State: ODISHA

Agriculture Contingency Plan for District: NUAPADA

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-subregion (12.1)			
	Agro-Climatic Region (Planning Commission)	Eastern Plateau and Hills Region (VII)			
	Agro Climatic Zone (NARP)*	Western Undulating Zone (OR-8)			
	List all the districts failing under the NARP Zone	Nuapada, kalahandi			
	Geographical coordinates of district	Latitude	Longitude	Altitude	
		20^0 44' 33.59' N	85^0 04' 52.41'E	142 m	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Regional Research & Technological Transformation Station, Near College of Agriculture, Bhawanipatna -766001			
	Mention the KVK located in the district	Krishi Vigyan Kendra,Near Bus Stand, Nuapada -766105			
1.2	**Rainfall**	**Average (mm)**	**Normal Rainy days (Number)**	**Normal Onset**	**Normal Cessation**
	SW monsoon (June-Sep):	933.7	52.8	3rd wk of June	3rd wk. of Sept
	NE Monsoon (Oct-Dec):	125.6			
	Winter (Jan-Feb)	8.3			
	Summer (March-May)	48.2			
	Annual	1116			

* Source: District Emergency Cell: If a district falls in two NARP zones, mention the zone in which more than 50% area falls

1.3	Land use pattern of the district (latest statistics)	Geographical area (units)	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)	385	157	185	3	2	2	1	2	32	1

Source: Orissa Agriculture Statistics, 2008-2009

1.4	Major Soils	Area ('000 ha)	Percent (%) of total
	Red Soil	145.4	37.8
	Forest Soil	124.4	32.3
	Red & Black Soil	48.03	12.5
	Red & Yellow Soil	37.3	9.7
	Black Soil	15.4	4.01
	Alluvial soil	14.4	3.7

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	157	171
	Area sown more than once	112	
	Net irrigated area	47.4	
	Gross cropped area	269.0	

Source: Orissa Agriculture Statistics, 2008-2009

1.6	**Irrigation**	**Area ('000 ha)**		
	Net irrigated area	45.2		
	Gross irrigated area	61.8		
	Rainfed area	111.8		
	Source of irrigation	**Number**	**Area ('000 ha)**	**% area**
	Canals	38	25.9	13.0
	Tanks	1074	0.21	0.1
	Open wells	8290	4.0	2.0
	Bore wells	874	1.7	1.0
	Lift irrigation	320	5.7	2.8
	Other sources Dugwell, Chahala	4200	9.9	5.0
	Total	14796	47.5	
	Pumpsets			
	Micro-irrigation			
	Groundwater availability and use	**No. of blocks**	**% area**	**Quality of water**
	Over exploited	-		
	Critical	-		
	Semi-critical	-		
	Safe	5	100%	Good
	Wastewater availability and use	-		

*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%

* Potential Linked Credit Plan, NABARD, Bhawanipatana

1.7 Area under major field crops & horticulture etc.

1.7	**Horticulture crops-**	**Total area('000 ha)**	**Irrigated**	**Rain fed**
	Paddy	101.6	3.9	87.8
	Green gram	35.5	11.8	23.7
	Balck gram	28.8	2.7	26.1
	Groundnut	13.7	2.6	11.1
	Mustard	2.0	2.0	-
	Sunflower	0.2	0.18	0.02
	Horticulture crops- Fruits	**Total area ('000ha)**		
	Mango	4.7		
	Guava	0.7		
	Banana	0.4		
	Citrus	0.5		
	Papaya	0.05		
	Horticulture crops- Vegetables	**Total area(in ha)**		
	Okra	0.4		
	Pumpkin	1.4		
	Pointed gourd	0.5		
	Colocasia	0.6		
	Potato	0.05		
	Medicinal and Aromatic crops	**Total area**		
	Aswagandha	0.001		
	Amla	0.012		
	Bach	0.012		
	Coleus	0.05		
	Plantation crops	Total area		

	Eucalyptus	36
	Teak	52
	Bamboo	156
	Fodder crops	Total area
	cowopea	16
	Mp cherry	40
	Stylo	2
	Maize	16
	Bajra	12
	Total fodder crop area	84
	Grazing land	

*If break-up data (irrigated, rainfed) is not available, give total area

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Cattle			225.4
	Buffaloes			33.8
	Commercial dairy farms (Number)			06
	Goat			84.7
	Sheep			25.4
	Others (Pig)			1.1
1.9	**Poultry**			
	Commercial	168.0		
	Backyard	276.7		
1.10	**Inland Fisheries**	**Area (ha)**	**Yield (t/ha)**	**Production (tones)**
	Brackish water	-	-	-

	Fresh water	4.8	0.65	3188
	Others Capture(Rivers, Canal, Beels & Swamps)	-	-	-

Source: Fishery Dept.

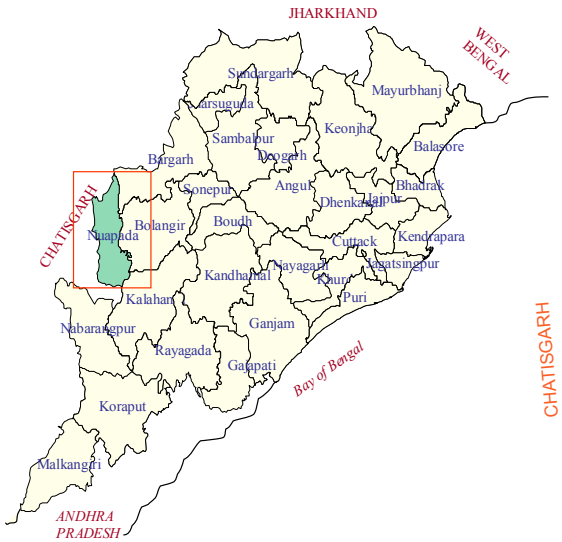
1.11 Production and Productivity of major crops (Average of 2008)

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	211.9	2085	13.1	3369	0	0	225.02	2132	-
	Greengram	8.8	380	4.2	354	0	0	13.05	371	-
	Blackgram	9.5	375	1.1	365	0	0	10.6	374	
	Cotton	4.5	432	0	0	0	0	4.5	432	
	Sunflower	0.01	550	0.19	630	0	0	0.2	625	
Major Horticultural crops (Crops to be identified based on total acreage)										
	Mango	0	0	0	0	14.9	2696	14.9	2696	
	Guava	0	0	4.1	6023	0	0	4.1	6023	
	Citrus	0	0	0	0	3.7	8103	3.7	8103	
	Banana	0	0	5.3	12058	0	0	5.3	12058	
	Papaya	0	0	0.7	20357	0	0	0.7	20357	
Source : Orissa Agriculture Statistics, 2008-09										

1.12	**Sowing window for 5 major crops (start and end of sowing period)**	Paddy	Cotton	Groundnut	Greengram	Blackgram
	Kharif-Rainfed	3rd week of June-1st week August	2nd week of June-1st week July	2nd week June-1st week July	2nd week June-2nd week July	2nd week June-2nd week July
	Kharif-Irrigated	3rd week of June-1st week August	2nd weekJune-1st week July	2nd week June-1st week July	2nd week June	2nd week July
	Rabi-Rainfed		-	2nd week December-2nd week January	2nd week December-2nd week January	1st week November-4th week January
	Rabi-Irrigated	2nd week November -2nd week of December	-	2nd week December-2nd week January	2nd week December-2nd week January	1st week November-4th 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 inundation			
	Pests and diseases (specify)	✓	✓	

1.14	**Include Digital maps of the district for**	Location map of district with in States as Annexure 1	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

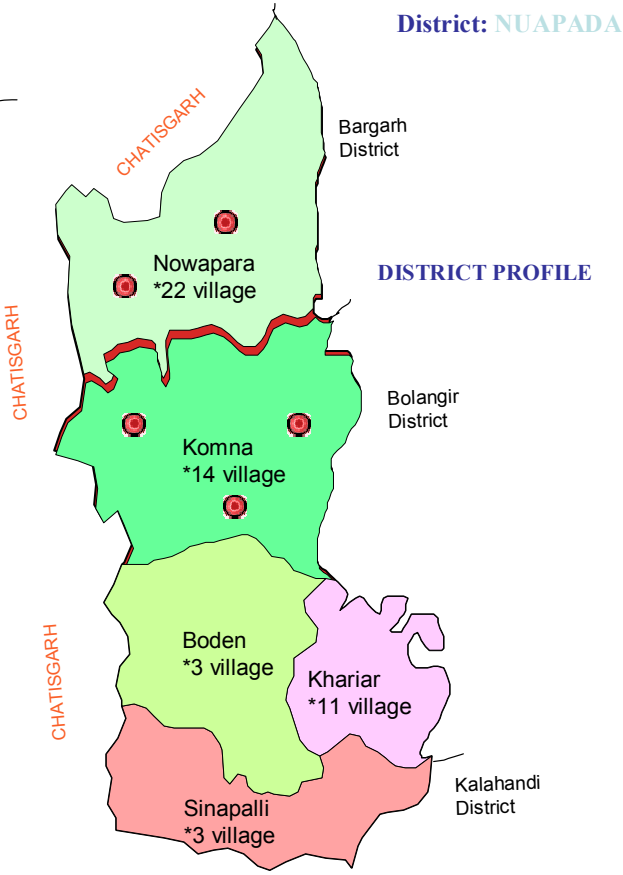


BLOCKS

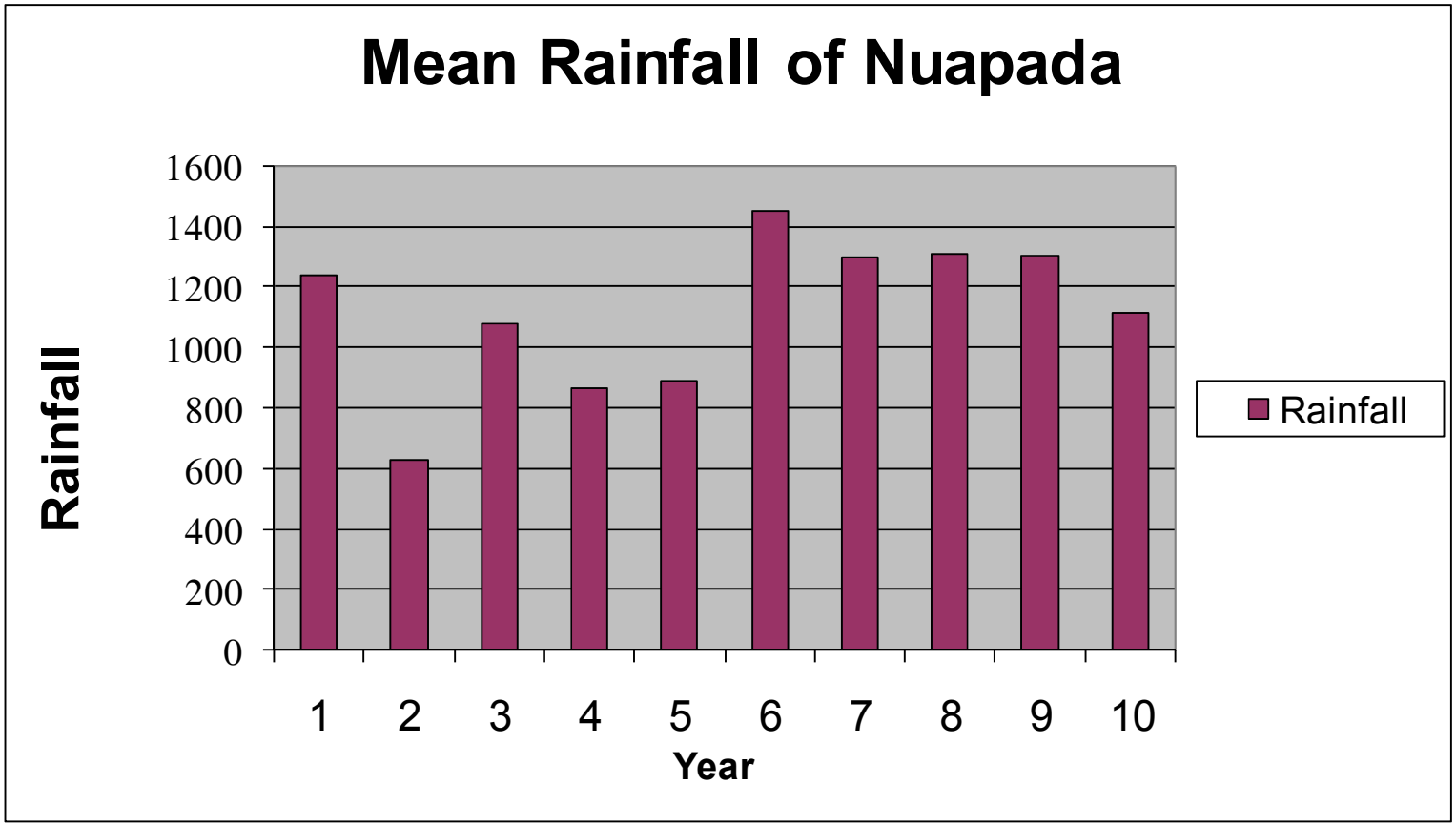
- BODEN
- KHARIAR
- KOMNA
- NOWAPARA
- SINAPALLI

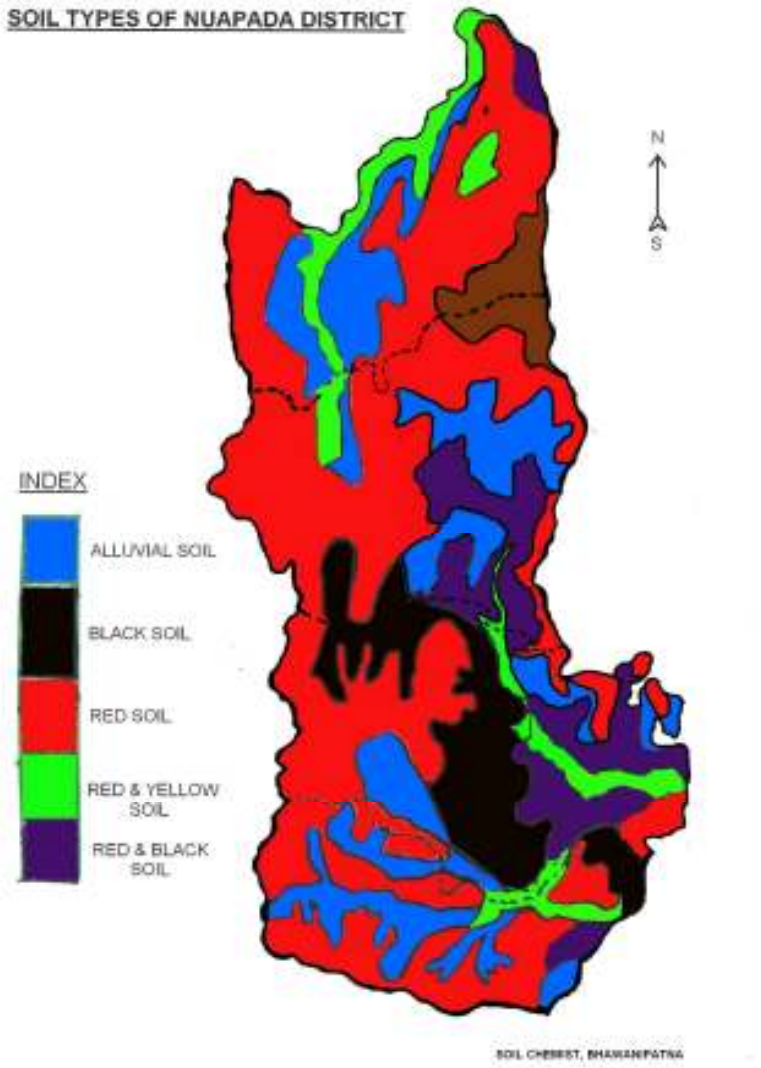
* *Indicates outreach of kvk*

Indicates adopted viilage



Mean annual rainfall as Annexure 2




SOIL TYPES OF NUAPADA DISTRICT
N
S
INDEX
ALLUVIAL SOIL
BLACK SOIL
RED SOIL
RED & YELLOW SOIL
RED & BLACK SOIL

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 (July 1st wk**)**	Red soil Medium rainfall Medium elevation	Paddy,Arhar,Paddy +Arhar	Varietal substitution of short duration drought tolerant varieties of sole crops Select short duration var. Paddy-Heera, Kalinga-I, Sneha, Jogesh, Sidhanta; Arhar – Upas120, Durga, Pragati, Jagruti (120 – 130 days) Grow moisture stress tolerant var. of paddy like Saubhaga dhan(90 days)	Perform summer ploughing Sow across slope Apply FYM in seed furrows Sow arhar : rice in 2:5 row ratio or 40:60 mixed broadcast	OSSC ISOPOM NFSM
		Paddy-Vegetable	Sowing may be continued to last week of June Grow moisture stress tolerant var. of paddy like Mandakini, late planting var. like Lalat	Practice seed priming Summer ploughing Apply FYM@ 5t/ha	OSSC NFSM
		Paddy – Blackgram	Nursery sowing may be delayed Restrict sowing of varieties of not more than 150 days duration like Mahanadi, Indrabati	Adopt 10% model for storing rain water Practice seed priming Apply FYM@ 5t/ha	OSSC NFSM
	Red soil High rainfall Medium elevation	Cotton	Sow in mounds just before or after monsoon onset in dry weather Select short duration var. like Savita and Bunny	Plough across slope Apply FYM in mound Raise seedlings in polythene for gap fill	ICDP-cotton
		Paddy-Lathyrus	Sowing should be delayed to last week of June 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	OSSC NFSM
		Paddy	Restrict sowing of varieties of not more than 150 days duration like Mahanadi , Indrabati	-do-	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	ICDP-course cereals
		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	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	OSSC NFSM
	Red and Yellow soil High rainfall Medium elevation	Cotton	Sow in mounds just before or after monsoon onset in dry weather Select short duration var. like Savita and Bunny	Plough across slope Apply FYM in mound Raise seedlings in polythene for gapfill	ICDP-cotton
		Paddy – Onion	Sowing should be delayed to last week of June 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	OSSC NFSM
		Mung	Restrict sowing of varieties of not more than 150 days duration like Mahanadi , Indrabati	-do-	OSSC NFSM
	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	Sowing should be delayed to last week of June 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	OSSC NFSM
		Paddy – Lathyrus	Restrict sowing of varieties of not more than 150 days duration like Mahanadi , Indrabati	-do-	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 Perform seed priming, Sow across slope Apply FYM in seed furrows	OSSC ISOPOM

		Paddy	Sowing should be delayed to last week of June 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	OSSC NFSM
		Paddy	Restrict sowing of varieties of not more than 150 days duration like Mahanadi , Indrabati	-do-	OSSC NFSM

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 4 weeks (July 3r^{d} wk)	Red soil Medium rainfall Medium elevation	Paddy,Arhar, Paddy +Arhar	Seed sowing – 2nd july variety selected – Khandagiri, Jogesh, Sidhanta Arhar - Upas 120 Sowing of non paddy crops-Ragi, Greengram, Maize and Cowpea for fodder purpose	Application of full P, K and 20% N of RD as basal dose for vigorous seedling In-situ rainwater conservation and recycling of excess runoff for life saving irrigation	OSSC NFSM ISOPOM
		Paddy- Vegetable	Seed Sowing – last june Variety selected – Mandakini, Lalat, Naveen	Adopt 10% model for storing rain water Apply FYM@ 5t/ha	OSSC NFSM
		Paddy – Blackgram	Seed Sowing _ 1st June Variety selected – 150 days duration like Savitri, mahalaxmi,T-9,sarala	-do-	OSSC NFSM
	Red soil High rainfall Medium elevation	Cotton	Sow in mounds just before or after monsoon onset in dry weather Select short duration var. like Savita and Bunny	Plough across slope Apply FYM in mound Raise seedlings in polythene for gapfill	ICDP
		Paddy- Lathyrus	Seed Sowing – last june Selection of Variety – Mandakini, Lalat, Nabeen	Adopt 10% model for storing rain water Apply FYM@ 5t/ha	OSSC NFSM
			Seed Sowing _ 1st June Variety selected – 150 days duration like	-do-	OSSC

		Paddy	Savitri, Mahalaxmi		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 fertilizer 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 – Paddy	If rice population < 50% -re-sow the crop Re-sowing of sprouted seeds of 125 days variety If rice population > 50% - carryout khelua operation Raise community nursery of rice for transplanting	Adopt 10% model for storing rain water Apply FYM@ 5t/ha	OSSC NFSM
	Red and Yellow soil High rainfall Medium elevation	Cotton	Sow in mounds just before or after monsoon onset in dry weather Select short duration var. like Savita and Bunny	Plough across slope Apply FYM in mound Raise seedlings in polythene for gapfill	ICDP
		Paddy – Onion	Seed Sowing – last June Variety selected – Mandakini, Lalat, Nabeen	Adopt 10% model for storing rain water Apply FYM@ 5t/ha	OSSC NFSM
		Paddy –Mung	Seed Sowing _ 1st June Variety selected – 150 days duration like Savitri, Mahalaxmi	-do-	OSSC NFSM
	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 fertilizer basal	
		Paddy – Onion	Seed Sowing – last June selection of Variety – Mandakini, Lalat, Nabeen	Adopt 10% model for storing rain water Apply FYM@ 5t/ha	OSSC NFSM
		Paddy – Lathyrus	Seed Sowing _ 1st June Variety selected – 150 days duration like Savitri, Mahalaxmi	-do-	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	Sowing should be delayed to last week of June 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	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

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 (Aug 1st Week)	Red soil Medium rainfall Medium elevation	Paddy,Arhar,Paddy +Arhar	Substitute crop with Blackgram (T-9,Sarala) and Greengram TARM,PDM 54, cowpea (Utkal manik), Niger (Deomali), Horsegram (urmi) Grow maize(Navjyot), Cowpea (Utkal manika) to meet fodder crisis	Application of full P, K and 20% 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, Naveen	Adopt 10% model for storing rain water Apply FYM@ 5t/ha	OSSC NFSM
		Paddy – Blackgram	Sowing varieties like Swarna, Pratikhya, MTU-1001	-do-	OSSC NFSM
	Red 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 in mound Raise seedlings in polythene for gapfill	ICDP
		Paddy-Lathyrus	Sowing sprouted seeds of varieties like Lalat, Naveen	Adopt 10% model for storing rain water Apply FYM@ 5t/ha	OSSC NFSM

		Paddy	Sowing varieties like Swarna, Pratikhya, MTU-1001	-do-	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	NFSM
		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 NFSM
	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 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	-do-	OSSC
	Black soil Medium rainfall Medium elevation	Millets	Select short duration var. like Ragi (Dibyasingha, AKP2Subhra),Bajra(WBC75,BSB15), Little millet(Kolab,Sabar), Kodo(VL 129), Foxtail millet(SIA 2876)	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 – Lathyrus	Sowing varieties like Swarna, Pratikhya, MTU-1001	-do-	OSSC
	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	Adopt 10% model for storing	OSSC

			Lalat, Nabeen	rain water Apply FYM@ 5t/ha	
		Paddy	Sowing varieties like Swarna, Pratikhya, MTU-1001	-do-	OSSC
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 (Aug 3rd week)	Red soil Medium rainfall Medium elevation	Paddy, Arhar, 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 20% 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 Conservn.dept
		Paddy – Blackgram	Sowing varieties like Swarna, Pratikhya, MTU-1001	-do-	
	Red 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 in mound Raise seedlings in polythene for gapfill	NFSM
		Paddy- Lathyrus	*Sowing sprouted seeds of varieties like Lalat, Nabeen	Adopt 10% model for storing rain water Apply FYM@ 5t/ha	OSSC Soil Conservn.dept
		Paddy	Sowing varieties like Swarna, Pratikhya, MTU-1001	-do-	
	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 sprouted seeds of varieties like	Adopt 10% model for storing	OSSC

			Lalat, Nabeen	rain water Apply FYM@ 5t/ha	Soil Conservn.dept
		Paddy	Sowing varieties like Swarna, Pratikhya, MTU-1001	-do-	
	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 and sow across the slope Apply FYM @ 2t/ha Apply all fert. basal	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 Conservn.dept
		Paddy – Mung	Sowing varieties like Swarna, Pratikhya, MTU-1001	-do-	
	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 Conservn.dept
		Paddy – Lathyrus	Sowing varieties like Swarna, Pratikhya, MTU-1001	-do-	
	Forest soil	Maize – Mustard	Substitute crop with blackgram and greengram, cowpea, Niger (Deomali), Horsegram (urmi) Grow maize, cowpea to meet fodder crisis	Plough and sow across the slope Apply FYM @ 2t/ha Apply all fert. basal	OSSC ISOPOM
		Paddy	Sowing sprouted seeds of varieties like Lalat, Nabeen	Adopt 10% model for storing rain water Apply FYM@ 5t/ha	OSSC Soil Conservn.dept
		Paddy	Sowing varieties like Swarna, Pratikhya, MTU-1001	-do-	-do-

Condition			Suggested Contingency measures		
Early season drought **(Normal onset)**	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Red soil Medium rainfall Medium elevation	Paddy, Arhar Paddy +Arhar	If 50% mortality then resow the crop up to July after receipt of rainfall Growing non paddy crop like Ragi (Dibyasinha,Suvra), Greengram, 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 runoff 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 population 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 – Blackgram	-do-	Bond plugging for storing water	OSSC NFSM
	Red soil High rainfall Medium elevation	Cotton	Spray Quizalofop ethyl for weed control Gapfill 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	-do-	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 reseeding	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 Gapfill 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	-do-	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	-do-	-do-	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	-do-	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	Red soil Medium rainfall Medium elevation	Paddy,Arhar,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	Practice organic mulching to extend the period of moisture availability. Close drainage holes to check the seepage loss Don't apply N to nursery	

			close spacing &4-5 seedling/hill	Apply 50% N of RD at transplanting	
		Paddy – Blackgram	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	
	Red soil High rainfall Medium elevation	Cotton	Spray Quizalofop ethyl for weed control	Spray planofix Top dress after rain	
		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	
		Paddy – Blackgram	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 beushaning 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	Cotton	Spray Quizalofop ethyl for weed control	Spray planofix Top dress after rain	ICDP
		Paddy – Onion	With hold N fertilizer application up to	Practice organic mulching to	NFSM

	Medium elevation		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	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	NREGS RKVY
		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	
	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 beushaning 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
	Forest soil	Maize – mustard	Hoeing for dust mulch Spray weedicide with hood	Apply N on rainfall receipt	ISOPOM
		Paddy	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	NFSM

				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			**Suggested Contingency measures**		
Mid season drought (long dry spell)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measues**	**Remarks on Implementation**
At flowering/ fruiting stage	Red soil Medium rainfall Medium elevation	Paddy, Arhar, 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 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	-do-	NFSM ISOPOM
		Paddy -Blackgram	-do-	-do-	-do-
	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	-do-	-do-	-do-
	Red soil High rainfall	Minor millet-Niger	Provide protective irrigation through recycling of harvested rain water	Apply 1000ml micronutrient/ha	ICDP-minor millet

	High elevation	Arhar	-do-	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	-do-	Spray urea and MOP	
	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	-do-	Spray urea and MOP	
	Forest soil	Maize – mustard	Provide irrigation at critical stages	Apply 1000ml micronutrient/ha	
		Paddy	Provide irrigation at critical stages such as flowering and grain filling	Foliar application with urea and Zn	
		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	

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
	Red soil Medium rainfall Medium elevation	Paddy,Arhar, Paddy +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-Vegetable	Provide irrigation at critical stages such as flowering and grain filling	-do-	NFSM ISOPOM
		Paddy – Blackgram	-Do-	Sow blackgram earlier in residual moisture condition	
	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	-do-	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	-do-	-do-	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	-do-	Sow Greengram earlier in residual moisture condition	NFSM ISOPOM
	Black soil	Millets	Harvest at physiological maturity stage	Mulch with stovers	ICDP

	Medium rainfall Medium elevation			Dibble rabi crop	
		Paddy – onion	Provide irrigation at critical stages such as flowering and grain filling	Sow Onion nursery earlier	NFSM ISOPOM NHM
		Paddy – Lathyrus	-do-	Sow lathyrus 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	-do-	Spray urea and MOP	

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	Canal irrigated red soils/ Canal irrigated alluvial soils/Canal irrigated black soils	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 radish 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 pulses like Groundnut, Greengram, Blackgram, Sunflower, Sesamum in rabi	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**
Limited release of water in canals due to low rainfall	Canal irrigated red soils/ Canal irrigated alluvial soils/Canal irrigated black soils	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	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**
			legumes like cowpea, bean or root vegetables like radish during rabi seasons.		

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	Canal irrigated red soils/ Canal irrigated alluvial soils/Canal irrigated black soils	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

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
		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.	-do-	-do-

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Tank irrigated red soils/Tank irrigated alluvial soils/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,	Irrigate the kharif crops during dry spell with harvested water. Harvesting of kharif rice at physiological maturity will realize 80-85% of normal	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**
			sesamum	yield.	
		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 radish during rabi seasons.	-do-	-do-

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Insufficient groundwater recharge due to low rainfall	Tank irrigated red soils/Tank irrigated alluvial soils/Tank irrigated black soil	Paddy-Paddy	Choose short duration varieties as per water availablity 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	Same as above for kharif rice	Users group

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
			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)		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**			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvests**
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 plant protection 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	-do-
Ground nut	-do-	-do-	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.	-do-	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 span[2]				
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	-do-	-do-	-do-	-do-

Outbreak of pests and diseases due to unseasonal rains				
Paddy(Swarming caterpillar)	Creation of intermittent / Buffer channels & Dusting with methyl parathion/Cholopyriphos			
Paddy(Yellow stem borer, gall midge)	Application of fipronil(0.3g) @ 10kg/ac	-	-	
Paddy(BPH)	-	Drain excess water through channels/spraying with Buprofezin @400ml/ac	Drain excess water through channels/spraying with Buprofezin @400ml/ac	
Paddy(Blast)	Spraying the crop with tricyclazole 1g/ltr of water	-	-	

Paddy (Sheathblight/ Sheathrot)		Drain excess water, spray the crop with propyconazole/hexaconazole @ 400ml/ac	Drain excess water, spray the crop with propyconazole/hexaconazole @ 400ml/ac	
Cotton(Aphid, thripes, mite, whitefly) Cotton(Bollworm)	Spraying with acetamiprid/thiomethoxan @50g/ac	Trapping through helileure, spraying with prophenophos @400ml/ac, spinosad 75ml/ac	Trapping through helileure, spraying with prophenophos @400ml/ac, spinosad 75ml/ac	
Groundnut (Tika) Groundnut(white grub)	Spray the crop with mancozeb @600g/ac	Soil trenching the crop with choloropyriphos @4ml/ltr	Soil trenching the crop with choloropyriphos @4ml/ltr	
Pulses(Aphids) Pulses(Pod borer)	Spray the crop with neem formulations 1500ppm @5ml/ltr or in severe cases with dimethoate @2ml/ltr or imidachloprid @ 1ml in 4 ltr of water		Spray the crop with neem formulations 1500ppm @5ml/ltr or nuvan 1ml/ltr	
Horticulture				
Solanaceous Vegetables(Wilting) Potato (Early & Late Blight) Chilli (Die Back)	Soil drenching with Plantomycin @ 1gm/Lt+Bavistin 2gm/lt Spraying with Mancozeb/COC @ 3gm/lt	Spraying with Kasugamycin@1.5ml/Lt+COC@3 gm/Lt		
Cole crops(Bacterial & Fungal Leaf blight, Head rotting) Head Borer		Spraying with Plantomycin @1gm/lt+coc @ 3gm/lt	Spraying with Nuvan@1ml/lt	
Onion (Stem Phylum		Spray with		

Blight & Purple Blutch) Thrips		Mancozeb/COC@3gm /Lt Spray with Metasystox/Trizophos@2ml/ Lt or Acetamiprid or Thiomethazam@4ml in 15 Lt		
Mango (Flower drop)		Spray with Carbendazim@2gm/Lt		

2.3 Floods

Condition	**Suggested contingency measures[o]**			
Transient water logging/ partial inundation	**Seedling/ nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
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% K2O + full P may be applied as basal and rest 50% N + 50% K2O 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 *rabi* 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 days				

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 heavillly 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 Growing of cucurbits after receding flood water
Horticulture				
Sea water inundation	**NOT A FEATURE OF THE DISTRICT**			

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

Extreme event type	Suggested contingency measures			
	Seedling/ nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave				
Paddy	Re do the nursery. Keep extra seedlings in the nursery to meet additional requirement	Gap filling with aged seedlings	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. Wind breaker plants may be planted to act as barrier.	Harvest at Physiological maturity. Mechanized harvesting should be taken up for speed up the process.
Groundnut	Provide mulcjhing, use antitranspirants	Use antitranspirants	Give one irrigation at least to moistune the field for easy hervest	Early harvest avoiding heat wave.
Horticulture				
Mango	Sappling to be kept at shade net. Avoid planting till coolness arrives.	Provide irrigation. Plan to have shelter belt plantation.	Regular irrigation to avoid fruit and flower drop.	Shift the harvested produce in the proper place
Banana	-do-			

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			
Feed and fodder availability	• Livestock insurance • Encourage perennial fodder production on river beds and tank bed on community basis. • Village gauchar (grazing) lands should be developed for fodder production.	• Utilizing fodder from perennial trees and fodder bank reserves. • Transporting excess fodder from adjoining districts. • Utilizing the existing crops which fail to grow adequately due to failure of monsoon	• Supplementary feeding of remaining livestock and the replacement stock.

	• 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.	for feeding of animals. • 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	Preserving water in community tanks and ponds etc for drinking purpose by excavation and sanitization of these resources. In addition, wells (bore wells or dug wells) may be constructed ahead of possible event of draught.	• Water sources of Temples, Churches, Gurdwaras, Jain temples and Maszids are generally ideal sources during draught.	
Health and disease management	• Veterinary preparedness with vaccine and medicines.	• Conducting animal health camps and treating the affected animals • Supplementation of mineral and vitamin mixtures	• Availing insurance • Culling of unproductive livestock • Proper disposal of dead animals
Floods			
Feed and fodder availability		• Procured feeds and fodders should be fed to all animals on the order of priority of animals. • Straws and stoves that got soaked during floods need not be thrown away out right. They can be fed to animals as long as rotting or fungal growth has not set in. Partial drying choffing and sprinkling concentrate mixture can improve intake and utility.	• Provision of supplementary feeding (concentrate / Roughage) with vitamin & minerals.

Drinking water		• 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.	• Provision of clean drinking water.
Health and disease management	• 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. • 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 torniquet), Surgical scissors – Curved and made of stainless steel, Forceps, Splints or Split bamboos (for fractures), Clinical thermometers – two or three, Disinfectants – potassium permanganate, Acriflvin, Dettol, Savlon, Tannic acid powder (for poisons) and Jelly (for burns) Antibiotic eye drops, Epsom salts, copper sulphate, Treacle, oil of turpentine (for bloat), Obstetric ropes, chains and hooks, Tincture of iodine, tincture of Benzoin Co.(for wounds), Cotton rope, halters	• 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.	• 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

	(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.		
Cyclone			
Feed and fodder availability		• Procured feeds and fodders should be fed to all animals on the order of priority of animals. • Straws and stoves that got soaked during floods need not be thrown away out right. They can be fed to animals as long as rotting or fungal growth has not set in. Partial drying choffing and sprinkling concentrate mixture can improve intake and utility.	• Provision of supplementary feeding (concentrate / Roughage) with vitamin & minerals.
Drinking water		• 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.	• Provision of clean drinking water.
Health and disease management	• 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.	• 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	• 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.

	• 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 torniquet), Surgical scissors – Curved and made of stainless steel, Forceps, Splints or Split bamboos (for fractures), Clinical thermometers – two or three, Disinfectants – potassium permanganate, Acriflvin, Dettol, Savlon, Tannic acid powder (for poisons) and Jelly (for burns) Antibiotic eye drops, Epsom salts, copper sulphate, Treacle, oil of turpentine (for bloat), Obstetric ropes, chains and hooks, Tincture of iodine, tincture of Benzoin Co.(for wounds), Cotton rope, halters (for restraint), Trocar and canola (for bloat), Pocket Knife (for cutting, strangulating ropes etc.) • 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.	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.	Necessary steps should be taken for the control of non-specific digestive and respiratory infections in consultation of local veterinary personals. • Improving shed hygiene especially in the farmers household through cleaning and disinfection
Heat wave and cold wave			
Shelter/environment	1. Green cover (trees plantation, land scaping) 2. Proper sheltering / housing white painting outside	1. Washing / wallowing / sprinkling/ splashing / showering	

management	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		• Feeding Green fodder/ silage/ hay • Provision for night feeding • Grazing only if green pastures/ grass lands available • Graze early in the morning and late in the afternoon	• Protection of dry / milch cows/ buffaloes/ breeding bulls and teasers against thermal stress • Heat detection with young teasers • Close observation of all open cows • Study of cervical mucous • Heat detection and AI during cooler parts of the day. • Insemination at optimal time with good quality semen.

2.5.2 Poultry

	Suggested contingency measures			**Convergence/linkages with ongoing programs, if any**
	Before the event	**During the event**	**After the event**	
Drought				
Shortage of feed ingredients	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	BAIF, WATERSHED
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	RWSS
Health and disease management	Procurement of vaccines and medicines and antistress agent. Feeding antibiotics Procurement of litter materials	Continue feeding of antistress agent		VET
Floods				
Shortage of feed ingredients	Ensure procurement of feed ingredients / compound feed sufficient ahead as feed supply to	Supply the compound feed to the poultry farm under submerged area	Supply will continued till the situation is under control	BAIF

	the farm will hamper due to submergence of the connecting roads			
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	JALANIDHI,RWSS
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	VET. DEPT.
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	BAIF,SILAGE
Drinking water	-	Attempt will be made to provide sanitized drinking water	Water sources will sanitized with bleaching powder or any water sanitizer	RWSS
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	VET.DEPT.
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	VET.DEPT, NREGS
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 hour 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 ends and then feeding will be done with normal diet Antistress agents will be continued	VET.DEPT.

			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.	

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
1) Drought			
A. Capture			
Marine	-	-	-
Inland			
(i) Shallow water depth due to insufficient rains/ inflow	1. Restricted release of water from reservoir. 2. Supplementary water harvest structures like pond and tanks has to be developed. 3. Renovation and maintenance of existing water harvest structures.	-	-
(ii) Changes in water quality	Prepare to release water into the habitat.	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 over come high temperature	1. Recharge the ponds with bore well water or water from other sources. 2. Partial harvesting of the stock to reduce stocking density. 3. Artificial shelter by putting aquatic floating weeds in 1/3rd area.	-
(ii) Impact of salt load build up in ponds/ change in water quality	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