhan, Swarna Sub-1, Pratikhya)	➢ Strengthening field bunds, plugging drainage holes ➢ Transplanting 3-4 seedlings per hill	
		Blackgram	Blackgram(PU-30, PU-35)	Life saving irrigation at critical stages Pulse seed treatment with bio-fertiliser	

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 (up to July 3rd week)	Red laterite rainfed	Paddy	Paddy (KalingaIII, Hira, Jaldidhan	• Summer ploughing, inter tillage, conservation furow, in-situ rain water harvest / conservation • Strengthening of field bunds in paddy	NFSM, CLDP IWMP, RKVY, ISOPOM OCTMP, OCTMP
		Maize	Maize(Kiran, VL 16, Pratap)	• Weeding and hoeing within 20 days to provide dust mulch • Rain water harvesting and recycling • Life saving irrigation when needed	
	High rainfall light laterite	Maize	Maize (Kiran,VL 16,Pratap)	➢ Summer ploughing, inter tillage, conservation furrow for in-situ rain water conservation ➢ Strengthening field bunds ➢ Apply lime @ 5.0qtl + 5.0ton FYM per ha ➢ Sowing across the slope, ridge and furrow planting ➢ Hoeing ,weeding and ridging	
		Groundnut	Groundnut (Devi, Smruti)	➢ Broad bed and furrow planting in groundnut ➢ Hoeing within 20days to provide soil mulch and weeding ➢ Application of Oxiflurofen @ 200gm/ha as PE spray or post emergence spray of Quizalofop Ethyle @ 0.05kg ai/ha to groundnut for weed control	

		Brinjal	Brinjal(Greenstar) + Maize (Kiran, VL16) / Arhar (UPAS-120 /ICPL 87) (4:2)	➢ Organic mulch to brinjal ➢ Provide life saving irrigation when needed	
	Rainfed Alluvium	Paddy	Paddy (Pooja, Ranidhan, Swarna, Sarala, Padmini)	➢ Strengthening of field bunds , in-situ moisture conservation , raising bund heights in paddy ➢ Blocking drainage holes ➢ Community nursery raising and transplanting 3-4 seedling per hill	
		Jute	Jute (Naveen ,Baladev,Basudev)	➢ Weed control, thinning and 2% urea solution spray to jute ➢ Basal application of K and Bo ➢ Provide life saving irrigation	
		Paddy - Blackgram	➢ Paddy (Pooja, Ranidhan, Swarna, Sarala, Padmini) ➢ Blackgram(PU-30,PU-19)	➢ Strengthening of field bunds , in-situ moisture conservation , raising bund heights in paddy ➢ Blocking drainage holes ➢ Community nursery raising and transplanting 3-4 seedling per hill	
	Medium rainfall river valley alluvium	Paddy – Groundnut	➢ Paddy (Jogesh,Sidhhant, Lalata, Surendra, Konark, Khandagiri) – Groundnut (Devi,Smruti,TMV-2)	➢ Strengthening field bunds , in-situ moisture conservation , raising bund height in paddy ➢ Blocking drainage holes ➢ Higher seed rate to direct seeded paddy ➢ Community nursery raising and transplanting 3-4 seedling per hill	
		Jute – Groundnut	➢ Jute (Naveen, Basudev) - Groundnut (Devi,Smruti)	➢ Weed control , thining and 2% urea solution spray to jute ➢ Provide life saving irrigation	

	low laying flood prone	Local paddy - Blackgram	➢ Paddy (Pooja, Tulasi, Upahar, Varsadhan, Swarna Sub-1) – Blackgram-(PU-30, PU-19)	➢ Strengthening field bunds, plugging drainage holes, raising bund height ➢ Transplant 3-4 seedling per hill ➢ Life saving irrigation at critical stage s ➢ Raising community nursery and transplanting ➢ Pulse seed treatment with bio fertiliser	

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 (August 1nd week)	Red laterite rainfed	Paddy Maize	➢ Sesamum (Uma , ,Prachi, Nirmala) ➢ Cowpea(Utakala Manika, Pusa Barsati) ➢ Ricebean(RBL -6, KRB-1) ➢ Radish -Pusa Chetki ➢ Arhar (UPAS-120,ICPL-87) + Cowpea (2:2) / Sesamum(2:4)/ Radish(2:2)	➢ Summer ploughing, inter tillage, conservation furrow, in-situ rain water conservation ➢ Strengthening of field bunds, weeding and hoeing within 20 days to provide dust mulch ➢ Well decomposed FYM in seed rows. Ridge & forrow planting ➢ Spraying 2%KCl + 0.1 PPM Boron to pulse crop, ➢ Foliar application of 2% urea at pre flowering and flowering stage ➢ Rainwater harvesting and recycling as life saving irrigation	IWMP, CLDP ISOPOM NHM NFSM RKVY
	High rainfall light laterite	Maize Groundnut Brinjal	➢ Sesamum (Uma ,Prachi, Nirmala) ➢ Cowpea(Utakala Manika, Pusa Barsati) ➢ Ricebean(RBL -6,KRB-1) ➢ Radish -Pusa Chetki	➢ Summer ploughing, inter tillage, conservation furow, ➢ in-situ rain water harvest / conservation ➢ Strengthening of field bunds, weeding and hoeing within 20 days to provide dust mulch ➢ Well decomposed FYM in seed rows. Ridge & forrow planting ➢ Rainwater harvesting and recycling as	**IWMP,** **CLDP** **ISOPOM** **NHM** **NFSM** **RKVYOCTMP**

			➢ Arhar (Upas 120,ICPL-87) + Cowpea (2:2) / Sesamum(2:4)/ Radish(2:2)	life saving irrigation ➢ Spraying 2%KCl + 0.1PPM Boron to pulse crop, ➢ Foliar application of 2% urea at preflowering and flowering stage	
	Rainfed alluvium	Paddy Jute Paddy - Blackgram	➢ Paddy (Jogesh , Khandagiri, Naveen, Surendra, Pooja) - Blackgram (PU-30,PU-19) ➢ Jute (Naveen ,Basudev, Baladev) - Greengram(PDM-54,OBGG-52,TARM-2) /	➢ Strengthening field bunds , raising bund height in paddy and blocking drainage holes ➢ Community nursery raising and transplanting ➢ closer spacing and 4-5 seedlings per hill ➢ Sowing pregerminated seeds & weed control ➢ Spraying 2% urea solution to jute ➢ Rain water harvest & life saving irrigation when needed	**IWMP, CLDP ISOPOM NHM NFSM RKVY OCTMP**
	Medium rainfall river valley alluvium	Paddy – Groundnut Jute – Groundnut	➢ Paddy (Jogesh, Sidhhant, Khandagiri, Naveen) – Groundnut (Devi,Smruti,TMV-2) ➢ Jute (Naveen, Basudev) - Groundnut (Devi, Smruti, TMV-2)	➢ Strengthening field bunds , raising bund height in paddy and blocking drainage holes ➢ Community nursery raising and transplanting ➢ closer spacing and 4-5 seedlings per hill ➢ Sowing pregerminated seeds & weed control ➢ Spraying 2% urea solution to jute ➢ Rain water harvest & life saving irrigation when needed	**IWMP, CLDP ISOPOM NHM NFSM RKVY OCTMP**
	low laying flood prone	Local paddy – Blackgram	➢ Paddy (Pooja, Tulasi, Indrabati, Upahar, Varsadhan, Swarna Sub-1) – Blackgram-(PU-30, PU-35)	➢ Strengthening field bunds, plugging drain-age holes ➢ Life saving irrigation at critical stages ➢ Raising community nursery and transpla-nting 3-4 seedling /hill ➢ Closer spacing to clonal tillers and aged seedlings ➢ Apply 50% N as basal ➢ Pulse seed treatment with bio-fertiliser	**IWMP, CLDP ISOPOM NHM NFSM RKVY**

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop /cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8 weeks (August 3r^{d} week)	Red laterite rainfed	Paddy Maize	➢ Niger (Deomali) ➢ Blackgram (T-9,PU-30) ➢ Cowpea (Utakala Manika, Pusa Barsati) ➢ Sesamum (Uma , Prachi) ➢ Horsegram (Urmi) ➢ Arhar (Upas 120,ICPL-87) + Cowpea (2:2) / Sesamum(2:4)/ Blackgram/ Horsegram(2:3)	• Summer ploughing, inter tillage, in-situ rain water harvest and conservation • Strengthening of field bunds, weeding and hoeing within 20 days to provide dust mulch • Rainwater harvesting and recycling as life saving irrigation when needed • Apply full P & K along with 20% N • Well decomposed FYM in seed rows. • Spraying 2%KCl + 0.1PPM Boron to pulse crop, • Foliar application of 2% urea at preflowering and flowering stage	IWMP, CLDP ISOPOM NHM NFSM RKVY
	High rainfall light laterite	Maize Groundnut Brinjal	➢ Niger (Deomali) ➢ Blackgram (T9, PU-30) ➢ Cowpea(Utakala Manika, Pusa Barsati) ➢ Sesamum (Uma ,Nirmala, Prachi) ➢ Horsegram (Urmi) ➢ Arhar (Upas 120,ICPL-87) + Cowpea (2:2) / Sesamum(2:4)/ Blackgram/ Horsegram(2:3)	• Summer ploughing, inter tillage, in-situ rain water harvest and conservation • Strengthening of field bunds, weeding and hoeing within 20 days to provide dust mulch • Well decomposed FYM in seed rows. • Spraying 2%KCl + 0.1PPM Boron to pulse crop, • Foliar application of 2% urea at preflowering and flowering stage • Rainwater harvesting and recycling as life saving irrigation when needed	
	Rainfed alluvium	Paddy Jute Paddy - Blackgram	➢ Paddy (Jogesh , Khandagiri, Lalata, Surendra, Konarka) - Blackgram (PU-30,T-9) ➢ Jute (Naveen ,Basudev, Baladev) ➢ Sesamum (Uma,Nirmala, Prachi) - Greengram(PDM-54,OBGG-52)	➢ Strengthening field bunds , raising bund height in paddy and blocking drainage holes ➢ Community nursery raising and transplanting ➢ Closer spacing and 4-5 seedlings per hill ➢ Sowing pregerminated seeds & weed control ➢ Spraying 2% urea solution to jute ➢ Rain water harvest & life saving irrigation when needed	

	Medium Rainfall river valley alluvium	Paddy – Groundnut	➢ Paddy (Jogesh, Sidhhant, Khandagiri) – Groundnut (Devi,Smruti,TMV-2)	➢ Strengthening field bunds ,raising field bund in paddy ➢ Higher seed rate to direct sown paddy and weed control Community nursery raising and transplanting, 4-5 seedling per hill	
		Jute – Groundnut	➢ Jute (Naveen, Basudev) - Groundnut (Devi, Smruti, TMV-2) ➢ Sesamum (Uma, Nirmala, Prachi) - Groundnut (Devi,Smruti,TMV-2)	➢ Application of 50% N as basal ➢ 2% urea solution spray to jute ➢ Bio fertiliser to pulse and oilseeds along with drainage ➢ Rainwater harvesting and life saving irrigation when needed	
	Low laying flood prone	Local paddy - Blackgram	➢ Paddy (Pooja, Tulasi, Upahar, Varsadhan, Swarna Sub-1) - Blackgram-(PU-30, T-9)	➢ Strengthening field bunds raising field bund in paddy ➢ Higher seed rate to direct Sown paddy plugging drainage holes ➢ Life saving irrigation at critical stages ➢ Raising community nursery and transplanting 4-5 seedling /hill ➢ Closer spacing to clonal tiller apply 50% N as basal ➢ Pulse seed treatment with bio fertiliser	

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.	Red Laterite Rainfed	Paddy Maize	➢ FYM:SSP @10:1 placed at seeding point to avoid seedling mortality ➢ Resowing if more than 50% population damaged other wise gap filling. ➢ Preferring paddy varieties like Hira,Kalinga-III, Jaldidhan	➢ Application of FYM and lime @ 5.0qtl/ha ➢ Sowing across the slope ➢ Water harvesting and recycling for life saving irrigation ➢ Bed -furrow and strip - furrow system of planting	IWMP RKVY NHM NFSM OCTMP

			➢ Summer ploughing , weeding ➢ Seed treatment with $CaCl_2$ for drought tolerance ➢ Hoeing and weeding after 20 DAS for in-situ moisture conservation	➢ Inter tillage and hoeing for dust mulching ➢ Strengthening field bunds ➢ Blocking seepage holes & gully plugging in paddy	
	High rainfall lilght laterite	Maize Groundnut	➢ Summer ploughing ➢ Application of FYM and lime @5.0qtl/ha ➢ Seed treatment with $CaCl_2$ for seed drought tolerance ➢ Weed control ➢ Resowing if more than 50% population damaged other wise gap filling ➢ FYM : SSP @ 10:1placed at seeding point to avoid seedling mortality ➢ Sowing in furrows across the slope ➢ Hoeing and weeding after 20 DAS for in-situ moisture conservation	➢ Water harvesting and recycling ➢ Inter tillage and hoeing for dust mulching ➢ Bed furrows system of planting ➢ Weeding , hoeing, ridging in maize	
	Rain fed alluvium	Paddy Jute Paddy –Blackgram/ Greengram	➢ Prefer varieties like Lalata, Konarka, Surendra ➢ Sow sprouted seeds ➢ Community nursery raising and transplanting ➢ Application of 2% urea solution to jute ➢ Providing life saving irrigation ➢ Resowing if more than 50% population damaged ➢ FYM : SSP @ 10:1placed at seeding point to avoid seedling mortality sowing in furrows across the slope ➢ Gap filling by Khelua and by clonal propagation	➢ Strengthening of field bunds ➢ In-situ water harvesting and recycling ➢ Blocking seepage hole ➢ Gully plugging	

			➢ Weed control to check transpiration loss		
	Medium rainfall river valley alluvium	Paddy – Groundnut Jute -	➢ Prefer varieties like Jogesh, Sidhhant, Khandagiri ➢ Community nursery raising and transplanting ➢ Sow sprouted seeds ➢ Application of 2% urea solution to jute ➢ Providing life saving irrigation ➢ Resowing if more than 50% population damaged ➢ FYM : SSP @ 10:1placed at seeding point to avoid seedling mortality sowing in furrows across the slope ➢ Gap filling by Khelua and by clonal propagation ➢ Weed control to check the transpiration loss	➢ Strengthening of field bunds ➢ Insitu water harvesting and recycling ➢ Blocking seepage hole ➢ Gully plugging	
	Medium rainfall rivervelly	Paddy – Groundnut Jute	➢ Prefer variety like Jaldidhan, Jogesh, Sidhhant, Khandagiri, Vandana, Anjali, Annada) – Groundnut (Devi,Smruti,TMV-2) ➢ Jute (Naveen, Basudev) - Groundnut (Devi, Smruti, TMV-2) Community nursery raising and transplanting ➢ Providing life saving irrigation ➢ Resowing if more than 50% population damaged ➢ Gap filling by Khelua and clonal propagation ➢ Sow sprouted seeds	➢ Strengthening of field bunds ➢ In-situ water harvesting and recycling ➢ Blocking seepage holes ➢ Gully plugging	

	Low lying flood prone	Paddy – Blackgram	➢ Prefer varieties like Pratikhya, Ranidhan, Swarna sub-1 ➢ Community nursery raising and transplanting ➢ Providing life saving irrigation ➢ Resowing if more than 50% population damaged ➢ Gap filling by Khelua and clonal propagation ➢ Sow sprouted seed	➢ Strengthening of field bunds ➢ In-situ water harvesting and recycling ➢ Blocking seepage holes ➢ Gully plugging	

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 measues**	**Remarks on Implementation**
At vegetative stage	Red laterite rain fed	Paddy Maize	➢ Provide dust mulch using rotary peg weeder for hoeing ➢ Spray 2% urea and withhold topdressing till receipt of rain ➢ Intercropping of arhar with maize (2:2) and paddy(2:5) ➢ Spraying 2%KCl and 0.1% Boron to pulses	➢ Strengthening bunds with compartmental bunding ➢ Insitu water harvesting and recycling for life saving irrigation ➢ Plugging drainage lines ➢ Sowing across the slope with ridge and furrow method ➢ Summer ploughing and application of FYM 5t and lime 5qtl per ha	RKVY NFSM ISOPOM NREGS IWMP OCTMP
	High rainfall light laterite	Maize Groundnut	➢ Provide dust mulch by hoeing with rotary-peg weeder ➢ Prune weeds and apply Quizalo-fopethyl 5% EC@ 0.05kg ai/ha at 20 DAS to control weeds in dicots ➢ Spray 1% urea to brinjal	➢ Strengthening bunds with compartmental bunding ➢ In-situ water harvesting and recycling for life saving irrigation ➢ Sowing across the slope with bed-furrow /ridge --furrow method	

		Brinjal	➢ Top dress after receipt of rain ➢ Thin out 25% plants in groundnut and provide organic mulch ➢ Organic mulching to wide row crops. ➢ Intercropping arhar with maize (2:2) ,groundnut (2:6) ➢ bed furrow and ridge furrow system of planting ➢ Spraying anti transpirant (Kaoline) to brinjal ➢ Spray 2% KCL and 0.1 % Boron to pulses	➢ Summer ploughing and application of FYM 5t and lime 5qtl Per ha	
	Rain fed alluvium	Paddy Jute Paddy - Blackgram/ Greengram	➢ No beusuning if crop is more than 45 days old ➢ Weed out field without waiting for rain ➢ Gap filling with clonal tillers and topdressing after receipt of rain ➢ Transplant up to 35 days old seedlings for medium duration paddy ➢ Remove weeds in nursery with blast management and life saving irrigation ➢ Close transplanting with 4-5 seedlings per hill ➢ Spray 2% urea as foliar spray and apply potasic fertiliser	➢ Close the drainage lines ➢ Strengthening the field bund ➢ In-situ water harvesting and recycling for protective irrigation	
	Medium rainfall river valley alluvium	Paddy – Groundnut Jute – Groundnut	➢ Weed out field without waiting for rain ➢ Gap filling with clonal tillers after receipt of rain ➢ Transplant up to 35 days old seedlings for medium duration paddy ➢ Remove weeds in nursery , blast management and life saving irrigation ➢ Close transplanting with 4-5 seedlings per hill ➢ Spray 2% urea as foliar spray	➢ Close the drainage lines ➢ Strengthening the field bund ➢ In-situ water harvesting and recycling for protective irrigation ➢ Close drainage hole and check seepage losses	
	low laying flood prone	Paddy – Blackgram/ Greengram	➢ No beusning to 45 days old paddy crop ➢ Weed out field without waiting for rain ➢ Gap filling with clonal tillers after receipt of rain ➢ Community nursery raising	➢ Close the drainage lines ➢ Strengthening the field bunds ➢ In-situ water harvesting and recycling for protective irrigation	

			➢ Remove weeds in nursery , blast management and life saving irrigation ➢ Close transplanting with 4-5 seedlings per hill with up to 35 days old seedling of Swarna, Ranidhan, Swarna sub1 etc. ➢ Foliar spray with 2% urea		

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measues**	**Remarks on Implementation**
At flowering/ fruiting stage	Red laterite rain fed	Paddy	➢ Inter cropping arhar with paddy (2:5)& maize (2:2) ➢ Sprinkling of water to keep micro climate moist ➢ Spraying of 2% urea solution	➢ Strengthening of field bunds, blocking drainage and seepage holes,Compartmental bunding ➢ In-situ water harvesting and recycling	RKVY IWMP, NREGS, NFSM OCTMP
		Maize	➢ Application of life saving irrigation ➢ Maize may be harvested for cobs	➢ Sowing across the slope with ridge furrow method ➢ Application of FYM(5t) and lime(5qtl) per ha ➢ Provide dust mulching by hoeing with mechanical weeder	
	High rainfall light laterite	Maize – Fallow Groundnut – Fallow Brinjal - Fallow	➢ Inter cropping arhar with maize (2:2) ➢ Sprinkling of water to keep micro climate moist ➢ Maize may be harvested for cobs ➢ Spraying of 1% urea solution to brinjal ➢ Spraying 2% KCL and 0.1% boron to pulses and vegetables ➢ Application of protective life saving irrigation ➢ Spraying anti transpirant (Kaoline) to brinjal ➢ Organic mulching to wide row crops	➢ Strengthening of field bunds, blocking drainage and seepage holes,Compartmental bunds ➢ In-situ water harvest and recycling ➢ Sowing across the slope with bed-furrow/ ridge -furrow methods ➢ Application of FYM (5t) and lime (5qtl) / ha ➢ Provide dust mulching by hoeing with mechanical weeder	

	Rain fed alluvium	Paddy Jute Paddy – Blackgram/Greemgram	➢ Provide life saving irrigation ➢ Sprinkling of water to keep micro climate moist ➢ Spraying of 2% urea solutions after weeding the plot ➢ Top dressing with receipt of rain	➢ Strengthening of field bunds ➢ Blocking drainage and seepage hole ➢ In-situ water harvesting in small ditches to recycle as protective irrigation	
	Mid rainfall river valley alluvium	Paddy – Groundnut Jute – Groundnut	➢ Provide life saving irrigation ➢ Sprinkling of water to keep micro climate moist ➢ Spraying of 2% urea solutions after weeding the plot ➢ Top dressing with receipt of rain	➢ Strengthening of field bunds ➢ Blocking drainage and seepage holes ➢ Insitu water harvesting in small ditches to recycle as protective irrigation	
	Low laying flood prone	Paddy – Black gram / Green gram	➢ Provide life saving irrigation ➢ Sprinkling of water to keep micro climate moist ➢ Spraying of 2% urea solutions after weeding the plot ➢ Apply potassic fertiliser even through spray solution ➢ Top dressing with receipt of rain	➢ Strengthening of field bunds ➢ Blocking drainage and seepage holes ➢ Compartmental bunds ➢ In-situ water harvesting in small ditches to recycle as protective irrigation	

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
	Red laterite rainfed	Paddy Maize	➢ Provide protective I life saving irrigation from the harvested rain water preferably in root zones ➢ Application of sufficient FYM at sowing to extend period of water availability ➢ Maize may be harvested as cobs ➢ Harvest paddy at physiological maturity stage ➢ Sowing the crop across the slope with ridge and furrow method ➢ Strengthening field bunds blocking drainage channel and seepage holes	➢ Sow / dibble pre-rabi crops like sesamum (Uma, Nirmala,Prachi) , Niger (Deomali), Horsegram(Urmi) in case of complete crop failure	RKVY, IWMP, NREGS, ISOPOM NFSM OCTMP
	High rainfall light laterite	Maize Groundnut Brinjal	➢ Provide protective life saving irrigation from the harvested rain water preferably in root zones ➢ Application of sufficient FYM at sowing to extend period of water availability ➢ Maize may be harvested as cobs ➢ Sowing the crop across the slope with ridge and furrow method ➢ Strengthening field bunds, blocking drainage channes and seepage holes	➢ Sow dibble prerabi crops like sesamum (Uma, Nirmala,Prachi) , Niger (Deomali), Horsegram(Urmi)incase of complete crop failure	
	Rain fed alluvium	Paddy	➢ Provide protective life saving irrigation from the harvested rain water	➢ Sow prerabi crops like horsegram (Urmi),	

		Jute Paddy – Blackgram/ Greengram	➢ Application of sufficient FYM at sowing to extend period of water availability ➢ Harvest paddy at physiological maturity stage ➢ Application of potassium fertilizer ➢ Strengthening field bunds , cheak runoff and seepage loss and block drainage channels	➢ Sesamum(Uma, Nirmala,Prachi), ➢ Blackgram(T-9, PU-19,PU- 30), Greengram(PDM-54,Sujata)	
	Medium rainfall river valley alluvium	Paddy – Groundnut Jute - Groundnut	➢ Provide protective life saving irrigation from the harvested rain water ➢ Application of sufficient FYM at sowing to extend periods of water availability ➢ Harvest paddy at physiological maturity stage ➢ Strengthening field bunds ,cheak runoff and seepage loss and block drainage channels	➢ Sow groundnut (Smruti, Devi, TMV-2) as pre rabi crop utilizing residual moisture ➢ In extreme case sow Horsegram (Urmi), sesamum(Uma, Nirmala,Prachi), Blackgram(T-9,PU-30,PU-19) Green gram (PDM-54, Sujata) as pre rabi crops.	
	Low laying flood prone	Paddy-Blackgram/Greengram	➢ Provide protective life saving irrigation from the harvested rain water ➢ Application of sufficient FYM at sowing to extend period of water availability ➢ Harvest paddy at physiological maturity stage ➢ Strengthening field bunds , cheak runoff and seepage loss and block drainage channels	➢ Paira sowing of blackgram/field pea ➢ Sow pre-rabi crops like horsegram (Urmi), ➢ Sesamum(Uma,Nirmala,Prachi), ➢ Blackgram(T-9,PU-30,PU-19), Green gram (PDM-54, Sujata)	

2.1.2 Drought - 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	Rain fed alluvium	Paddy Paddy – Moong Paddy / Jute – Groundnut	Paddy – groundnut / moong / sunflower Jute – Vegetable / Groundnut- moong Paddy – Sugarcane + moong – Ratoon ➢ Varieties for Moong- TARM-2,PDM-54, OBGG-52 Groundnut- Devi, Smruti,TMV-2 Sunflower – KBSH-1, MSH-1	➢ Raising community nursery ➢ Water harvesting and recycling ➢ Preferring shorter duration paddy (Lalata,Konarka,Surendra in place of Swarma,Pratikhya and Ranidhan and Kandagiri, Jogesh in place of Lalata and Surendra) ➢ Maintaining higher plant stand through closer spacing 3-4 seedling per hill in delayed transplanting of already raised nursery ➢ Planting pregerminated seeds ➢ Growing green gram intercropped with sugarcane ➢ 2% urea spray to jute ➢ Weeding to direct seeded paddy without beusuning ➢ Nitrogen top dressing after receipt of rain / irrigation	**RKVY, IWMP, NREGS, ISOPOM OCTMP**

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	Rain fed alluvium	Paddy Paddy – Moong Paddy / Jute – Groundnut	Paddy – Moong Paddy - G.nut Jute - G.nut /- Vegetable Varieties for Moong- TARM-2, PDM-54, OBGG-52 Groundnut- Devi, Smruti, TMV-2 Sunflower – KBSH-1, MSH-1	➢ Strengthening field bunds, water harvesting and recycling ➢ Application of irrigation at critical crop growth stages ➢ Preferring short duration paddy (var. Lalata, Konarka, Surendra, Khandagiri, Jogesh, Sidhhant) ➢ Opt for SRI method using cono weeder ➢ Direct seeding with pregerminated seeds ➢ Foliar nutrient application ➢ Bed - furrow system of planting in groundnut ➢ Skip row irrigation in vegetables , sprinkler irrigation to groundnut and moong	RKVY, IWMP, NREGS, ISOPOM OCTMP

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/ cropping system**	**Change in crop/cropping system**	**Agronomic measure**	**Remarks on Implementation**
Non release of water in canals under delayed onset of monsoon	Rain fed alluvium	Paddy Paddy – Moong	Paddy – moong/ groundnut Jute- moong/ groundnut	➢ Strengthening field bunds ➢ Water harvesting and recycling at critical stages for life saving ➢ Community nursery raising and	RKVY, IWMP, NREGS, ISOPOM OCTMP

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/ cropping system**	**Change in crop/cropping system**	**Agronomic measure**	**Remarks on Implementation**
in catchment		Paddy / Jute – Groundnut	Varieties for Moong- TARM-2, PDM-54, OBGG-52 Groundnut- Devi, Smruti,TMV-2 Sunflower – KBSH-1, MSH-1	transplanting 4-5 seedling /hill ➢ Growing shorter duration paddy (varieties, Lalata, Konarka, Surenda and Khandagiri, Jogesh, Sidhhant) ➢ Opt for SRI method using cono weeder ➢ Chemical weed control to direct seeded paddy ➢ Foliar nutrient application ➢ 2% urea spray to jute ➢ Nitrogen top dressing to paddy after receipt of rain	

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	Rain fed Alluvium	Paddy Paddy – Moong Paddy / Jute – Groundnut	Paddy – moong Jute- moong / groundnut ➢ Varieties for Moong- TARM-2, PDM-54, OBGG-52 Groundnut- Devi, Smruti,TMV-2	➢ Strengthening field bunds , water harvesting and recycling ➢ Transpl anting paddy(Khandagiri, Sidhhant, Jogesh) ➢ Opt for SRI method using cono weeder ➢ Foliar nutrient application(2% urea spray to jute) ➢ Sprinkler irrigation to jute ➢ Bed furrow system of planting groundnut ➢ Skip row irrigation	RKVY, IWMP, NREGS, ISOPOM

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
			Sunflower – KBSH-1, MSH-1	➢ Application of irrigation at critical growth stages	

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**
Paddy	Provide drainage Gap filling for damaged seedling Varieties : Swarna sub-1, CR-1014, CR-1018	Intermittent drainage	Provide drainage Apply potash fertiliser Harvest at physiological maturity	Drying Safe storage Early disposal
Black gram	Provide drainage Higher seed rate	Do-	Do-	Do-
Green gram	Do-	Do-	Do-	Do-
Groundnut	Do-	Do-	Do-	Do-
Sugarcane	It escapes	Provide drainage Earthing up	Provide drainage Earthing up	Safe storage and transportation
Horticulture				
Mango	Drainage system should be developed	Drainage system should be developed	Drainage system should be developed	Keeping Fruit in a well ventilated dry place
Cashew	Do-	Do-	Do-	Do-
Banana	Do-	Do-	Do-	Do-

Heavy rainfall with high speed winds in a short span	*provide wind break and shelter belt *Phosphate application for route development *Potasium ,Boron, Silica and Zinc application			
Paddy	Provide drainage Gap filling for damaged seedling Varieties : Swarna sub-1, CR-1014, CR-1018	Intermitant drainage	Provide drainage Apply potassic fertiliser Harvest at physiological maturity	Drying Safe storage Early disposal
Blackgram	Provide drainage Higher seed rate	Do-	Do-	Do-
Greengram	Provide drainage	Do-	Do-	Do-
Groundnut	Provide drainage	Provide drainage	Early harvest	Drying Safe storage Early disposal
Sugarcane	It escapes	Provide drainage Earthing up Wrapping and propping	Provide drainage Earthing up Wrapping and propping	Provide drainage Safe storage and transportation Wrapping and propping
Horticulture				
Mango	Drainage of excess water	Drainage of excess water	Drainage of excess water	Keeping Fruit in a well ventilated dry place
Cashew	Do-	Do-	Do-	Do-
Banana	Do-	Do-	Do-	Do-
Outbreak of pests and diseases due to unseasonal rains				
Paddy	Swarming caterpillar spray cartap hydrochloride @ 1gm/ltr of water. Disease – sheath blight spray hexaconazol @1ml/ltr of water and adopt need based pesticide	BPH- Apply thiomethoxam @ 1gm/4ltr of water and adopt need based pesticide	Adopt need based pesticide	Drying Safe storage Early disposal
Blackgram	Tobacco leaf eating caterpillar-	Adopt need based pesticide	Adopt need based pesticide	Drying

	spraying of chloropyriphos @ 2ml/ltr of water at evening			Safe storage Early disposal
Green gram	Tobacco leaf eating caterpillar- spraying of chloropyriphos @ 2ml/ltr of water at evening	Adopt need based pesticide	Adopt need based pesticide	Drying Safe storage Early disposal
Groundnut	Adopt need based insecticide	Tikka disease – apply Saf @ 1gm/ltr of water and adopt need based pesticide	Do-	Do-
Sugarcane	IPM	Adopt need based pesticide	Do-	Do-
Horticulture				
Mango	Adopt need based pesticide	Adopt need based pesticide	Adopt need based pesticide	Safe storage Early disposal
Cashewnut	Do-	Do-	Do-	Do-
Banana	Do-	Do-	Do-	Do-

2.3 Floods

Condition	**Suggested contingency measure**			
Transient water logging/ partial inundation	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
paddy	• Provide drainage • Spray clean water to clear up the leaves • If seedling damaged go for reseeding by dapog method • Community nursery raising • Select varieties like Swarna Sub-1 & Sarasa	• Provide drainage • If damage is more than 50% retransplant or put pregerminated sprouted seeds on puddle soil with higher seed rate and closer spacing • Use short duration variety like Lalata , Khandagiri , Konark ,Surendra ,Jogesh Sidhhant . • Transplant 40 – 60 days old seedling after flood water recedes with close spacing and 4-5 seedlings per hill • Drainage excess water • Transplant clonal tillers .do not go for beusaning • Apply moderate dose of fertiliser @40:20:20NPK / ha • Weeding out and gap filling by clonal tillers	• Provide drainage • Rinsing the top leaves and floral parts • If revibal not possible go for sowing blackgram /greengram • Harvest at physiological maturity • Paira cropping blackgram	• Provide drainage • Preventing premature germination by hormonal spray • Plan for rabi crop – blackgram, greengram or groundnut • Safe storage • Threshing by power thresher and drying of the produce

		• Weed out rice field • Apply N&K to boost the growth • Redistribution of seedling • Ridge and forrow planting to horticulture crops		
Jute (water logging/ partial irrigated	• It escapes	• Spray application of N & K fertiliser (2%) • Early draining out of flood water	• Provide drainage • Early harvest at physiological maturity stage • planning for rabi groundnut & Blackgram	• Provide drainage • Safe stacking after drying
Sugarcane	• It escapes	• Provide drainage • Spraying of 2% urea • Higher K application • Application of Carbendazim to previous redrot infected field • Weed out the infected / diseased shoots to prevent lodging	• Quick drain out of flood water by deep drains • Early harvest • Gap filling for ratoon • Basal fertiliser to be followed by earthing up	• Provide drainage • Safe harvest washing & crushing • Deep drains for ratoon crop
Continuous submergence for more than 2 days				
paddy	• Provide drainage • Spray clean water to clear up the leaves • If seedlings damaged reseeding • Community nursery raising	• Provide drainage • If damage is more than 50% retrans plant or put pregerminated sprouted seeds on puddle soil with higher seed rate and closer spacing • Use short duration variety like Lalata , Khandagiri, Konarka , Surendra , Jogesh Sidhhant etc. • Transplant 40 – 60 days old seedling after flood water residues • Apply moderate dose of fertiliser @40:20:20NPK / ha • Weed ing and gap filling by clonal tillers • Apply N&K to boost the growth	• Early drainage • Rinsing the top leaves and floral parts • If revibal is not possible go for paira cropping blackgram/sowing greengram	• Provide drainage • Preventing premature germination by hormonal spray • Plan for rabi crop – blackgram, greengram or groundnut • Drying of the produce
Jute	• It escapes	• Spray application of N & K fertiliser (2%)	• Provide drainage	• Provide drainage

		• Early draining out of flood water	• Early harvest at physiological maturity stage • planning for rabi groundnut & Blackgram	• Safe stacking after drying
Sugarcane	• It escapes	• Provide drainage • Spraying of 2% urea • Higher K application • Application of Carbendazim to previous red rot infected field • Weed out the infected / diseased shoots to prevent lodging	• Quick drain out of flood water by deep drains • Early harvest • Gap filling for ratoon • Basal fertiliser to be followed by earthing up	• Provide drainage • Safe harvest washing & crushing • Deep drains for ratoon crop

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

Extreme event type	**Suggested contingency measure**			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave				
Paddy	Shading of nursery Sprinkling irrigation	Sprinkling water Soil mulching	Sprinkling water Frequent irrigation	NA
Blackgram	Sprinkling water	Do-	Do-	NA
Greengram	Sprinkling water	Do-	Do-	NA
Groundnut	Frequent irrigation	Frequent irrigation	Frequent irrigation	NA
Sugarcane	Do-	Do-	Do-	NA
Horticulture	Do-	Do-	Do-	NA
Mango	Watering through rose cane	Pitcher Irrigation	Pitcher Irrigation with water spraying	Harvest mature fruits and keep them in well ventilated place
Cashewnut	Do-	Do-	Do-	Do-

Banana	Do-	Do-	Do-	Do-
Cold wave	NA	NA	NA	NA
Frost	NA	NA	NA	NA
Hailstorm	NA	NA	NA	NA
Cyclone				
Paddy	Drainage Reseeding	Cleaning	Cleaning	Immediate harvest and drying
Blackgram	Escapes	Drainage	Drainage	Immediate harvest and drying
Green gram	Escapes	Do-	Do-	Immediate harvest and drying
Groundnut	Escapes	Do-	Do-	Do-
Sugarcane	Draiage Wrapping & propping	Drainage Wrapping & propping	Drainage Wrapping & propping	Do-
Horticulture				
Mango	Shift the planting material to safer shed place	Stacking in case of smaller plants	Stacking in case of smaller plants	Immediate harvest of mature fruits
Cashewnut	Do-	Stacking in case of smaller plants	Stacking in case of smaller plants	Immediate harvest of mature fruits
Banana	Do-	Stacking	Stacking	Immediate harvest of mature fruits

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Drought	• Livestock insurance • On boundaries of agricultural field trees or shrubs like Sesbania, Subabul, Neem etc should be planted. • Explore the possibilities of availability of unconventional / alternative feed resources during draught. • Up-gradation of desi cow through artificial insemination and up-gradation of local good breeds, Black Bengal through cross breeding with improved breeds(Sirohi &Beetal)	• Conducting animal health camps and treating the affected animals • Regular de-worming with vaccination of cows with need based treatments against ailments. • Regular de-worming and vaccination for goats against PPR, FMD with intensive care and treatment for ailments. • Low cost housing with stake arrangement • Preventive measures against early kid mortality by regular deworming	• Availing insurance • Culling of unproductive livestock
Feed and fodder availability	• It is essential to establish fodder bank near forest areas. • Provision is also necessary to store surplus crop residues in fodder banks, which can be made available during draught. • Excess fodder in flush season can be preserved as hay / silage. • Encourage perennial fodder production on river beds and tank bed on community basis. • Village gauchar (grazing) lands should be developed for fodder production.	• Utilizing fodder from perennial trees and fodder bank reserves. • Transporting excess fodder from adjoining districts. • Utilizing the existing crops which fail to grow adequately due to failure of monsoon for feeding of animals. • Use of unconventional livestock feed such as sugar cane top, sugar cane bagasse and banana plant Crop residues such as cassiatora water hyacinth and other like tree pods and seeds etc. Improving poor quality roughages by ammonia treatment, urea treatment, urea molasses mineral block etc and feeding them	• Supplementary feeding of remaining livestock and the replacement stock. • Addition of calcium, mineral mixture and multi-vitamin supplement @ 40 g/cow/day with home prepared feed (rice and wheat bran: groundnut oilcake at 9:1 ratio mixed with kitchen waste) + 40 kg green fodder/cow/day • Stall feeding with home prepared feed (mixture of maize + Mahua cake + rice/wheat bran @ 6:1:3 ratio in kitchen waste) + mineral and multi-vitamin supplement (25 g/goat/day). Sufficient browsing for at least four hours per day
Drinking water	• Preserving water in community tanks and ponds etc for drinking purpose by	• Water sources of Temples, Churches, Gurdwaras, Jain temples and Maszids	• Pure drinking water and vaccines to be

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
	excavation and sanitization of these resources. In addition, wells (bore wells or dug wells) may be constructed ahead of possible event of draught.	are generally ideal sources during draught.	given
Health and disease management	• Organizing training programme of persons connected with A.H. on feeding and management of animals during draught. • Veterinary preparedness with vaccine and medicines.	• Supplementation of mineral and vitamin mixtures • Campaign and mass vaccination	• Proper disposal of dead animals
Floods			
Feed and fodder availability	• Procured feeds and fodders to be used for feeding all animals.	• Straw and stover that got soaked during flood need not be thrown away out right. They can be fed to animals as long as rotting or fungal growth has not set in. Partial drying, chopping and sprinkling concentrate mixture can improve intake and utility. • Priorities animals as suckling animals, suckling animals along with their nursing mothers, producing and working animals, sick and old animals, adult open and non-producing animals as the feed and water may be in short supply.	
Drinking water		Pure drinking water and vaccines to be given	• Sanitization of water resources. • Pure drinking water and vaccines to be given
Health and disease management	• Training to the farmers about care of their animals when catastrophe strives, so that they are prepared for the situation. Preparation and distribution of leaflets or booklets in simple local language for care of livestock in	• Supplementation of mineral and vitamin mixtures • Campaign and mass vaccination	• Proper disposal of dead animals

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
	disaster. • Keeping track of weather forecast and prior information through radio and TV Etc. • Prior construction of animal shelters in disaster prone areas. • Temporary relief camps on spots can be set up at short notice to provide shelter to animals on roads, railway line embankments, other earthen embankments, upland etc. • Variation of livestock before onset of rainy season • Temporary camps may be started to herd or flocks animals of 25-50 animals in each group. Inside the camp the animals can be just left free within the paddock/ barricades created with wooden pole. • If no trees or sheds are available shelter the animals under a tent / tarpaulins held aloft by supporting poles or temporary sheds with coconut leaf roof. Keep the emergency service kit (first Aid Requisites) ready always containing Cotton wool, Bandages, Surgical gauze, old cotton sheets, Rubber tubing (for torniquet), Surgical scissors – Curved and made of stainless steel, Forceps, Splints or Split bamboos (for fractures), Clinical thermometers – two or three, Disinfectants – potassium permanganate, Dettol, Savlon, Tannic acid powder (for poisons) and Jelly (for burns) Antibiotic eye drops, Epsom		

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
	salts, copper sulphate, oil of turpentine (for bloat), Obstetric ropes, chains and hooks, Tincture of iodine, tincture of Benzoin Co.(for wounds), Cotton rope, halters (for restraint), Trocar and canola (for bloat), Pocket Knife (for cutting, strangulating ropes etc.)		

Cyclone			
Feed and fodder availability	• Procured feeds and fodders to be used for feeding all animals.	• Procured feeds and fodders should be fed to all animals on the order of priority of animals. • Priorities animals as suckling animals, suckling animals along with their nursing mothers, producing and working animals, sick and old animals, adult open and non-producing animals as the feed and water may be in short supply.	• Provision of supplementary feeding (concentrate / Roughage) with vitamin & minerals.
Drinking water	• Provision of clean drinking water.	• Drinking water be made available to the animals in any kind of clean container available with the farmer.	• Provision of clean drinking water.
Health and disease management	• Training to the farmers about care of their animals when catastrophe strives, so that they are prepared for the situation. Preparation and distribution of leaflets or booklets in simple local language for care of livestock in disaster. • Keeping track of weather forecast and prior information through radio and TV Etc. • Prior construction of animal shelters in disaster prone areas.	• There should be one veterinarian with 3 to 4 village to work with the help of local volunteers. • The team should be well equipped with contingent items like bandages, tourniquet ropes, controlling rope, splints, slings, poles and ropes to lift animals. Drugs including painkillers, antiseptics, antibiotics, anti-venom and anti-shock drugs etc. should	• Prompt and appropriate attention to injuries by providing necessary medicines to the livestock owners. • Vaccination campaign against common endemic diseases of the areas (like H.S. B.Q, Anthrax etc.) must be taken up urgently. Necessary steps should be taken for the control of non-specific digestive and respiratory infections in consultation of local veterinary personals.

	• Temporary relief camps on spots can be set up at short notice to provide shelter to animals on roads, railway line embankments, other earthen embankments, low hillocks, upland etc. • Variation of livestock before onset of rainy season • Temporary camps may be started to herd or flocks animals of 25-50 animals in each group. Inside the camp the animals can be just left free within the paddock/ barricades created with wooden pole. • If no trees or sheds are available shelter the animals under a tent / tarpaulins held aloft by supporting poles or temporary sheds with coconut leaf roof. • Keep the emergency service kit (first Aid Requisites) ready always containing Cotton wool, Bandages, Surgical gauze, old cotton sheets, Rubber tubing (for torniquet), Surgical scissors – Curved and made of stainless steel, Forceps, Splints or Split bamboos (for fractures), Clinical thermometers – two or three, Disinfectants – potassium permanganate, Acriflvin, Dettol, Savlon, Tannic acid powder (for poisons) and Jelly (for burns) Antibiotic eye drops, Epsom salts, copper sulphate, Treacle, oil of turpentine (for bloat), Obstetric ropes, chains and hooks, Tincture of iodine, tincture of Benzoin Co.(for wounds), Cotton rope, halters (for restraint), Trocar and canola (for bloat), Pocket Knife (for cutting, strangulating ropes etc.)	be adequately available with them. • Keep the animals loose in paddock (sheltered or unsheltered) rather keeping them tethered. • Releasing animals from the unnatural and harmful position or situation, stopping bleeding, binding broken limbs, administering painkillers, anti-poison and anti-shock drugs, sedating difficult animals and even performing euthanasia on hopelessly injured and suffering animals with the consent of their owners.	• Improving shed hygiene especially in the farmers household through cleaning and disinfection

Heat wave and cold wave			
Shelter/environment management		• Green cover (trees plantation, land scaping) • Proper sheltering / housing white painting outside the roof and black painting inside the roof. • Washing / wallowing / sprinkling/ splashing / showering • Provision of cool drinking water (inearthen pitches) • Cooling devices : fans, wet curtains or panels, air cooler if possible	
Health and disease management		• Feeding Green fodder/ silage/ hay • Provision for night feeding • Grazing only if green pastures/ grass lands available • Graze early in the morning and late in the afternoon	• Protection of dry / milch cows/ buffaloes/ breeding bulls and teasers against thermal stress • Heat detection with young teasers • Close observation of all open cows • Study of cervical mucous • Heat detection and AI during cooler parts of the day. • Insemination at optimal time with good quality semen.

2.5.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	**During the event**	**After the event**	
Drought				
Shortage of feed ingredients	Breed (OUAT synthetic, Vanaraja, Gramapriya/ Kalinga Brown, Giriraja) Ensure procurement of feed ingredients sufficient ahead	Feed supplementation will be made to the farms. Free range system (Self feeding in the back yard) depending on local household waste	Attempt will be made for available of feed ingredient or compound feed to the farmers. Regular vaccination starting from day old chick. Immediately isolating the birds affected by infectious diseases from the flock. Protecting birds from dog, wild cat, jackel, fox etc.	
Drinking water	Check water source for ensuring sufficient portable water during draught	Attempt will be made to provide sanitized drinking water	Availability of water will be ensured by digging of bore well	
Health and disease management	Procurement of vaccines and medicines and anti stress agent. Feeding antibiotics Procurement of litter materials	Continue feeding of anti stress agent		
Floods				
Shortage of feed ingredients	Ensure procurement of feed ingredients / compound feed sufficient ahead as feed supply to the farm will hamper due to submergence of the connecting	Supply the compound feed to the poultry farm under submerged area	Supply will continued till the situation is under control	

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	**During the event**	**After the event**	
	roads			
Drinking water	Protect the water sources from submergence/ contamination	Attempt will be made to provide sanitized drinking water	Water sources will sanitized with bleaching powder or any water sanitizer	
Health and disease management	Procurement of vaccines and medicines. Feeding antibiotics Procurement of litter materials	Continue feeding antibiotics Prevent entrance of flood water to the shed Replace wet litter Proper disposal of dead birds if any	Disinfection of the farm premises. Feeding antibiotics And deworming. Replace wet litter Disinfection of sheds. Proper disposal of dead birds if any	
Cyclone				
Shortage of feed ingredients	Procurement of feed	Supply the compound feed to the poultry farm under cyclone affected area	Supply will continued till the situation is under control	
Drinking water	-	Attempt will be made to provide sanitized drinking water	Water sources will sanitized with bleaching powder or any water sanitizer	
Health and disease management	Procurement of medicine and vaccine	Vaccination of birds against different diseases Provision should be made for available of sanitized water	Water sources will sanitized with bleaching powder or any water sanitizer	

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	**During the event**	**After the event**	
Heat wave				
Shelter/environment management	Pruning of big trees in the farm. Putting curtains on open sides of the shed. Procurement of electrical accessories Providing shed to poultry houses. Providing proper ventilation.	Attempt will be made for cooling of poultry shed by adapting different cooling methods Thickness of litter should be reduced Ventilation to the house should be increased by providing ceiling fans and exhaust fan	Provision should be made to ensure proper ventilation to the house	
Health and disease management	Procurement of Anti stress drugs	Supplementation of anti stress drug	Vaccination of birds against RD	
Cold wave				
Shelter/environment management	Procurement of curtains to cover open sides of the shed. Heating arrangement kept ready	Close the open sides of the shed by curtain in such a way that ventilation should not be hampered. Provide heat if necessary depending on the temperature and age of the birds	Remove the curtains. Discontinue heating.	
Health and disease management	Procurement of Anti stress drugs and vaccine	Feeding of anti stress drugs in drinking water Vaccination with fowl pox	Vaccination against IBD and RD	Procurement of Anti stress drugs and vaccine

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
1) Drought			
A. Capture			
Marine	-	-	-
Inland			
(i) Shallow water depth due to insufficient rains/inflow	1. Restricted release of water from reservoir. 2. Supplementary water harvest structures like pond and tanks has to be developed. 3. Renovation and maintenance of existing water harvest structures. 4. Species : (Indian Major Carps (IMC), i.e., Rohu, Mrigal and Catla + Exotic carps (Silver carp and Grass carp @ 5000 fingerlings/ha	Application of rice bran + Groundnut oil cake + vitamins or 80 kg, urea + 40 kg SSP/ha/year: Raw cow dung @ 5 t/ha + micronutrient to enhance the production of phyto plankton and zoo plankton.	Using Cifax @ 1 lit/ha or lime and turmeric powder ! 10:1 ratio applied @ 200 kg/ha during the month of November and January to control Ulcerative disease syndrome (UDS) and Epicortical ulcerative syndrome (EUS)
(ii) Changes in water quality	1. Prepare to release water into the habitat. 2. Leveling of farm bonds , testing of water body 3. Development high stocking density	1. Mixing of water from the water harvest structure like ponds and tanks into the fish habitat.	1. Monitoring the water quality and health of aquatic organisms.
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	1. Building deep ditches in culture ponds for shelter of the fish to overcome high temperature	1. Recharge the ponds with bore well water or water from other sources. 2. Partial harvesting of the stock to reduce stocking density.	-

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
		3. Artificial shelter by putting aquatic floating weeds in 1/3rd area.	
(ii) Impact of salt load build up in ponds / change in water quality	1. Application of organic manure in culture system	1. Recharge the ponds with bore well water or water from other sources	1. Application of organic manure in culture system
2) Floods			
A. Capture			
Marine			
Inland			
(i) No. of boats / nets/damaged	1. The boats has to be secured safely to river/ reservoir banks. 2. Non operation of fixed bag nets in streams and rivers. 3. Insurance coverage for nets and boats.	1. Checking of the safety of the boats / nets. 2. An inventory logbook with name of crewmembers should be maintained. 3. Number of crew and load should be much below the marked tonnage.	1. Maintenance of the boats and nets. 2. Assessment and settlement of insurance.
(ii) No.of houses damaged	1. Insurance coverage for houses.	-	1. Settlement of insurance.
(iii) Loss of stock	-	-	1. Assessment of stock (fish population) and replenishment if stock is depleted. 2. Habitat restoration for the stock remaining.
(iv) Changes in water quality	-	-	1. Application of lime in tanks. 2. Application of fertilizer.

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
(v) Health and diseases	-	-	1. Observation of the health status of fish and accordingly control measure should be taken. 2. Control on transport of brooders and seeds
B. Aquaculture			
(i) Inundation with flood water	1.Strengthening and increase in dyke height. 2. This should be constructed with inlet and out let facility.	1. Net enclosure should be provided over the dyke to prevent the escape of fish from pond.	1. Repairing and strengthening of dyke if required.
(ii) Water contamination and changes in water quality	1. Application of lime.	-	1. Application of lime and geolite. 2. Application of Alum. 3. Application of KmnO4
(iii) Health and diseases	1. Application of lime	-	1. Application of lime and $KMnO_4$. 2. Assessment of the health status of fish and accordingly control measure should be taken. 3. Control on transport of brooders and seeds.
(iv) Loss of stock and inputs (feed, chemicals etc)	1. Strengthening and increase in dyke height. 2. Before flood the stock should be harvested and sold in flood prone areas.	1. Net enclosure should be provided over the dyke to prevent the escape of fish from pond. 2. Water should be diverted from the main stream. 3. Sand bags can be used for	1. Stock assessment and restocking with advanced fingerlings or yearling if required. 2. Repairing of dykes. 3. Assessment of quality of feed and

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
	3. Transport of feed and chemicals to safer place. 4. Purchase of feeds and chemicals on weekly or fortnightly basis. 5. Insurance coverage for stock.	protection of dykes. 4. Storing of feed and chemicals to safer place.	fertilizer. 4. Assessment and settlement of insurance.
3. Cyclone / Tsunami			
A. Capture			
Marine			
(i) Average compensation paid due to loss of fishermen lives	1. Repeated broadcast and telecast of warning. 2. Sea venture should be avoided 3. Insurance coverage for lives of fishermen.	1. Provision of relief. 2. Evacuation of people to safer areas.	1. Assessment and settlement of insurance.
(ii) Avg. no. of boats / nets/damaged	1. The boats has to be secured safely to river/ reservoir banks. 2. Insurance coverage for nets and boats.	1. Checking of the safety of the boats / nets. 2. An inventory logbook with name of crewmembers should be maintained.	1. Maintenance of the boats and nets. 2. Assessment and settlement of insurance.
(iii) Avg. no. of houses damaged	1. Insurance coverage for houses.	-	1. Settlement of insurance.
Inland			
B. Aquaculture			
(i) Overflow / flooding of ponds	1.Strengthening and increase in dyke height.	1. Net enclosure should be provided	1. Repairing and strengthening of dyke

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
	2. This should be constructed with inlet and out let facility.	over the dyke to prevent the escape of fish from pond.	if required.
(ii) Changes in water quality (fresh water / brackish water ratio)			
(iii) Health and diseases	-	-	1. Application of lime and $KmnO_4$. 2. Assessment of the health status of fish and accordingly control measure should be taken. 3. Control on transport of brooders and seeds.
(iv) Loss of stock and inputs (feed, chemicals etc)	1. Strengthening and increase in dyke height. 2. Transport of feed and chemicals to safer place. 3. Insurance coverage for stock.	1. Net enclosure should be provided over the dyke to prevent the escape of fish from pond. 2. Storing of feed and chemicals in safer place.	1. Stock assessment and restocking with advanced fingerlings or yearling if required. 2. Repairing of dykes. 3. Assessment of quality of feed and chemicals. 4. Assessment and settlement of insurance.
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)	-	-	1. Repairing of pumps, aerators if required. 2. Repairing of damaged hut.
4. Heat wave and cold wave			
A. Capture			
Marine	-		-

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Inland	-	1. During hot waves night fishing should be done. 2. Preservation by cold chain should be increased during hot waves.	-
B. Aquaculture			
(i) Changes in pond environment (water quality)	1. During heat waves adequate water depth should be maintained.	1. During heat waves mixing of water with fresh water should be done. 2. The culture system should be provided with aeration to avoid oxygen depletion due to high temperature during heat waves. 3. Partial harvesting can be done to avoid loss of crop.	-
(ii) Health and Disease management	1. Application of lime and turmeric.	1. Feeding should be stopped. 2. If cold waves persists EUS outbreak takes place	1. Application of CIFAX to control EUS disease in fish.