

## State: JHARKHAND

### Agriculture Contingency Plan for District: Gumla

<b>.0 District Agriculture profile</b>				
<b>1.1</b>	<b>Agro-Climatic/Ecological Zone</b>			
	Agro Ecological Sub Region (ICAR)	Moderately to gently sloping chattisgarh mahanadi basin, hot moist/dry subhumid transitional eco sub región (11.0)		
	Agro-Climatic Zone (Planning Commission)	Eastern Plateau And Hills Region (VII)		
	Agro Climatic Zone (NARP)	Western Plateau Zone (BI-5)		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Chatra, Garwa, Gumla, Latehar, Lohardaga, Palamau, Simdega		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		22°30'N - 24° 30' N	83.22°00'E- 85°06' E	222 to 1142 ft
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	ZRS, ,Chianki Palamu		
	Mention the KVK located in the district with address	KVK, Gumla, Vill- Bishunpur , PO- Bishunpur, Gumla.		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Vikash Bharti (NGO).		

<b>1.2</b>	<b>Rainfall</b>	<b>Normal RF(mm)</b>	<b>Normal Onset ( specify week and month)</b>	<b>Normal Cessation (specify week and month)</b>
	SW monsoon (June-Sep):	1101	2 <sup>nd</sup> week of June	1 <sup>st</sup> week of October
	NE Monsoon(Oct-Dec):	70	2 <sup>nd</sup> week of October	3 <sup>rd</sup> week of December
	Winter (Jan- March)	52	1 <sup>st</sup> week of January	4 <sup>th</sup> week of March

	Summer (April-May)	62	1 <sup>st</sup> week of April	4 <sup>th</sup> week of May
	Annual	1285	-	-

1.3	Land use pattern of the district (latest statistics)	Geographical area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area (ha)	5214	3296	1356	31958	-	31.96	-	-	-	

1.4	Major Soils (common names like red sandy loam deep soils (etc.))*	Area ('000 ha)	Percent (%) of total
	Inceptisols	40.3	45.13
	Entisols	6.2	6.94
	Alfisols	42.8	47.93

\* mention colour, depth and texture (heavy, light, sandy, loamy, clayey etc) and give vernacular name, if any, in brackets (data source: Soil Resource Maps of NBSS & LUP)

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	-	109.5
	Area sown more than once		
	Gross cropped area		

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	9.13		
	Gross irrigated area	10.2		
	Rainfed area	3.2		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals			

	Tanks			
	Open wells			66.1
	Bore wells			20.01
	Lift irrigation schemes			7.4
	Micro-irrigation			
	Other sources (please specify)			1.85
	Total Irrigated Area			
	Pump sets			
	No. of Tractors			
	<b>Groundwater availability and use* (Data source: State/Central Ground water Department /Board)</b>	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			
	Wastewater availability and use			
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

### 1.7 Area under major field crops & horticulture

1.7	Major field crops cultivated	Area (*000 ha)							
		<i>Kharif</i>			<i>Rabi</i>			Summer	Grand total
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
	Rice	8.8	89.6	98.4	-	-	-	-	98.4
	Maize	0.2	2.7	3.05	-	-	-	-	3.05
	Wheat	-	-	-	2.4	0.2	2.6	-	2.6

	Finger millet	0.1	0.7	0.9				-	0.9
	Mustard and Rapeseed	-	-	-	3.6	0.3	4.0	-	4.0

	<b>Horticulture crops - Fruits</b>	<b>Area (ha)</b>		
		<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>
	<b>Mango</b>	498	41.6	456.6
	<b>Guava</b>	624	562.6	61.4
	<b>Lemon</b>	105	45	60
	<b>Banana</b>	165	28	137
	<b>Horticulture crops - Vegetables</b>	<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>
	Brinjal	4000	3400	600
	Tomato	3000	2000	1000
	Bhindi	3500	2000	1500
	Chilies	1500	800	700
	<b>Medicinal and Aromatic crops</b>	-	-	-
	<b>Plantation crops</b>	-	-	-
	Eg., industrial pulpwood crops etc.	-	-	-
	<b>Fodder crops</b>	-	-	-

	<b>Total fodder crop area</b>	-	-	-
	<b>Grazing land</b>	4902.00 hac		
	<b>Sericulture etc</b>			
	<b>Others (specify)</b>			

(Source: 2009-2010)

<b>1.8</b>	<b>Livestock</b>	<b>Male ('000)</b>	<b>Female ('000)</b>	<b>Total ('000)</b>			
	Non descriptive Cattle (local low yielding)						
	Improved cattle						
	Crossbred cattle						
	Non descriptive Buffaloes (local low yielding)						
	Descript Buffaloes						
	Goat						
	Sheep						
	Others (Camel, Pig, Yak etc.)						
	Commercial dairy farms (Number)						
<b>1.9</b>	<b>Poultry</b>	<b>No. of farms</b>	<b>Total No. of birds ('000)</b>				
	Commercial						
	Backyard						
<b>1.10</b>	<b>Fisheries (Data source: Chief Planning Officer)</b>						
	<b>A. Capture</b>						
	<b>i) Marine (Data Source: Fisheries Department)</b>	<b>No. of fishermen</b>	<b>Boats</b>		<b>Nets</b>		<b>Storage facilities (Ice plants etc.)</b>
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	

	<b>ii) Inland</b> (Data Source: Fisheries Department)	<b>No. Farmer owned ponds (private)</b>	<b>No. of govt. ponds</b>	<b>Total</b>	<b>No. of village tanks</b>
<b>B. Culture</b>					
			<b>Water Spread Area (ha)</b>	<b>Yield (t/ha)</b>	<b>Production ('000 tons)</b>
	<b>i) Brackish water</b> (Data Source: MPEDA/ Fisheries Department)				
	<b>ii) Fresh water</b> (Data Source: Fisheries Department)				
	<b>Others</b>				

#### 1.11 Production and Productivity of major crops

S. No	Crop	Area (ha)	Production (Qtl)	Productivity (Qtl /ha)
1.	<b>Cereals:</b>			
	Rice	98,397	76,846	741
	Maize	3050	2094	687
	Finger millet			
	Wheat	2687	3613	1377
2.	<b>Pulses:</b>			
	Redgram	-	-	-
	Blackgram	3000	2700	900
	Kulthi	1200	3600	300
	Greengram	1800	9000	500
	Lentil	300	1800	600
	Pea	-	-	-
	Chickpea	3057	4233	1385

Source: Dist –statistics office, Simdega

S. No	Crop	Area (ha)	Production (Qtl)	Productivity (Qtl /ha)
	<b>Oilseed:</b>			
	Mustard	4061	3959	1003
	<b>Vegetables:</b>			

	<b>Fruits:</b>
--	----------------

Source: Dist – statistics office, Simdehga

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)	
<b>Major Field crops (Crops to be identified based on total acreage)</b>										
	Rice	76.8	781							
	Black gram			4.2	1385					
	Pigeon pea	-								
	Maize	2.09	687							
<b>Major Rabi crops (oil seed &amp; pulse)</b>										
	Mustard			3.9	1003					
	Chickpea			4.2	1385					
	Wheat			3.6	1327					
	Pea			-						
	Linseed			-						

1.12	Sowing window for 5 major field crops	Rice	Blackgram	Pigeonpea	Niger	Maize
	Kharif- Rainfed	4 <sup>th</sup> week of June – 4 <sup>th</sup> week of July	1 <sup>st</sup> week of June- 4 <sup>th</sup> week of July	1 <sup>st</sup> week of June- 4 <sup>th</sup> week of July	1 <sup>st</sup> week of August- 2 <sup>nd</sup> week of September	2 <sup>nd</sup> week of June- 4 <sup>th</sup> week of July
	Kharif-Irrigated					
	Rabi- irrigated	December- January				
	Rabi-Rainfed	-	-	-	-	-

1.13	What is the major contingency the district is prone to? (Tick mark)	Regular	Occasional	None
------	---	---------	------------	------

	Drought		√	
	Flood			√
	Cyclone			√
	Hail storm			√
	Heat wave	√		
	Cold wave		√	
	Frost		√	
	Sea water intrusion			√
	Pests and disease outbreak (specify)	√ (gallmidge in Rice )		
	Others			

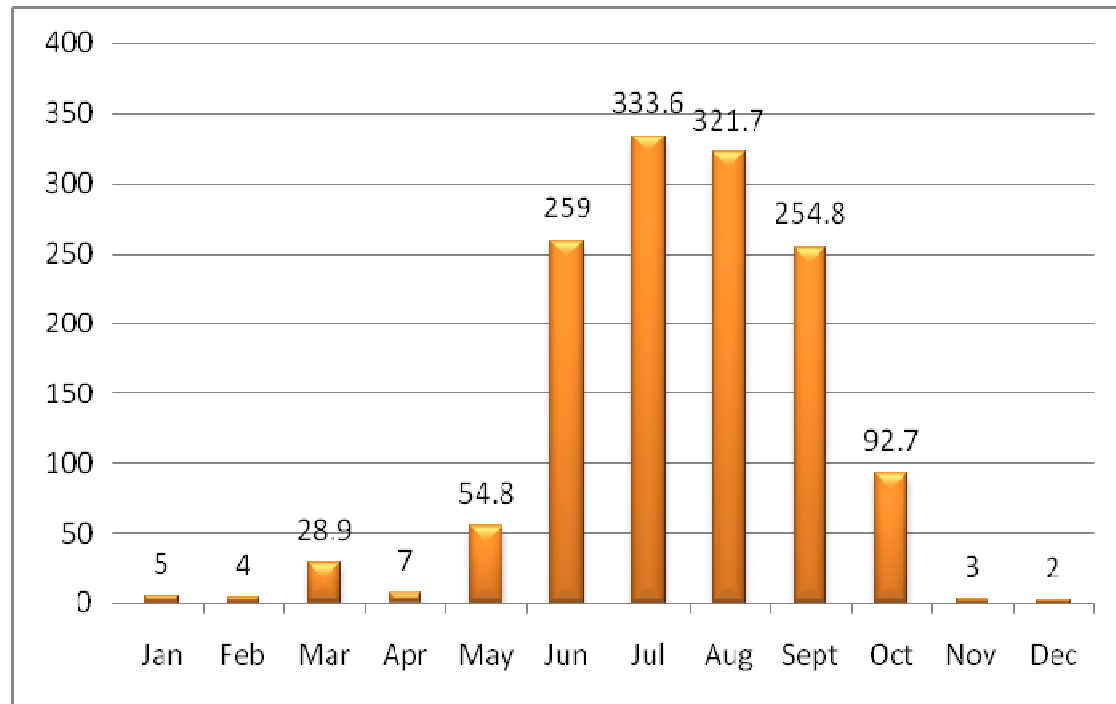
<b>1.14</b>	<b>Include Digital maps of the district for</b>	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes



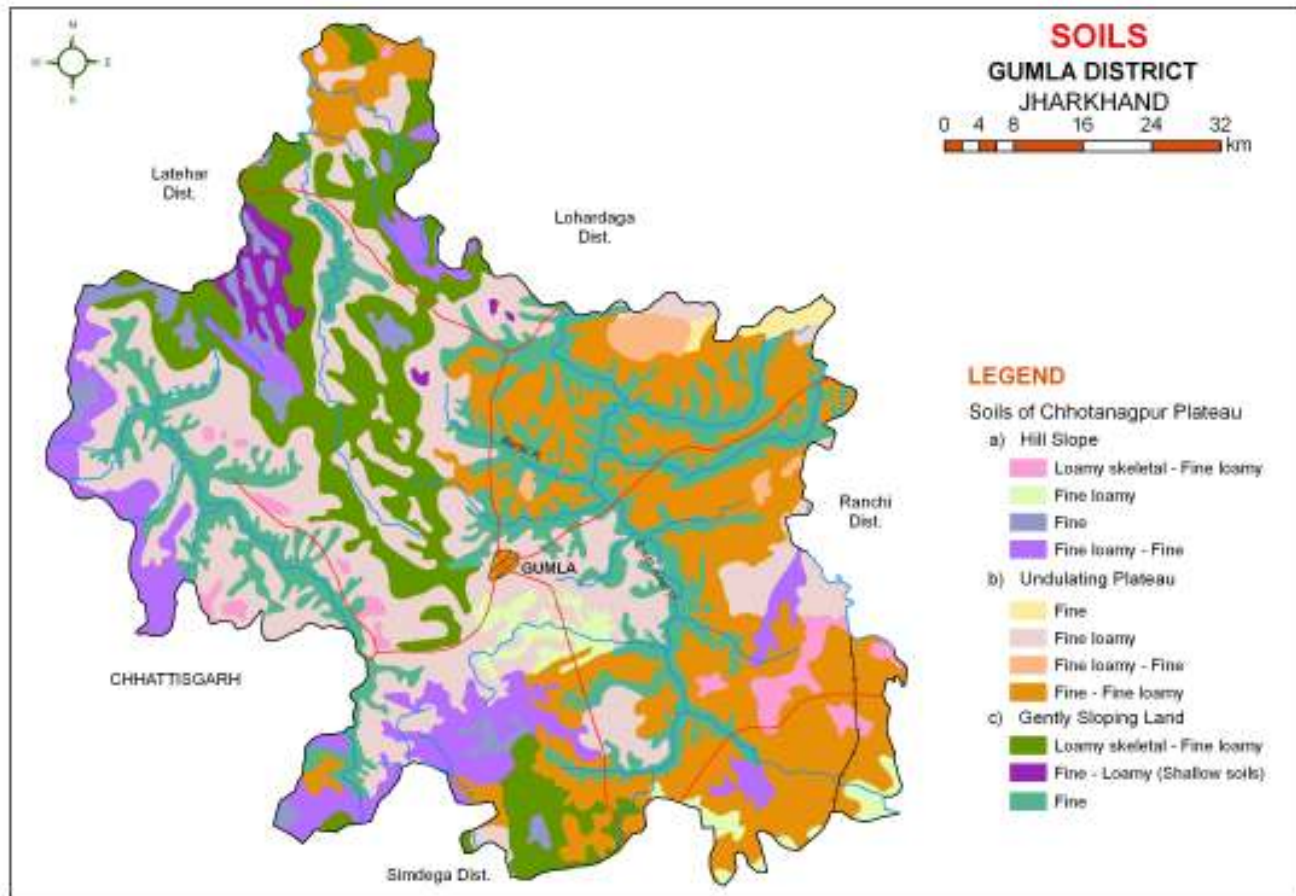
Annexure I



**ANNEXTURE-II**



ANNEXTURE-III



SOURCE: NBSSLUP, Kolkata

## 2.0 Strategies for weather related contingencies

### 2.1 Drought

#### 2.1.1 Rainfed situation

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)  Delay by 2 weeks  4 <sup>th</sup> week June	Undulated upland red lateritic soils	Pigeon pea- Bahar, Birsa arhar-1, UPAS-120	Pigeon pea + ground nut, Pigeon pea + maize, Pigeon pea + okra	Follow closer spacing 75 x 30 cm	1.Seed drills under RKVY 2.Supply of seeds through NFSM
		Blackgram- Birsa Urd-1, Pant U 19, T 9	Pigeon pea +Black gram	-	
		Maize- Swan Rice,1, Birsa makka-1	Pigeonpea + maize	Earthing up	
		Upland Rice - Vandana, Birsa 108, Birsa vikas dhan 109. Okra. Arka anamina, Pusa A4, Prabhni kranti	No change	Direct seeding of rice	
	Mid land red lateritic sandy soils	Rice-, IR-36, IR-64 Lalat	Rice - Naveen, Sahbhagi , Birsa Dhan 201, IR-64 Lalat Rajendra dhan-202	Transplanting and direct seeding Seed treatment with Bavistin @ 2g/kg seed	
	Lowland sandy loam soils	MTU-7029, Kalamdani, Tulsi manjri, Lal Dhan	MTU-7029, Rajshri, MTU-1010 Hybrid variety KRH-2, Arize- 6444, 27P27, PHB 71	Seed treatment with Bavistin @ 2g.kg seed	

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)  Delay by 4 weeks	Undulated upland red lateritic soils	Pigeon pea	Pigeon pea + Black gram, pigeon pea + maize (1:2)	Follow closer spacing 75 x 30 cm	1.Seed drills under RKVY

2 <sup>nd</sup> week of July			Pigeon pea- Birsa arhar-1, Upas-120, BR 65, Local Black Gram- Birsa Urd-1, T 9	Seed treatment with Bavistin @ 2g/kg seed of any crop followed by rhizobium in pulses	2. Supply of seeds through NFSM -
		Black Gram	Pigeon pea + Black gram	Follow closer spacing 75 x 30 cm  Seed treatment with Bavistin @ 2g/kg seed followed by rhizobium	
		Maize	Pigeon Pea + Maize  Maize- Swan composite, Birsa Makka 1	Interculture	
		Upland rice - Vandana, Birsa 108, Birsa Vikas Dhan 109, 110	Rice + lady's finger (2:2)	Direct seeding after receipt of rain Seed treatment with Bavistin @ 2g/kg seed of any crop followed by rhizobium in pulses	
	Mid land red lateritic sandy soils	Rice - IR-36, IR-64, Birsa Dhan 201, Lalat	Director seeding of midland rice variety Sahbhagi, Lalat, IR-64 Naveen . Prefer short duration maize variety, Birsa vikas Makka 1&2 Finger millet: A-404, Birsa Marua-2	Seed treatment with Bavistin @ 2g/kg seed	
	Lowland sandy loam soils	Rice -MTU-7029, MTU-1010 Tulsi manjri, Karaihani	MTU-7029, RRAJSHREE, MTU-1010, KRH-2 PHB-71, ARIZE 6444, 27P27		

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)	Undulated upland red lateritic soils	Pigeon pea	Pigeon pea + Black gram/ Pigeon pea + Maize	Follow closer spacing 75 x 30 cm	1. Seed drills under RKVY

4 <sup>th</sup> week of July		Blackgram	<b>Pigeon pea-</b> Birsa arhar-1, Upas-120, Narendra Arhar 1 <b>Blackgram-</b> Birsa Urd-1, T 9 <b>Maize-</b> Birsa Vikash Makka - 2	Inter culture operation	2. Supply of seeds through NFSM	
		Maize- Swan composite, Birsa Makka 1		Earthing up		
		Upland Rice - Vandana, Birsa 108, Birsa Vikas Dhan 109	Rice / Maize Maize : Birsa Vikash Makka -2,	Direct seeding after receipt of rain Seed treatment with Bavistin @ 2g/kg seed of any crop followed by rhizobium in pulses		
	Mid land red lateritic sandy soils	Rice - IR-36, Birsa Dhan 201, IR-64 Lalat .	Direct seeded rice (Sahabhagi, lalat IR-64, Naveen, Arize Tez, US 312)	Seed treatment with Bavistin @ 2g.kg seed		-
	Midland sandy soils	Rice - IR-36, Birsa Dhan 201, IR-64 Lalat	Finger millet : A-404			
Lowland sandy loam soils	Rice -MTU-7029,	MTU-7029, RAJSHRI MTU-1010, KRH-2 PHB-71, ARIZE 6444, 27P27	Seed treatment with Bavistin @ 2g.kg seed	-		

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)					
Delay by 8 weeks  2 <sup>nd</sup> week of August	Undulated upland red lateritic soils	Upland rice/ Pigeonpea/ Maize (Swan)/ Blackgram Greengram ( K851)	Niger –Birsa Niger 1/ Horse gram- Birsa Kulthi 1/ Greengram- K851, Pusa Bishal, Sweet potato: Pusa safed, kalmegh Maize-Birsa Vikash Makka -2 Fingermillet-A-404, Pigeonpea + Mung (Pusa vishal)	Seed treatment with Bavistin @ 2g/kg seed of any crop followed by rhizobium in pulses Use of vermi compost for incase WHC use of Rhizobium in Pulse crops.	Supply of suitable seed through disaster management.

			Upland Rice - Birsa Dhan 108	Direct seeding after receipt of rain  Before sowing seed treatment with Bavistin @ 2g/kg seed	
	Mid land red lateritic sandy soils	Rice - IR-36, Lalat Rajendra dhan-202, Birsa Dhan 201, IR-64	Horse gram- Birsa Kulthi -1 short duration green gram (Pusa vishal) + Pigeonpea (UPAS-120)	Seed treatment with Bavistin @ 2g.kg seed	
	Midland Sandy soils	Rice - IR-36, IR-64 Lalat Rajendra dhan-202, Birsa Dhan 201,	Rice (Sahabhagi, Naveen, Arize Tez, PAC 801) Niger: Birsa niger-1&2+ Horse gram (Birsa kulthi) (4:2)		
		Niger – local	Tomato – Swarna lalima,swarna sampada. S 22		
	Lowland sandy loam soils	Rice -MTU-7029, MTU-1010 Tulsi manjri	Grow Medium duration rice Like BVD 202, Sahabhagi, Arize Tez, 25P25, PAC 801	-	-

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Early season drought (Normal onset)					
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Upland red lateritic soils	Pigeonpea- Bahar, Birsa arhar-1 and Upas-120, BR 65	Gap filling and and re-sowing in case of severe mortality	Mulching	
		Blackgram- Birsa Urd-1, T 9, Pant U-19.	Gap filling and and re-sowing in case of severe mortality	-	
		Maize- Swan composite, Birsa makka 1	Gap filling and and re-sowing in case of severe mortality	Mulching	
		Upland rice- Vandana, Birsa 108, Birsa Vikas Dhan 109, 110	Re- broadcasting	-	
	Midland red lateritic sandy soils	Rice - IR-36, Birsa Dhan 201, IR-64 Lalat.	Rice Var- Lalat, Navin, MTU-1010, Abhishek  Life saving irrigation	Application of FYM to increase moisture holding capacity	

			Direct sowing of rice		
	Low land sandy loam soil	MTU-7029, Bera Malti and Pani Dhan, Arize 6444	Nursery raising and transplanting	-	

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	Upland red lateritic soils	Pigeon pea	Gap filling	Mulching  Life saving irrigation at critical stage of the crop if possible	- -   Application of FYM to increase the moisture holding capacity  Life saving irrigation through well, ponds check dams
		Black Gram			
		Maize			
		Upland Rice			
	Midland red lateritic sandy soils	Rice	-		
Low land sandy loam soil	Rice	-			

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At flowering/ fruiting stage	Upland red lateritic soils	Pigeon pea	Foliar application of 2% DAP	Mulching  Life saving irrigation at critical stage of the crop if possible	-    Life saving irrigation
		Black Gram			
		Maize			
		Upland Rice			
	Midland red lateritic	Rice	-		



	sandy soils			Strengthening of farm bunds	
	Low land sandy loam soil	Rice			

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
	Upland red lateritic soils	Pigeon pea	1. Upland rice harvested for straw purpose 2. Harvest at physiological maturity stage	Plan for early rabi sowing with Niger- BN-1, BN-2, JNC-06/  Horse gram- Birsa Kulthi, Madhu/toria / potato	-
		Black Gram			
		Maize			
		Upland Rice			
	Midland red lateritic sandy soils	Rice	Harvest at physiological maturity stage	Plan for early sowing of vegetable-tomato, brinjal, pumpkin , cowpea  Plan to sow mustard and lentil  Life saving irrigation,	-
Low land sandy loam soil	Rice	Harvest at physiological maturity stage	Plan for early sowing of vegetables like tomato, brinjal, pumpkin , cowpea  Life saving irrigation  Plan to sow mustard and linseed, chickpea and pea	-	

**2.1.2 Drought - Irrigated situation-Not applicable**

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

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Continuous high rainfall in a short span leading to water logging				
Rice	Provide drainage			
Heavy rainfall with high speed winds in a short span <sup>2</sup>				
Outbreak of pests and diseases due to unseasonal rains				
Pulses	Control Leaf hoper/Caterpillar			
Maize	Stem borer Control- Phorate 10G@ 20 kg/ha	Sheath blight Control- Hexaconazole1.0 lit in 500 lit water/ha		
Rice		Blast diseases Control- Tricyclazole (0.05 %)	False Smut Control- Propiconazole 0.1 % or Copper oxy chloride -50 (2 kg/ha)	
Bhendi		Yellow mosaic virus Control- Carbofuran 3G @ 3 gm/m <sup>2</sup>		

**2.3 Floods-**

Condition	Suggested contingency measure <sup>o</sup>			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation <sup>1</sup>				
Continuous submergence for more than 2 days <sup>2</sup>	Not applicable			
Sea water intrusion <sup>3</sup>				

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

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
<b>Hailstorm</b>	Not applicable			
<b>Heat Wave</b>				
Wheat	Life saving irrigation	Life saving irrigation	Life saving irrigation (Terminal heat)	
<b>Cold wave</b>				
Wheat	Irrigation  Balanced fertilizer application  Foliar spray of nutrients	Light irrigation Mulching with crop residue \ weeds Fertilizer application	Irrigation, fertilizer application	
Vegetables	Raising of seedling in Poly house, re sowing if damaged	Light irrigation Mulching with crop residue \ weeds Disease and pest control, care for chilling injury or replanting	Quick harvesting	Grading, quick disposal for marketing
Pigeon pea		Light irrigation Mulching with crop residue \ weeds		
<b>Frost</b>				
Wheat		Light irrigation Mulching with crop residue \ weeds		
Pigeonpea	Exposure of crop to smoke by burning waste material during night time	Exposure of crop to smoke by burning waste material during night time, Light sprinkler irrigation	Exposure of crop to smoke by burning waste material during night time, Light sprinkler irrigation	Exposure of crop to smoke by burning waste material during night time

Tomato & Potato		Earthing up, Irrigation,		Harvest in dry weather
Horticultural crops (fruit crops)	Light frequent irrigation may be practiced wherever irrigation facilities are available, mulching, thatching and creating smoke screens and lighting of fire is also practiced where irrigation facilities are not available			
<b>Cyclone</b>	Not applicable			

## 2.5 Contingent strategies for Livestock, Poultry & Fisheries

### 2.5.1 Livestock

	Suggested contingency measures		
	Before the event <sup>s</sup>	During the event	After the event
<b>Drought</b>			
Feed and fodder availability	Conservation and storage of available feed and fodder, ensiling of green fodder, hay making, livestock insurance, drought tolerant perennial fodder cultivation, conservation non conventional crop residue like pigeon pea, mung, masoor, Chickpea, bhusa, tree leaves	Restrict grazing to reduce energy consumption, balanced feeding using conventional and non conventional feed and fodder, Procurement of low cost feed and fodder from adjoining state like orrisa and chhatisgarh.	Claim Insurance Culling unproductive livestock , balanced feeding in weak and debilitated livestock
Drinking water	Preserving water in the ponds, ditches, and Other reservoir for drinking purpose, de silting of dead ponds	Restricted grazing in sunny day to avoid dehydration. To prevent for moving during day time.	
Health and disease management	Vaccination and deworming camps Veterinary preparedness with medicines and vaccines	Regular health checkup of livestock, Mineral mixture and electrolyte supplementation,	

<b>Floods</b>			
Feed and fodder availability			
Drinking water			
Health and disease management			
<b>Cyclone</b>			
Feed and fodder availability			
Drinking water			
Health and disease management			
<b>Heat wave and cold wave</b>			
Shelter/environment management	Insurance, heat tolerant breeds, Dark cool sheds, thatching of roof and ceiling, thatching of windows and doors	Ad lib drinking water, electrolyte, mineral mix feeding, early and late hour grazing	Insurance claiming, in case of losses
Health and disease management	Anti stress medicine procurement, electrolyte and fluid stocking,	Use of need based medicine and feed additive	Insurance claiming, in case of losses

<sup>s</sup> based on forewarning wherever available

### 2.5.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	During the event	After the event	
<b>Drought</b>				
Shortage of feed ingredients	Insurance & Integration , drought tolerant variety	Use feed reserve banks , conventional	Availing insurance Strengthening feed	Health camps and vaccination camps,

	Establishing feed reserve Bank, procure non conventional feed ingredient	and non conventional feed ingredients	Reserve Banks	promotion of improved backyard poultry birds having heat and drought tolerant capacity
Drinking water	Economize water use, enhance water use efficiency			
Health and disease management	Emergency Veterinary preparedness with medicines vaccination to birds	Campaigne and Mass Vaccination	Culling affected birds	Emergency Veterinary preparedness with medicines vaccination to birds
<b>Floods</b>				
Shortage of feed ingredients				
Drinking water				
Health and disease management				
<b>Cyclone</b>				
Shortage of feed ingredients				
Drinking water				
Health and disease management				
<b>Heat wave and cold wave</b>				
Shelter/environment management	Insurance, heat tolerant breeds, Dark cool sheds, thatching of roof and ceiling, thatching of windows and doors	Ad lib drinking water, electrolyte, mineral mix feeding, early and late hour grazing	Insurance claiming, in case of losses	Insurance, heat tolerant breeds, Dark cool sheds, thatching of roof and ceiling, thatching of windows and doors
Health and disease management	Anti stress medicine procurement, electrolyte and fluid stocking,	Use of need based medicine and feed additive	Insurance claiming, in case of losses	Anti stress medicine procurement, electrolyte and fluid stocking,

<sup>a</sup> based on forewarning wherever available

## 2.5.3

## Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event <sup>a</sup>	During the event	After the event
<b>1) Drought</b>			
<b>A. Capture</b>			
Marine			
Inland			
(i) Shallow water depth due to insufficient rains/inflow			
(ii) Changes in water quality			
(iii) Any other			
<b>B. Aquaculture</b>			
(i) Shallow water in ponds due to insufficient rains/inflow	(i) Thinning of fish density  (ii) Arrangement of water supply from external resource  (iii) Deepening of ponds to accommodate more water	(i) Partial harvesting (ii) Addition of water in ponds (iii) Stocking of air breathing fishes (Singhi, Magur or Murrel)	(i) Maintenances of remaining stock till onset of favorable conditions or otherwise. (ii) Harvesting or transfer of fish stock to other place. (ii) Preparation of ponds for next crop.
(ii) Impact of salt load build up in ponds / change in water quality	(i) Regular monitoring of water quality parameters. (ii) Arrangement for water from external source. (iii) Arrangement for aeration.	(i) Addition of required water. (ii) Arrangement of aeration. (iii) Continuous monitoring of water quality parameters. (iv) Reduction in manuring.	(i) Exchange and addition of water. (ii) Manuring if required.
(iii) Any other	Laying of Polythene lining in ponds having water seepage problem.		
<b>2) Floods</b>			
<b>A. Capture</b>			

Marine			
Inland			
(i) No. of boats / nets/damaged			
(ii) No.of houses damaged			
(iii) Loss of stock			
(iv) Changes in water quality			
(v) Health and diseases			
<b>B. Aquaculture</b>			
(i) Inundation with flood water	(i) Elevation and renovation dykes of ponds. (ii) Construction of ponds in upland areas (ii) Arrangement for shifting of inputs, crafts and gears.	(i) Collection of naturally bred fish seed from flood water. (ii) Stocking of seed in nursery ponds constructed in upland area. (iii) Further raising of dykes by putting sand bags/fencing dykes with nylon nets.	(i) Repairing of damaged pond dykes. (ii) Removal of unwanted fishes from ponds. (iii) Sale large sized fishes.
(ii) Water contamination and changes in water quality	(i) Arrangement for monitoring of water quality parameters.		(I) Use of lime/Pott. Permanganate.
(iii) Health and diseases	(i) Arrangement of Pott. Permanganate and lime. (ii) Arrangement for CIFAX/ or other medicines.	Use of Pott. Permanganate and lime.	(i) Sampling of water and diseased fish for pathological analyses. (ii) Use of Pott. Permanganate and lime. (iii) Treatment with medicines/ CIFAX.
(iv) Loss of stock and inputs (feed, chemicals etc)	(i) Shifting of inputs to safer place. (ii) Raising height of pond dykes by fencing with	(i) Arrangement of fish seed/inputs	(i) Fertilization of ponds, stocking with fish fingerlings and restoring supplementary feeding. (ii) Harvesting and sale of produce.



	nylonnet/bamboo mats.		
(v) Infrastructure damage (pumps, aerators, huts etc)	Arrangement, repairing and shifting of equipments, crafts and gears to safer place.		Restoration of infrastructural facility to its original.
(vi) Any other			
<b>3. Cyclone / Tsunami</b>			
A. Capture			
Marine			
(i) Average compensation paid due to loss of fishermen lives			
(ii) Avg. no. of boats / nets/damaged			
(iii) Avg. no. of houses damaged			
Inland			
B. Aquaculture			
(i) Overflow / flooding of ponds			
(ii) Changes in water quality (fresh water / brackish water ratio)			
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)			
(vi) Any other			
<b>4. Heat wave and cold wave</b>			
A. Capture			

Marine			
Inland			
<b>B. Aquaculture</b>			
(i) Changes in pond environment (water quality)			
(ii) Health and Disease management			
(iii) Any other			
	<b>Suggested contingency measures</b>		
	<b>Before the event</b>	<b>During the event</b>	<b>After the event</b>
<b>1) Drought</b>			
<b>A. Capture</b>			
Marine			
Inland			
(i) Shallow water depth due to insufficient rains/inflow			
(ii) Changes in water quality			
(iii) Any other			
<b>B. Aquaculture</b>			
(i) Shallow water in ponds due to insufficient rains/inflow			
(ii) Impact of salt load build up in ponds / change in water quality			
(iii) Any other			
<b>2) Floods</b>			
<b>A. Capture</b>			
Marine			

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

(i) Overflow / flooding of ponds			
(ii) Changes in water quality (fresh water / brackish water ratio)			
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)			
(vi) Any other			
<b>4. Heat wave and cold wave</b>			
<b>A. Capture</b>			
Marine			
Inland			
<b>B. Aquaculture</b>			
(i) Changes in pond environment (water quality)			
(ii) Health and Disease management			
(iii) Any other			

<sup>a</sup> based on forewarning wherever available