

State: ORISSA

Agriculture Contingency Plan for District: KANDHAMAL

1.0 District Agriculture profile			
1.1	Agro-Climatic/Ecological Zone		
	Agro Ecological Sub Region (ICAR)	Garjat hills, Dandakaranya and Eastern Ghats hot moist sub-humid eco-sub-region (12.1).	
	Agro-Climatic Zone (Planning Commission)	East coast plain and Hill region (XI)	
	Agro Climatic Zone (NARP)	North Eastern Ghat Zone (OR-5)	
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Kandhamal, Rayagada, Baudh	
	Geographic coordinates of district	Latitude	Longitude
		20 ^o 27'01.98" N	84 ^o 14'15.92" E
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Regional Research & Technology Transfer Station (RRTTS), G- Udayagiri, Kandhamal	
	Mention the KVK located in the district with address	KVK, Kandhamal P/O G.Udayagiri Dist. Kandhamal	
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Regional Research & Technology Transfer Station (RRTTS), G- Udayagiri, Kandhamal	

1.2	Rainfall	Normal RF(mm)	Normal Rainy days (number)	Normal Onset	Normal Cessation
	SW monsoon (June-Sep):	1306.0	41	1 st week of June	4 th week of September
	NE Monsoon(Oct-Dec):	242.5	12	3 rd week of October	4 th week of December

	Winter (Jan- Feb)	40.0	1		
	Summer (March-Apr-May)	138.0	6		
	Annual	1726.5	60	-	-

1.3	Land use pattern of the district (latest statistics)	Geographical area	Cultivable 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)	802	148	571	9	10	14	34	30	10	6

1.4	Major Soils (common names like red sandy loam deep soils (etc.))*	Area ('000 ha)	Percent (%) of total
	Black soils	2.0	1.7
	Red light texture soils	125.6	98.3

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1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	118	161
	Area sown more than once	72	
	Gross cropped area	190	

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	18.7		
	Gross irrigated area	30.7		
	Rainfed area	77.9		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals		2.0	11.6
	Tanks	485	2.1	12.2
	Open wells	3555	1.4	8.2
	Bore wells	51	5.8	33.7
	Lift irrigation schemes	81	1.43	8.3
	Micro-irrigation			
	Other sources (please specify)		4.3	25
	Total Irrigated Area		17.2	100
	Pump sets	500		
	No. of Tractors			
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tahsils	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited			
	Critical			
	Semi- critical			
	Safe			
	Wastewater availability and use			
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				
<i>Strategic Research and Extension Plan, SREP, Kandhamal</i>				

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

1.7	Major field crops cultivated	Area ('000 ha)							Grand total
		<i>Kharif</i>			<i>Rabi</i>			Summer	
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
Rice	-	53.1	53.1	0.66	-	0.66		53.8	
Maize	-	15.8	15.8	0.17	-	0.17		16.0	
Arhar	-	5.0	5.0	-	-	-		5.0	
Blackgram	-	4.5	4.5	0.20	-	0.20		4.7	
Niger	-	12.0	12.0	-	-	-		12.0	

Horticulture crops - Fruits	Area ('000 ha)
	Total
Mango	5.73
Citrus	1.18
Banana	0.78
Guava	0.49
Litchi	0.18
Horticulture crops - Vegetables	Total
Potato	0.56
Sweet potato	2.02
Cabbage	2.51
Cauliflower	3.42
Tomato	3.03
Medicinal and Aromatic crops (Spice crop)	Total
Turmeric	11.40
Ginger	4.29
Garlic	0.10
Coriander	0.34
Plantation crops	Total
Eg., industrial pulpwood crops etc.	

	Fodder crops	Total
	Total fodder crop area	
	Grazing land	
	Sericulture etc	
	Others (specify)	

Source- Orissa Agriculture Statistics-2008-09

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)			302.2
	Improved cattle			3.02
	Crossbred cattle			-
	Non descriptive Buffaloes (local low yielding)			60.1
	Descript Buffaloes			2.10
	Goat			104.7
	Sheep			12.1
	Others (Camel, Pig, Yak etc.)			24.8
	Commercial dairy farms (Number)			
1.9	Poultry	No. of farms	Total No. of birds ('000)	
	Commercial		246.0	
	Backyard			

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1.10	Fisheries (Data source: Chief Planning Officer)						
	A. Capture						
	i) Marine (Data Source: Fisheries Department)	No. of fishermen	Boats		Nets		Storage facilities (Ice plants etc.)
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
	ii) Inland (Data Source: Fisheries Department)	No. Farmer owned ponds		No. of Reservoirs		No. of village tanks	
	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)			2018.1	801.0	1.61		
Others							

Source- District Fisheries Department-Kandhamal

1.11 Production and Productivity of major crops (Year- 2008-09)

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)										

	Rice	73.02	2050			0.95	2169	73.97	2019.5	
	Maize	25.74	1626	0.28	1665	-	-	26.02	1645.5	
	Arhar	4.81	952	-	-	-	-	4.81	952	
	Blackgram	1.71	378	0.06	285	-	-	1.77	331.5	
	Niger	3.71	308	-	-	-	-	3.71	308	
Major Horticultural crops (Crops to be identified based on total acreage)										
	Mango							136.4	220	
	Citrus							0.4	140	
	Tomato							48.4	15971	
	Cauliflower							48.9	14312	
	Cabbage							69.2	27615	

Source- Orissa Agriculture Statistics-2008-09, Directorate of Horticulture.

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Rice	Turmeric	Maize	Black gram	Ground nut
	Khariif- Rainfed	2 nd week June – 4 th week July	2 nd week May – 2 nd week of June	1 st week June to 4 th week of June	2 nd week June – 4 th week July	1 st week of June – 2 nd week July
	Khariif-Irrigated	2 nd week June – 4 th week July			-	
	Rabi- Rainfed	-			2 nd week Sept – 2 nd week Oct	
	Rabi-Irrigated	4 th week Dec- 4 th week Jan			3 rd week Oct- 2 nd week Nov	

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)	-	-	-

1.14	Include Digital maps of the district for	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

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 including variety	Agronomic measures	Remarks on Implementation
Delay by 2 weeks (June 2 nd week – June 4 th week)	Brown forest soils, rainfall high, high elevation (500-1000m) Rainfed Upland	Rice	Varietal substitutions of drought tolerant varieties of the sole crops i.e Hira, JHU, Pathara, Vandana,	<ul style="list-style-type: none"> • Closer row and plant spacing, • In-situ rain water conservation, summer ploughing, interculture, tillage practices, weed control 	<ul style="list-style-type: none"> • Seed arrangement by ATMA, NFSM and

			Khandagiri, Arnapura	<p>and unbunded uplands converted to banded uplands.</p> <ul style="list-style-type: none"> • Apply full P, K and 20% N of recommended dose along with well decomposed organic matter for early seedling vigor, • Conservation furrow, • Inter-cultivation and thinning to maintain plant population per unit area of the crop • Plough and sow the crops across the slope to develop a ridge and furrow type of land configuration for effective soil moisture conservation to overcome drought for longer period 	RKVY, ISOPOM
		Maize	Navjot		
		Black gram	Pant U-19 &30,Ujala,Sarala		
		Ragi	Dibya Singha		
		Niger	Deomali, IGP-76, Utkal Niger		
		Kharif vegetables Tomato	Utkal Kumari, Utkal Raja (determinate type)		
		Brinjal	Blue star, Utkal Anushree Tarini		
	Red and yellow soils, moderate rainfall, moderate elevation (300-500m), moderate irrigation Rainfed Upland	Sole crops	Varietal substitutions of drought tolerant varieties of the sole crops i.e Hira, JHU, Pathara, Vandana, Khandagiri, Arnapura	-do-	
		Rice			
		Maize	Navjot		
		Black gram	Pant U-19 &30,Ujala,Sarala		
		Groundnut	Smruti,Devi, TMV-2,TAG-24		
		Niger	Deomali, IGP-76		
		Kharif vegetables Tomato	Utkal Kumari, Utkal Raja (determinate type)		
		Brinjal	Blue star, Utkal Anushree, Tarini		
		Cow pea	Utkal Manika		
		Cabbage	Pride of India, Disa Pusa early		

			synthetic		
		Cauliflower	Summer king		
	Brown forest soil, rainfall high, high elevation(500-1000m) Rainfed Medium land	Sole crops : Rice	Lalat,Manaswini,Naveen, Konark,Jogesh, Surendra	Apply full P, K and 20% N of recommended dose along with well decomposed organic matter for early seedling vigor	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	-do-	-do-	-do-	
	Brown forest soil, rainfall high, high elevation(500-1000m) Rainfed Low land	Sole crop: Rice	Swarna, Pratikshya,Rani dhan, Sidhanta and Musuri	Apply full P, K and 20% N of recommended dose along with well decomposed organic matter for early seedling vigor.If mortality is less than 50% the crops may be gap filled in direct seeded condition	
	Red and yellow soils, moderate rainfall, moderate elevation(300-500m), moderate irrigation	-do-	-do-	-do-	
	Brown forest soil, rainfall high, high elevation(500-1000m) rainfed	Maize-mustard	Suitable Hybrid maize variety like Maharaja, DHM103, should be intercropped with cowpea (2:2). and mustard variety PT-303 and Parvati	Plough and sow the crops across the slope to develop a ridge and furrow type of land configuration for effective soil moisture conservation to overcome drought for longer period	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m),	Maize-fallow	Suitable Hybrid maize variety like Maharaja, DHM103, should be intercropped with cowpea (2:2).	-do-	

	moderate irrigation				
	Brown forest soil, rainfall high, high elevation(500-1000m) rainfed	Turmeric –fallow	Roma, Lakdong	Emphasis should be given in-situ rain water conservation	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	-do-	-do-	-do-	
	Brown forest soil, rainfall high, high elevation(500-1000m) rainfed	Rice-Horse gram	Growing of medium duration rice variety: Lalat,, Jajati Naveen, MTU-1001, (120-135 days) and horsegram variety Urmi	Apply full P, K and 20% N of recommended dose along with well decomposed organic matter for early seedling vigour. Apply life saving irrigation to maintain nursery seedlings	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	Rice-Toria	Growing of medium duration rice variety: Lalat, , Jajati Naveen, MTU-1001 , (120-135 days) and toria variety like PT-303, Parvati and Anuradha	-do-	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 4 weeks Normal onset: June 2nd wk	Brown forest soil, rainfall high, high elevation(500-1000m) Rainfed Upland	Sole crops Rice	Varietal substitutions of drought tolerant varieties of the sole crops i.e Hira, JHU, Pathara, Vandana,	<ul style="list-style-type: none"> If mortality is less than 50% gap filling should be done, if more than 50% mortality, resow the crop with short duration high yielding low water requiring crops like 	<ul style="list-style-type: none"> Seed arrangement by ATMA, NFSM and RKVY,

After 4 weeks delay : July 2nd wk			Khandagiri, Arnapura	<p>green gram, black gram,) cow pea, after receiving the rainfall.</p> <ul style="list-style-type: none"> • Insitu moisture conservation practices may be adopted complete hoeing, weeding, followed by ridging to the base of the crop rows at 20 days after sowing for moisture conservation. • Complete hoeing, weeding followed by ridging to the base of the root crop for in-situ moisture conservation 	ISOPOM
		Maize	Navjot		
		Black gram	Pant U-19 &30,Ujala,Sarala		
		Ragi	Dibya Singha		
		Niger	Deomali, IGP-76		
		Kharif vegetables Tomato	Utkal Kumari, Utkal Raja (determinate type)		
		Brinjal	Blue star, Utkal Anushree, Tarini		
Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation Rainfed upland	Rice	Paddy var like JHU,, Vandana, Khandagiri, Mal Jhalaka(local) can be grown	-do-		
	Maize	Maize var. Navjot , Maharaja			
	Black gram	Some of the suitable varieties of non rice crop in upland are: Blackgram: PU 30, PU 35,Ujala, sekhar			
	Groundnut	Groundnut: Smruti, TMV-2, TAG -24			
	Niger Kharif vegetables <ul style="list-style-type: none"> • Tomato • Brinjal • Cow pea • Cabbage 	Sweet potato- kisan, Gouri Adopt the intercropping system Rice+Okra (parvani kranti) (4:2). Intercropping of arhar +			

		<ul style="list-style-type: none"> • Cauliflower 	groundnut (2 : 5) Arhar var. ICPL 87051, UPAS 120, Maize + Cow pea (2:2) Yam : (Orissa Elite,)		
	Brown forest soil, rainfall high, high elevation(500-1000m) Rain fed Medium land	Sole crops rice	Lalat, Manaswini, Naveen, ,Konark, , Surendra	<ul style="list-style-type: none"> • If rice population is less than 50% resow the sprouted seeds in line through pre-germinated seed drill or fresh seedlings. • Select short to medium duration varieties (90-120d) • Raise community nursery of both short duration rice varieties at reliable water source to save further delay of transplanted rice through transplanter saving of 50% seed requirement or through SRI method (@5kg seeds/ha). • Do not top dress nitrogen in nursery • Apply life saving irrigation 	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation Medium land	Sole crops : Rice	Lalat,Manaswini,Naveen, ,Konark, , Surendra	-do-	
	Brown forest soil, rainfall high, high elevation(500-1000m) Rain fed Low land	Sole crop : Rice	Swarna, Pratikshya,Rani dhan, Sidhanta and Musuri	<ul style="list-style-type: none"> • If rice population is more than 50% carryout weeding and maintain the plant population by <i>Khelua</i> operation (removing and distributing the hills)Raise community nursery of both short duration rice varieties at reliable water source to save further delay of transplanted rice. • Do not top dress nitrogen in 	

				nursery	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation Rainfed Low land	Sole crop: Rice	Swarna, Pratikshya,Rani dhan, Sidhanta and Musuri	-do-	
	Brown forest soil, rainfall high, high elevation (500-1000m) rainfed	Maize-Mustard	Suitable Hybrid maize variety like Maharaja, DHM103, should be intercropped with cowpea (2:2). and mustard variety PT-303 and Parvati	Plough and sow the crops across the slope to develop a ridge and furrow type of land configuration for effective soil moisture conservation to overcome drought for longer period.	
	Red and yellow soil, moderate rainfall, moderate elevation (300-500m), moderate irrigation	Maize-fallow	Suitable Hybrid maize variety like Maharaja, DHM103, should be intercropped with cowpea (2:2).	-do-	
	Brown forest soil, rainfall high, high elevation (500-1000m) rain fed	Turmeric –fallow	Roma, Lakdong	Emphasis should be given in-situ rain water conservation and application of organic matter to enhance water holding capacity of the soil.	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	Turmeric –fallow	Roma, Lakdong	-do-	

	Brown forest soil, rainfall high, high elevation(500-1000m) rain fed	Rice-Horse gram	Growing of medium duration rice variety: Lalat, , Jajati Naveen, MTU-1001 , (120-135 days) and horsegram variety Urmi	Emphasis should be given in-situ rain water conservation	
	Red and yellow soil, moderate rainfall, moderate elevation (300-500m), moderate irrigation	Rice-Toria	Growing of medium duration rice variety: Lalat, , Jajati Naveen, MTU-1001 , (120-135 days) and toria variety like PT-303, Parvati and Anuradha	-do-	

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 (Specify month) August 1st Week After 6 weeks delay : July 4th wk	Brown forest soil, rainfall high, high elevation (500-1000m) rain fed Upland	Sole crops	Varietal substitutions of drought tolerant varieties of the sole crops i.e	<ul style="list-style-type: none"> • Complete hoeing and weeding of non-paddy crops to provide dust mulch. • Post emergence spray of Quinalphos 5%EC @ 0.05 kg ai / ha in 500lt of water to control weeds in groundnut. • Spraying of 2% KCl + 0.1 ppm Boron to black gram. • Foliar application of 2% urea at pre-flowering and flowering stage of green gram. • Spray 1% urea in vegetables crops. • Top dressing of 25 % urea and potash after receipt of the rain for upland rice.. • Remove the pest and disease infected plants from the main field. • Insitu rain water conservation ,harvesting excess run off for 	<ul style="list-style-type: none"> • Seed arrangement by ATMA, NFSM and RKVY, ISOPOM
		Rice	Hira, JHU, Pathara, Vandana, Khandagiri, Arnapurna		
		Maize	Navjot		
		Black gram	Pant U-19 30,Ujala,Sarala		
		Ragi	Dibya Singha		
		Niger	Deomali, IGP-76		
	Kharif vegetables <ul style="list-style-type: none"> • Tomato • Brinjal 	Utkal Kumari, Utkal Raja (determinate type) Blue star, Utkal Anushree, Tarini			

				recycling	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation Rainfed Upland	Sole crops Rice	Varietal substitutions of drough tolerant varieties of the sole crops i.e Hira, JHU, Pathara, Bandana, Khandagiri,	-do-	
		Maize	Navjot		
		Blackgram	Pant U-19 &30,Ujala,Sarala		
		Groundnut	Smruti,Devi, TMV-2,TAG- 24		
		Niger	Deomali, IGP-76		
		Kharif vegetables			
		Tomato	Utkal Kumari, Utkal Raja		
		Brinjal	Blue star, Utkal Anushree,		
		Cow pea	Utkal Manika		
	Cabbage	Pride of india, Disha Pusa early synthetic, summer king			

		Cauliflower	Intercropping of arhar + groundnut (2:5) Arhar var. ICPL 87051, UPAS 120 Maize + cowpea(2:2) Maize var. Navjot Yam : (Orissa Elite) Sowing drought tolerant non-paddy crops as Ragi, Black Gram, Cow pea, Rice bean ,		
	Brown forest soil, rainfall high, high elevation (500-1000m) Medium land Rainfed	Sole crop: Rice	Lalat, Manaswini, Naveen, MTU 1001, Konark, and Surendra	<ul style="list-style-type: none"> • Close the drainage hole and check the seepage loss in direct sown medium land rice regularly. • Withhold N fertilizer (top dressing) application up to receipt of rainfall. • Transplanting of 45 days old seedlings at closer spacing. 	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m) medium land rainfed, moderate irrigation	Sole crop: Rice	-do-	-do-	
	Brown forest soil, rainfall high, high elevation(500-1000m) Rainfed Medium Low lands	Sole crops : Rice	Swarna, Pratikshya, Rani dhan, Sidhanta and Masuri	<ul style="list-style-type: none"> • Close the drainage hole and check the seepage loss in direct sown medium land rice regularly. • Withhold N fertilizer application till receipt of rainfall. • Transplant seedlings up to 45 days old. • Follow need based plant protection measures against steam borer and blast. • Use tractor, power tiller, rotavator for speedy land preparation. 	

				<ul style="list-style-type: none"> • Follow close planting of 4-5 seedling per hill. • Apply full P, K and 50 % N at the time of transplanting. • Apply life saving irrigation as and when necessary 	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation Medium low lands	Sole crops: Rice	Swarna, Pratikshya, Rani dhan, Sidhanta and Masuri	-do-	
	Brown forest soil, rainfall high, high elevation(500-1000m) rainfed	Maize-mustard	Suitable Hybrid maize variety like Maharaja, DHM103, should be intercropped with cowpea (2:2). and mustard variety PT-303 and Parvati	<ul style="list-style-type: none"> • Complete hoeing and weeding in maize crop field to provide dust mulch • Alternate row may be irrigated 	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	Maize-fallow	Suitable Hybrid maize variety like Maharaja, DHM103, should be intercropped with cowpea (2:2).	-do-	
	Brown forest soil, rainfall high, high elevation(500-1000m) rainfed	Turmeric –fallow	Roma, Lakdong	<ul style="list-style-type: none"> • Emphasis should be given in-situ rain water conservation • Making fields free of weeds for full utilization of water and nutrients by the crops 	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	Turmeric –fallow	-do-	-do-	
	Brown forest soil, rainfall high, high elevation(500-1000m) rainfed	Rice-Horse gram	Growing of medium duration rice variety: Lalat, , Jajati Naveen, MTU-1001 , (120-135 days) and	<ul style="list-style-type: none"> • Withhold N fertilizer application till receipt of rainfall • Spray of 2.5% urea with 2.5% KCl or MOP may be useful in areas where some soil moisture is available to impart 	

			horsegram variety Urmi	drought tolerance to the plants.	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	Rice-Toria	Growing of medium duration rice variety: Lalat, , Jajati Naveen, MTU-1001 , (120-135 days) and toria variety like PT-303, Parvati and Anuradha	-do-	

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 2nd Week	Brown forest soil, rainfall high, high elevation(500-1000m) Rainfed upland	Sole crops	Varietal substitutions of drought tolerant varieties of the sole crops i.e	<ul style="list-style-type: none"> • Provide life saving irrigation • Remove the pest and disease infected plants from the field. • Spray 1% urea in brinjal and foliar application of 2% urea at preflowering and stage of blackgram is helpful to mitigate the drought 	Seed arrangement from CRRI, OUAT, Seed Corporation , For purchasing implements Agriculture engineering dept , Govt Of Orissa
		Rice	Hira, JHU, Pathara, Vandana, Khandagiri, Arnapura		
		Maize	Navjot		
		Black gram	Pant U-19 &30,Ujala,Sarala		
		Ragi	Dibya Singha		
		Niger	Deomali, IGP-76		
		\Kharif vegetables	Utkal Kumari, Utkal Raja (determinate type)		
Tomato					
Brinjal	Blue star, Utkal Anushree, Tarini				

Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation Rainfed Upland	Sole crops	Hira, JHU, Pathara, Bandana, Khandagiri,	<ul style="list-style-type: none"> • Provide life saving irrigation • Remove the pest and disease infected plants from the field. • Spray 1% urea in brinjal • Application of 2% urea at preflowering and stage of blackgram is helpful to mitigate the drought • Crops like cowpea and maize may be harvested for fodder purpose to avoid their failure as grain crops • Pre rabi crops like pulses can be taken with residual moisture in upland condition.
	Rice		
	Maize	Navjot	
	Black gram	Pant U-35 &30,Ujala,Saral	
	Groundnut	Smruti,Devi, TMV-2,TAG-24	
	Niger	Deomali, IGP-76	
	Kharif vegetables	Utkal Kumari, Utkal Raja (determinate type)	
	Tomato		
	Brinjal	Blue star,UtkalAnushree,	
	Cow pea	Utkal Manika	
Cabbage	Disha		
Cauliflower	Pusa early synthetic		
	Intercropping of arhar + groundnut (2:5) Arhar var. ICPL 87, UPAS 120 Maize+cowpea(2:2) Maize var.Navjot Yam : (Orissa Elite) Sowing drought tolerant non-paddy crops as Ragi, Black Gram, Cowpea		
Brown forest soil, rainfall high, high elevation (500-1000m)	Sole crop : Rice	Lalata, Konark,Surendra, Jogesh, Jajati, Manawini, Pusa-44,MTU-1001	<ul style="list-style-type: none"> • Close the drainage hole and check the seepage loss in direct sown medium land rice regularly.

	Rainfed Medium Land			<ul style="list-style-type: none"> • Withhold N fertilizer application of receipt of rainfall. • Provide life saving irrigation. • Weed incorporation through Conoweeder 	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation Rainfed Medium Land	Sole crop: Rice	Lalata, Konark, Surendra, Jogesh, Jajati, Manawini, Pusa-44, MTU-1001	-do-	
	Brown forest soil, rainfall high, high elevation(500-1000m) Rainfed Medium Land	Sole crops : Rice	Swarna, Pratikshya, and Masuri Surendra	<ul style="list-style-type: none"> • Close the drainage hole and check the seepage loss in direct sown medium land rice regularly. • Withhold N fertilizer application of receipt of rainfall. • Transplant seedlings up to 45 days old. • Follow plant protection measures against stem borer and blast in nursery. • Use tractor, power tiller, rotavator for speedy land preparation. • Follow close planting of 4-5 seedling per hill. • Apply full P, K and 50 % N at the time of transplanting. • Apply life saving irrigation. 	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation Rainfed Medium Land	Sole crops: Rice	Swarna, Pratikshya, and Masuri Surendra	-do-	
	Brown forest soil, rainfall high, high elevation(500-1000m) rainfed	Maize-mustard	Suitable Hybrid maize variety like Maharaja, DHM103, should be intercropped with cowpea (2:2). and mustard variety PT-303 and Parvati	Adopt alternate furrow irrigation to effect water economy Repeated intercultural operations to keep the field weed free.	

	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	Maize-fallow	Suitable Hybrid maize variety like Maharaja, DHM103, should be intercropped with cowpea (2:2).	Apply life saving irrigation Repeated intercultural operations to keep the field weed free.	
	Brown forest soil, rainfall high, high elevation(500-1000m) rainfed	Turmeric –fallow	Roma, Lakdong	<ul style="list-style-type: none"> • Emphasis should be given in-situ rain water conservation • Top dressing of N @ 30 kg /ha after receipt of rainfall followed by mulching 	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	Turmeric –fallow	Roma, Lakdong	-do-	
	Brown forest soil, rainfall high, high elevation(500-1000m) rainfed	Rice-Horse gram	Growing of medium duration rice variety: Lalat, , Jajati Naveen, MTU-1001 , (120-135 days) and horsegram variety Urmi	Withhold N fertilizer application till receipt of rainfall	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	Rice-Toria	Growing of medium duration rice variety: Lalat, , Jajati Naveen, MTU-1001 , (120-135 days) and toria variety like PT-303, Parvati and Anuradha	-do-	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Early season drought (Normal onset)					
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Brown forest soil, rainfall high, high elevation (500-1000m) Rainfed Uplands	Sole crops Rice	Varietal substitutions of drought tolerant varieties of the sole crops i.e Hira, JHU, Pathara, Vandana, Khandagiri, Arnapura	<ul style="list-style-type: none"> • Thinning and gap filling of the existing crop if mortality is less than 50%. • Resow the crop if the mortality is more than 50%. • Cultivate vegetables like cow pea and tomato. • Complete hoeing weeding and earthing up at 20 DAS for moisture conservation for groundnut and vegetable crops • Grow sweet potato var. Gouri, Shankar in ridges and allow the furrow to conserve rainwater, application of paper mill sludge (PMS) @ 5 q/ha, potash and boron and FYM during final land preparation for obtaining higher yield of sweet potato. 	<ul style="list-style-type: none"> • Farm pond under NREGS, IWMP, diesel pump sets and KB pumps in tankfed areas under RKVY and NFSM. • Small nursery development under NHM.
		Maize	Navjot		
		Black gram	Pant U-19 &30,Ujala,Sarala		
		Ragi	Dibya Singha		
		Niger	Deomali, IGP-76		
		Kharif vegetables Tomato	Utkal Kumari, Utkal Raja (determinate type)		
		Brinjal	Blue star, Utkal Anushree, Tarini		
Red and yellow soil, moderate rainfall, moderate elevation (300-500m), moderate irrigation Rainfed Upland		Sole crops Rice	Hira, JHU, Pathara, Bandana, Khandagiri, Arnapura	-do-	<ul style="list-style-type: none"> • Farm pond under NREGS, IWMP, diesel pump sets and KB pumps in tankfed areas under RKVY and NFSM. • Small nursery development under NHM.
		Maize	Navjot		
		Black gram	Pant U-30,Ujala,Sarala		
		Groundnut	Smruti,Devi, TMV-2,TAG-24		
		Niger	Deomali,ONS-150		
		Kharif vegetables • Tomato	Utkal Kumari, Utkal Raja (determinate type) Varietal substitutions of drought tolerant varieties of the sole crops i.e		

		• Brinjal	Blue star, Utkal Anushree,		
		• Cow pea	Utkal Manika		
		• Cabbage	Pride of india		
		• Cauliflower	Pusa early synthetic Intercropping of arhar + groundnut (2:5) Arhar var., UPAS 120 Maize+cowpea(2:2) Maize var.Navjot Yam : (Orissa Elite) Sowing drought tolerant non- paddy crops as Ragi, Black Gram, and Cowpea.		
	Brown forest soil, rainfall high, high elevation(500-1000m) Medium Land Rainfed :	Sole crop : Rice	Lalata, Konark,Surendra, Jogesh, Jajati, Manawini, Pusa- 44,MTU-1010	<ul style="list-style-type: none"> •If rice population is less than 50% resow the crop. •Select early maturing varieties (90d). •Sprouted seeds may be direct seeded in lines or fresh seedlings may be raised for transplanting •If rice population is more than 50 % carryout weeding and adjust the plant population by redistribution of hills (Khelua) , plugging of drainage hole for checking seepage 	<ul style="list-style-type: none"> • Supply of seed drills and intercultural implements through RKVY. • Good quality seeds through NFSM and OSSC.

				loss and to provide • Life saving irrigation as and when necessary.	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation Medium Land	Sole crop: Rice	Lalata, Konark,Surendra, Jogesh, Jajati, Manawini, Pusa-44,MTU-1010	-do-	<ul style="list-style-type: none"> • Supply of seed drills and intercultural implements through RKVY. • Good quality seeds through NFSM and OSSC.
	Brown forest soil, rainfall high, high elevation(500-1000m) Rainfed Low land	Sole crop : Rice	Swarna, Pratikshya, Sidhanta and Masuri	<ul style="list-style-type: none"> •If rice population is less than 50% gap filling may be dawn. •Fresh seedlings may be transplanted <p>If rice population is more than 50 % carryout weeding and adjust the plant population by redistribution of hills (Khelua)</p>	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	Sole crop low land rainfed : Rice	Swarna, Pratikshya, Sidhanta and Masuri	<ul style="list-style-type: none"> •If rice population is less than 50% gap filling may be dawn. •Fresh seedlings may be transplanted <p>If rice population is more than 50 % carryout weeding and adjust the plant population by redistribution of hills (Khelua)</p>	
	Brown forest soil, rainfall high, high elevation(500-1000m) rainfed	Maize-mustard	Suitable Hybrid maize variety like Maharaja, DHM103, should be intercropped with cowpea (2:2). and mustard variety PT-303 and Parvati	Complete hoeing weeding and earthling up for moisture conservation	

Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	Maize-fallow	Suitable Hybrid maize variety like Maharaja, DHM103, should be intercropped with cowpea (2:2).	Complete hoeing weeding and earthing up for moisture conservation Application of organic matter to retain water holding capacity of the soil	
Brown forest soil, rainfall high, high elevation(500-1000m) rainfed	Turmeric –fallow	Roma, Lakdong	Emphasis should be given in-situ rain water conservation Application of organic matter to retain water holding capacity of the soil	
Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	Turmeric –fallow	-do-	Emphasis should be given in-situ rain water conservation	
Brown forest soil, rainfall high, high elevation(500-1000m) rainfed	Rice-Horse gram	Growing of medium duration rice variety: Lalat, , Jajati Naveen, MTU-1001 , (120-135 days) and horsegram variety Urmi	Weed out the field without waiting the rainfall.	
Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	Rice-Toria	-do-	-do-	

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 measure	Remarks on Implementation
At vegetative stage	Brown forest soil, rainfall high, high elevation(500-1000m) Rainfed Upland	Sole crop: Rice	Varietal substitutions of drought tolerant varieties of the sole crops i.e Hira, JHU, Pathara, Vandana, Khandagiri, Arnapura	<ul style="list-style-type: none"> • Inter-cultivation (Soil mulching) • Conservation furrow • Organic mulching with previous crop residues • Scooping • Compartmental bunding • Follow ridge and furrow method of planting for groundnut and vegetable crops. • Follow strip cropping in rolling topography for moisture conservation 	Supply of seed drills and intercultural implements through RKVY. Good quality seeds through NFSM and OSSC.
		Maize	Navjot		
		Black gram	Pant U-19 &30,Ujala,Sarala		
		Ragi	Dibya Singha		
		Niger	Deomali, IGP-76		
		<ul style="list-style-type: none"> • Kharif vegetables • Tomato 	Utkal Kumari, Utkal Raja (determinate type)		
		<ul style="list-style-type: none"> • Brinjal 	Blue star, Utkal Anushree, Tarini		
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), Rainfed Upland	Sole crop: Rice	Hira, JHU, Pathara, Bandana, Khandagiri, Arnapura	<ul style="list-style-type: none"> • Inter-cultivation (Soil mulching) • Conservation furrow • Organic mulching with previous crop residues • Scooping • Compartmental bunding • Follow ridge and furrow method of planting for groundnut and vegetable crops. • Follow strip cropping in rolling topography for moisture conservation 	
		Maize	Megha,Navjot		
		Black gram	Pant U-35 &30,Ujala,Sarala		
		Groundnut	Smruti,Devi, TMV-2,TAG-24		
		Niger	Deomali, IGP-76		

		Kharif vegetables Tomato	Utkal Kumari, Utkal Raja (determinate type)		
		Brinjal	Varietal substitutions of drought tolerant varieties of the sole crops i.e Blue star, Utkal Anushree,		
		Cow pea	Utkal Manika		
		Cabbage	Pride of india		
		Cauliflower	Intercropping of arhar + groundnut (2:5) Arhar var. ICPL 87, UPAS 120 Maize+cowpea (2:2) Maize var. Navjot Yam : (Orissa Elite,) Sowing drought tolerant non- paddy crops as Ragi, Black Gram, and Cowpea.		
	Brown forest soil, rainfall high, high elevation(500- 1000m) Rainfed Medium Land	Sole crop: Rice	Lalata, Konark,Surendra, Jogesh, Jajati, Manawini,	<ul style="list-style-type: none"> • Weed out the field • Go for gap filling using seedling of same age. • Strengthen the field bunds and close the holes • Provide life saving irrigation • withhold N application upto receipt of rainfall 	
	Red and yellow soil, moderate rainfall, moderate elevation(300- 500m),	Sole crop: Rice	-do-	-do-	

	Rainfed Medium Land				
	Brown forest soil, rainfall high, high elevation(500-1000m) Rainfed Low Land	Sole crop: Rice	Swarna, Pratikshya, Sidhanta and Masuri	<ul style="list-style-type: none"> • Seedling of 45 days old can be transplanted or gap filled. • Do not practice beushaning • Weed out the field • Follow plant protection measures • Provide protective irrigation through harvested rain water • Withhold N application • Apply Potassic fertilizer • Strengthen field bunds. 	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), Rainfed Low Land	Sole crop: Rice	-do-	-do-	
	Brown forest soil, rainfall high, high elevation (500-1000m) rainfed	Maize-mustard	Suitable Hybrid maize variety like Navjot Maharaja, DHM103, should be intercropped with cowpea (2:2). and mustard variety PT-303 and Parvati	<ul style="list-style-type: none"> • Provide life saving irrigation, Withhold N application • remove the disease affected plants and dry leaves 	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	Maize-fallow	-do-	-do-	
	Brown forest soil, rainfall high, high elevation(500-1000m) rainfed	Turmeric –fallow	Roma, Lakdong	<ul style="list-style-type: none"> • Emphasis should be given in-situ rain water conservation, Organic mulching with previous crop residues • Topdress N @30kg/ha after 	

				receipt of rainfall followed by mulching	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	Turmeric –fallow	-do-	-do-	
	Brown forest soil, rainfall high, high elevation(500-1000m) rainfed	Rice-Horse gram	Growing of medium duration rice variety: Lalat,, Jajati Naveen, MTU-1001, (120-135 days) and horsegram variety Urmi	<ul style="list-style-type: none"> • Weed out the field • Strengthen the field bunds and close the holes Provide life saving irrigation	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	Rice-Toria	-do-	-do-	

Condition	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Mid season drought (long dry spell)					
At flowering/ fruiting stage	Brown forest soil, rainfall high, high elevation(500-1000m) Rainfed Uplands	Sole crop: Rice	Varietal substitutions of drought tolerant varieties of the sole crops i.e Hira, JHU, Pathara, Vandana, Khandagiri,	<ul style="list-style-type: none"> • Spray 2% KCl + 0.1 ppm boron to non paddy crops to overcome drought. • Foliar application of 2% urea at pre-flowering and flowering stage to pulses and oilseeds is helpful. • Remove and destroy pest and disease affected plants 	Supply of seed drills and intercultural implements through RKVY. Good quality seeds through NFSM and OSSC.
		Maize	Navjot Pant U-19		

		Black gram	&30,Ujala,Sarala	<ul style="list-style-type: none"> • Provide irrigation at critical stages at flowering and grain filling stage. • Crops like cow pea, green gram, black gram, maize and vegetables may be harvested. • Under situation of complete failure of Kharif crop, dismantle it and sow pre-rabi crops minor pulses like horse gram (var. Urmi), Niger (Deomali) • Need based plant protection measures to be taken. 	
		Ragi	Dibya Singha		
		Niger	Deomali, IGP-76		
		Kharif vegetables <ul style="list-style-type: none"> • Tomato 	Utkal Kumari, Utkal Raja (determinate type)		
		<ul style="list-style-type: none"> • Brinjal 	Blue star, Utkal Anushree, Tarini		
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), Rainfed Upland	Sole crop: Rice	Hira, JHU, Pathara, Bandana, Khandagiri, Arnapurna	-do-	
		Maize	Megha,Navjot		
		Black gram	Pant U-19 &30,Ujala,Sarala		
		Groundnut	Smruti,Devi, TMV-2,TAG-24		
		Niger	Deomali, IGP-76		
		Kharif vegetables Tomato	Utkal Kumari, Utkal Raja (determinate type)		
		Brinjal	Varietal substitutions of drought tolerant varieties of the sole crops i.e Blue star, Utkal Anushree,		

		Cow pea	Utkal Manika		
		Cabbage	Pride of india,Disha Hemalata		
		Cauliflower	Intercropping of arhar + groundnut (2:5) Arhar var., UPAS 120 Maize + Cowpea(2:2) Maize var. Navjot Yam : (Orissa Elite,)		
	Brown forest soil, rainfall high, high elevation(500-1000 m) Rainfed Medium Land	Sole crop: Rice	Lalata, Konark,Surendra, , Manawini	<ul style="list-style-type: none"> • Advised to spray Tricyclazole (Beam/Team) 0.06-0.1% at 10-12 days interval to control blast and brown spot diseases in rice during this period. • To control stem borer and Gandhi bug, spray Methyl demeton/Dimethioate • Provide life saving irrigation. 	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), Rainfed Lowland	Sole crop: Rice	-do-	-do-	
	Brown forest soil, rainfall high, high elevation(500-1000m) Rainfed Low Land	Sole crop: Rice	Swarna, Pratikshya, Sidhanta and Masuri	<ol style="list-style-type: none"> For late transplanted rice 2 spraying at 10 days interval with Validamycin 0.3% to control sheath blight. Provide life saving irrigation and plugging of drainage holes. 	
	Red and yellow soil, moderate rainfall,	Sole crop: Rice	-do-	-do-	

	moderate elevation(300-500m), Rainfed Lowland				
	Brown forest soil, rainfall high, high elevation(500-1000m) rainfed	Maize-mustard	Suitable Hybrid maize variety like Maharaja, DHM103, should be intercropped with cowpea (2:2). and mustard variety PT-303 and Parvati	<ul style="list-style-type: none"> • Provide life saving irrigation Withhold N application • remove the disease affected plants and dry leaves 	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	Maize-fallow	-do-	-do-	
	Brown forest soil, rainfall high, high elevation(500-1000m) rainfed	Turmeric –fallow	Roma, Lakdong	<ul style="list-style-type: none"> • Emphasis should be given in-situ rain water conservation, Organic mulching with previous crop residues 	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	Turmeric –fallow	-do-	-do-	
	Brown forest soil, rainfall high, high elevation(500-1000m) rainfed	Rice-Horse gram	Growing of medium duration rice variety: Lalat, , Jajati Naveen, MTU-1001 , (120-135 days) and horsegram variety Urmi	<ul style="list-style-type: none"> • Advised to spray Tricyclazole (Beam/Team) 0.06-0.1% at 10-12 days interval to control blast and brown spot diseases in rice during this period. Provide life saving irrigation.	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	Rice-Toria	-do-	-do-	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Rabi Crop planning	Remarks on Implementation
Terminal drought (Early withdrawal of monsoon)	Brown forest soil, rainfall high, high elevation(500-1000m) Rainfed Uplands	Sole crops Rice	Varietal substitutions of drought tolerant varieties of the sole crops i.e Hira, JHU, Pathara, Vandana, Khandagiri, Arnapura	Utilization of residual moisture for early sowing of pre-rabi crops like Cow pea (SEB – 2, Utkal Manik), horse gram (Urmi), green gram (Durga), black gram (Ujala), Niger (Deomali,ONS-150) tomato Utkal Raja, Utkal Kumari, Utkal Urbasi. Cabbage (Pride of India, Golden Acre, Konark, , Cauliflower (Snow ball, Improved Japanese, Himani), Okra (Utkal Gourab, Arka Anamika), and leafy vegetables to be sown to conserve soil moisture. And provide life saving irrigation as and when necessary	<ul style="list-style-type: none"> Supply of seed drills and intercultural implements through RKVY. Good quality seeds through NFSM and OSSC.
		Maize	Navjot		
		Black gram	Pant U-19 &30,Ujala,Sarala		
		Ragi	Dibya Singha		
		Niger	Deomali, IGP-76		
		Kharif vegetables <ul style="list-style-type: none"> Tomato Brinjal 	Utkal Kumari, Utkal Raja (determinate type) Blue star, Utkal Anushree, Tarini		
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation Rainfed Uplands	Sole crop : Rice	Hira, JHU, Pathara, Bandana, Khandagiri, Arnapura	-do-	
		Maize	Navjot		
		Black gram	Pant U-19 &30,Ujala,Sarala		

		Groundnut	Smruti,Devi, TMV-2,TAG-24		
		Niger	Deomali, IGP-76		
		<ul style="list-style-type: none"> ➤ Kharif vegetables <ul style="list-style-type: none"> • Tomato • Brinjal • Cow pea • Cabbage • Cauliflower 	<p>Utkal Kumari, Utkal Raja (determinate type) Varietal substitutions of drought tolerant varieties of the sole crops i.e</p> <p>Blue star, Utkal Anushree, Utkal Manika Pride of india Pusa early synthetic Intercropping of arhar + groundnut (2:5)</p> <p>Arhar var., UPAS 120</p> <p>Maize+cowpea(2:2)</p> <p>Maize var.Navjot</p> <p>Yam : (Orissa Elite)</p>		
	Brown forest soil, rainfall high, high elevation(500-1000m) Rainfed Medium Land	Sole crop : Rice	Lalata, Konark,Surendra, , Manawini, MTU-1010	Provide life saving irrigation,control of blast by applying Tricyclazole -do- Provide life saving irrigation, and monitoring of pest surveillance, <i>paira</i> cropping of blackgram and greengram	
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation Rainfed Medium Land	Sole crop : Rice	-do-		
	Brown forest soil, rainfall high, high elevation(500-1000m)	Sole crop : Rice	Swarna, Pratikshya, Sidhanta and Masuri		

	Rainfed, Lowland			
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), Rainfed Lowland	Sole crop : Rice	-do-	-do-
	Brown forest soil, rainfall high, high elevation(500-1000m) rainfed	Maize-mustard	Suitable Hybrid maize variety like Maharaja, DHM103, should be intercropped with cowpea(2:2). and mustard variety PT-303 and Parvati	Provide life saving irrigation
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	Maize-fallow	-do-	-do-
	Brown forest soil, rainfall high, high elevation(500-1000m) rainfed	Turmeric –fallow	Roma, Lakdong	Emphasis should be given in-situ rain water conservation, Organic mulching
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	Turmeric –fallow	-do-	-do-
	Brown forest soil, rainfall high, high elevation(500-1000m) rainfed	Rice-Horse gram	Growing of medium duration rice variety: Lalat,, Jajati Naveen, MTU-1001, (120-135 days) and horsegram variety Urmi	Provide life saving irrigation,control of blast by applying Tricyclazole
	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation	Rice-Toria	-do-	-do-

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	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation Lowland	Paddy	Medium duration variety like lalat, jajati, naveen can be taken Pulse crops like blackgram, and green gram can be grown	Resowing the crop if mortality is more than 50% and if mortality is less than 50% go for gapfilling	Seed arrangement under RKVY , ATMA, NFSM

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in canals due to low rainfall	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation Low land	Paddy	Pulse crops like blackgram, green gram	Resowing the crop if mortality is more than 50% and if mortality is less than 50% go for gapfilling	Integrated Scheme on Oilseeds, Pulses, Oilpalm and Maize (ISOPOM), Seeds from NFSM

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation Low land	Paddy	Pulse crops like Blackgram, Green gram		Integrated Scheme on Oilseeds, Pulses, Oilpalm and Maize (ISOPOM)

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation Medium land	paddy	Short duration variety like Zhu or pathara and non paddy crops blackgram	Construct series of percolation tank in light texture soil	Integrated Scheme on Oilseeds, Pulses, Oilpalm and Maize (ISOPOM)

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	Red and yellow soil, moderate rainfall, moderate elevation(300-500m), moderate irrigation Medium land	Paddy	Short duration variety like Zhu or pathara , vandana and non paddy crops blackgram	Construct series of percolation tank in light texture soil	National Rural Employment Guarantee Scheme (NREGS), farm pond, Mo Pokhari Scheme

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

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Continuous high rainfall in a short span leading to water logging				
Paddy	Drainage	Drainage	Drainage	Shift the produce to half covered threshing floor and other safer places for post harvest operations and cover the crops to protect from moisture absorption
Turmeric	Drainage	Drainage & spraying of Trichoderma To control rhizome rot	Drainage	-
Ground nut	Drainage	Drainage	Drainage	Shift the produce to half covered threshing floor and other safer places for post harvest operations and cover the crops to protect from moisture absorption
Blackgram	Provide drainage	Provide drainage	Drainout excess water and harvest at physiological maturity	Shift the produce to half covered threshing floor and other safer places for post harvest operations
Horticulture				
Cauliflower	Drainage	-	Drainage, control of bud rot	
Brinjal	Drainage	Drainage, Control of wilt, spraying of hormone	Drainage, control of rotting	Shift the produce to half covered threshing floor and other safer places for post harvest operations and cover the crops to protect from moisture absorption
Mango	Drainage	Drainage, spraying of hormone	Drainage, control of diseases	Shifting of produce to safer place for drying

Tomato	Drainage	Drainage, Control of wilt	Drainage, control of rotting	Shift the produce to half covered threshing floor and other safer places for post harvest operations and cover the crops to protect from moisture absorption
Heavy rainfall with high speed winds in a short span				
Paddy	Drainage	Drainage	Drainage & harvesting	-
Turmeric	Drainage	Drainage	Drainage	-
Ground nut	Gap filling	Drainage	Drainage	
Horticulture				
Cauliflower	Drainage	Drainage	Drainage	Drainage
Brinjal	Staking	Staking	Staking	Staking
Mango				Shifting of produce to safer place for drying
Tomato	Staking	Staking	Staking	Staking
Outbreak of pests and diseases due to unseasonal rains				
Paddy Swarming caterpillar	SPRAY the crop with chloropyriphos or triazophos @ 2 ml /litre of water or dusting with Quinalphos 1.5 % dust i.e., 25 kg/ha and prevent migration from one field to another`		-	-
Turmeric	Spraying metalaxyl & plantomycin to control rotting	-	-	-
Ground nut	Spraying chloropyriphos to control termite	Spraying of mancozeb to control tikka	Spraying of mancozeb to control tikka	
Horticulture				
Cauliflower	Drainage and spraying of Ridomil to control Damping off	-	Spraying of Methomyl to control Spodoptera	-

Brinjal	Drainage and spraying of Hexaconazole to control Damping off	Drainage and drenching with coc & plantomycin	Spraying of Thiophenate methyl to control phomopsis fruit rot	-
Mango	Spraying of Dimethoate to control mealy bug	Spraying of Imidachloprid to Control mango hopper,	Spraying of mancozeb to control anthracnose	-
Tomato	Drainage and spraying of Ridomil to control Damping off	spraying of Carbosulfan to control helicoverpa	spraying of mancozeb to control rotting	-

2.3 Floods

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation				
Paddy(mid and low land	Drainage	Drainage,gap filling	Drainage	Harvest & Sundrying
Turmeric	Drainage	Drainage	Drainage	Harvest & Sundrying
Ground nut	-	Drainage, gap filling	Drainage	-
Horticulture				
Cauliflower	Drainage	Drainage, gap filling	Drainage	Harvest
Brinjal	Drainage	Drainage, gap filling	Drainage	Harvest
mango	Drainage	Drainage	Drainage	Drainage & harvest
Continuous submergence for more than 2 days				
Paddy	Select rice var like Kanchan, Durga , Sarala, Ramachandi for semideep low lands, Broadcasting / line sowing of sprouted seeds of relatively short duration rice varieties in soft puddle after flood water recedes .transplant 40-65 days old seedlings after flood water	If damage is more than 50% re-transplant rice crop, in partially damaged fields, allow the rice plants to stand upright. Do not go for beushaning as it may further reduce the plant population. Apply moderate dose of fertilizer (40:20:20)	After the flood recedes there is probability of attack of swarming cater pillar in rice , when thay cross the ETL spray the crop with chloropyriphos /trizophos @ 1 lit /ha	harvest & Sundrying

	recedes, Raise nursery by Dapog method			
Turmeric	Drainage	Drainage	Drainage	Harvest & Sundrying
Ground nut	-	Leaf minor in ground nut may increase which can be managed by spraying of monocrtophos/ trizophos 40 EC @ 1 lit /ha at fortnight interval	Drainage	-
Horticulture				
Cauliflower	Drainage	Drainage, gap filling	Drainage, control of diseases	Harvest & Sundrying
Brinjal	Drainage	Drainage, gap filling	Drainage, control of diseases	Harvest & Sundrying
mango	Drainage	Drainage	Drainage	-

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
Hailstorm				
Horticulture				
Cauliflower	-	-	-	-
Brinjal	-	-	-	-
mango	Sprinkling water	Drip / sprinkler irrigation with soil mulching	Drip / sprinkler irrigation with soil mulching	Drip / sprinkler irrigation with soil mulching
Litchi	-Do-	-Do-	-Do-	-Do-
Cyclone				
paddy	-	-	Harvest at physiological maturity stage	-

Turmeric	-	-	-	-
Ground nut	-	-	-	
Horticulture				
Cauliflower	-	-	-	-
Brinjal	-	-	-	-
Mango	-	-	Harvesting of matured 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	<ul style="list-style-type: none"> • 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. • Upgradation of desi cow through artificial insemination and upgradation of local goad brids (Ganjm, Black Bengal through cross breeding with improved bucks) 	<ul style="list-style-type: none"> • Conducting animal health camps and treating the affected animals • Regular deworming with vaccination of cows with need based treatments against ailments. • Regular de-worming for 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 external/ artificial feeding arrangement. 	<ul style="list-style-type: none"> • Availing insurance • Culling of unproductive livestock
Feed and fodder availability	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Utilizing fodder from perennial trees and fodder bank reserves. • Transporting excess fodder from adjoining districts. • Utilizing the existing crops which fail 	<ul style="list-style-type: none"> • Supplementary feeding of remaining livestock and the replacement stock. • Addition of calcium, mineral mixture and multi-vitamin

	<ul style="list-style-type: none"> • 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. 	<p>to grow adequately due to failure of monsoon for feeding of animals.</p> <ul style="list-style-type: none"> • Use of unconventional livestock feed such as sugar cane top, sugar cane bagasse, banana plant Crop residues such as cassiadora 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. 	<p>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</p> <ul style="list-style-type: none"> • 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) @ 300 g/goat/day. Sufficient browsing for at least four hours per day
Drinking water	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Water sources of Temples, Churches, Gurdwaras, Jain temples and Maszids are generally ideal sources during draught. 	<ul style="list-style-type: none"> • Pure drinking water and vaccines to be given
Health and disease management	<ul style="list-style-type: none"> • Organizing training programme of persons connected with A.H. on feeding and management of animals during draught. • Veterinary preparedness with vaccine and medicines. 	<ul style="list-style-type: none"> • Supplementation of mineral and vitamin mixtures • Campaign and mass vaccination 	<ul style="list-style-type: none"> • Proper disposal of dead animals
Floods			
Feed and fodder availability	<ul style="list-style-type: none"> • Procured feeds and fodders to be used for fed all animals. 	<ul style="list-style-type: none"> • 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. • 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	<ul style="list-style-type: none"> • Sanitization of water resources. • Pure drinking water and vaccines to be given
Health and disease management	<ul style="list-style-type: none"> • Training to the farmers about care of their animals when catastrophe strikes, 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. • 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 tourniquet), 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 	<ul style="list-style-type: none"> • Supplementation of mineral and vitamin mixtures • Campaign and mass vaccination 	<ul style="list-style-type: none"> • Proper disposal of dead animals

	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.)		
Cyclone			
Feed and fodder availability	<ul style="list-style-type: none"> • Procured feeds and fodders to be used for fed all animals. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Provision of supplementary feeding (concentrate / Roughage) with vitamin & minerals.
Drinking water	<ul style="list-style-type: none"> • Provision of clean drinking water. 	<ul style="list-style-type: none"> • Drinking water be made available to the animals in any kind of clean container available with the farmer. 	<ul style="list-style-type: none"> • Provision of clean drinking water.
Health and disease management	<ul style="list-style-type: none"> • Training to the farmers about care of their animals when catastrophe strikes, 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. • 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 	<ul style="list-style-type: none"> • 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 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 	<ul style="list-style-type: none"> • 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. a. Improving shed hygiene especially in the farmers household through cleaning and disinfection

	<p>group. Inside the camp the animals can be just left free within the paddock/ barricades created with wooden pole.</p> <ul style="list-style-type: none"> • 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 tourniquet), 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.) 	<p>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.</p>	
Heat wave and cold wave			
Shelter/environment management		<ul style="list-style-type: none"> • Green cover (trees plantation, landscaping) • Proper sheltering / housing white painting outside the roof and black painting inside the roof. • Washing / wallowing / sprinkling/ splashing / showering • Provision of cool drinking water (in earthen pitches) Cooling devices : fans, wet curtains or panels, air cooler if possible Provide good shelter during 	

		Heat wave and cold wave	
Health and disease management		<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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, Banaraja, 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, jackle, 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 antistress agent. Feeding antibiotics Procurement of litter materials	Continue feeding of antistress 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. 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	
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	Provision should be made to ensure proper ventilation to the house	

		be increased by providing ceiling fans and exhaust fan		
Health and disease management	Procurement of Antistress drugs	Supplementation of antistress 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 Antistress drugs and vaccine	Feeding of antistress drugs in drinking water Vaccination with fowl pox	Vaccination against IBD and RD	Procurement of Antistress drugs and vaccine

2.5.3 Fisheries/ Aquaculture

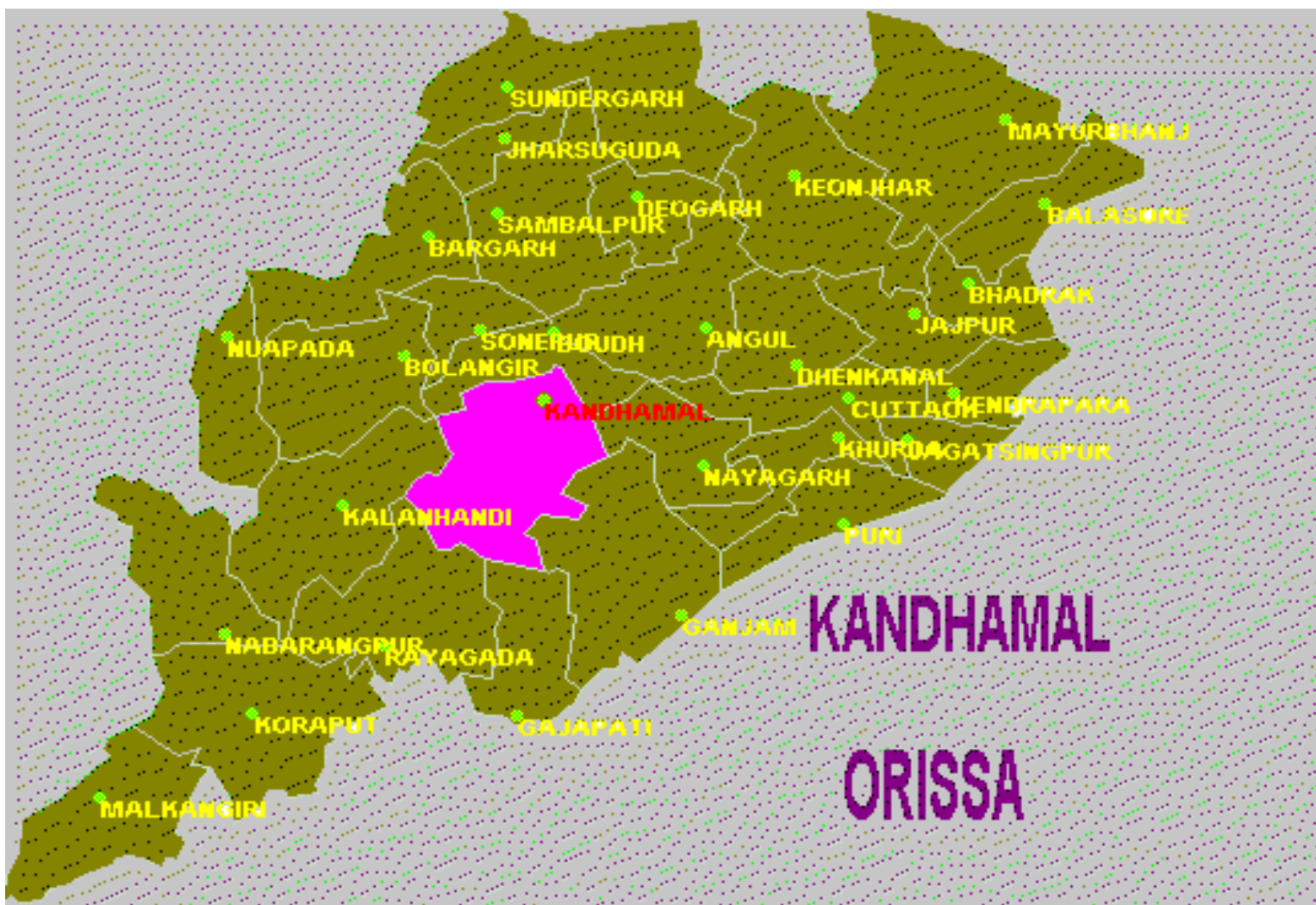
	Suggested contingency measures		
	Before the event	During the event	After the event
1) Drought			
A. Capture			
Marine			
Inland			
(i) Shallow water depth due to insufficient rains/inflow	<ol style="list-style-type: none"> 1. Restricted release of water from reservoir. 2. Supplementary water harvest structures like pond and tanks has to be developed. 3. Renovation and maintenance of 	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	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

	existing water harvest structures. 4. Species : (Indian Major Carps (IMC), i.e., Rohu, Mrigal and Catla + Exotic carps (Silger carp and Grass carp @ 5000 fingerlings/ha	plankton and zoo plankton.	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	Mixing of water from the water harvest structure like ponds and tanks into the fish habitat.	Monitoring the water quality and health of aquatic organisms.
(iii) Any other			
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	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. 3. Artificial shelter by putting aquatic floating weeds in 1/3 rd area.	
(ii) Impact of salt load build up in ponds / change in water quality	Application of organic manure in culture system	Recharge the ponds with bore well water or water from other sources	Application of organic manure in culture system
2) Floods			
A. Capture			
Marine			
Inland			
(i) No. of boats / nets/damaged			
(ii) No.of houses damaged			
(iii) Loss of stock			
(iv) Changes in water quality			

(v) Health and diseases			
B. Aquaculture			
(i) Inundation with flood water			
(ii) Water contamination and changes in water quality			
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, huts etc)			
3. Cyclone / Tsunami			
A. Capture			
Marine			
(i) Average compensation paid due to loss of fishermen lives			
(ii) Avg. no. of boats / nets/damaged			
(iii) Avg. no. of houses damaged			
Inland			
B. Aquaculture			
(i) Overflow / flooding of ponds			
(ii) Changes in water quality (fresh water / brackish water ratio)			
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps,			

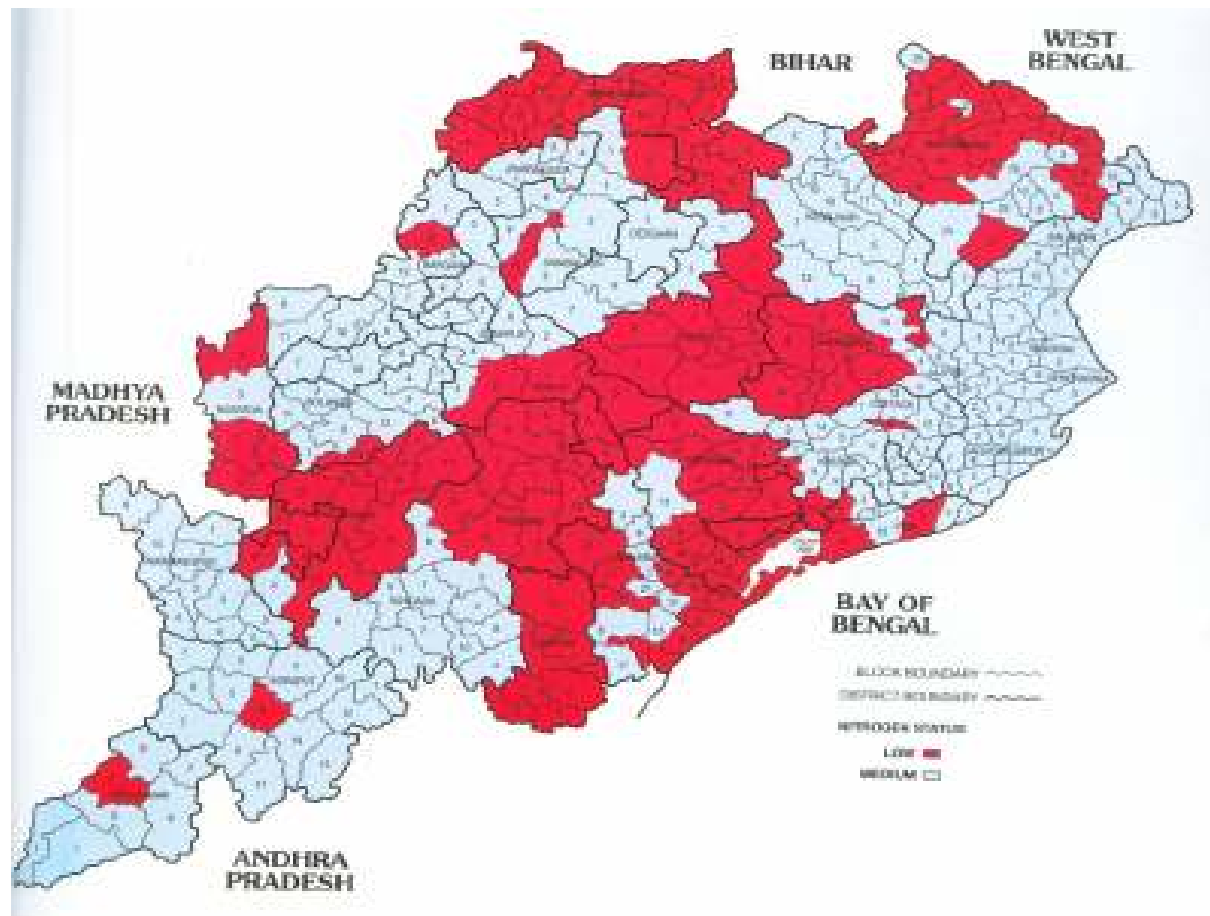
aerators, shelters/huts etc)			
4. Heat wave and cold wave			
A. Capture			
Marine			
Inland			
B. Aquaculture			
(i) Changes in pond environment (water quality)			
(ii) Health and Disease management			

Annexure 1- Location map of district with in state

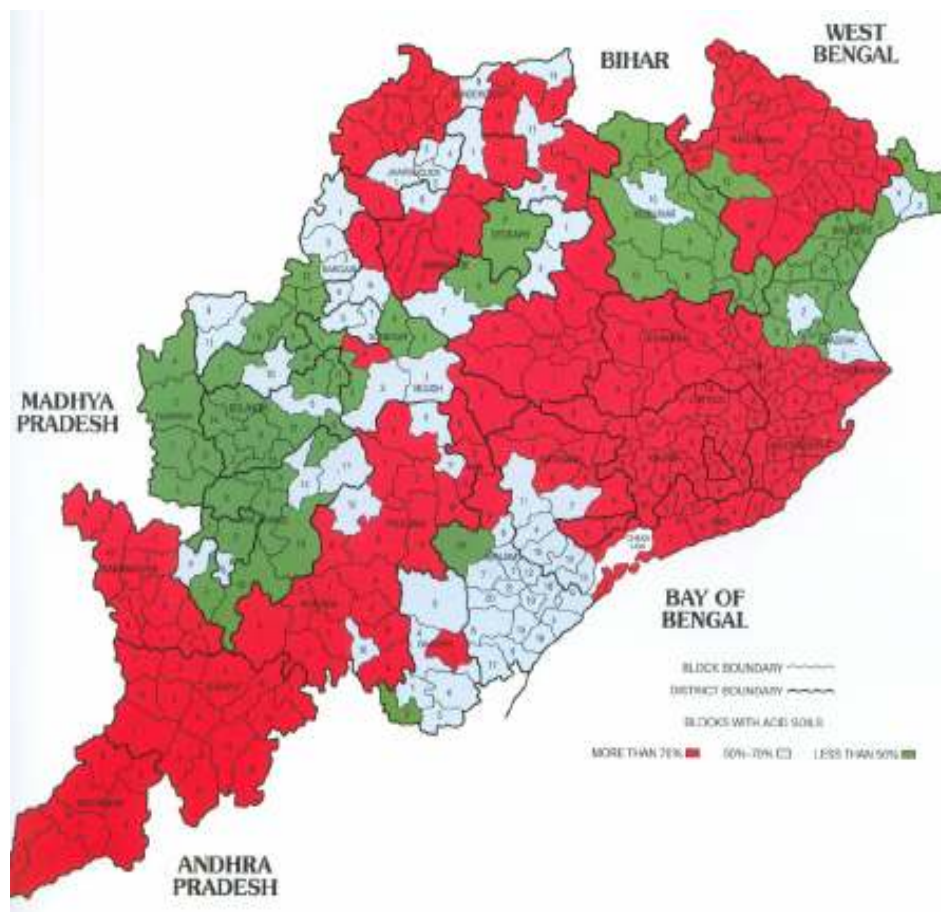


Annexure -II

Nitrogen status of the soils of Orissa at the Block level.



Soil Reaction status of the soils of Orissa at the Block level.



Annexure III- Mean annual rainfall

District: Kandhamal

Year-2008-09

Location of the weather station.- RRTTS , G. Udayagiri , Kandhamal

Month	Rain Fall (mm)	No. of Rainy days	Temperature Degree Celsius	
			Max	Min
June ,08	123.4	8	31.8	21.3
July,08	162.3	9	30.1	20.1
August'08	273.7	16	29.2	19.8
September'08	499.5	18	24.7	18.3
October'08	0	0	31.8	16.29
November'08	0	0	30.13	8.3
December'08	0	0	28.43	6.4
January'09	0	0	29.38	5.74
Feb,09	0	0	30.57	7.5
Marc,09	0	0	30.96	12.16

Mean annual rainfall

District: Kandhamal

District: Kandhamal

Year-2009-10

Location of the weather station: RRTTS, G.udayagiri

Month	Rain Fall (mm)	No. of Rainy days	Temperature Degree Celsius	
			Max	Min
March'09	-	-	30.96	12.16
April'09	3	1	38.36	15.33
May'09	135	5	40.04	17.35
June'09	144.4	7	38.53	19.6
July'09	746.5	11	27.46	19.62
August'09	232.5	13	31.61	19.06
September'09	182.6	10	30.23	17.36
October'09	186.1	6	26.74	10.62
November'09	56.4	6	27.54	7.30
December'09	-	-	26.22	6.03
January'10	40	1	26.77	3.29
Feb,10	-	-	32.57	5.46

**Rainfall distribution in Kandhamal district
Year 2009-10**

