

State: Jharkhand

Agriculture Contingency Plan for District: Hazaribagh

1.0 District Agriculture profile			
1.1	Agro-Climatic/Ecological Zone		
	Agro Ecological Sub Region (ICAR)	Moderately To Gently Sloping Chattisgarh Mahanadi Basin, Hot Moist/Dry Sub humid Transitional ESR With Deep Loamy To Clayey Red And Yellow Soils (11.0)	
	Agro-Climatic Zone (Planning Commission)	Eastern Plateau and Hills Region (VII)	
	Agro Climatic Zone (NARP)	Central And North Eastern Plateau Zone (BI-4)	
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Bokaro, Chatra, Deogarh, Dhanbagh, Giridh, Godda, Hazaribagh, Jamtara, Khunthi	
	Geographic coordinates of district headquarters	Latitude	Longitude
		23.5 to 24.4 N	85.1 to 85.9 E
		Altitude	611 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Zonal Research Station (ZRS), Dumka, Birsa Agricultural University, Ranchi	
	Mention the KVK located in the district with address	Krishi Vignan Kendra, Holycross, Near Kanari Hill, Distt. Hazaribagh-825 301	
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Birsa Agricultural University, Ranchi	

1.2	Rainfall	Normal RF(mm)	Normal Rainy days (number)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep)	700		3 rd week of June	3 rd week of September
	NE Monsoon(Oct-Dec)	41			
	Winter (Jan- Feb)	15		-	-
	Summer (Mar-May)	27		-	-
	Annual	783		-	-

1.3	Land use pattern of the district (latest statistics)	Geographical area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area ('000 ha)	604.9	160.9	265.8	100.4	-	-	-	-	77.7	-

1.4	Major Soils	Area ('000 ha)	Percent (%) of total
	Red lateritic (Ultic Paleustalfs) soils		
	Loam soils (Haplustalfs)		
	Fine Loam (Rhodustlafs) soils		
	Fine mixed Loam (Paleustalfs) soils		

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	160.9	117%
	Area sown more than once	26.3	
	Gross cropped area	187.2	

1.6	Irrigation	Area ('000 ha)
	Net irrigated area	23.3
	Gross irrigated area	

	Rainfed area			
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals	2	1.3	
	Tanks	279	2.3	
	Open wells	2752	8.0	
	Bore wells	44	2.9	
	Lift irrigation schemes	31	0.6	
	Micro-irrigation			
	Other sources (Check Dam)	187	8.3	
	Total Irrigated Area			
	Pump sets			
	No. of Tractors			
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited			
	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			57.8					57.8
	Maize			13.3			0.5		13.8
	Pigeonpea			3.6					3.6
	Blackgram			1.7					1.7
	Greengram			0.2					0.2
	Groundnut								
	Wheat						5.5		5.5

	Chick pea						2.3		2.3
	Pea						1.6		1.6
	Lentil						0.4		0.4

	Horticulture crops - Fruits	Area ('000 ha)		
		Total	Irrigated	Rainfed
	Horticulture crops - Vegetables			
	Cauliflower	1.6		
	Cabbage	1.6		
	Tomato	1.0		
	Brinjal	0.8		
	Chilli	0.1		
	Ladiesfinger	0.5		
	Bottle gourd	0.5		
	Bitter gourd	0.5		
	Cucumber	0.1		
	Ridge gourd	0.3		
	Sponge gourd	0.5		
	French bean	0.2		
	Medicinal and Aromatic crops			
	Plantation crops			
	Fodder crops			
	Total fodder crop area			
	Grazing land			
	Sericulture etc			

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)			483.68
	Improved cattle			
	Crossbred cattle			
	Non descriptive Buffaloes (local low yielding)			
	Descript Buffaloes			143
	Goat			356
	Sheep			10
	Others (Camel, Pig, Yak etc.)			71.2
	Commercial dairy farms (Number)			

1.9	Poultry	No. of farms	Total No. of birds ('000)				
	Commercial						
	Backyard		918.7				
1.10	Fisheries (Data source: Chief Planning Officer)						
	A. Capture						
	i) Marine (Data Source: Fisheries Department)	No. of fishermen	Boats		Nets		Storage facilities (Ice plants etc.)
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
	ii) Inland (Data Source: Fisheries Department)	No. Farmer owned ponds		No. of Reservoirs		No. of village tanks	
	B. Culture						
			Water Spread Area (ha)	Yield (t/ha)	Production ('000 tons)		
	i) Brackish water (Data Source: MPEDA/ Fisheries Department)						
	ii) Fresh water (Data Source: Fisheries Department)						

1.11 Production and Productivity of major crops

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 identified based on total acreage)										
	Rice	63.8	1103					63.8	1103	
	Maize	20.5	1537	0.438	1674			20.9	1605	

	Pigeonpea	2.6	700					2.5	700	
	Blackgram	0.5	300					0.5	300	
	Greengram	0.1	350					0.1	350	
	Wheat			8.2	1500			8.2	1500	
	Chick pea			2.8	1200			2.8	1200	
	Pea			1.5	950			1.5	950	
	Lentil			0.2	400			0.2	400	
Major Horticultural crops (Crops identified based on total acreage)										
	Cauliflower	37.7	0.3					37.7	0.3	
	Cabbage	36.9	0.3					36.9	0.3	
	Tomato	32.7	0.3					32.7	0.3	
	Brinjal	45.8	0.3					45.8	0.3	
	Chilli	0.6	0.1					0.6	0.1	
	Ladies finger	7.3	0.2					7.3	0.2	
	Bottle gourd	69.1	0.2					69.1	0.2	
	Bitter gourd	88.7	0.1					88.7	0.1	
	Cucumber	32.6	0.2					32.6	0.2	
	Ridge gourd	39.4	0.1					39.4	0.1	

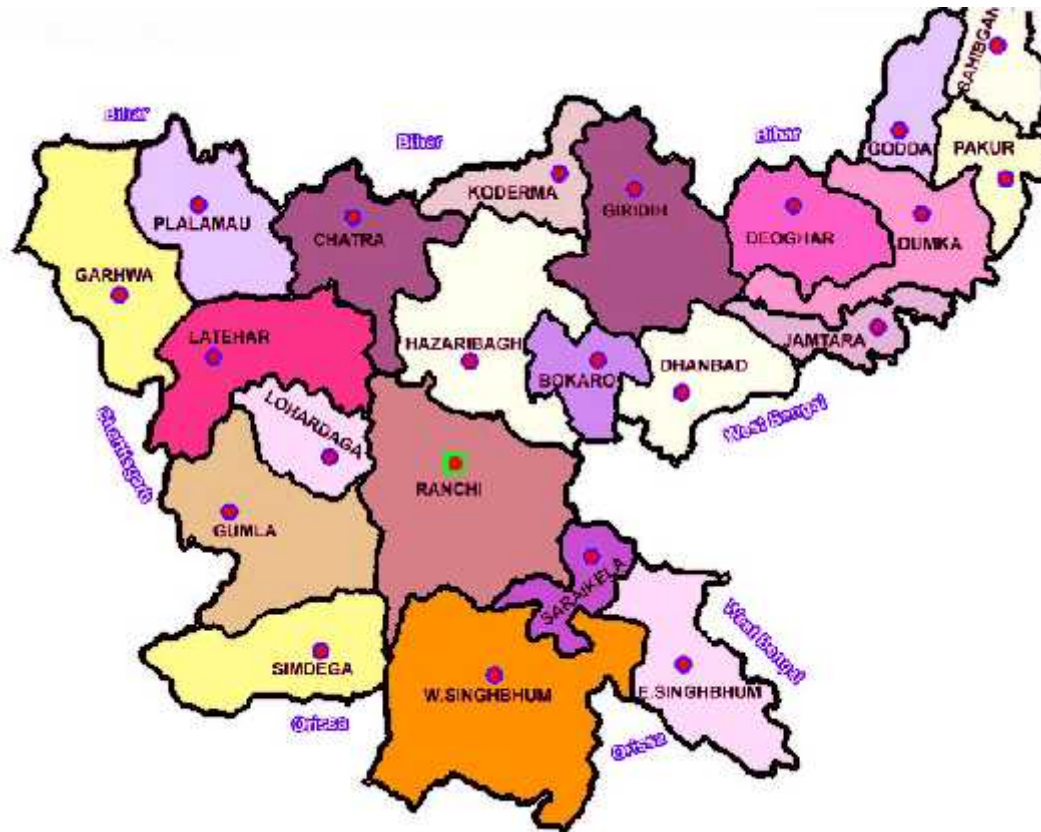
	Sponge gourd	7.8	0.1					7.8	0.1	
	French bean	14.5	0.1					14.5	0.1	

1.12	Sowing window for 5 major field crops	Rice	Pigeonpea	Maize	Wheat
	Kharif- Rainfed	4 th week of June to 4 th week of July	3 rd week of June to 2 nd week of July	3 rd week of June to 4 th week of July	
	Kharif-Irrigated	2 nd week of June to 3 rd week of June			
	Rabi-Rainfed				3 rd week of October to 4 th week of October
	Rabi-Irrigated				3 rd week of November to 4 th week of December

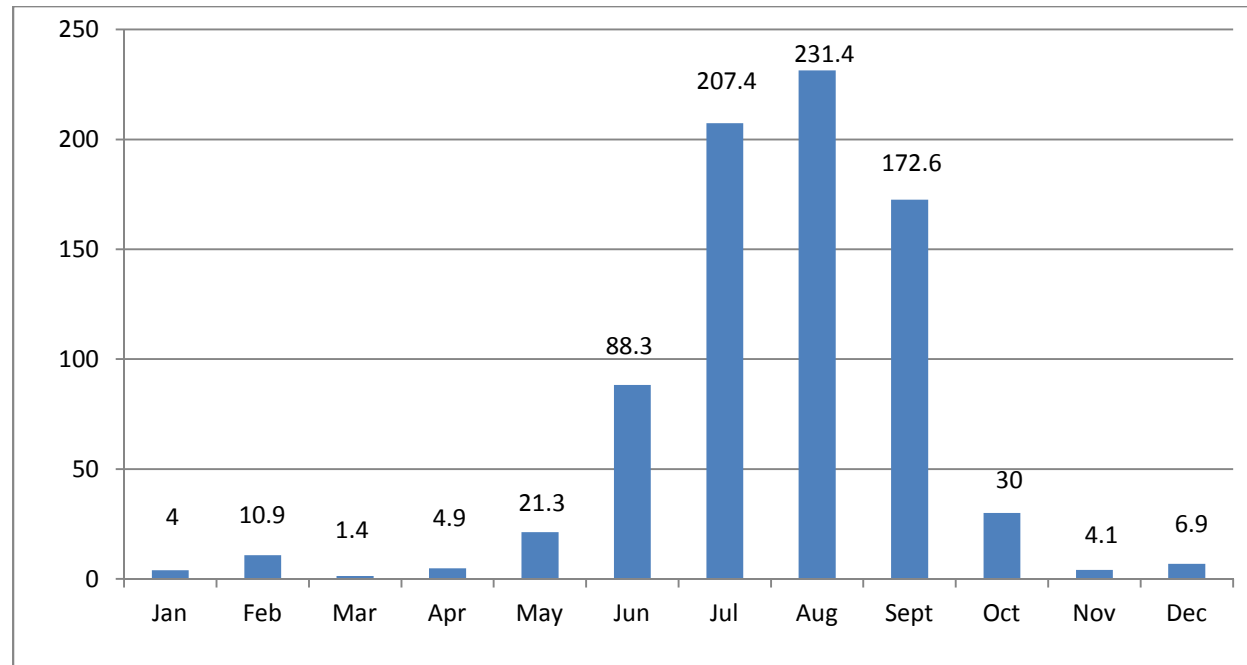
1.13	What is the major contingency the district is prone to? (Tick mark)	Regular	Occasional	None
	Drought	✓		
	Flood			✓
	Cyclone			✓
	Hail storm			✓
	Heat wave		✓	
	Cold wave		✓	
	Frost		✓	
	Sea water intrusion			✓
	Pests and disease outbreak		✓	

1.14	Include Digital maps of the district for	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure II	Enclosed: Yes
		Soil map as Annexure III	Enclosed: No

Annexure I



Annexure II



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 1 st week of July	UPLAND Sandy soils	Pigeonpea, Groundnut, Upland rice, Maize Pigeonpea+ Groundnut Pigeonpea + Maize Vegetables- Brinjal, Tomato, Sponge gourd	Pigeonpea, Groundnut, Maize, Upland rice, Black gram Pigeonpea + Black gram Pigeonpea + Upland rice Vegetables- Brinjal, Tomato, sponge gourd, Cucurbits, Cow pea, Bean	Follow wider spacing (90x25 cm) in Pigeonpea	-

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 4 weeks 3 rd week of July	Sandy soils	Pigeonpea, Groundnut, Upland rice, Blackgram, Greengram Vegetables- Brinjal, Tomato, Sponge gourd	Pigeonpea - Birsa A- 1, UPAS- 120, Asha (ICPL- 87119) ICPH- 2671 Finger millet- Var: A- 404, Birsa Maruwa- 2 Pigeonpea + Bhendi Maize + Beans Vegetables- Brinjal, Tomato, sponge gourd, Cucurbits, Cow pea, Beans, Bhendi, Chilli		Supply of seed through 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 July 4 th week	Sandy soils	Sweet potato , Frenchbean, Bhendi, Tomato, Brinjal	Blackgram, Niger, Horse gram, Finger millet Frenchbean, Bhendi, Tomato, Brinjal, Chilli, Cowpea		Supply of seed through NFSM

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation ^a	Normal Crop/cropping system ^b	Change in crop/cropping system ^c	Agronomic measures ^d	Remarks on Implementation ^e
Delay by 8 weeks 2 nd week of August	Sandy soils	Niger, Horse gram	Niger, Horsegram, Toria		Supply of seed through NFSM

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation ^a	Normal Crop / Cropping system ^b	Change in crop / cropping system ^c including variety	Agronomic measures ^d	Remarks on Implementation ^e
Delay by 2 weeks 4 th week of June	MID LAND Sandy loam soils	Rice	Rice		-

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation ^a	Normal Crop/cropping system ^b	Change in crop/cropping system ^c	Agronomic measures ^d	Remarks on Implementation ^e

Delay by 4 weeks 2 nd week of July	Sandy loam soils	Rice	Rice	Sowing behind the plough with seed rate 50-60 kg/ha (direct sowing method)	Promotion of SRI technique through RKVY
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Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation^a	Normal Crop/cropping system^b	Change in crop/cropping system^c	Agronomic measures^d	Remarks on Implementation^e
Delay by 6 weeks July 4 th week	Sandy soils	Rice	Rice - Anjali, Bandana, Abhisekh, Birsa Vikas Dhan-9 &10	Sowing behind the plough with seed rate 50-60 kg/ha (direct sowing method)	Promotion of SRI technique through RKVY

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation^a	Normal Crop/cropping system^b	Change in crop/cropping system^c	Agronomic measures^d	Remarks on Implementation^e
Delay by 8 weeks 2 nd week of August	Sandy loam soils	Transplanted Rice	Blackgram - PU-19 Torla- Var—T-9, PT- 303	Transplanting with 5-6 seedling/hill	Promotion of SRI technique through RKVY

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation^a	Normal Crop / Cropping system^b	Change in crop / cropping system^c including variety	Agronomic measures^d	Remarks on Implementation^e
Delay by 2 weeks 4 th week of June	LOW LAND Sandy clay loam soils	Rice	Rice	Sowing with sprouted seedlings	-

Condition	Major Farming situation ^a	Normal Crop/cropping system ^b	Suggested Contingency measures		
			Change in crop/cropping system ^c	Agronomic measures ^d	Remarks on Implementation ^e
Early season drought (delayed onset)	Major Farming situation ^a	Normal Crop/cropping system ^b	Change in crop/cropping system ^c	Agronomic measures ^d	Remarks on Implementation ^e
Delay by 4 weeks 2 nd week of July	Sandy clay loam soils	Rice	Rice		Promotion of SRI technique through RKVY

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 6 weeks 4 th week of July	Sandy clay loam soils	Transplanted Rice	Transplanting of Rice with lowland Varieties		Promotion of SRI technique through RKVY

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 8 weeks 2 nd week of August	Sandy clay loam soils	Transplanted Rice	Transplanting of Rice with lowland Varieties	Reduce fertilizer dose by 20 % (80:40:20 Kg) NPK/ha Increase no. of seedling (5-6/hill) Transplanting at closer spacing (15x10 cm)	Promotion of SRI technique through RKVY

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)	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.	UP LAND Red sandy soils	Upland Rice, Maize, Cow pea, Groundnut+ Pigeonpea Maize + Pigeonpea Bhendi + Maize Vegetables- Brinjal, Tomato, Sponge gourd, Cucurbits, Cowpea, Bean, Bhendi, Chilli	Pigeonpea- UPAS- 120, Asha, ICPL- 87109 Maize- Suwan- 1, HQPM-1 BVM-2, Kanchan Groundnut- TG-22, Birsa GN-2 Sesame- Kanke safed, TC-25 Upland rice + Pigeonpea (1:3) Pigeonpea+ Blackgram (1:2)	Intercultivation	1. Supply of weeding machine
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Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)					
At vegetative stage	Red Sandy soils	Upland Rice, Maize, Cow pea, Groundnut+ Pigeonpea Maize + Pigeonpea Bhendi + Maize Vegetables- Brinjal, Tomato, Sponge gourd, Cucurbits, Cowpea, Bean, Bhendi, Chilli	Life saving irrigation to vegetable crops		Rain water harvesting structure should be made through watershed programme/ MNREGA

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Mid season drought (long dry spell)					
At flowering/	Sandy soils	Upland Rice,	Intercultivation ,		

fruiting stage		Maize, Cow pea, Groundnut+ Pigeonpea Maize + Pigeonpea Bhendi + Maize Vegetables- Brinjal, Tomato, Sponge gourd, Cucurbits, Cowpea, Bean, Bhendi, Chilli	Weeding, Thining		Rain water harvesting structure should made through watershed programme / MNREGA
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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
	Sandy loam soils	Upland Rice, Maize, Cow pea, Groundnut+ Pigeonpea Maize + Pigeonpea Bhendi + Maize Vegetables- Brinjal, Tomato, Sponge gourd, Cucurbits, Cowpea, Bean, Bhendi, Chilli	1. Life saving irrigation for vegetables 2. Upland rice harvested for straw purpose 3. Harvest the Groundnut at physiological maturity stage	Toria, Potato	Farm ponds through watershed management programme Rain water harvesting through watershed management & MNREGA programme

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.	MID LAND Sandy loam soils	Rice	Life saving irrigation	Weeding, split application of Nitrogen fertilizer	Construct the water harvesting structures like ponds, check dams & open well through MNREGA programme

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Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation^a	Normal Crop/cropping system^b	Crop management^c	Soil nutrient & moisture conservation measures^d	Remarks on Implementation^e
At vegetative stage	Sandy loam soils	Rice	Life saving irrigation through well, ponds check dams	Weeding, Foliar spray of Urea	Construct the water harvesting structures like ponds, check dams & open well through MNREGA programme

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	Sandy loam soils	Rice	Weeding	Life saving irrigation through wells, ponds, check dams	

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
		Rice	Life saving irrigation Harvest the crop at physiological maturity for fodder	Toria, Chick pea, Lentil, Mustard (Shicani, Pusa Agrani) Linseed (Shubhra, T-397)	-

Condition			Suggested Contingency measures		
Early season drought (Normal onset)	Major Farming situation^a	Normal Crop/cropping system^b	Crop management^c	Soil nutrient & moisture conservation measures^d	Remarks on Implementation^e
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc	LOW LAND Sandy clay loam soils	Rice	Rice		Construct the water harvesting structures like ponds, check dams & open well. Through MNREGA scheme

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	Sandy clay loam soils	Rice	Life saving irrigation	Weeding, Foliar spray of Urea,	Ponds check dam through water shed management

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	Sandy clay loam soils	Rice	Weeding, Inter cultivation	Foliar spray of Urea	

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	Major Farming situation^a	Normal Crop/cropping system^b	Crop management^c	Rabi Crop planning^d	Remarks on Implementation^e

	Sandy clay loam	Rice	Harvest the crop at physiological maturity	Wheat, Mustard, Chick pea Wheat+ Mustard	
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2.1.2 Drought - Irrigated situation

Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Limited release of water in canals due to low rainfall					
Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Non release of water in canals under delayed onset of monsoon in catchment					
Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Lack of inflows into tanks due to insufficient /delayed onset of monsoon					

Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Insufficient groundwater recharge due to low rainfall					

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

Condition	Suggested contingency measure

Continuous high rainfall in a short span leading to water logging	Vegetative stage^k	Flowering stage^l	Crop maturity stage^m	Post harvestⁿ
Pigeonpea	Ridge making	Provide drainage		
Blackgram	Ridge making	Provide drainage		
Rice	Bund making	Provide drainage	Provide drainage	
Horticulture				
Cucurbits	Staking	Provide drainage	Provide drainage	
Vegetables	Sowing on ridges			

Outbreak of pests and diseases due to unseasonal rains				
Pulses	Leaf hoper/caterpillar Control- Monocrotophos @ 1 ml/lit			
Maize	Stem borer Control- Phorate 10G@ 20 kg/ha	Sheath blight Control- Hexaconazole 1.0 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		YVM Control- Carbofuran 3G @ 3 gm/m ²		
French bean	Rust disease Control- Mancozeb 2.5 kg/ ha			

2.3 Floods

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

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

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Hailstorm	Not applicable			
Heat Wave				
Wheat	Life saving irrigation	Life saving irrigation	Life saving irrigation (Terminal heat)	
Cold wave				
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
Pigeonpea		Light irrigation Mulching with crop residue \ weeds		

Frost				
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		Earth up Provide irrigation Inter cultivation, Mulching with weeds		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			
Cyclone	Not applicable			

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event ^s	During the event	After the event
Drought			
Feed and fodder availability	Preservation of surplus fodder, encourage fodder cultivation and tree plantation and also encourage supply of molasses to cattle feed plants.	Arrangement of feeds and fodder from adjoining areas, exploitation of non conventional feed resources, use of urea treated straw and feed blocks.	Promotion of fodder seed production, cultivation and storage, establishment of fodder block making machines in fodder surplus areas.
Drinking water	Repairs of tube wells, clear off the sludge in the canals and local water catchments and clean the water tanks, large ponds and lakes	Harnessing water through the existing reservoirs and exploitation of groundwater.	To strengthen reservoirs by promoting recharging of water and rain water harvesting during rainy season.
Health and disease	Mass vaccination and de worming	Provide shades to animals and water as much as possible. Treatment of diseased animals	Treatment of diseased animals and provide vitamin and mineral supplement to regain

management		and proper disposal of carcasses.	strength and vigour.
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^s 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	
Drought				
Shortage of feed ingredients	Storage of feed	Provide non conventional feed, supplement anti oxidant and anti stress		
Drinking water	Storage of water in tanks	Add vit-C and other anti stress ingredients with water		
Health and disease management	Regular vaccination	Vaccination and treatment of diseased one	Disposal of dead birds	

^a based on forewarning wherever available

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event ^a	During the event	After the event
1. Drought			
Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	Plough the pond and apply lime @ 250kg/ha	Reduce the stocking density from 25000 fry (1 inches size) to 10000-15000/ha	Remove the fishes of bigger size(0.5 kg)
(ii) Impact of salt load build up in ponds / change in water quality		Apply lime @ 50 kg on every 15-30 days. Aerate the water as per need	Apply lime as per need @ 50 kg/ha
2. Heat wave and cold wave			
Aquaculture			

(i) Changes in pond environment (water quality)	Reduce application of organic manure and supplementary feeds	Reduce/stop application of feed	Harvest the bigger fishes, reduce/stop application of supplementary feed. Apply lime @ 50 kg/ha and potassium permanganate in perforated plastic ball 5-10g in each ball
(ii) Health and Disease management	Apply lime	Apply lime/salt as per need	Apply lime/salt as per need.