State: ODISHA

Agriculture Contingency Plan for District: JAJPUR

1.0 District Agriculture profile				
1.1	Agro-Climatic/Ecological Zone			
	Agro Ecological Sub Region (ICAR)	Eastern plateau (chhotanagpur) And Eastern Zone (12.2)		
	Agro-Climatic Zone (Planning Commission)	East coast plain and hills region (XI)		
	Agro Climatic Zone (NARP)	North Eastern Costal Plain Zone (OR-3)		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Balasore, Bhadrak , Jajpur , Ghasipura and Hatadihi blocks of Keonjhar		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		20. 51' 00" N	86.20' 00" E	19m MSL
	Name and address of the concerned RRTTS	Regional Research & Technology Transfer Station (RRTTS) OUAT, Ranital, Bhadrak - 756111		
	Mention the KVK located in the district with address	KVK, Jajpur, At/Po- Barchana, Jajpur , Pin- 754 081		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	AMSS, Ranital, Bhadrak		

1.2	Rainfall	Normal RF(mm)	Normal Rainy days (number)	Normal Onset	Normal Cessation
	SW monsoon (June-Sep):	1168.6	51.0	June 2nd week	September last week
	NE Monsoon(Oct-Dec):	185.1	8.2	October 2nd week	December 2nd week
	Winter (Jan- Feb)	66.4	2.9		
	Summer (Mar-May)	139.8	6.1		
	Annual	1559.9	68.2		

*Source – SREP, ATMA Jajpur 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)	290	145	72	5	4	4	4	5	-	5

* 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 soils	156.8	54.1
	Alluvial soils	55.2	19.0
	Red Laterite soils	41.5	14.3
	Saline soil Alluvial soils	18.4	6.3
	Red Laterite Alluvial soils	17.7	6.1

*Source -SREP ATMA Jajpur 2008-09

1.5	Agricultural land use	Area (‘000 ha)	Cropping intensity %
	Net sown area	145	188
	Area sown more than once	128	
	Gross cropped area	273	

*Source- Orissa Agricultural statistic 2008-09

1.6	Irrigation	Area (‘000 ha)		
	Net irrigated area	54.3		
	Gross irrigated area	84.2		
	Rainfed area	91		
	Sources of Irrigation	Number	Area (‘000 ha)	Percentage of total irrigated area
	Canals		24.054	40.0
	Tanks		-	-
	Open wells		0.720	1.2
	Bore wells		17.928	29.9
	Lift irrigation schemes		7.129	11.9
	Micro-irrigation			
	Other sources (Water harvesting structure)		0.555	0.93
	Total Irrigated Area		54.36	
	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	2		
	Safe	5		
	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 Jajpur 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*				
		Irrigated	Rain fed	Total	Irrigated	Rain fed	Total	Summer	Grand total
	Paddy	45.3	90.3	135.7	-	-	-	3.1	138.9
	Groundnut	-	0.7	0.7	0.2	29.7	29.8		30.6
	Green gram				6.2	9.3	15.6		15.6
	Black gram	0.2	1.8	1.9	-	2.8	2.8		4.8
	Jute	-	1.4	1.4	-	-	-		1.4
	Sugarcane	-	-	-	134	-	1.3		1.3

*Source – Orissa Agril. Statistic2008-09

	Horticulture crops - Fruits	Area ('000 ha)
		Total
	Cashew nut	2.21
	Mango	1.67
	Banana	0.19
	Citrus	0.18
	Guava	0.12
	Horticulture crops - Vegetables	**Total**

	Chilli	2.6
	Potato	1.2
	Sweet Potato	1.05
	Onion	1.0
	Other vegetable	32.9
	Medicinal and Aromatic crops	**Total**
	Aloevera	1.0
	Amla	0.8
	Plantation crops	**Total**
	Coconut	2.43
	Cashew	2.21
	Eg., industrial pulpwood crops etc.	
	Fodder crops	**Total**
		211.5
	Total fodder crop area	211.5
	Grazing land	
	Sericulture etc	

*Source- SREP ATMA Jajpur 2008-09

1.8	**Livestock**	**Male (‘000)**	**Female (‘000)**	**Total (‘000)**
	Non descriptive Cattle (local low yielding)			
	Improved cattle			653.7
	Crossbred cattle			
	Non descriptive Buffaloes (local low yielding)			21.0
	Descript Buffaloes			
	Goat			255.6
	Sheep			67.4
	Others (Camel, Pig, Yak etc.)			5.8
	Commercial dairy farms (Number)			
1.9	**Poultry**	No. of farms	Total No. of birds (‘000)	
	Commercial		572.152	
	Backyard			

1.10	**Fisheries** (Data source: Chief Planning Officer) *Source- SREP ATMA , Jajpur 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)	1894.28	2.18	511.07MT

*Source: SREP ATMA, Jajpur 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	306.8	2661	9.9	3123			316.8	2280	
	Blackgram	0.7	375	13.7	446			14.4	442	
	Groundnut	1.1	1485	57.1	1918			58.3	1907	
	Jute	14.1	1725	-	-			14.1	1725	
	Sugarcane			80.2	59877			80.2	59877	
Others	Greengram			5.5	352			5.5	352	
	Major Horticultural crops (Crops to be identified based on total acreage)									
	Potato			2.2	11356			2.2	11356	
	Onion			7.5	8163			7.5	8163	
	Sweet potato	0.3	6000	0.7	9750			1.0	8307	
	Chilli	0.8	802	1.3	884			2.1	849	
	Coriander			0.5	500					

*Source: Orissa Agril. Statistic 2008-09

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Paddy	Blackgram	Groundnut	Jute	Sugarcane
	Kharif- Rainfed	May 2nd week – June 4th week	July 1st week – July 4th week	June 2nd week – July 1st week	May 4th week – June 2nd week	-
	Kharif-Irrigated	June 2nd week – August 2nd week	-	-	April 2nd week – May 2nd week	-
	Rabi- Rainfed	-	December 2nd week – December 4th week	September 2nd week – December 2nd week	-	-

	Rabi-Irrigated	January 2nd week – February 2nd week	January 2nd week – January 4th week	December 1st week – Jan uary 2nd week	-	December - February

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 green gram		√	
	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
		Soil map as Annexure 3	Enclosed

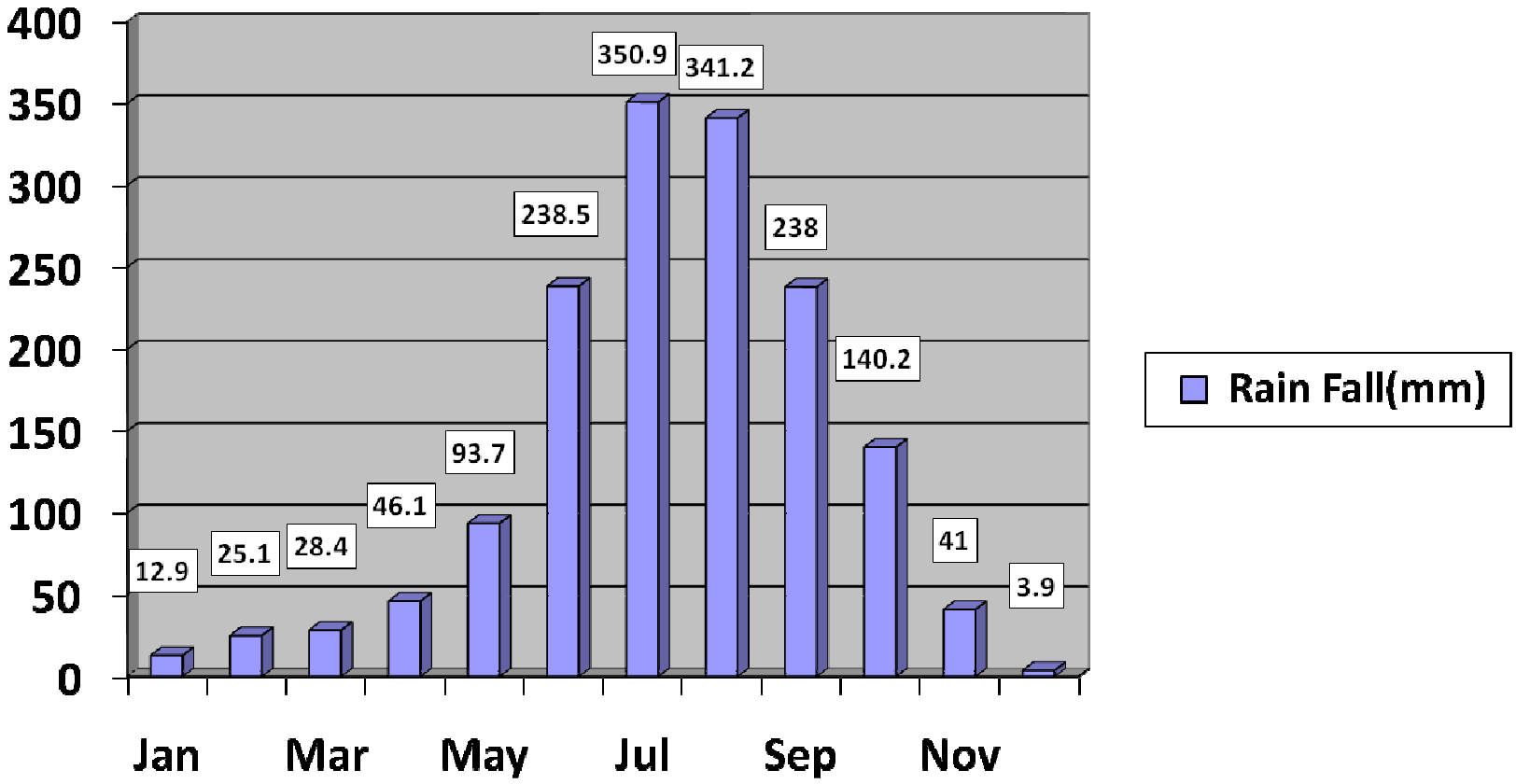
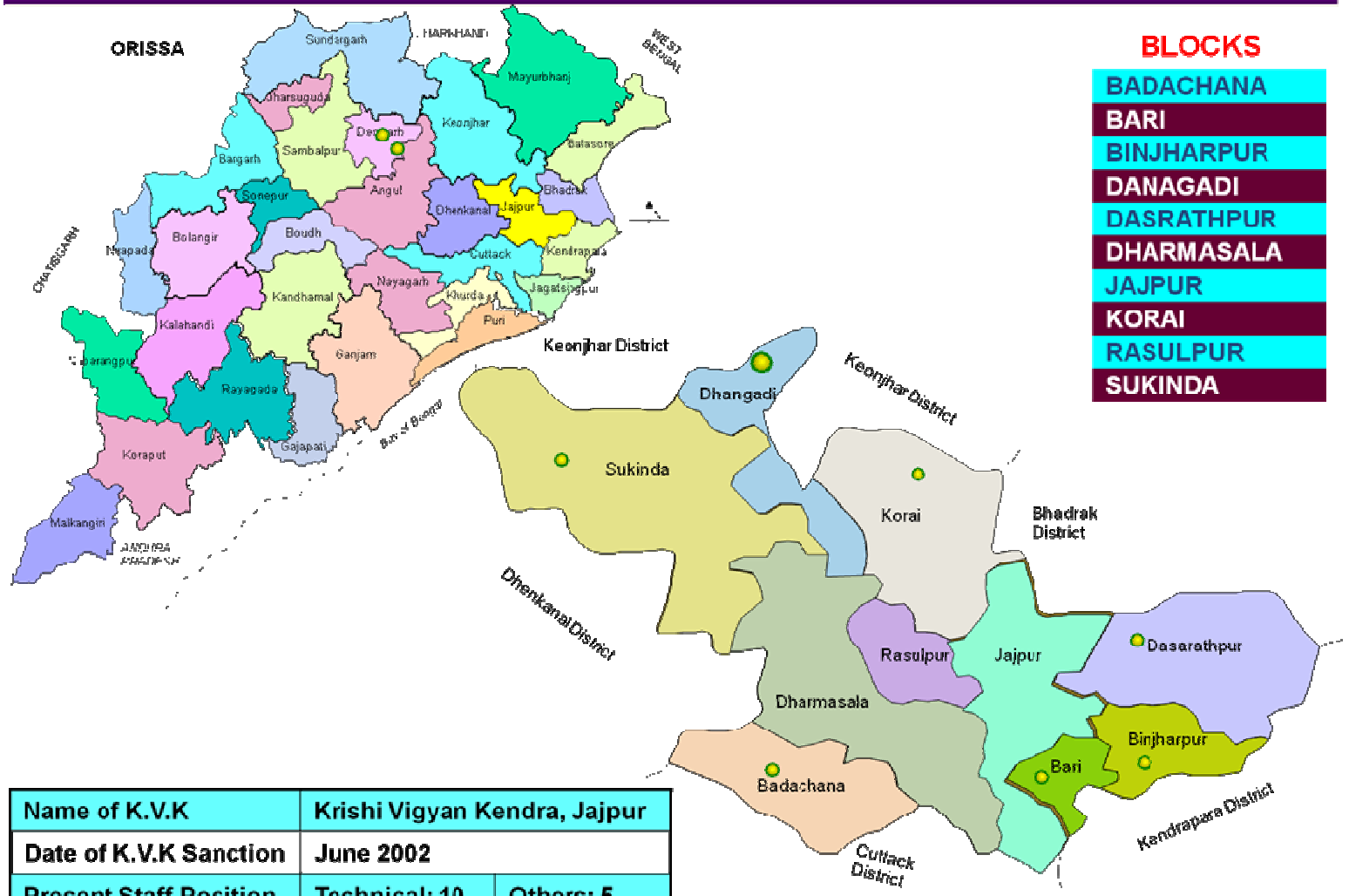


Figure 1 - Average Monthly Rainfall in Jajpur District

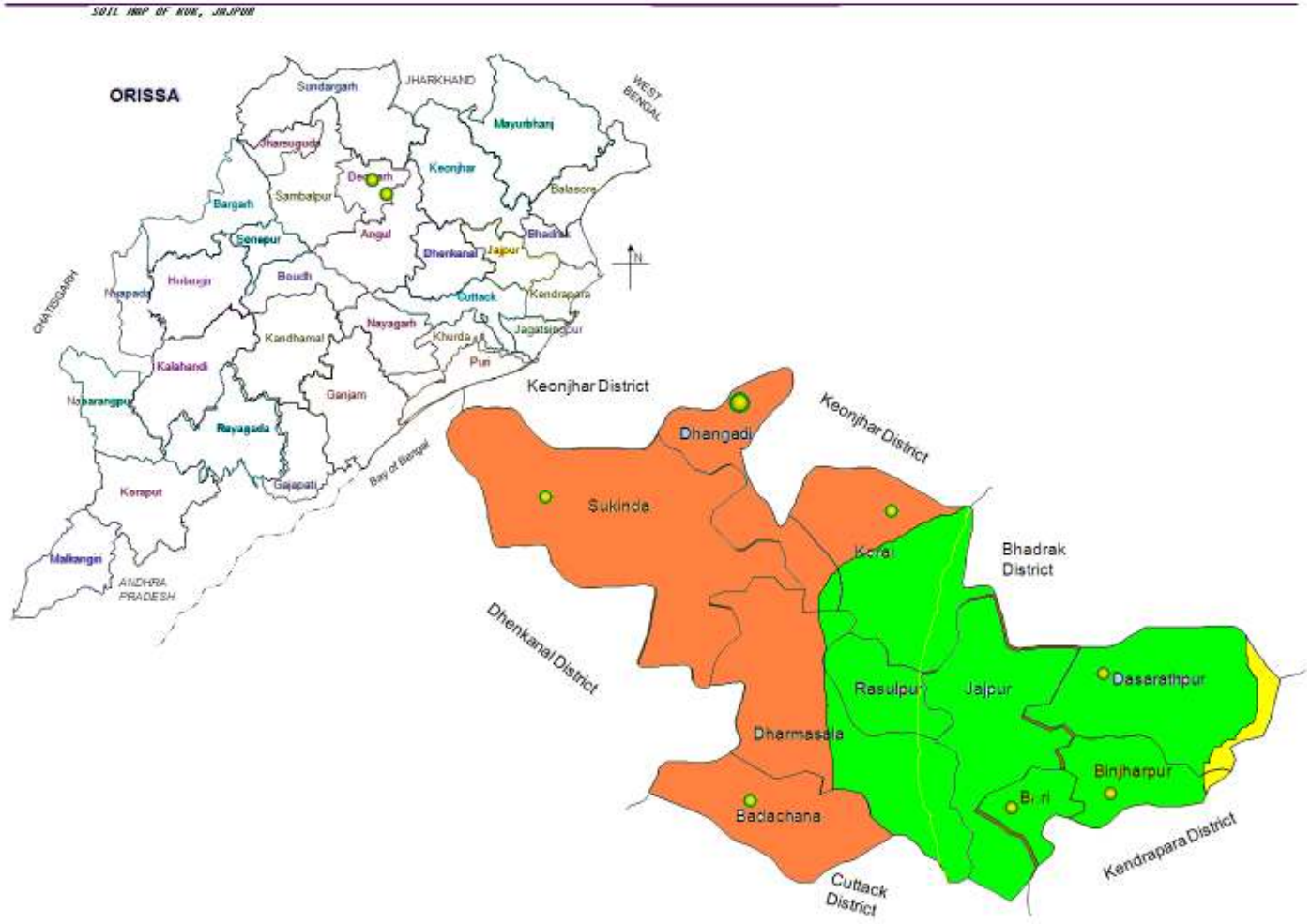
JAJPUR DISTRICT AT A GLANCE



BLOCKS

- BADACHANA
- BARI
- BINJHARPUR
- DANAGADI
- DASRATHPUR
- DHARMASALA
- JAJPUR
- KORAI
- RASULPUR
- SUKINDA

Name of K.V.K	Krishi Vigyan Kendra, Jajpur	
Date of K.V.K Sanction	June 2002	
Present Staff Position	Technical: 10	Others: 5
K.V.K e-Mail Address	jajpur_kvk@yahoo.co.in	



Soil Map of District Jajpur

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 soils	Paddy	Paddy(Hira,Patthara,Bandana, Sneha	• Summer ploughing, inter tillage, conservation furrow, in-situ rain water harvest / conservation • Strengthening of field bunds in paddy , weeding and hoeing within 20 days to provide dust mulch • Rain water harvesting and recycling	NFSM (seed) , CLDP, IWMP (WHS) , RKVY (chemicals)
		Maize	Maize (Kiran,Pratap, VL-16)	• Life saving irrigation	
	High rainfall light laterite soils	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	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)
		Groundnut - Fallow	Groundnut (Devi, smruti)	• Sowing across the slope, ridge and furrow planting • Broad bed and furrow planting • Hoeing within 20days to provide soil mulch and weeding • Life saving irrigation • Application of Oxiflurofen @ 200gm/ha as PE spray or post emergence spray of Quizalofop Ethyle @ 0.05kg ai/ha for weed control	
		Brinjal – Fallow	Brinjal (Green star)	• Hoeing weeding and ridging • Organic mulch to brinjal	

	Rainfed alluvium	Paddy Paddy-Blackgram	Paddy (Pooja ,Ranidhan, Swarna for low land and Lalat, Konarka for medium land) Blackgram (PU 30,PU 19)	• 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	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)
		Jute	Jute (Naveen, Basudev, Baladev) - Blackgram (PU 30,PU 19)	• PE spray or post emergence spray of Quizalofop Ethyle @ 0.05kg ai/ha for weed control • Thinning and 2% urea solution spray to jute • Basal K & Bo application	
	Medium rainfall river valley alluvium	Paddy – Groundnut	Paddy (Lalata, Surendra, Konark, 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 • Hoeing within 20days to provide soil mulch and weeding • Life saving irrigation • Application of Oxiflurofen @ 200gm/ha as PE spray or post emergence spray of Quizalofop Ethyle @ 0.05kg ai/ha for weed control	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)
		Jute – Groundnut	Jute (Naveen, Basudev) - Groundnut (Devi,Smruti,TMV-2)	• Blocking drainage hole • weed control, thining and 2% urea solution spray to jute • Basal K & Bo application • Hoeing within 20days to provide soil mulch and weeding • Life saving irrigation • Application of Oxiflurofen @ 200gm/ha as PE spray or post emergence spray of Quizalofop Ethyle @ 0.05kg ai/ha for weed control	

	Low lying flood prone soils	Local paddy - Blackgram	Paddy (Pooja, Tulasi,Indrabati, Upahar, Varsadhan, Swarna Sub-1,Pratikhya) - Blackgram(PU-30, PU-19)	• Strengthening field bunds, plugging drainage holes • Transplanting 3-4 seedlings per hill • Life saving irrigation at critical stages • Black gram seed treatment with Rhizobium & PSB	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)
	Saline soils	Paddy	Paddy (Luna Suvarna, Luna Sampad, Lunishree)	• Strengthening field bonds, checking drainage holes • Apply bulky organic manure • Transplanting 3-4 seedlings per hill in paddy • Community nursery raising and transplanting 3-4 seedling per hill	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)

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 (Upto July 3rd week)	Red laterite rain fed	Paddy	Paddy(Hira,Patthara,Bandana, 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 • Rain water harvesting and recycling	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)
		Maize	Maize (Kiran,Pratap, VL-16)	Life saving irrigation	
	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	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)

		Groundnut	Groundnut (Devi, smruti)	• Sowing across the slope, ridge and furrow planting • Broad bed and furrow planting • Hoeing within 20days to provide soil mulch and weeding • Life saving irrigation • Application of Oxiflurofen @ 200gm/ha as PE spray or post	
		Groundnut - Fallow	Groundnut (Devi, smruti)	• Emergence spray of Quizalofop Ethyle @ 0.05kg ai/ha for weed control	
		Brinjal – Fallow	Brinjal (Green star)	• Hoeing weeding and ridging • Organic mulch to brinjal	
	Rainfed alluvium	Paddy Paddy-Blackgram	Paddy (Pooja ,Ranidhan, Swarna for low land and Lalat, Konarka for medium land) Blackgram (PU 30,PU 19)	• 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	Jute (Naveen, Basudev, Baladev) - Blackgram (PU 30,PU 19)	• PE spray or post emergence spray of Quizalofop Ethyle @ 0.05kg ai/ha for weed control • Thinning and 2% urea solution spray to jute • Basal K & Bo application	
	Medium rainfall river valley alluvium	Paddy – Groundnut \	Paddy (Lalata, Surendra, Konark, 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 • Hoeing within 20days to provide soil mulch and weeding • Life saving irrigation • Application of Oxiflurofen @ 200gm/ha as PE spray or post emergence spray of Quizalofop Ethyle @ 0.05kg ai/ha for	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)

				weed control	
		Jute – Groundnut	Jute (Naveen, Basudev) - Groundnut (Devi,Smruti,TMV-2)	• Blocking drainage hole • weed control, thinning and 2% urea solution spray to jute • Basal K & Bo application • Hoeing within 20days to provide soil mulch and weeding • Life saving irrigation • Application of Oxyflurofen @ 200gm/ha as PE spray or post emergence spray of Quizalofop Ethyle @ 0.05kg ai/ha for weed control	
	Low lying flood prone	Local paddy - Blackgram	Paddy (Pooja, Tulasi,Indrabati, Upahar, Varsadhan, Swarna Sub-1,Pratikhya) - Blackgram(PU-30, PU-19)	• Strengthening field bunds, plugging drainage holes • Transplanting 3-4 seedlings per hill • Life saving irrigation at critical stages • Black gram seed treatment with Rhizobium & PSB	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)
	Saline soils	Paddy	Paddy (Luna Suvarna, Luna Sampad, Lunishree)	• Strengthening field bonds , checking drainage holes • Apply bulky organic manure • Transplanting 3-4 seedlings per hill in paddy • Community nursery raising and transplanting 3-4 seedling per hill	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)

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) • 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	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)
	High rainfall light laterite	Maize / Groundnut / Brinjal	-do-	-do-	
	Rainfed alluvium	Paddy Paddy – Blackgram	• Paddy (Jogesh , Khandagiri, Lalata, Surendra, Konarka) - Blackgram (PU-30,PU-19)	• 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 • Rain water harvest & life saving irrigation when needed	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)
		Jute	• Jute (Naveen ,Basudev, Baladev) • Greengram (PDM-54, OBGG-52,TARM-2)	Spraying 2% urea solution to jute	

	Medium rainfall river valley alluvium	Paddy – Groundnut	Paddy (Jogesh, Sidhhant, Khandagiri) – 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 • Rain water harvest & life saving irrigation when needed	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)
		Jute – Groundnut	Jute (Naveen, Basudev) - Groundnut (Devi, Smruti, TMV-2)	• Spraying 2% urea solution to jute	
	Low lying flood prone soils	Local paddy – Blackgram	Paddy (Pooja, Tulasi, Indrabati, Upahar, Varsadhan, Swarna Sub-1) – Blackgram (PU-30,PU-19)	• 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 • Black gram seed treatment with Rhizobium & PSB	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)
	Saline soils	Paddy	Paddy (Luna Suvarna, Luna Sampad, Lunishree)	-do-	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)

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 (2:3) / ○ 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	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)
	High rainfall light laterite soils	Maize / Groundnut /Brinjal	-do-	-do-	-do-
	Rainfed alluvium	Paddy Paddy – Blackgram	• Paddy (Jogesh , Khandagiri, Lalata, Surendra, Konarka) - Blackgram (PU-30,PU-19)	• 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 • Rain water harvest & life saving irrigation when needed	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)
		Jute	• Jute (Naveen ,Basudev, Baladev) - • Greengram(PDM-54, OBGG-52,TARM-2)	• Spraying 2% urea solution to jute • Green gram seed treatment with Rhizobium & PSB	

	Medium Rainfall river valley alluvium	Paddy – Groundnut	• Paddy (Jogesh, Sidh hant, 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 • Application of 50% N as basal • Rainwater harvesting and life • saving irrigation when needed	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)
		Jute – Groundnut	• Jute (Naveen, Basudev) - Groundnut (Devi, Smruti, TMV-2) • Sesamum (Uma, Nirmala, Prachi) - Groundnut (Devi,Smruti,TMV-2)	• 2% urea solution spray to jute • Ground nut seed treatment with Rhizobium & PSB	
	Low lying flood prone soils	Local paddy - Blackgram	• Paddy (Pooja, Tulasi, Upahar, Varsadhan, Swarna Sub-1) – Blackgram • (PU-30,T9)	• 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 • Black gram seed treatment with Rhizobium & PSB	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)
	Saline soils	Paddy	• Paddy (Luna Suvarna, Luna Sampad, Lunishree)	• Strengthening field bunds , checking drainage holes • Apply bulky organic manure • Raising community nursery and transplanting 3-4 seedling /hill • Closer spacing to clonal tiller • Apply 50% N as basal	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)

*

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 soils	Paddy	• Resowing if more than 50% population damaged other wise gap filling. • Preferring paddy varieties like Hira,Kalinga-III, Pathara • Summer ploughing , weeding • Seed treatment with $CaCl_2$ for drought tolerance • Hoeing and weeding after 20 DAS for in-situ moisture conservation	• 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 • Inter tillage and hoeing for dust mulching • Strengthening field bunds • Blocking seepage holes & gully plugging in paddy	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)
		Maize	• FYM:SSP @10:1 placed at seeding point to avoid seedling mortality		
	High rainfall lilght laterite soils	Maize	• 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 • Sowing in furrows across the slope	• Water harvesting and recycling • Inter tillage and hoeing for dust mulching • Bed furrows system of planting • Weeding , hoeing, ridging in maize	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)
		Groundnut	• Hoeing and weeding after 20 DAS for in-situ moisture conservation • FYM : SSP @ 10:1placed at seeding point to avoid seedling mortality		
	Rain fed alluvium soils	Paddy Paddy –Blackgram/ Greengram	• Prefer varieties like Lalata, Konarka, Surendra • Sow sprouted seeds • Community nursery raising and transplanting • Providing life saving irrigation	• Strengthening of field bunds • In-situ water harvesting and recycling • Blocking seepage hole • Gully plugging	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)

			• Resowing if more than 50% population damaged • FYM : SSP @ 10:1placed at seeding point to avoid seedling mortality • Gap filling by Khelua and by clonal propagation		
		Jute	• Weed control to check transpiration loss • Application of 2% urea solution to jute		
	Medium rainfall river valley alluvium	Paddy – Groundnut	• Prefer varieties like Jogesh, Sidhhant, Khandagiri • Community nursery raising and transplanting • Sow sprouted seeds • Providing life saving irrigation • Resowing if more than 50% population damaged • Gap filling by Khelua and by clonal propagation	• Strengthening of field bunds • Insitu water harvesting and recycling • Blocking seepage hole • Gully plugging	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)
		Jute – Groundnut	• Weed control to check the transpiration loss • FYM : SSP @ 10:1placed at seeding point to avoid seedling mortality sowing in furrows across the slope • Application of 2% urea solution to jute		
	Low lying flood prone soils	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 seeds	• Strengthening of field bunds • In-situ water harvesting and recycling • Blocking seepage holes • Gully plugging	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)

	6) Saline Soils	Paddy	• Prefer varieties like Luna Subarna, Luna Sampad, Lunishree • Community nursery raising and transplanting 3-4 seedling/hill • Providing life saving irrigation • Gap filling by Khelua and clonal propagation • Application of bulky organic manure/ green leaf manure as basal	• Strengthening of field bunds • In-situ water harvesting and recycling • Blocking seepage holes • Gully plugging • Raising bund height in paddy	CLDP, IWMP (WHS), NFSM (seed) , RKVY (chemicals)

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	Red laterite rain fed soils	Paddy	• Spray 2% urea and withhold topdressing till receipt of rain • Intercropping of arhar with paddy(2:5)	• 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
		Maize	• Intercropping of arhar with maize (2:2) • Provide dust mulch using rotary peg weeder for hoeing		
	High rainfall light laterite soils	Maize	• Bed furrow and ridge furrow system of planting • Provide dust mulch by hoeing with rotary- peg weeder • Intercropping arhar with maize (2:2)	• 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	IWMP, NREGS (WHS) , CLDP NFSM (seed) ,

		Groundnut	• Prune weeds and apply Quizalo-fopethyl 5% EC@ 0.05kg ai/ha at 20 DAS • Intercropping arhar with maize (2:2) ,groundnut (2:6) • Top dress after receipt of rain • Thin out 25% and provide organic mulch	• Summer ploughing and application of FYM 5t and lime 5qtl Per ha	RKVY (chemicals)
		Brinjal	• Spray 1% urea to brinjal • Organic mulching • Spraying anti transpirant (Kaoline)		
	Rain fed alluvium	Paddy 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	• Close the drainage lines • Strengthening the field bund • In-situ water harvesting and recycling for protective irrigation	RKVY (seed), IWMP, NREGS (WHS) , NFSM (chemical) CLDP
		Jute	Spray 2% urea as foliar spray and apply potasic fertiliser		
	Medium rainfall river valley alluvium	Paddy – 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	• Close the drainage lines • Strengthening the field bund • In-situ water harvesting and recycling for protective irrigation • Close drainage hole and check seepage losses	IWMP, NREGS (WHS) , CLDP NFSM (seed) , RKVY (chemicals)
		Jute – Groundnut	Spray 2% urea as foliar spray		

	Low lying flood prone soils	Paddy – Blackgram/ Greengram	• No beushaning 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 • 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 etc. • Foliar spray with 2% urea	• Close the drainage lines • Strengthening the field bunds • In-situ water harvesting and recycling for protective irrigation	RKVY (seed), IWMP, NREGS (WHS) , NFSM (chemical) CLDP
	Saline soils	Paddy – Fallow	• No beusaning if crop is above 45 days old • Weed out field • Gap filling with clonal tillers after receipt of rain • Community nursery raising • Remove weeds in nursery, blast management and life saving irrigation • Sow sprouted seeds of Luna Subarna, Luna Sampad varieties • Planting 3- 4 seedlings /hill • Foliar spray with 2% urea • Apply bulky organic manure /green leaf manure as basal	• Close the drainage lines • Strengthening the field bund • In-situ water harvesting and recycling for protective irrigation • Irrigate with good quality water	IWMP, NREGS (WHS), RKVY (seed), NFSM (chemical) CLDP

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 flowering/ fruiting stage	Red laterite rain fed	Paddy	• Inter cropping arhar with paddy (2:5) • Sprinkling of water to keep micro climate moist • Spraying of 2% urea solution • Application of life saving irrigation •	• Strengthening of field bunds, blocking drainage and seepage holes, Compartmental bunding • In-situ water harvesting and recycling • 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	RKVY (seed), NFSM (chemical) IWMP, NREGS (WHS), CLDP
		Maize	• Inter cropping arhar with maize (2:2) • Maize may be harvested for cobs		
	High rainfall light laterite soils	Maize – Fallow	• Inter cropping arhar with maize (2:2) • Sprinkling of water to keep micro climate moist • Maize may be harvested for cobs • Organic mulching	-do-	-do-
		Groundnut – Fallow	• Application of protective life saving irrigation • Organic mulching		
		Brinjal - Fallow	• Spraying of 1% urea solution to brinjal • Spraying 2% KCL and 0.1% boron • Spraying anti transpirant (Kaolin) to brinjal • Organic mulching		
	Rain fed alluvium	Paddy	• Provide life saving irrigation • Sprinkling of water to keep micro climate moist	• Strengthening of field bunds • Blocking drainage and seepage hole • In-situ water harvesting in small ditches to recycle as protective irrigation	RKVY (seed), NFSM (chemical) IWMP, NREGS (WHS), CLDP
		Jute	Spraying of 2% urea solutions after weeding the plot		

		Paddy – Blackgram/ Greengram	Top dressing with receipt of rain		
	Mid rainfall river valley alluvium	Paddy – Groundnut	• Provide life saving irrigation • Sprinkling of water to keep micro climate moist	• Strengthening of field bunds • Blocking drainage and seepage holes • Insitu water harvesting in small ditches to recycle as protective irrigation	IWMP, NREGS (WHS), RKVY (seed), NFSM (chemical) CLDP
		Jute – Groundnut	• Spraying of 2% urea solutions after weeding the plot • Top dressing with receipt of rain		
	Low lying flood prone soils	Paddy – Blackgram / Greengram	• 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	-do-	
	Saline soils	Paddy	• Provide life saving irrigation • Spraying of 2% urea solutions after weeding the plot • Top dressing with receipt of rain • Apply bulky organic manure & green leaf manure as basal	-do-	

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 soils	Maize	• Provide protective I life saving irrigation preferably in root zones • Application of sufficient FYM at sowing to extend period of water availability • Ridge and furrow Sowing across the slope • Strengthening field bunds blocking drainage channel and seepage holes • Maize may be harvested as cobs	Sow / dibble pre-rabi crops like sesamum (Uma, Nirmala,Prachi), Niger (Deomali), Horsegram(Urmi) in case of complete crop failure	IWMP, NREGS (WHS), RKVY (seed), NFSM (chemical) CLDP
		Paddy	• Harvest paddy at physiological maturity stage		
	2) High rainfall light laterite		• 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 • 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	
		Maize	• Maize may be harvested as cobs		
		Groundnut	• Sprinkle irrigation for harvest • Organic mulching		
		Brinjal	• Spraying of 1% urea solution to brinjal • Spraying 2% KCl and 0.1% boron • Spraying anti transpirant (Kaoline) to brinjal • Organic mulching		

	Rain fed alluvium	Paddy Paddy – Blackgram/ Greengram	• Strengthening field bunds , cheak runoff and seepage loss and block drainage channels • 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 • Application of potassium fertilizer	Sow prerabi crops like horsegram (Urmi), Sesamum(Uma, Nirmala,Prachi), Blackgram(T-9, PU-19,PU- 30), Greengram(PDM-54,Sujata)	NFSM (chemical) CLDP IWMP, NREGS (WHS), RKVY (seed),
		Jute	Spraying of 2% urea solutons after weeding the plot	
	Medium rainfall river valley alluvium soils	Paddy – Groundnut	• Strengthening field bunds , cheak runoff and seepage loss and block drainage channels • 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 • Application of potassium fertilizer	• 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	RKVY (seed), NFSM (chemical) IWMP, NREGS (WHS), CLDP
		Jute - Groundnut	• Spraying of 2% urea solutions after weeding the plot • Sprinkle irrigation for harvest • Organic mulching		
	Low lying flood prone soils	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	• Paira sowing of blackgram/field pea • Sow pre-rabi crops like horsegram (Urmi), sesamum (Uma, Nirmala, Prachi), blackgram (T-9,PU-30,PU-	IWMP, NREGS (WHS), RKVY (seed), NFSM

			• Harvest paddy at physiological maturity stage • Strengthening field bunds , cheak runoff and seepage loss and block drainage channels	19), Green gram (PDM-54, Sujata)	(chemical) CLDP
	Saline soils	Paddy- fallow	• 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 , check runoff and seepage loss and block drainage channels	• Sow pre-rabi crops – Safflower (A-300), Sunflower (Surya)	

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 – Groundnut / Sunflower- Moong (Varieties for : Moong- TARM-2, PDM-54, OBGG-52 Groundnut- Devi, Smruti,TMV-2 Sunflower – KBSH-1, MSH-1)	• Raising community nursery • 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	IWMP, NREGS (WHS), RKVY (seed), NFSM (chemical) CLDP

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
		Paddy – Moong	Paddy – Sugarcane + moong – Ratoon (Moong- TARM-2, PDM-54, OBGG-52)	• Planting pregerminated seeds • Weeding to direct seeded paddy without beusaning • Nitrogen top dressing after receipt of rain / irrigation • Growing green gram intercropped with sugarcane	
		Paddy / Jute – Groundnut	Jute – Vegetable / Groundnut- moong (Moong- TARM-2, PDM-54, OBGG-52 Groundnut- Devi, Smruti,TMV-2)	2% urea spray to jute Bed - furrow system of planting in Groundnut , Skip row / sprinkler irrigation to Groundnut	

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation[j]**
Limited release of water in canals due to low rainfall	Rain fed alluvium	Paddy	Paddy – Moong (Moong- TARM-2, PDM-54, OBGG-52)	• 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	RKVY (seed), NFSM (chemical) IWMP, NREGS (WHS), CLDP
		Paddy – Moong	Paddy – Sugarcane + moong – Ratoon (Moong- TARM-2, PDM-54, OBGG-52)	• Paired row planting in sugarcane	

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation[j]**
		Paddy / Jute – Groundnut	Paddy/Jute - Groundnut /Vegetable- Moong (Moong- TARM-2, PDM-54, OBGG-52 Groundnut- Devi, Smruti,TMV-2)	• Foliar nutrient application • 2% urea spray to jute • Bed - furrow system of planting in groundnut • Skip row irrigation / sprinkler irrigation to groundnut	

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 in catchment	Rain fed alluvium	Paddy	Paddy – Moong (Moong- TARM-2, PDM-54, OBGG-52)	• 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	IWMP, NREGS (WHS), RKVY (seed), NFSM (chemical) CLDP
		Paddy – Moong	Paddy – Sugarcane + Moong – Ratoon (Moong- TARM-2, PDM-54, OBGG-52)	• Paired row planting in sugarcane, Skip row irrigation	
		Paddy / Jute – Groundnut	Jute - G.nut - Moong (Groundnut- Devi, Smruti,TMV-2)	• Foliar nutrient (2% urea) spray to jute • Bed - furrow system of planting & sprinkler irrigation in groundnut	

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 – moong (Moong- TARM-2, PDM-54, OBGG-52)	• Strengthening field bunds , water harvesting and recycling • Transplanting paddy (Khandagiri, Sidhhant, Jogesh) • Opt for SRI method using cono weeder	RKVY (seed), NFSM (chemical) IWMP, NREGS (WHS), CLDP
		Paddy / Jute – Groundnut	Jute - Groundnut (Groundnut- Devi, Smruti,TMV-2)	• Foliar nutrient application(2% urea spray to jute) • Sprinkler irrigation & • Bed furrow system of • planting groundnut • Skip row irrigation • 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 potassic fertiliser Harvest at physiological maturity	Drying Safe storage Early disposal
Blackgram/ Greengram	Provide drainage Higher seed rate	Provide drainage	Provide drainage	Drying Safe storage Early disposal

Groundnut	Provide drainage	-do-	-do-	-do-
Jute	-do-	-do-	-do-	-do-
Sugarcane	It escapes	Provide drainage Earthing up	Provide drainage Earthing up	Provide drainage 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 drier 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	Intermittent drainage	Provide drainage Apply potassic fertiliser Harvest at physiological maturity	Drying Safe storage Early disposal
Blackgram	Provide drainage Higher seed rate	Provide drainage	Provide drainage	-do-
Groundnut	Provide drainage	-do-	-do-	-do-
Jute	-do-	-do-	Early harvest	-do-
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 propping	Drainage of excess water propping	Drainage of excess water propping	Keeping Fruit in a well ventilated drier 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- spraying of chloropiriphus @ 2ml/ltr of water at evening	Adopt need based pesticide	Adopt need based pesticide	Drying Safe storage Early disposal
Groundnut	Adopt need based pesticide	Tikka disease – apply Saf @ 1gm/ltr of water and adopt need based pesticide	Adopt need based pesticide	Drying Safe storage Early disposal
Jute	Semilooper - spray cartap hydrochloride @ 1gm/ltr of water.	Adopt need based pesticide	-do-	-do-
Sugarcane	Interned Borer- Spraying of cartap hydrochloride @ 1gm/ltr	-do-	-do-	-do-
Horticulture				
Mango	Adopt need based pesticide	Adopt need based pesticide	Adopt need based pesticide	Drying Safe storage Early disposal
Cashewnut	-do-	-do-	-do-	-do-
Banana	-do-	-do-	-do-	-do-

2.3 Floods

Condition	Suggested contingency measures			
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 • Weed out rice field • Apply N&K to boost the growth • Redistribution of seedling • Ridge and forrow planting to horticulture crops	• Provide drainage • Rinsing the top leaves and floral parts • If revival is 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
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

Sugarcan	• 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	• 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 revival 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%) • 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 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	Sprinkling water Soil mulching	Sprinkling water Frequent irrigation	NA
Groundnut	Sprinkling water	Sprinkling water Soil mulching	Sprinkling water Frequent irrigation	NA
Jute	Frequent irrigation	Frequent irrigation	Frequent irrigation	NA
Sugarcane	Frequent irrigation	Frequent irrigation	Frequent irrigation	NA
Horticulture	Frequent irrigation	Frequent irrigation	Frequent irrigation	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			
Horticulture				
Frost				
Horticulture				
Hailstorm				
Horticulture				
Cyclone				
Paddy	Drainage Reseeding	Cleaning	Cleaning	Immediate harvest and drying
Blackgram/ Green gram	Escapes	Drainage	Drainage	Immediate harvest and drying
Groundnut	Escapes	Drainage	Drainage	Immediate harvest and drying

Jute	Cleanning &earthing	Cleanning &earthing	Cleanning &earthing	Immediate harvest and drying
Sugarcane	Draiage Wrapping & propping	Drainage Wrapping & propping	Drainage Wrapping & propping	Immediate harvest and drying
Horticulture				
All Crops	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

2.5 Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event[s]	During the event	After the event
Drought			
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.	Use of unconventional livestock feed such as sugar cane top, sugar cane bagasse, banana plant Crop residues such as Cassia tora 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.	
Drinking water	Preserving water in community tanks and ponds etc for drinking purpose by excavation and sanitization of these resources. In addition, wells (bore wells or dug wells) may be constructed ahead of possible event of draught.	Water sources of Temples, Churches, Gurdwaras, Jain temples and Maszids are generally ideal sources during draught.	
Health and disease management	Veterinary preparedness with vaccine and medicines.	Conducting animal health camps and treating the affected animals Supplementation of mineral and vitamin mixtures	Supplementary feeding of remaining livestock and the replacement stock

Floods			
Feed and fodder availability	• Procured feeds and fodders should be fed to all animals on the order of priority of animals.	• Straws and stoves that got soaked during floods 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.	• Provision of supplementary feeding (concentrate / roughage) with vitamin &minerals. • Fungal / mouldy grown feed should not be fed
Drinking water	• Drinking water be made available to the animals in any kind of clean container available with the farmer.	• Drinking water be made available to the animals in any kind of clean container available with the farmer. • One Halogen tablet in one pot of water	• Provision of clean drinking water.
Health and disease management	• 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 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. • Keep animals away from dead animals • Carcasses should be dumped with lime and should not go to flood water	• 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. • Improving shed hygiene especially in the farmers household through cleaning and disinfection
Cyclone			
Feed and fodder availability	• Procured feeds and fodders should be fed to all animals on the order of priority of animals.	• Straws and stoves that got soaked during floods 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 choffing and sprinkling concentrate mixture can improve intake and utility.	• Provision of supplementary feeding (concentrate / Roughage) with vitamin & minerals.
Drinking water	• Drinking water is made available to the animals in any kind of clean container	• Drinking water is made available to the animals in any kind of clean container	• Provision of clean drinking water.

	available with the farmer.	available with the farmer.	
Health and disease management	• 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 be adequately available with them. • Normal saline, Dextrose, Anhallergic, Antipyretic	• 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.	• 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. • Improving shed hygiene especially in the farmers household through cleaning and disinfection
Heat wave and cold wave			
Shelter/ environment management	1. Green cover (trees plantation, land scaping) 2. Proper sheltering / housing white painting outside the roof and black painting inside the roof. 3. Washing / wallowing / sprinkling/ splashing / showering 4. Provision of cool drinking water (inearthen pitches) 5. Cooling devices : fans, wet curtains or panels, air cooler if possible.		
Health and disease management	1. Feeding Green fodder/ silage/ hay 2. Provision for night feeding 3. Grazing only if green pastures/ grass lands available 4. Graze early in the morning and late in the afternoon		

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	Ensure procurement of feed ingredients sufficient ahead	Feed supplementation will be made to the farms	Attempt will be made for available of feed ingredient or compound feed to the farmers	
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 antis tress agent. Feeding antibiotics (Tetracycline) Procurement of litter materials	Continue feeding of antis tress 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 roads	Supply the compound feed to the poultry farm under submerged area	Supply will continued till the situation is under control	
Drinking water	Protect the water sources from submergence	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.	Continue feeding antibiotics Prevent entrance of flood water to	Disinfection of the farm premises. Feeding antibiotics And	

	Feeding antibiotics Procurement of litter materials	the shed Replace wet litter Proper disposal of dead birds if any	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	
Shelter/environment management	Pruning of big trees in the farm. Putting curtains on open sides of the shed. Procurement of electrical accessories	Water proof materials will be supplied to protect the poultry sheds Provision of generator should be made to ensure electric supply for brooding of chicks and preparation of feed.	Renovation and reconstruction of affected sheds Repair of damaged electric connection	
Heat wave and cold wave				
feed Resource	Procurement of high protein and low energy diet Procurement of medicine, antistress	Feeding during cooler hour of the day. Supplementation of vitamin E and	Feeding will be continued with high protein and low energy till heat waves ends and then feeding will be done	

	agent and vitamin C and E.	C, antistress agent with water	with normal diet Antistress agents will be continued in drinking water for some days	
Water resource	Provision should be made for continuous available of water	Sufficient cool drinking water with sodium bicarbonate or electrolytes.	Availability of cold water will be made for some days	
Health and disease management	Procurement of Anti stress drugs	Supplementation of anti stress drug	Vaccination of birds against RD	
Shelter and 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	
Cold waves				
Feed resources	Procurement of high energy diet	Feed high energy diet		
Water resources	Proper water supply will be ensured			
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	
Shelter and 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.	

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.	-	-
(ii) Changes in water quality	1. Prepare to release water into the habitat.	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 over come 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. 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)Average compensation paid due to loss of humane life	1. Construction of humane shelter. 2. Storage of sand filled bags for emergency use. 3. Repair and maintenance of bundhs. 4. Preparedness for relief 5. Insurance coverage provision for life and property	1. Timely broadcast and telecast and other types of announcement warning about the danger level with respect to water level. 2. Evacuation of people to flood shelter areas. 3. Relief operation.	1. Relief operation will continue. 2. Care of health of affected people 3. Settlement of insurance. 4. Financial support to other people.
(ii) No. of boats / nets damaged	1. The boats have 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.
(iii) No. of houses damaged	1. Insurance coverage for houses.	-	1. Settlement of insurance.
(iv) Loss of stock	-	-	1. Assessment of stock (fish population) and replenishment if stock is depleted. 2. Habitat restoration for the stock remaining.
(v) Changes in water quality	-	-	1. Application of lime in tanks. 2. Application of fertilizer.
(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. The should be constructed with inlet and out let	1. Net enclosure should be provided over the dyke to prevent the escape of fish from	1. Repairing and strengthening of dyke if required.

	facility.	pond.	
(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 KmnO4. 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 ets)	1. Strengthening and increase in dyke height. 2. Before flood the stock should be harvested and sold in flood prone areas. 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.	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 cam be used for protection of dykes. 4. Storing of feed and chemicals to 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 fertilizer. 4. Assessment and settlement of insurance.
(v) Infrastructure damage (pumps, aerators, huts etc.)	Construction of flood shelter for pumps, aerators etc.	-	1. Repairing of pumps, aerators if required. 2. Repairing of damaged hut.

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	1. Provision of relief. 2. Evacuation of people to safer areas.	1. Assessment and settlement of insurance.

	fishermen.		
(ii) 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) No. of houses damaged	1. Insurance coverage for houses.	-	1. Settlement of insurance.
Inland			
B. Aquaculture			
(i) Over flow/ flooding of ponds	1. Strengthening and increase in dyke height. 2. The 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) Changes in water quality (fresh water / brackish water ratio)			
(iii) Health and diseases	-	-	1. Application of lime and KmnO4. 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 ets)	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 to 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	-	1. During hot waves night fishing should be done. 2. During hot waves preservation by cold chain should be increased.	-
Inland	-	1. During hot waves night fishing should be done. 2. Preservation by cold chain should be increased during hot waves.	-
B. Aquaculture			
(i) Change in pond environment	1. During hot waves adequate water depth should be maintained.	1. During hot 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 hot 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.