

STATE: ORISSA

Agriculture Contingency Plan for District: KALAHANDI

1.0 District Agriculture profile					
1.1	Agro-Climatic/Ecological Zone				
	Agro Ecological Sub Region (ICAR)	Gujrat Hills, Dandakaranya and Eastern Ghats hot moist sub humid eco sub-region (12.1)			
	Agro-Climatic Zone (Planning Commission)	Eastern plateau and hill region (Zone: VII)			
	Agro Climatic Zone (NARP)	Western undulating zone (OR-8)			
	List all the districts falling under the NARP Zone*(*>50% area falling in the zone)	Kalahandi, Nuapara			
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude	
		19° 40'N	83° 00'E	247 m	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	RRTTS, Bhawanipatna			
	Mention the KVK located in the district with address	KVK, Kalahandi At/PO: Bhawanipatna, Dist: Kalahandi-766 001			
Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	RRTTS, Bhawanipatna At/PO: Bhawanipatna, Dist: Kalahandi-766 001				
1.2	Rainfall	Normal RF(mm)	Normal Rainy days (number)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW Monsoon (June-Sep):	1128.1	48.9	3 rd week June	3 rd week Sept.
	NE Monsoon(Oct-Dec):	86.5	4.6	2 nd week Oct.	2 nd week Nov.
	Winter (Jan- Feb)	48.4	3.0	2 nd week Jan.	3 rd week Feb.
	Summer (Mar-May)	67.5	4.7	2 nd week Apr.	1 st week May
	Annual	1330.5	61.2	-	-

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)	792	378	254	35	23	21	8	57	3	16

Source : Orissa Agriculture Statistics, 2008-09

1.4	Major Soils (common names like red sandy loam deep soils (etc.,))*	Area ('000 ha)	Percent (%) of total
	Red soil	305.15	38.53
	Red and Yellow soil	270.78	34.19
	Mixed red and black	87.75	11.08
	Black soil	76.03	9.6
	Alluvial soil	52.27	6.6

* mention colour, depth and texture (heavy, light, sandy, loamy, clayey etc) and give vernacular name, if any, Source: SREP, Kalahandi -2009

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	375	162 %
	Area sown more than once	231	
	Gross cropped area	587	

Source : Orissa Agriculture Statistics, 2008-09

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	135.57		
	Gross irrigated area	215.7		
	Rainfed area	371.3		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals		33.79	15.66
	Tanks	2332	14.26	6.61
	Open wells	13470	8.39	3.89

Bore wells	468	1.61	0.74
Lift irrigation schemes	765	12.98	6.0
Micro-irrigation		0.22	0.01
Other sources (please specify)MIP	-	144.44	66.96
Total Irrigated Area		215.7	
Pump sets	1550		
No. of Tractors	148		
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			
Critical			
Semi- critical			
Safe	13	100	Good
Wastewater availability and use			
Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%			

Source: Ground Water Board

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

1.7	Major field crops cultivated	Area ('000 ha)							Summer	Grand total
		<i>Kharif</i>			<i>Rabi</i>					
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total			
	Paddy	100.4	117.77	218.17	50.08	-	50.08	-	268.25	
	Green gram	9.17	30.79	39.96	1.09	36.89	37.98	-	77.94	
	Black gram	7.65	32.86	40.51	0.72	10.64	11.36	-	51.87	
	Cotton	-	19.35	19.35	-	-	-	-	19.35	
	Arhar	-	13.19	13.19	-	-	-	-	13.19	
	Horticulture crops - Fruits	Area ('000 ha)								
		Total								
	Mango	9.68								
	Banana	1.03								
	Guava	1.59								
	Citrus	1.17								
	Horticulture crops - Vegetables	Total								
	Brinjal	7.68								
	Tomato	6.85								
	Onion	4.25								
	Cowpea	14.28								
	Okra	1.58								
	Medicinal and Aromatic crops	Total								
	Ginger	0.07								
	Turmeric	0.95								
	Plantation crops	Total								
		-								
	Fodder crops	Total								
	Maize	16.40								
	Cowpea	1.10								

Total fodder crop area	17.50
Grazing land	
Sericulture etc	

Source: Orissa Agriculture Statistics, 2008-09

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)	263.89	177.90	441.79
	Improved cattle		-	-
	Crossbred cattle	85.05	12.64	97.69
	Non descriptive Buffaloes (local low yielding)	51.86	33.39	85.26
	Descript Buffaloes			
	Goat	-	-	223.72
	Sheep	-	-	86.95
	Others (Camel, Pig, Yak etc.)	-	-	6.39
	Commercial dairy farms (Number)			38
1.9	Poultry	No. of farms	Total No. of birds ('000)	
	Commercial	34	25	
	Backyard	125	12.5	

Source: Veterinary Department, 2009-10

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, 2009-10)	No. Farmer owned ponds		No. of Reservoirs		No. of village tanks	
		1237		13		1456	
	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, 2009-10)		6268		2.1	13162.8	

Source: Fishery Department, 2009-10

1.11 Production and Productivity of major crops (Average of 2008)

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	387.07	2560	202.01	4006	-	-	589.08	2921.7	-
	Green gram	27.07	655	22.75	587	-	-	49.82	622	-
	Black gram	26.56	632	15.3	958	-	-	41.86	721	-
	Cotton	186.58	1020	-	-	-	-	186.58	1020	-
	Arhar	134.45	1010	-	-	-	-	134.45	1010	-
Others	-	-	-	-	-	-	-	-	-	-
Major Horticultural crops (Crops to be identified based on total acreage)										
	Brinjal	-	-	-	-	-	-	115.78	15000	
	Tomato	-	-	-	-	-	-	91.29	13300	
	onion	-	-	-	-	-	-	38.63	9009	
	cowpea	-	-	-	-	-	-	9.94	696	
	okra	-	-	-	-	-	-	12.89	8130	
Source : Orissa Agriculture Statistics, 2008-09										

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Paddy	Green gram	Black gram	Cotton	Arhar
	Kharif- Rainfed	4 th week June-4 th week July	2 nd week June-3 rd week July	2 nd week June-3 rd week July	2 nd week June-1 st week July	2 nd week June-1 st week July
	Kharif-Irrigated	4 th week June-4 th week July	2 nd week June-3 rd week July	2 nd week June-3 rd week July	-	-
	Rabi- Rainfed	-	1 st week October- 2 nd week November	1 st week October- 2 nd week November	-	-
	Rabi-Irrigated	3 rd week Dec-3 rd week Jan	4 th week December-1 st week January	4 th week December-1 st week January	-	-

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 (swarming caterpillar, boll worm)	✓		

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	Agonomic measures	Remarks on Implementation
Delay by 2 weeks (July 1st wk)*	Red soil Medium rainfall Medium elevation	Paddy	*Select short duration var. (Paddy-Heera, Khandagiri, Jogesh, Sidhanta)	*Perform summer ploughing *Sowing may be continued to last week of June *Sow across slope *Apply FYM in seed furrows	OSSC NFSM OSSC ISOPOM NFSM
		Arhar	Arhar – Upas120, Durga, Pragati, Jagruti (120 – 130 days)	*Perform summer ploughing *Sowing may be continued to last week of June *Sow across slope *Apply FYM in seed furrows	
		Paddy +Arhar	*Grow moisture stress tolerant var. of paddy like Saubhaga dhan(90 days)	*Perform summer ploughing *Sowing may be continued to last week of June *Sow across slope	

				*Apply FYM in seed furrows *Sow arhar : rice in 2:5 row ratio or 40:60 mixed broadcast	
		Paddy-Vegetable	Grow moisture stress tolerant var. of paddy like Mandakini, late planting var. like Lalat	*practice seed priming *Summer ploughing *Apply FYM@ 5t/ha * Sowing may be continued to last week of june	
		Paddy – Blackgram	*Restrict sowing of varieties of not more than 150 days duration like Mahanadi , Indrabati	*adopt 10% model for storing rain water *Practice seed priming * Nursery sowing may be delayed *Apply FYM@ 5t/ha	
	Red soil High rainfall Medium elevation	Cotton	*Select short duration var. like Savita and Bunny	*Plough across slope *Apply FYM in mound *Sow in mounds just before or after monsoon onset in dry weather *Raise seedlings in polythene for gapfill	ICDP NFSM OSSC NFSM
		Paddy-Lathyrus	*grow moisture stress tolerant var. of paddy like Mandakini, late planting var. like Lalat	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha *Sowing should be delayed to last week of June	
		Paddy	*Restrict sowing of varieties of not more than 150 days duration like Mahanadi , Indrabati	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha	
	Red soil High rainfall High elevation	Minor millet - Niger	*Select short duration var. like Ragi(Dibyasingha, AKP2, Subhra), Bajra(WBC75,BSB15), Little millet(Kolab,Sabar) , Kodo(VL 129), Foxtail millet(SIA 2876)	*Plough and sow across the slope *Apply FYM @ 2t/ha *Apply all fert. basal	ICDP NFSM OSSC NFSM
		Arhar	Select short duration varieties like UPAS 120,Durga,Pragati, Jagruti (120 – 130 days)	*Test germination % *Soak 5-6 hr before sowing	
		Paddy	*Restrict sowing of varieties of not more than 150 days duration like Pratikhya Mahanadi, Indrabati	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha	

Red and Yellow soil High rainfall Medium elevation	Cotton	*Select short duration var. like Savita and Bunny	*Plough across slope *Apply FYM in mound *Sow in mounds just before or after monsoon onset in dry weather *Raise seedlings in polythene for gapfill	ICDP OSSC NFSM	
	Paddy – Onion	*Grow moisture stress tolerant var. of paddy like Mandakini, late planting var. like Lalat	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha *Sowing should be delayed to last week of June		
	Paddy – Mung	*Restrict sowing of varieties of not more than 150 days duration like Mahanadi , Indrabati	*Adopt 10% model for storing rain water *Apply FYM@ 5t/ha		
Black soil Medium rainfall Medium elevation	Millets	*Select short duration var. like Ragi (Dibyasingha, AKP2 Subhra), Bajra (WBC75,BSB15), Little millet (Kolab, Sabar) , Kodo (VL 129), Foxtail millet (SIA 2876)	*Plough and sow across the slope *Apply FYM @ 2t/ha *Apply all fert. basal	ICDP-course cereals	
	Paddy – Onion	*Grow moisture stress tolerant var. of paddy like Mandakini, late planting var. like Lalat	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha *Sowing should be delayed to last week of June		OSSC NFSM
	Paddy – Lathyrus	*Restrict sowing of varieties of not more than 150 days duration like Mahanadi , Indrabati	*Adopt 10% model for storing rain water *Apply FYM@ 5t/ha		OSSC NFSM
Black soil High rainfall Medium elevation	Cotton+Arhar	*Select short duration cotton var. like Savita and Bunny *Select short duration arhar var. like UPAS 120,Durga,Pragati, Jagruti (120 – 130 days)	*Perform summer ploughing *Sow across slope *Apply FYM in seed furrows *Sow cotton: arhar in 8:2 row ratio	ICDP COTTON ISOPOM	
	Paddy – Lentil	*Grow moisture stress tolerant var. of paddy like Mandakini, late planting var. like Lalat	*Adopt 10% model for storing rain water *Apply FYM@ 5t/ha *Sowing should be delayed to last week of June		OSSC NFSM
	Paddy - Mung	*Restrict sowing of varieties of not more than 150 days duration like	*Adopt 10% model for storing rain water	OSSC	

			Mahanadi , Indrabati	*Apply FYM@ 5t/ha	NFSM
Alluvial soil	Groundnut – Mung		*Select short duration var. like Smruti and TAG 24 (95 days)	*Sow across slop	OSSC
			*Select varieties resistant to bud necrosis like ICGS 44, TMV 2, TAG 24 in endemic areas	*Give 10% higher seed rate	ISOPOM
				*Treat seed chemically	
Paddy – Sunflower			*Grow moisture stress tolerant var. of paddy like Mandakini, late planting var. like Lalat	*adopt 10% model for storing rain water	OSSC
				*Apply FYM@ 5t/ha	NFSM
				*Sowing should be delayed to last week of June	
Paddy - Blackgram			*Restrict sowing of varieties of not more than 150 days duration like Mahanadi , Indrabati	*Adopt 10% model for storing rain water	OSSC
				*Apply FYM@ 5t/ha	NFSM
Forest soil	Maize – mustard		*Select short duration var. like Pragati, Shakti 1,Pratap,Navjot Arun (80 -95 days)	*Perform summer ploughing	OSSC
			*Can be sown with cow pea or runner bean in 2:2 ratio	* Perform seed priming	ISOPOM
				*Sow across slope	
				*Apply FYM in seed furrows	
Paddy			*grow moisture stress tolerant var. of paddy like Mandakini, late planting var. like Lalat	*Adopt 10% model for storing rain water	OSSC
				*Apply FYM@ 5t/ha	NFSM
				*Sowing should be delayed to last week of June	
Paddy			*Restrict sowing of varieties of not more than 150 days duration like Mahanadi , Indrabati	*Adopt 10% model for storing rain water	OSSC
				*Apply FYM@ 5t/ha	NFSM

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 (July 31 st wk)	Red soil Medium rainfall Medium elevation	Paddy	*Variety selected – Khandagiri, Jogesh, Sidhanta	*Application of full P, K and 25% N of RD as basal dose for vigorous seedling *Apply FYM@ 5t/ha	OSSC NFSM
		Arhar	*Sowing of non paddy crops- Arhar - Upas 120	*Application of full P, K and 25% N of RD as basal dose for vigorous seedling *In situ rainwater conservation and recycling of excess run-off for life saving irrigation	ISOPOM
		Paddy +Arhar	Ragi, greengram, Maize and Cowpea for fodder purpose	*Application of full P, K and 25% N of RD as basal dose for vigorous seedling *In situ rainwater conservation and recycling of excess run-off for life saving irrigation	ISOPOM NFSM
		Paddy-Vegetable	Variety selected – Mandakini, Lalat, Nabeen	*Adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC NFSM
		Paddy – Blackgram	*Variety selected – 150 days duration like Savitri, Mahalaxmi	*Adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC NFSM
	Farming situation: Red soil High rainfall Medium elevation	Cotton	*Select short duration var. like Savita and Bunny	*Plough across slope *Apply FYM in mound *Sow in mounds just before or after monsoon onset in dry weather *Raise seedlings in polythene for gapfill	ICDP
		Paddy-Lathyrus	Selection of Variety – Mandakini, Lalat, Nabeen	*Adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC NFSM

		Paddy	*Variety selected – 150 days duration like Savitri, Mahalaxmi	*Adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC NFSM
Red soil High rainfall High elevation		Minor millet-Niger	*Select short duration var. like Ragi(Dibyasingha, AKP2 Subhra),Bajra(WBC75,BSB15), Little millet(Kolab,Sabar) , Kodo(VL 129), Foxtail millet(SIA 2876)	*Plough and sow across the slope *Apply FYM @ 2t/ha *Apply all fert. basal	
		Arhar	Select short duration varieties like UPAS 120,Durga,Pragati, Jagruti (120 – 130 days)	*Test germination % *Soak 5-6 hr before sowing	OSSC ISOPOM
		Paddy	**Variety selected – 150 days duration like Savitri, Mahalaxmi	*Adopt 10% model for storing rain water *Apply FYM@ 5t/ha *Raise community nursery of rice for transplanting	OSSC NFSM
Red and Yellow soil High rainfall Medium elevation		Cotton	*Select short duration var. like Savita and Bunny	*Plough across slope *Apply FYM in mound *Sow in mounds just before or after monsoon onset in dry weather *Raise seedlings in polythene for gap filling	ICDP
		Paddy – Onion	Variety selected – Mandakini, Lalat, Nabeen	*Adopt 10% model for storing rain water *Seed Sowing – last June *Apply FYM@ 5t/ha	OSSC NFSM
		Paddy – Mung	*Variety selected – 150 days duration like Savitri, Mahalaxmi	*Adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC NFSM
Black soil Medium rainfall Medium elevation		Millet	*Select short duration var. like Ragi (Dibyasingha, AKP2 Subhra),Bajra(WBC75,BSB15), Little millet(Kolab,Sabar) , Kodo(VL 129), Foxtail millet(SIA 2876)	*Plough and sow across the slope *Apply FYM @ 2t/ha *Apply all fert. basal	
		Paddy – Onion	selection of Variety – Mandakini, Lalat, Nabeen	*Adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC NFSM

		Paddy – Lathyrus	*Variety selected – 150 days duration like Savitri, Mahalaxmi	*Adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC NFSM
	Black soil High rainfall Medium elevation	Cotton+Arhar	*Select short duration cotton var. like Savita and Bunny *Select short duration arhar var. like UPAS 120,Durga,Pragati, Jagruti (120 – 130 days)	*Perform summer ploughing *Sow across slope *Apply FYM in seed furrows *Sow cotton: Arhar in 8:2 row ratio	ICDP ISOPOM
		Paddy – Lentil	selection of Variety – Mandakini, Lalat, Nabeen	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC NFSM
		Paddy - Mung	*Variety selected – 150 days duration like savitri, mahalaxmi	*Adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC NFSM
	Alluvial soil	Groundnut – Mung	*Select short duration var.like Smruti and TAG 24 (95 days) *Select varieties resistant to bud necrosis like ICGS 44, TMV 2, TAG 24 in endemic areas	*Sow across slope *Give 10% higher seed rate *Treat seed chemically	OSSC ISOPOM
		Paddy – Sunflower	*grow moisture stress tolerant var. of paddy like Mandakini and late planting var. like Lalat	*Adopt 10% model for storing rain water *Apply FYM@ 5t/ha *Sowing should be delayed to last week of June	OSSC NFSM
		Paddy - Blackgram	*Restrict sowing of varieties of not more than 150 days duration like Mahanadi , Indrabati	*Adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC NFSM
	Forest soil	Maize – Mustard	*Select short duration var. like Pragati, Shakti 1,Pratap,Navjot Arun (80 -95 days) *Can be sown with cow pea or runner bean in 2:2 ratio	*Perform summer ploughing *Sow across slope *Apply FYM in seed furrows	OSSC ISOPOM
		Paddy	*Grow moisture stress tolerant var. of paddy like Mandakini, late planting var. like Lalat	*Adopt 10% model for storing rain water *Apply FYM@ 5t/ha *Sowing should be delayed to last week of June	OSSC NFSM

		Paddy	*Restrict sowing of varieties of not more than 150 days duration like Mahanadi , Indrabati	*Adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC NFSM
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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 6 weeks (Aug 1 st Week)	Farming situation: *Red soil Medium rainfall Medium elevation	Paddy	*Substitute crop with black gram and green gram, cowpea, Niger (Deomali), Horse gram (urmi) *grow maize, cowpea to meet fodder crisis	*Application of full P, K and 25% N of RD as basal dose for vigorous seedling *In situ rainwater conservation and recycling of excess runoff for life saving irrigation	OSSC NFSM
		Arhar	*Substitute crop with black gram and green gram, cowpea, Niger (Deomali), Horse gram (urmi) *grow maize, cowpea to meet fodder crisis	*Application of full P, K and 25% N of RD as basal dose for vigorous seedling *In situ rainwater conservation and recycling of excess runoff for life saving irrigation	OSSC NFSM
		Paddy +Arhar	*Substitute crop with black gram and green gram, cowpea, Niger (Deomali), Horse gram (urmi) *Grow maize, cowpea to meet fodder crisis	*Application of full P, K and 25% N of RD as basal dose for vigorous seedling *In situ rainwater conservation and recycling of excess runoff for life saving irrigation	OSSC NFSM
		Paddy-Vegetable	*Sowing sprouted seeds of varieties like Lalat, Nabeen	* Adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC NFSM
		Paddy – Black gram	Sowing varieties like Swarna, Pratikhya, MTU-1001	*Adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC NFSM
	Farming situation: Red soil High rainfall	Cotton	*Substitute crop with black gram and green gram, cowpea, Niger (Deomali), Horse gram (urmi)	*Plough across slope *Apply FYM in mound *Raise seedlings in	ICDP

	Medium elevation		*Grow maize, cowpea to meet fodder crisis	polythene for gapfill	
		Paddy-Lathyrus	*Sowing sprouted seeds of varieties like Lalat, Nabeen	*Adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC NFMS
		Paddy	Sowing varieties like Swarna, Pratikhya, MTU-1001	*Adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC
	Red soil High rainfall High elevation	Minor millet-Niger	*Select short duration var. like Ragi (Dibyasingha, AKP2 Subhra),Bajra(WBC75,BSB15), Little millet(Kolab,Sabar) , Kodo(VL 129), Foxtail millet(SIA 2876)	*Plough and sow across the slope *Apply FYM @ 2t/ha *Apply all fert. basal	NFMS
		Arhar	Select short duration varieties like UPAS 120,Durga,Pragati, Jagruti (120 – 130 days)	*Test germination % *Soak 5-6 hr before sowing	OSSC ISOPOM
		Paddy	Sowing varieties like Swarna, Pratikhya, MTU-1001	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC NFMS
	Red and Yellow soil High rainfall Medium elevation	Cotton	*Substitute crop with black gram and green gram, cowpea, Niger (Deomali), Horse gram (urmi) *grow maize, cowpea to meet fodder crisis	*Plough across slope *Apply FYM in mound *Raise seedlings in polythene for gapfill	OSSC ISOPOM
		Paddy – Onion	*Sowing sprouted seeds of varieties like Lalat, Nabeen	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC
		Paddy – mung	Sowing varieties like Swarna, Pratikhya, MTU-1001	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC
	Black soil Medium rainfall Medium elevation	Millets	*Select short duration var. like Ragi(Dibyasingha, AKP2 Subhra),Bajra(WBC75,BSB15), Little millet(Kolab,Sabar) , Kodo(VL 129), Foxtail millet(SIA 2876)	*Plough across slope *Apply FYM @ 5 t/ha	OSSC ISOPOM
		Paddy – Onion	*Sowing sprouted seeds of varieties like Lalat, Nabeen	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC
		Paddy – Lathyrus	Sowing varieties like Swarna, Pratikhya, MTU-1001	*adopt 10% model for storing rain water	OSSC

				*Apply FYM@ 5t/ha	
Black soil High rainfall Medium elevation	Cotton+Arhar	*Substitute crop with black gram and green gram, cowpea, Niger (Deomali), Horse gram (urmi) *grow maize, cowpea to meet fodder crisis	*Plough across slope *Apply FYM in mound	OSSC ISOPOM	
	Paddy – Lentil	*Sowing sprouted seeds of varieties like Lalat, Nabeen	*Adopt 10% model for storing rain water *Apply FYM@ 5t/ha		
	Paddy - Mung	Sowing varieties like Swarna, Pratikhya, MTU-1001	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha		
Alluvial soil	Groundnut – Mung	*Substitute crop with black gram and green gram, cowpea, Niger (Deomali), Horse gram (urmi) *grow maize, cowpea to meet fodder crisis	*Plough across slope *Apply FYM in mound *Raise seedlings in polythene for gapfill	ISOPOM OSSC	
	Paddy – Sunflower	*Sowing sprouted seeds of varieties like Lalat, Nabeen	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha		
	Paddy - Blackgram	Sowing varieties like Swarna, Pratikhya, MTU-1001	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha		
Forest soil	Maize – Mustard	*Substitute crop with blackgram and greengram, cowpea, Niger (Deomali), Horsegram (urmi) *grow maize, cowpea to meet fodder crisis	*Plough across slope *Apply FYM in mound *Raise seedlings in polythene for gapfill	OSSC ISOPOM	
	Paddy	*Sowing sprouted seeds of varieties like Lalat, Nabeen	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha		
	Paddy	Sowing varieties like Swarna, Pratikhya, MTU-1001	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha		

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 8 weeks (Aug 3 rd week)	Farming situation: *Red soil Medium rainfall Medium elevation	Paddy	*Substitute crop with blackgram and greengram, cowpea, Niger (Deomali), Horsegram (urmi) *grow maize, cowpea to meet fodder crisis	*Application of full P, K and 25% N of RD as basal dose for vigorous seedling *Insitu rainwater conservation and recycling of excess runoff for life saving irrigation	OSSC ISOPOM
		Arhar	*Substitute crop with blackgram and greengram, cowpea, Niger (Deomali), Horsegram (urmi) *grow maize, cowpea to meet fodder crisis	*Application of full P, K and 25% N of RD as basal dose for vigorous seedling *Insitu rainwater conservation and recycling of excess runoff for life saving irrigation	OSSC ISOPOM
		Paddy +Arhar	*Substitute crop with blackgram and greengram, cowpea, Niger (Deomali), Horsegram (urmi) *grow maize, cowpea to meet fodder crisis	*Application of full P, K and 25% N of RD as basal dose for vigorous seedling *Insitu rainwater conservation and recycling of excess runoff for life saving irrigation	OSSC ISOPOM
		Paddy-Vegetable	*Sowing sprouted seeds of varieties like Lalat, Nabeen	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha *spray weedicide	OSSC Soil Cons. Dept.
		Paddy – Black gram	Sowing varieties like Swarna, Pratikhya, MTU-1001	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha *spray weedicide	OSSC Soil Cons. Dept.
		Farming situation: Red soil High rainfall Medium elevation	Cotton	*Substitute crop with blackgram(Prasad,PU 30) and greengram(PDM54,K851), cowpea, Niger (Utkal Niger)), Horsegram (urmi) *grow maize, cowpea to meet fodder crisis	*Plough across slope *Apply FYM @ 5 t/ha
		Paddy- Lathyrus	*Sowing sprouted seeds of varieties like Lalat, Nabeen	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC Soil Cons. Dept.

		Paddy	Sowing varieties like Swarna, Pratikhya, MTU-1001	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC Soil Cons. Dept.
Red soil High rainfall High elevation		Minor millet-Niger	*Select short duration var. like Ragi(Dibyasingha, AKP2 Subhra), Bajra(WBC75,BSB15), Little millet(Kolab,Sabar), Kodo(VL 129), Foxtail millet(SIA 2876)	*Plough and sow across the slope *Apply FYM @ 2t/ha *Apply all fert. basal	OSSC ICDP-Course cereals
		Arhar	*Sowing cowpea(Utkal Manika), Niger (Utkal Niger)), Horsegram (urmi)	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC Soil Cons. Dept.
		Paddy	Sowing varieties like Swarna, Pratikhya, MTU-1001	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC Soil Cons. Dept.
Red and Yellow soil High rainfall Medium elevation		Cotton	*Substitute crop with blackgram and greengram, cowpea, Niger (Deomali), Horsegram (urmi) *grow maize, cowpea to meet fodder crisis	*Plough across slope *Apply FYM @ 5t/ha *Control weed chemically	OSSC ISOPOM
		Paddy – Onion	*Sowing sprouted seeds of varieties like Lalat, Nabeen	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC Soil Cons. Dept
		Paddy – mung	Sowing varieties like Swarna, Pratikhya, MTU-1001	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC Soil Cons. Dept
Black soil Medium rainfall Medium elevation		Millets	*Select short duration var. like Ragi(Dibyasingha, AKP2 Subhra), Bajra(WBC75,BSB15), Little millet(Kolab,Sabar), Kodo(VL 129), Foxtail millet(SIA 2876)	*Plough and sow across the slope *Apply FYM @ 2t/ha *Apply all fert. basal	ICDP-course cereals OSSC
		Paddy – onion	*Sowing sprouted seeds of varieties like Lalat, Nabeen	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC Soil Cons. Dept
		Paddy – Lathyrus	Sowing varieties like Swarna, Pratikhya, MTU-1001	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC Soil Cons. Dept
Black soil High rainfall		Cotton+Arhar	*Substitute crop with blackgram and greengram, cowpea, Niger	*Plough across slope Apply FYM @ 5t/ha	ISOPOM OSSC

Medium elevation		(Deomali), Horsegram (urmi) *grow maize, cowpea to meet fodder crisis	*Control weed chemically	
	Paddy – Lentil	*Sowing sprouted seeds of varieties like Lalat, Nabeen	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC Soil Cons. Dept
	Paddy - Mung	Sowing varieties like Swarna, Pratikhya, MTU-1001	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC Soil Cons. Dept
Alluvial soil	Groundnut – Mung	*Substitute crop with blackgram and greengram, cowpea, Niger (Deomali), Horsegram (urmi) *grow maize, cowpea to meet fodder crisis	*Plough across slope * Apply FYM @ 5t/ha *Control weed chemically	OSSC Soil Cons. Dept
	Paddy – Sunflower	*Sowing sprouted seeds of varieties like Lalat, Nabeen	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC Soil Cons. Dept NFSM
	Paddy - Blackgram	Sowing varieties like Swarna, Pratikhya, MTU-1001	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC Soil Cons. Dept
Forest soil	Maize – mustard	*Substitute crop with blackgram and greengram, cowpea, Niger (Deomali), Horsegram (urmi) *grow maize, cowpea to meet fodder crisis	*Plough across slope * Apply FYM @ 5t/ha *Control weed chemically	OSSC ISOPOM
	Paddy	*Sowing sprouted seeds of varieties like Lalat, Nabeen	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC Soil Cons. Dept
	Paddy	Sowing varieties like Swarna, Pratikhya, MTU-1001	*adopt 10% model for storing rain water *Apply FYM@ 5t/ha	OSSC Soil Cons. Dept

Condition			Suggested Contingency measures		
			Normal Crop/ cropping system	Crop management	Soil nutrient & moisture conservation measures
Early season drought (Normal onset)	Major Farming situation				
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Farming situation: *Red soil Medium rainfall Medium elevation	Paddy	*if 50% mortality then re-sow the crop up to July after receipt of rainfall * growing non paddy crop like Ragi (Dibyasinha, Suvra), Green gram, PDM-54, Cowpea, Utkalmanika *if mortality <50%, then crop may be gap filled	*In-situ moisture conservation by hoeing, ridging to base crop for storing excess run-off water	ICDP-course cereals OSSC
		Arhar	*if 50% mortality then re-sow the crop up to July after receipt of rainfall * growing non paddy crop like Ragi (Dibyasinha, Suvra), Green gram, PDM-54, Cowpea, Utkalmanika *if mortality <50%, then crop may be gap filled	*In-situ moisture conservation by hoeing, ridging to base crop for storing excess run-off water	ICDP-course cereals OSSC
		Paddy +Arhar	*if 50% mortality then re-sow the crop up to July after receipt of rainfall * growing non paddy crop like Ragi (Dibyasinha, Suvra), Green gram, PDM-54, Cowpea, Utkalmanika *if mortality <50%, then crop may be gap filled	*In-situ moisture conservation by hoeing, ridging to base crop for storing excess run-off water	ICDP-course cereals OSSC
		Paddy-Vegetable	*If rice population < 50% -resow the crop *resowing of sprouted seeds of 125 days variety @100-120 kg/ha for maintaining plant popln. 400-600/m ² *if rice population > 50% - carryout khelua operation *raise community nursery of rice for transplanting *Sow seeds in punji method	*Cover seeds with FYM:SSP(10:1) mixture	OSSC
		Paddy – Black gram	*If rice population < 50% -resow the crop *resowing of sprouted seeds of 125 days variety *if rice population > 50% - carryout khelua operation *raise community nursery of rice for	*Bond plugging for storing water	OSSC NFSM

			transplanting		
Farming situation: Red soil High rainfall Medium elevation	Cotton	*Spray Quizalofop ethyl for weed control *gap fill with polythene raised seedlings		*Go for mulching	ICDP
	Paddy-Lathyrus	*If rice population < 50% -resow the crop *resowing of sprouted seeds of 125 days variety *if rice population > 50% - carryout khelua operation *raise community nursery of rice for transplanting		*cover seeds with FYM:SSP (10:1) mixture	OSSC NFSM
	Paddy	*If rice population < 50% -resow the crop *resowing of sprouted seeds of 125 days variety *if rice population > 50% - carryout khelua operation *raise community nursery of rice for transplanting		*Bond plugging for storing water	OSSC NFSM
Red soil High rainfall High elevation	Minor millet-Niger	Resowing may be done if mortality is there		Apply fertilizer (top dressing) immediately after rainfall.	ICDP-course cereals
	Arhar	Gap filling by reseedling		Apply fertilizer (top dressing) immediately after rainfall.	ISOPOM
	Paddy	*If rice population < 50% -resow the crop *resowing of sprouted seeds of 125 days variety *if rice population > 50% - carryout khelua operation *raise community nursery of rice for transplanting		*Bond plugging for storing water *Apply fertilizer (top dressing) immediately after rainfall.	OSSC NFSM
Red and Yellow soil High rainfall Medium elevation	Cotton	*Spray Quizalofop ethyl for weed control *gap fill with polythene raised seedlings		*Go for mulching	ICDP
	Paddy – Onion	*If rice population < 50% -resow the crop *resowing of sprouted seeds of 125 days variety *if rice population > 50% - carryout khelua operation *raise community nursery of rice for transplanting		Apply fertilizer (top dressing) immediately after rainfall.	OSSC

		Paddy – Mung	*If rice population < 50% -resow the crop *resowing of sprouted seeds of 125 days variety *if rice population > 50% - carryout khelua operation *raise community nursery of rice for transplanting	*Bond plugging for storing water *Apply fertilizer (top dressing) immediately after rainfall.	OSSC
	Black soil Medium rainfall Medium elevation	Millets	Resowing may be done if mortality is there	Apply fertilizer (top dressing) immediately after rainfall.	ICDP-course cereals
		Paddy – Onion	*If rice population < 50% -resow the crop *resowing of sprouted seeds of 125 days variety *if rice population > 50% - carryout khelua operation *raise community nursery of rice for transplanting	*Bond plugging for storing water *Apply fertilizer (top dressing) immediately after rainfall.	OSSC
		Paddy – Lathyrus	*If rice population < 50% -resow the crop *resowing of sprouted seeds of 125 days variety *if rice population > 50% - carryout khelua operation *raise community nursery of rice for transplanting	*Bond plugging for storing water *Apply fertilizer (top dressing) immediately after rainfall.	OSSC NFSM
	Black soil High rainfall Medium elevation	Cotton+Arhar	*Spray Quizalofop ethyl for weed control *gapfill with polythene raised seedlings	*Go for mulching *Apply fertilizer (top dressing) immediately after rainfall.	ICDP
		Paddy – Lentil	*If rice population < 50% -resow the crop *resowing of sprouted seeds of 125 days variety *if rice population > 50% - carryout khelua operation *raise community nursery of rice for transplanting	*Bond plugging for storing water *Apply fertilizer (top dressing) immediately after rainfall.	OSSC
		Paddy - Mung	*If rice population < 50% -resow the crop *resowing of sprouted seeds of 125 days variety *if rice population > 50% - carryout khelua operation	*Bond plugging for storing water *Apply fertilizer (top dressing) immediately after rainfall.	OSSC

			*raise community nursery of rice for transplanting		
Alluvial soil	Groundnut – Mung		*Spray Quisalofop ethyl for weed control. *complete hoeing immediately after 25 days	* Complete hoeing, weeding followed by ridging	
	Paddy – Sunflower		*If rice population < 50% -resow the crop *resowing of sprouted seeds of 125 days variety *if rice population > 50% - carryout khelua operation *raise community nursery of rice for transplanting	cover seeds with FYM:SSP mixture	OSSC NFSM
	Paddy - Blackgram		*If rice population < 50% -resow the crop *resowing of sprouted seeds of 125 days variety *if rice population > 50% - carryout khelua operation *raise community nursery of rice for transplanting	*Bond plugging for storing water *Apply fertilizer (top dressing) immediately after rainfall.	OSSC NFSM
Forest soil	Maize – Mustard		*Complete hoeing for dust mulching	* Complete hoeing, weeding followed by ridging *Apply fertilizer (top dressing) immediately after rainfall.	ISOPOM
	Paddy		*If rice population < 50% -resow the crop *resowing of sprouted seeds of 125 days variety *if rice population > 50% - carryout khelua operation *raise community nursery of rice for transplanting	cover seeds with FYM:SSP mixture	OSSC
	Paddy		*If rice population < 50% -resow the crop *resowing of sprouted seeds of 125 days variety *if rice population > 50% - carryout khelua operation *raise community nursery of rice for transplanting	*Bond plugging for storing water *Apply fertilizer (top dressing) immediately after rainfall.	OSSC

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	Farming situation: *Red soil Medium rainfall Medium elevation	Paddy	*complete hoeing and weeding in non-paddy crop to provide dust mulch	*practice organic mulching to extend the period of moisture availability. *close drainage holes to check the seepage loss	NFSM NREGS RKVY
		Arhar	*complete hoeing and weeding in non-paddy crop to provide dust mulch	*practice organic mulching to extend the period of moisture availability. *close drainage holes to check the seepage loss	NFSM NREGS RKVY
		Paddy +Arhar	*complete hoeing and weeding in non-paddy crop to provide dust mulch	*practice organic mulching to extend the period of moisture availability. *close drainage holes to check the seepage loss	NFSM NREGS RKVY
		Paddy-Vegetable	*with hold N fertilizer application up to receipt of rainfall * Follow plant protection measures against blast disease *Lifesaving irrigation to nursery *Transplant seedlings upto 45 days old with close spacing &4-5 seedling/hill	*practice organic mulching to extend the period of moisture availability. *close drainage holes to check the seepage loss *Don't apply N to nursery *Apply 50% N of RD at transplanting	NFSM NREGS RKVY
		Paddy – Black gram	*Skip beusaning if 45days old *Weed out the field Gap fill clonally *Lifesaving irrigation to nursery *Transplant seedlings upto 60days old with close spacing & 4-5 seedling/hill	*Apply N on rainfall receipt *Don't apply N to nursery *Apply 50% N of RD at transplanting	NFSM NREGS RKVY

	Farming situation: Red soil High rainfall Medium elevation	Cotton	* Spray Quizalofop ethyl for weed control	*Spray planofix *Top dress after rain	NFSM NREGS RKVY
		Paddy-Lathyrus	*with hold N fertilizer application up to receipt of rainfall * Follow plant protection measures against blast disease*Lifesaving irrigation to nursery *Transplant seedlings upto 45 days old with close spacing &4-5 seedling/hill	*practice organic mulching to extend the period of moisture availability. *close drainage holes to check the seepage loss *Don't apply N to nursery *Apply 50% N of RD at transplanting	NFSM NREGS RKVY
		Paddy – Black gram	*Skip beusaning if 45days old *Weed out the field Gap fill clonally *Lifesaving irrigation to nursery *Transplant seedlings upto 60days old with close spacing &4-5 seedling/hill	*Apply N on rainfall receipt *Don't apply N to nursery *Apply 50% N of RD at transplanting	NFSM NREGS RKVY
	Red soil High rainfall High elevation	Minor millet-Niger	Thin out to the extent of 25% for mulching	*Apply N on rainfall receipt	ICDP
		Arhar	Provide irrigation at critical stage	Spray 2% urea	
		Paddy	*Skip beusaning if 45days old *Weed out the field Gap fill clonally *Lifesaving irrigation to nursery *Transplant seedlings upto 60days old with close spacing &4-5 seedling/hill	*Apply N on rainfall receipt *Don't apply N to nursery *Apply 50% N of RD at transplanting	NFSM NREGS RKVY
	Red and Yellow soil High rainfall Medium elevation	Cotton	* Spray Quizalofop ethyl for weed control	*Spray planofix *Top dress after rain	ICDP
		Paddy – Onion	*with hold N fertilizer application up to receipt of rainfall * Follow plant protection measures against blast disease	*practice organic mulching to extend the period of moisture availability. *close drainage holes to check the seepage loss *Don't apply N to nursery	NFSM NREGS RKVY

			*Lifesaving irrigation to nursery *Transplant seedlings upto 45 days old with close spacing &4-5 seedling/hill	*Apply 50% N of RD at transplanting	
		Paddy-Mung	*Skip beusaning if 45days old *Weed out the field Gap fill clonally *Lifesaving irrigation to nursery *Transplant seedlings upto 60days old with close spacing &4-5 seedling/hill	*Apply N on rainfall receipt *Don't apply N to nursery *Apply 50% N of RD at transplanting	NFSM NREGS RKVY
	Black soil Medium rainfall Medium elevation	Millets	Thin out to the extent of 25% for mulching	*Apply N on rainfall receipt	ICDP
		Paddy – onion	*with hold N fertilizer application up to receipt of rainfall * Follow plant protection measures against blast disease *Lifesaving irrigation to nursery *Transplant seedlings upto 45 days old with close spacing &4-5 seedling/hill	*practice organic mulching to extend the period of moisture availability. *close drainage holes to check the seepage loss *Don't apply N to nursery *Apply 50% N of RD at transplanting	NFSM NREGS RKVY
		Paddy – Lathyrus	*Skip beusaning if 45days old *Weed out the field Gap fill clonally *Lifesaving irrigation to nursery *Transplant seedlings upto 60days old with close spacing &4-5 seedling/hill	*Apply N on rainfall receipt *Don't apply N to nursery *Apply 50% N of RD at transplanting	NFSM NREGS RKVY
	Black soil High rainfall Medium elevation	Cotton+Arhar	* Spray Quizalofop ethyl for weed control Provide irrigation at critical stage	*Spray planofix *Top dress after rain Spray 2% urea	ICDP
		Paddy – Lentil	*with hold N fertilizer application up to receipt of rainfall	*practice organic mulching to extend the period of moisture availability. *close drainage holes to check the	NFSM NREGS RKVY

			* Follow plant protection measures against blast disease *Lifesaving irrigation to nursery *Transplant seedlings upto 45 days old with close spacing &4-5 seedling/hill	seepage loss *Don't apply N to nursery *Apply 50% N of RD at transplanting	
		Paddy -Mung	*Skip beusaning if 45days old *Weed out the field Gap fill clonally *Lifesaving irrigation to nursery *Transplant seedlings upto 60days old with close spacing &4-5 seedling/hill	*Apply N on rainfall receipt *Don't apply N to nursery *Apply 50% N of RD at transplanting	NFSM NREGS RKVY
Alluvial soil		Groundnut – Mung	Spray Quizalofop ethyl for weed control Skip hoing	Spray 2% urea and B	ISOPOM
		Paddy – Sunflower	*with hold N fertilizer application up to receipt of rainfall * Follow plant protection measures against blast disease *Lifesaving irrigation to nursery *Transplant seedlings upto 45 days old with close spacing &4-5 seedling/hill	*practice organic mulching to extend the period of moisture availability. *close drainage holes to check the seepage loss *Don't apply N to nursery *Apply 50% N of RD at transplanting	NFSM
		Paddy – Black gram	*Skip beusaning if 45days old &Weed out the field Gap fill clonally *Lifesaving irrigation to nursery *Transplant seedlings upto 60days old with close spacing &4-5 seedling/hill	*Apply N on rainfall receipt *Don't apply N to nursery *Apply 50% N of RD at transplanting	NFSM
		Maize – Mustard	Hoing for dust mulch Spray weedicide with hood	Apply N on rainfall receipt	ISOPOM
Forest soil		Paddy	*with hold N fertilizer application up to receipt of	*practice organic mulching to extend the period of moisture availability.	NFSM

			rainfall * Follow plant protection measures against blast disease *Lifesaving irrigation to nursery *Transplant seedlings upto 45 days old with close spacing &4-5 seedling/hill	*close drainage holes to check the seepage loss *Don't apply N to nursery *Apply 50% N of RD at transplanting	
		Paddy	*Skip beusaning if 45days old & Weed out the field Gap fill clonally *Lifesaving irrigation to nursery *Transplant seedlings upto 60days old with close spacing &4-5 seedling/hill	*Apply N on rainfall receipt *Don't apply N to nursery *Apply 50% N of RD at transplanting	NFSM

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measues	Remarks on Implementation
Mid season drought (long dry spell)					
At flowering/ fruiting stage	Farming situation: *Red soil Medium rainfall Medium elevation	Paddy	*Provide protective irrigation through recycling of harvested rain water *provide irrigation at critical stages such as flowering and grain filling	Spray urea and MOP as top dressing	NFSM
		Arhar	*Provide protective irrigation through recycling of harvested rain water *provide irrigation at critical stages such as flowering and grain filling	Spray urea and MOP as top dressing	NFSM
		Paddy +Arhar	*Provide protective irrigation through recycling of harvested rain water *provide irrigation at critical stages such as flowering and grain filling	Spray urea and MOP as top dressing	NFSM
		Paddy-Vegetable	*provide irrigation at critical stages	Spray urea and MOP as top	NFSM

			such as flowering and grain filling *If crop fails,the ideal pre rabi crops like horsegram, Niger, Blackgram, and sesame can be taken in residual moisture condition	dressing	ISOPOM
		Paddy -Blackgram	*provide irrigation at critical stages such as flowering and grain filling *If crop fails,the ideal pre rabi crops like horsegram, Niger, Blackgram, and sesame can be taken in residual moisture condition	Spray urea and MOP	NFSM ISOPOM
Farming situation: Red soil High rainfall Medium elevation		Cotton	*Applying of Planofix hormone * spraying the crop with Imidacloprid for controlling of sucking pests	Apply 1250ml micronutrient/ha	ICDP
		Paddy-Lathyrus	*provide irrigation at critical stages such as flowering and grain filling *If crop fails,the ideal pre rabi crops like horsegram, Niger, Blackgram, and sesame can be taken in residual moisture condition	Spray urea and MOP	NFSM ISOPOM
		Paddy – Blackgram	*provide irrigation at critical stages such as flowering and grain filling *If crop fails,the ideal pre rabi crops like horsegram, Niger, Blackgram, and sesame can be taken in residual moisture condition	Spray urea and MOP	NFSM ISOPOM
Red soil High rainfall High elevation		Minor millet-Niger	Provide protective irrigation through recycling of harvested rain water	Apply 1000ml micronutrient/ha	ICDP-minor millet
		Arhar	Provide protective irrigation through recycling of harvested rain water	Spray 2% urea	ISOPOM
		Paddy	*provide irrigation at critical stages such as flowering and grain filling *If crop fails,the ideal pre rabi crops like horsegram, Niger, Blackgram, and sesame can be taken in residual moisture condition	Spray urea and MOP	NFSM ISOPOM

	Red and Yellow soil High rainfall Medium elevation	Cotton	*Applying of Planofix hormone * spraying the crop with Imidacloprid for controlling of sucking pests	Apply 1250ml micronutrient/ha	ICDP
		Paddy – Onion	*provide irrigation at critical stages such as flowering and grain filling *If crop fails,the ideal pre rabi crops like horsegram, Niger, Blackgram, and sesame can be taken in residual moisture condition	Spray urea and MOP	NFSM ISOPOM
		Paddy -Mung	*provide irrigation at critical stages such as flowering and grain filling *If crop fails,the ideal pre rabi crops like horsegram, Niger, Blackgram, and sesame can be taken in residual moisture condition	Spray urea and MOP	NFSM ISOPOM
	Black soil Medium rainfall Medium elevation	Millets	Provide protective irrigation through recycling of harvested rain water	Apply 1000ml micronutrient/ha	ICDP
		Paddy – Onion	*provide irrigation at critical stages such as flowering and grain filling *If crop fails,the ideal pre rabi crops like horsegram, Niger, Blackgram, and sesame can be taken in residual moisture condition	Spray urea and MOP	NFSM ISOPOM
		Paddy – Lathyrus	*provide irrigation at critical stages such as flowering and grain filling *If crop fails,the ideal pre rabi crops like horsegram, Niger, Blackgram, and sesame can be taken in residual moisture condition	Spray urea and MOP	NFSM ISOPOM
	Black soil High rainfall Medium elevation	Cotton+Arhar	*Applying of Planofix hormone * spraying the crop with Imidacloprid for controlling of sucking pests	Apply 1250ml micronutrient/ha	ICDP ISOPOM
		Paddy – Lentil	*provide irrigation at critical stages such as flowering and grain filling *If crop fails,the ideal pre rabi crops like horsegram, Niger, Blackgram, and sesame can be taken in residual moisture condition	Spray urea and MOP	NFSM ISOPOM

		Paddy -Mung	*provide irrigation at critical stages such as flowering and grain filling *If crop fails,the ideal pre rabi crops like horsegram, Niger, Blackgram, and sesame can be taken in residual moisture condition	Spray urea and MOP	NFSM ISOPOM
	Alluvial soil	Groundnut – Mung	Skip hoeing Deweed with sickle	Foliar application with urea,Zn and B	ISOPOM
		Paddy – Sunflower	*provide irrigation at critical stages such as flowering and grain filling *If crop fails,the ideal pre rabi crops like horsegram, Niger, Blackgram, and sesame can be taken in residual moisture condition	Spray urea and MOP	NFSM ISOPOM
		Paddy - Blackgram	*provide irrigation at critical stages such as flowering and grain filling *If crop fails,the ideal pre rabi crops like horsegram, Niger, Blackgram, and sesame can be taken in residual moisture condition	Spray urea and MOP	NFSM ISOPOM
	Forest soil	Maize – mustard	*provide irrigation at critical stages	Apply 1000ml micronutrient/ha	ISOPOM
		Paddy	provide irrigation at critical stages such as flowering and grain filling	Foliar application with urea and Zn	ISOPOM
		Paddy	*provide irrigation at critical stages such as flowering and grain filling *If crop fails,the ideal pre rabi crops like horsegram, Niger, Blackgram, and sesame can be taken in residual moisture condition	Spray urea and MOP	NFSM ISOPOM

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)					
	Farming situation: *Red soil Medium rainfall	Paddy	Provide protective irrigation	If crop fails,the ideal pre rabi crops like horsegram, Niger, Blackgram, and sesame can be taken in residual moisture condition	ISOPOM

	Medium elevation	Arhar	Provide protective irrigation	If crop fails, the ideal pre rabi crops like horsegram, Niger, Blackgram, and sesame can be taken in residual moisture condition	ISOPOM
		Paddy +Arhar	Provide protective irrigation	If crop fails, the ideal pre rabi crops like horse gram, Niger, Black gram, and sesame can be taken in residual moisture condition	ISOPOM
		Paddy-Vegetable	provide irrigation at critical stages such as flowering and grain filling	If crop fails, the ideal pre rabi crops like horse gram, Black gram, can be taken in residual moisture condition	NFSM ISOPOM
		Paddy – Black gram	provide irrigation at critical stages such as flowering and grain filling	Sow black gram earlier in residual moisture condition	NFSM ISOPOM
	Farming situation: Red soil High rainfall Medium elevation	Cotton	Provide protective irrigation	Mulch with stovers Dibble rabi crop	ICDP
		Paddy-Lathyrus	provide irrigation at critical stages such as flowering and grain filling	Sow lathyrus earlier in residual moisture condition	NFSM ISOPOM
		Paddy – Blackgram	provide irrigation at critical stages such as flowering and grain filling	Sow blackgram earlier in residual moisture condition	NFSM ISOPOM
	Red soil High rainfall High elevation	Minor millet-Niger	Harvest at physiological maturity stage	Mulch with stovers Dibble rabi crop	ICDP
		Arhar	Harvest at physiological maturity stage	Mulch with stovers Dibble rabi crop	ISOPOM
		Paddy	provide irrigation at critical stages such as flowering and grain filling	Spray urea and MOP	NFSM ISOPOM
	Red and Yellow soil High rainfall Medium elevation	Cotton	Provide protective irrigation	Mulch with stovers Dibble rabi crop	ICDP
		Paddy – Onion	provide irrigation at critical stages such as flowering and grain filling	Sow onion nursery earlier	NFSM ISOPOM NHM
		Paddy -Mung	provide irrigation at critical stages such as flowering and	Sow green gram earlier in residual moisture condition	NFSM ISOPOM

			grain filling		
Black soil Medium rainfall Medium elevation	Millets	Harvest at physiological maturity stage	Mulch with stovers Dibble rabi crop	ICDP	
	Paddy – onion	provide irrigation at critical stages such as flowering and grain filling	Sow onion nursery earlier	NFSM ISOPOM NHM	
	Paddy – Lathyrus	provide irrigation at critical stages such as flowering and grain filling	Sow lathyrus earlier in residual moisture condition	NFSM ISOPOM	
Black soil High rainfall Medium elevation	Cotton+Arhar	Provide protective irrigation Harvest at physiological maturity stage	Mulch with stovers Dibble rabi crop	ICDP ISOPOM	
	Paddy – Lentil	provide irrigation at critical stages such as flowering and grain filling	Sow lentil earlier in residual moisture condition	NFSM ISOPOM	
	Paddy -Mung	provide irrigation at critical stages such as flowering and grain filling	Sow green gram earlier in residual moisture condition	NFSM ISOPOM	
Alluvial soil	Groundnut – Mung	Sprinkle water from WHS for harvesting	Sow green gram in residual moisture condition	ISOPOM	
	Paddy – Sunflower	provide irrigation at critical stages such as flowering and grain filling	Dibble sunflower seeds immediately	NFSM ISOPOM	
	Paddy - Blackgram	provide irrigation at critical stages such as flowering and grain filling	Sow blackgram earlier in residual moisture condition	NFSM ISOPOM	
Forest soil	Maize – Mustard	Harvest as fodder	Sow mustard during evening hours followed by planking in the morning	ISOPOM	
	Paddy	*provide irrigation at critical stages such as flowering and grain filling *If crop fails,the ideal pre rabi crops like horsegram, Niger, Blackgram, and sesame can be taken in residual moisture condition	Spray urea and MOP	NFSM ISOPOM	

		Paddy	*provide irrigation at critical stages such as flowering and grain filling *If crop fails, the ideal pre rabi crops like horsegram, Niger, Blackgram, and sesame can be taken in residual moisture condition	Spray urea and MOP	NFSM ISOPOM
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2.1.2 Drought - Irrigated situation

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall	Farming situation: 1. Canal irrigated red soil 2. Canal irrigated alluvial soil 3 Canal irrigated black soil	Paddy-Paddy	Choose varieties as per time available from receiving canal water Rice area during rabi should be reduced. Instead, low water requiring oilseeds and pulses like groundnut, green gram, black gram, sunflower, sesamum are preferred options. Use of mid duration variety like 'Lalat' (120 days) is well suited in rabi.	Raise nursery after water comes or irrigate the dry sown beds Irrigate the kharif rice with groundwater during dry spells only, if dry spell comes before release of canal water. Reduction of conveyance losses while irrigating the light textured soils. Spread a polythene sheet in the field channel before irrigating the field and then roll it back for irrigating the other field.	Irrigation dept. Pani panchayat
		Paddy-Vegetables	Choose varieties as per time available from receiving canal water Growing of short duration legumes like cowpea, bean or root vegetables like raddish during rabi seasons.	Same as above for kharif rice.	Irrigation dept. Pani panchayat
		Paddy- Pulses	Choose varieties as per time available from receiving canal water Low water requiring oilseeds and	Same as above for kharif rice	Irrigation dept. Pani panchayat

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
			pulses like groundnut, green gram, black gram, sunflower, sesamum in rabi		

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	1 Canal irrigated red soil 2. Canal irrigated alluvial soil 3 Canal irrigated black soil	Paddy-Paddy	Choose varieties as per water available from canal Rice area during rabi should be reduced. Instead, low water requiring oilseeds and pulses like groundnut, green gram, black gram, sunflower, sesamum are preferred options. Use of mid duration variety like 'Lalat' (120 days) is well suited in rabi.	Irrigate the kharif/rabi rice with groundwater during dry spells and critical stages only. Reduction of conveyance losses while irrigating the light textured soils. Spread polythene sheet in the field channel before irrigating the field and then roll it back for irrigating the other field. Harvesting of kharif rice at physiological maturity will realize 80-85% of normal yield. Rescheduling of irrigation roster is called upon to optimise use of depleted water supplies and high demand.	Irrigation dept. Pani panchayat
		Paddy-oilseeds/pulses	Choose varieties as per water available from canal Low water requiring oilseeds and pulses like groundnut, green gram, black gram, sunflower, sesamum	Same as above for kharif rice	Irrigation dept. Pani panchayat

		Paddy-vegetables	Choose varieties as per water available from canal Growing of short duration legumes like cowpea, bean or root vegetables like raddish during rabi seasons.	Same as above for kharif rice.	Irrigation dept. Pani panchayat
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Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	1 Canal irrigated red soil 2. Canal irrigated alluvial soil 3 Canal irrigated black soil	Paddy-Paddy	Measures should be taken as per the rainfed condition mentioned above Rice area during rabi should be reduced. Instead low water requiring oilseeds and pulses like groundnut, green gram, black gram, sunflower, sesamum are to be grown depending on rainfall	Irrigate the kharif crops during dry spell with harvested water. Irrigate the rabi rice at critical stages only with ground water . Reduction of conveyance losses while irrigating the crops. Harvesting of kharif rice at physiological maturity will realize 80-85% of normal yield.	Irrigation dept. Pani panchayat
		Paddy-oilseeds/pulses	(Measures should be taken as per the rainfed condition mentioned above) Low water requiring oilseeds and pulses like groundnut, green gram, black gram, sunflower, sesamum	Irrigate the kharif crops during dry spell with harvested water. Harvesting of kharif rice at physiological maturity will realize 80-85% of normal yield.	Irrigation dept. Pani panchayat
		Paddy-vegetables	(Measures should be taken as per the rainfed condition mentioned above) Substitute with non paddy crops as like rainfed condition Growing of short duration legumes like cowpea, bean or root vegetables like raddish during rabi seasons.	Irrigate the kharif crops during dry spell with harvested water. Harvesting of rice at physiological maturity will realize 80-85% of normal yield.	Irrigation dept. Pani panchayat

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	1. Tank irrigated red soil 2. Tank irrigated alluvial soil 3 Tank irrigated black soil	Paddy-Paddy	Measures should be taken as per the rainfed condition mentioned above Rice area during rabi should be reduced. Instead low water requiring oilseeds and pulses like groundnut, green gram, black gram, sunflower, sesamum are to be grown depending on rainfall	Irrigate the kharif crops during dry spell with harvested water. Irrigate the rabi rice at critical stages only with ground water . Reduction of conveyance losses while irrigating the crops. Harvesting of kharif rice at physiological maturity will realize 80-85% of normal yield.	Irrigation Dept. Pani panchayat
		Paddy-oilseeds/pulses	(Measures should be taken as per the rainfed condition mentioned above) Low water requiring oilseeds and pulses like groundnut, green gram, black gram, sunflower, sesamum.	Irrigate the kharif crops during dry spell with harvested water. Harvesting of kharif rice at physiological maturity will realize 80-85% of normal yield.	Irrigation dept. Pani panchayat
		Paddy-vegetables	(Measures should be taken as per the rainfed condition mentioned above) Substitute with non paddy crops as like rainfed condition Growing of short duration legumes like cowpea, bean or root vegetables like raddish during rabi seasons.	Irrigate the kharif crops during dry spell with harvested water. Harvesting of rice at physiological maturity will realize 80-85% of normal yield.	Irrigation dept. Pani panchayat

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	1.Tubewell irrigated red soil 2.Tubewell irrigated red and yellow soil 3.Tubewell irrigated black soil	Paddy-Paddy	Choose short duration varieties as per water availability Rice area during rabi should be reduced. Instead, low water requiring oilseeds and pulses like groundnut, green gram, black gram, sunflower, sesamum are preferred options.	Irrigate the kharif/rabi rice with groundwater during dry spells and critical stages only. Reduction of conveyance losses while irrigating the light textured soils. Spread polythene sheet in the field channel before irrigating the field and then roll it back for irrigating the other field. Harvesting of kharif rice at physiological maturity will realize 80-85% of normal yield.	Users group Irrigation dept
		Paddy- Pulses	Choose paddy varieties requiring less water/short duration Low water requiring oilseeds and pulses like groundnut, green gram, black gram, sunflower, sesamum (Other measures may be same as rainfed condition)	Same as above for kharif rice	Users group Irrigation dept
		Paddy-Vegetables	Choose varieties as per water available from canal (Other measures may be same as rainfed condition) Growing of short duration legumes like cowpea, bean or root vegetables like raddish during rabi seasons.	Same as above for kharif rice.	Users group Irrigation dept

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

Condition	Suggested contingency measures			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvests
Continuous high rainfall in a short span leading to water logging				
Paddy	Provide deep drains at frequent intervals for adequate irrigation	Provide drainage If possible	1.Drain water for drying 2.Harvest at physiological maturity stage	1. Mechanization of harvesting for speed up the process. 2. Shifting to a safer place 3. Dry in shade in a well ventilated space 4. Don't stalk wet bundles
Arhar	Provide drainage	Provide drainage	1. Drain water for drying. 2. Harvest for vegetable purpose if plant withers	Harvest after drying Safe storage against pest & diseases
Cotton	Provide drainage. Necessary PP measures should be taken against disease and pest.	Provide drainage Spray planofix	1.Drain water for drying 2. Harvest as early as possible	Shifting to a safer place Dry in shade in a well ventilated space
Millets	Provide drainage. .	Provide drainage	Harvest at physiological maturity stage	Shifting to a safer place Dry in shade in a well ventilated space
Ground nut	Provide drainage. .	Provide drainage. .	Drain water Harvest at physiological maturity	Don't stalk wet bundles Dry in shade in a well ventilated space Go for mechanized stipping
Maize	Provide drainage Make furrow & ridges	Provide drainage Make furrow & ridges	Provide drainage	Harvest cobs, remove sheath and dry under shed
Horticulture				
Fruits (Mango, Citrus etc)	Provide drainage Earthing up of plant base/root zone	Provide drainage Earthing up of plant base/root zone	Provide drainage Ear thing up of plant base/root zone (In case of established tree, no problem)	Dry the fruits, Keep at safer place, may be sold at green stage
Banana	Provide drainage. Earthing up of plant base/root zone. Spray mancozeb @3 g/ltr and Bavistin @ 2 g/ltr alternately preventive measures against sigatoka disease.	Provide drainage Earthing up of plant base/root zone	Harvested at green stage or table purpose, No problem for marketing as it has buyers' preference	Store for ripening in closed godowns for marketing

Solanaceous/ cruciferous vegetables	Seedling in raised nursery beds, drainage,	Provide drainage Application of hormones to induce more flowering	Provide drainage	Ensure drainage Harvesting at tender stages
Heavy rainfall with high speed winds in a short span²				
Paddy	Drainage if water logging persists Small seedlings withstand the problem	Drainage if water logging persists	Lodged panicles may be harvested at physiological maturity stage	Dry under shade
Arhar	Drainage if water logging persists Small plants withstand the problem	Drainage if water logging persists	Harvest at physiological maturity stage	Dry under shade
Outbreak of pests and diseases due to unseasonal rains				
Paddy	Spray Tricyclazole(1 gm/lit) against blast, Chloropyrifos(2 ml/lit) against stem borer, buffer channels & dusting methyl parathion against Swarming caterpillar, Propiconazole/Hexaconazole @ 1 lit/ha for Sheath blight/rot	Spray Tricyclazole(1 gm/lit) against blast, fipronyl(0.3 g) against stem borer, leaf folder&gall midge buffer channels & dusting methyl parathion against Swarming caterpillar	Malathion spray against Gundhy bug, Buprofezin(1200ml/ha) for BPH	Sun drying / disinfection of gunny bags with malathion or heat treatment to manage stored grain pests
Arhar	Removal of infested tips to manage leaf webber, spraying of imidacloprid @1 ml/4 lt of water	Hand picking & destruction of blister beetles	Spray of Ekalux against pod borer	Store in clean godown, disinfection of gunny bags / storage structure with malathion
Cotton	Imidacloprid@1 ml/4lt/Thiamethaxom @ 4 ml /15 lt for sucking pests	Imidacloprid@1 ml/4lt /Thiamethaxom @ 4 ml /15 lt for sucking pests Endosulfan @ 2ml/lit for boll worm	Place pheromone traps Spray related pyrethroid for boll worm	After harvest destroy the residues
Blackgram/ Greengram	spraying of imidacloprid @1 ml/4 lt of water	Application of malathion against Flea beetle	Spray of Nuvan(1ml/lt) against pod borer	Disinfection of storage structure to manage stored grain pests
Horticulture				

Solanaceous vegetables	Spraying malathion against hadda beetle, hand collection of egg mass Soil drenching of Plantomycin 1gm & carbendazim @ 2 gm per lit of water against wilting	Application of Neem oil & Triazophos alternatively against brinjal fruit & shoot borer/ leaf curl virus,	Spraying of Profenophos (1 lit/ha) against fruit borer Metalaxyl(2 gm/lit) against fruit rot	Segregation of infested fruits & destruction
Cucurbit vegetables	Spraying of Ekalux against Red pumpkin beetle, Collection & destruction of eggs/grubs, Soil drenching of COC & streptocycline against wilting	Spraying Endosulfan against leaf eating caterpillars Metalaxyl against Powdery mildew, Carbendazim against leaf spot & blight	Poison baiting with Malathion & Jaggery against fruit fly	Destruction of overripe & infested fruits

2.3 Floods

Condition	Suggested contingency measures			
	Seedling/ nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation				
Paddy	Drainage of the Nursery bed, If not possible go for re sowing. Wet seeding of sprouted seeds (@75-80 kg/ha) of medium duration varieties (Lalat (120 days), Konark (125 days), Surendra (135 days).	50% N and 50% K ₂ O + full P may be applied as basal and rest 50% N + 50% K ₂ O as top dressing during the tillering stage. In partially damaged field gap filling may be done by redistributing the tillers. Spraying of water on the foliage to wash out the silt deposition. Management of pests & diseases	Spray water for silt washing Emphasis should be given on forthcoming rabi crops. Supply of seeds and other agro-inputs of <i>rabi</i> crops at subsidized rate, provision of bank loan etc Utilization of residual soil moisture and use of recharged soil profile for growing pulses	Shifting to a safer place Dry in shade in a well ventilated space Growing of cucurbits after receding flood Adoption of integrated farming system to obtain more income and to compensate the loss during kharif.
Horticulture	NOT A FEATURE OF FARMING SITUATION WHERE VEGETABLE IS GROWN			
Continuous submergence for more than 2 days²				

Paddy	Drainage of the Nursery bed, If not possible go for re sowing. Wet seeding of sprouted seeds (@75-80 kg/ha) of medium duration varieties (Lalat (120 days), , Konark (125 days), Surendra (135 days)	In partially damaged field gap filling may be done by redistributing the tillers. A parallel nursery may be maintained in the small irrigated area in regular flood occurring area. So as to re plant the seedlings in heavilly damaged condition. Spraying of water on the foliage to wash out the silt deposition. Management of pests & diseases	Spraying of water on the foliage to wash out the silt deposition. Spraying of validamycin @ 2 ml/litre of water as protective measure against sheath rot. If flood comes during reproductive stage, emphasis should be given on forthcoming rabi crops Supply of seeds and other agro-inputs of rabi crops at subsidized rate, provision of bank loan etc Utilization of residual soil moisture and use of recharged soil profile for growing pulses Growing of cucurbits after receding flood	If flood comes during reproductive stage, emphasis should be given on forthcoming rabi crops. Supply of seeds and other agro-inputs of rabi crops at subsidized rate, provision of bank loan etc Utilization of residual soil moisture and use of recharged soil profile for growing pulses Growingof cucurbits after receding flood water
Horticulture				
Sea water inundation³	NOT A FEATURE OF THE DISTRICT DUE			
Crop1				

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

	Suggested contingency measures			
	Seedling/ nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave				
Summer paddy	Not encountered	Not encountered	Spraying of amino acid based formulations for better grain filling. Soil application of zinc sulphate @ 10 kg/ha Early sowing and short duration var. may be taken to escape the heat wave.	Mechanized harvesting should be taken up for speed up the process.

			Wind breaker plants may be planted to act as barrier.	
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2.5 Pest and disease outbreak: Swarming caterpillar / boll worm

	Suggested contingency measures			
	Seedling/ nursery stage	Vegetative stage	Reproductive stage	At harvest
Swarming caterpillar				
Paddy	Seedling stage in poorly drained field. *Spary of Chloropyriphos 2EC @ 2.5litres per ha or Triazophos 40EC @ 1 lt/ha during evening hours * Flooding the field with water and pour kerosene @ 2 lt/ha and dislodge the larvae by shaking the plants with a rope.	-	-	-
Boll worm				
Cotton	-	*Spray of profenophos @ 2 ml/lt of water i.e. 400ml/acre or Indoxacarb @ 1ml/lt of water i.e. 200ml/acre or Triazophos@ 400 ml/acre	*Spray of profenophos @ 2 ml/lt of water i.e. 400ml/acre or Indoxacarb @ 1ml/lt of water i.e. 200ml/acre or Triazophos@ 400 ml/acre	-

2.6 Contingent strategies for Livestock, Poultry & Fisheries

2.6.1 Livestock

	Suggested contingency measures		
	Before the event	During the event	After the event
Drought			
Feed and fodder availability	<ul style="list-style-type: none"> Livestock insurance Encourage perennial fodder production on river beds and tank bed on community basis. Village gauchar (grazing) lands should be 	<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 to 	<ul style="list-style-type: none"> Supplementary feeding of remaining livestock and the replacement stock.

	<p>developed for fodder production.</p> <ul style="list-style-type: none"> • On boundaries of agricultural field trees or shrubs like Sesbania, Subabul, Neem etc should be planted. • In the costal part of Orissa Sun hemp (Crotolaria) can be sown. • 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. • Explore the possibilities of availability of unconventional / alternative feed resources during draught. • Organizing training programme of persons connected with A.H. on feeding and management of animals during draught. 	<p>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 cassiatora water hyacinth and other like tree pods and seeds etc. Improving poor quality roughages by ammonia treatment, urea treatment, urea molasses mineral block etc and feeding them. 	
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. 	
Health and disease management	<ul style="list-style-type: none"> • Veterinary preparedness with vaccine and medicines. 	<ul style="list-style-type: none"> • Conducting animal health camps and treating the affected animals • Supplementation of mineral and vitamin mixtures 	<ul style="list-style-type: none"> • Availing insurance • Culling of unproductive livestock • Proper disposal of dead animals
Floods			
Feed and fodder availability		<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Provision of supplementary feeding (concentrate / Roughage) with vitamin & minerals.
Drinking water		<ul style="list-style-type: none"> • Priorities animals as suckling animals, 	<ul style="list-style-type: none"> • Provision of clean drinking

		<p>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.</p> <ul style="list-style-type: none"> • Drinking water be made available to the animals in any kind of clean container available with the farmer. 	<p>water.</p>
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 • 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, Acriflavin, 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 	<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 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. 	<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. • Improving shed hygiene especially in the farmers household through cleaning and disinfection

	<p>etc.)</p> <ul style="list-style-type: none"> • 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. 		
Cyclone			
Feed and fodder availability		<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Provision of supplementary feeding (concentrate / Roughage) with vitamin & minerals.
Drinking water		<ul style="list-style-type: none"> • 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 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 animas when catastrophe strives, so that they are prepared for the situation. Preparation and distribution of leaflets or booklets in simple local language for care of livestock in disaster. • Keeping track of weather forecast and prior information through radio and TV Etc. 	<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, 	<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

	<ul style="list-style-type: none"> • 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 • 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.) • 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. 	<p>antibiotics, anti-venom and anti-shock drugs etc. should be adequately available with them.</p> <ul style="list-style-type: none"> • 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. 	<p>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.</p> <ul style="list-style-type: none"> • Improving shed hygiene especially in the farmers household through cleaning and disinfection
Heat wave and cold wave			
Shelter/environment	<ol style="list-style-type: none"> 1. Green cover (trees plantation, land scaping) 2. Proper sheltering / housing white painting 	<ol style="list-style-type: none"> 1. Washing / wallowing / sprinkling/ splashing / showering 	

management	outside the roof and black painting inside the roof.	2. Provision of cool drinking water (inearthen pitches) 3. Cooling devices: fans, wet curtains or panels, air cooler if possible.	
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.

^s based on forewarning wherever available

2.6.2 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 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	Supply the compound feed to the poultry farm under submerged area	Supply will continued till the situation is under control	

	roads			
Drinking water	Protect the water sources from submergence	Attempt will be made to provide sanitized drinking water	Water sources will be 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 be continued till the situation is under control	
Drinking water	-	Attempt will be made to provide sanitized drinking water	Water sources will be 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 availability of sanitized water	Water sources will be sanitized with bleaching powder or any water sanitizer	
Heat wave and cold wave	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	
Shelter/environment management				
Health and disease management	Procurement of high protein and low energy diet Procurement of medicine, antistress agent and vitamin C and E.	Feeding during cooler hours of the day. Supplementation of vitamin E and C, antistress agent with water	Feeding will be continued with high protein and low energy till heat waves end and then feeding will be done with normal diet Antistress agents will be continued in drinking water for some days	

	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	
	Procurement of Antistress drugs	Supplementation of antistress drug	Vaccination of birds against RD	
	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	
	Procurement of high energy diet	Feed high energy diet.		
	Proper water supply will be ensured			
	Procurement of Antistress drugs and vaccine	Feeding of antistress drugs in drinking water Vaccination with fowl pox	Vaccination against IBD and RD	
	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.	

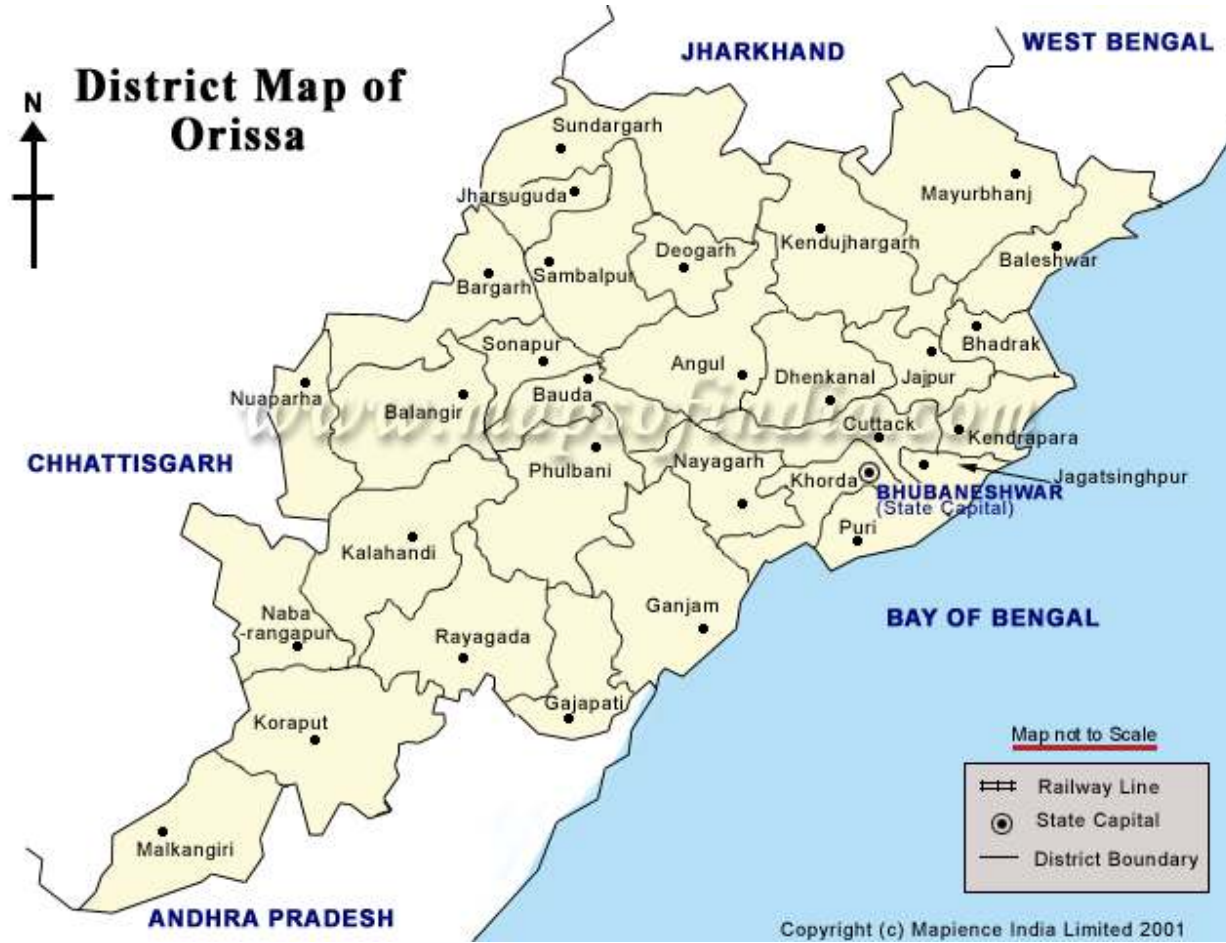
2.6.3 Fisheries/ Aquaculture

	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.
(iii) Any other	-	-	-
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 1/3 rd 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
(iii) Any other	-	-	-

^a based on forewarning wherever available

Annexure I

Location map of district within State:



Annexure 2

Mean annual rainfall:

Unit: in mm

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
10.3	14.4	23.7	25.7	41.8	240.4	327.7	355.4	204.6	74.0	10.9	1.6	1330.5

Annexure 3

Soil map:

