State: Jharkhand

Agriculture Contingency Plan for District: East Singhbhum

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	Eastern plateau (chotanagpur) And Eastern Ghats, Hot Subhumid Eco-Region (12.3)		
	Agro-Climatic Zone (Planning Commission)	Eastern Plateau And Hills Region (VII)		
	Agro Climatic Zone (NARP)	South 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	Altitude
		22^0 12' 23.01" N	86^0 04' 86.54" E	244m msl
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Zonal Research Station (ZRS), Darisai, Birsa Agricultural University, Ranchi		
	Mention the KVK located in the district with address	Krishi Vignan Kendra, Darisai, Vill-Barakhurshi, PO. Giridhi, Distt. East Singhbhum-832 304		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	ZRS, Darisai		

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)	1092		3rd week of June	4th week of September
	NE Monsoon(Oct-Dec)	102			
	Winter (Jan- Feb)	35		-	-
	Summer (Mar-May)	147		-	-
	Annual	1376		-	-

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)	347.5	119.3	83.6						28.6	

(according to district agricultural plan, 2008 to 2012)

1. 4	Major Soils	Area ('000 ha)	Percent (%) of total
	1. Red lateritic soils		
	2. Loam soils		
	3. Fine loam soils		
	4. Fine mixed loam soils		

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	119.3	114%
	Area sown more than once		
	Gross cropped area		

1.6	**Irrigation**	Area (‘000 ha)		
	Net irrigated area	14.7		
	Gross irrigated area			
	Rainfed area			
	Sources of Irrigation	Number	Area (‘000 ha)	Percentage of total irrigated area
	Canals		3.9	
	Tanks		3.3	
	Open wells		9.4	
	Bore wells			
	Lift irrigation schemes			
	Micro-irrigation			
	Other sources (Check Dam)		9.4	
	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 (as per latest figures)

1.7	Major field crops cultivated	Area ('000 ha)							
		Kharif			*Rabi*				
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Summer	Grand total
	Rice			154.5					154.5
	Maize			2.9			0.3		3.2
	Pigeonpea			1.7					1.7
	Blackgram			1.3					1.3
	Greengram			0.7					0.7
	Wheat						1.8		1.8
	Chick pea						0.5		0.5
	Pea						0.3		0.3
	Lentil						0.2		0.2

	Horticulture crops - Fruits	Area ('000 ha)		
		Total	Irrigated	Rainfed
	Horticulture crops - Vegetables	**Total**	**Irrigated**	**Rainfed**
	Cauliflower	1.3		
	Cabbage	1.1		
	Tomato	1.0		
	Brinjal	0.5		
	Chilli	0.1		
	Ladies finger	0.4		
	Bottle gourd	0.5		
	Bitter gourd	0.6		
	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)			276.3
	Improved cattle			
	Crossbred cattle			
	Non descriptive Buffaloes (local low yielding)			
	Descript Buffaloes			35.4
	Goat			230.3
	Sheep			55.4
	Others (Camel, Pig, Yak etc.)			25.3
	Duckery			
	Commercial dairy farms (Number)			
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**	
	Commercial			
	Backyard		959.2	

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 (Average of last 5 years: 2004- 08)

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)										
	Maize	3.2	1093	0.5	1704			3.7	1398	
	Pigeonpea	1.3	750					1.3	750	
	Blackgram	0.9	677					0.9	677	
	Greengram	0.5	790					0.5	790	
	Groundnut							0.1	608	
	Wheat			2.3	1295			2.3	1295	
	Chick pea			0.5	985			0.5	985	
	Pea			0.2	804			0.2	804	
	Lentil			0.1	494			0.1	494	
	Mustard							0.4	243	

Major Horticultural crops (Crops identified based on total acreage)										
	Cauliflower	35.6	0.3					35.6	0.3	
	Cabbage	32.3	0.3					32.3	0.3	
	Tomato	28.4	0.3					28.4	0.3	
	Brinjal	12.8	0.2					12.8	0.2	
	Chilli	0.5	0.1					0.5	0.1	
	Ladies finger	6.0	0.1					6.0	0.1	
	Bottle gourd	80.0	0.1					80.0	0.1	
	Bitter gourd	99.7	0.1					99.7	0.1	
	Cucumber	22.8	0.2					22.8	0.2	
	Ridge gourd	46.1	0.1					46.1	0.1	
	Sponge gourd	8.0	0.1					8.0	0.1	
	French bean	13.4	0.09					13.4	0.09	

1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	**Rice**	**Groundnut**	**Pigeon pea**	**Maize**	**Wheat**
	Kharif- Rainfed	4th week of June to 4th week of July	3rd week of June to 4th week of June	3rd week of June to 2nd week of July	3rd week of June to 4th week of July	
	Kharif-Irrigated	2nd week of June to 3rd week of June				
	Rabi-Rainfed					3rd week of October to 4th week of October
	Rabi-Irrigated					3rd week of November to 4th week of December

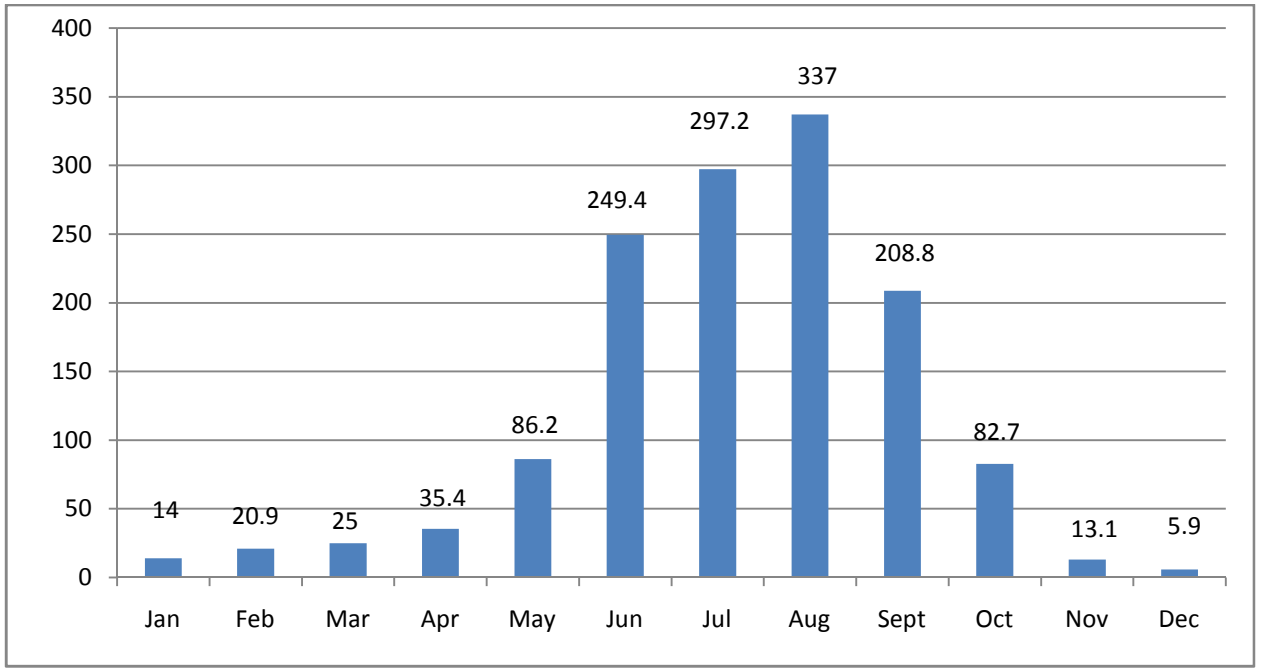
1.13	**What is the major contingency the district is prone to?** (Tick mark)	**Regular**	**Occasional**	**None**
	Drought	✓		
	Flood			✓
	Cyclone			✓
	Hail storm			✓
	Heat wave		✓	
	Cold wave		✓	
	Frost		✓	
	Sea water intrusion			✓
	Pests and disease outbreak		✓	

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: Yes

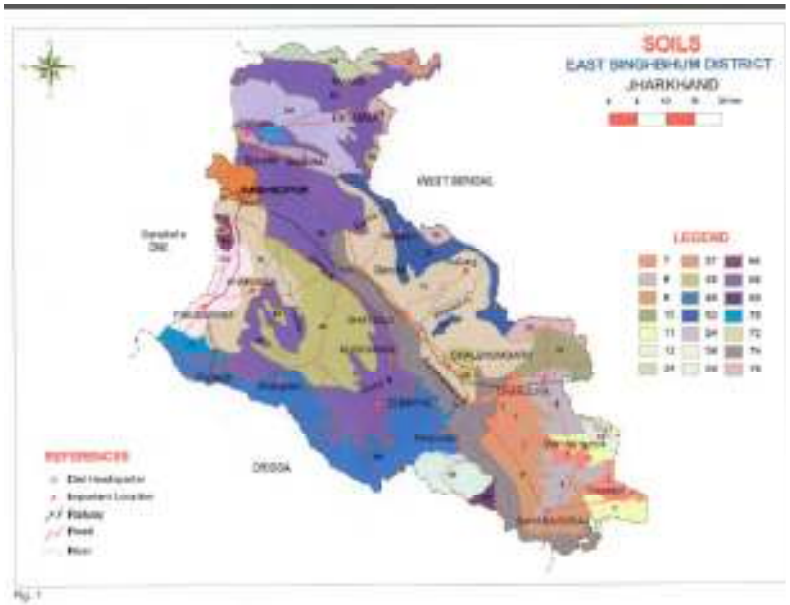
Annexure I


Bihar
Bihar
Bihar
SAHIBGANJ
GODDA
PAKUR
KODERMA
GIRIDIH
PLALAMAU
CHATRA
DEOGHAR
DUMKA
GARHWA
LATEHAR
HAZARIBAGH
JAMTARA
BOKARO
DHANBAD
West Bengal
LOHARDAGA
Chattisgarh
RANCHI
GUMLA
SARAIKELA
West Bengal
SIMDEGA
W.SINGHBHUM
E.SINGHBHUM
Orissa
Orissa

Annexure II


400
350
300
250
200
150
100
50
0
14
20.9
25
35.4
86.2
249.4
297.2
337
208.8
82.7
13.1
5.9
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sept
Oct
Nov
Dec

Annexure III



Legend Information:-

7-Deep, moderately well drained, fine loamy soils

8- Shallow, moderately well drained, fine loamy soils

9-Deep poorly drained fine soils

10-Deep poorly drained fine cracking soils

11- Very deep poorly drained fine soils

12- Very deep imperfectly drained fine soils

27-Deep, moderately well drained, fine loamy soils.

48-Shallow excessively drained gravelly loam soils.

49- Deep, well drained, fine loamy soils

52- Shallow well drained gravelly loam soils

54- Shallow moderately well drained loamy soils

56- Very deep moderately well drained fine soils

58- Deep moderately well drained fine soils

64- Shallow well drained loamy soils

68-Moderately deep well drained fine loamy soils

70-Very deep well drained fine loamy soils

72- Deep well drained fine loamy soils

74- Deep poorly drained fine loamy soils

76- Deep moderately well drained fine loamy soils

Source: SAMETI, Jharkhand

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[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 1st week of July	UPLAND High rainfall, shallow iron rich , light textured sandy & acidic soil.	Upland Rice (Sole), Finger millet (Sole), Pigeonpea + Sorghum, Pigeonpea + Maize	Upland Rice (Sole), Finger millet (sole), Groundnut, Soybean, Rice + Pigeonpea, Rice + Okra, Rice + Maize, Pigeonpea + Groundnut, Pigeonpea + Maize, Pigeonpea + Sorghum	Dry seeding with 15% to 20% higher seed rate Seed treatment with Rhizobium in pulse Seed treatment with Azotobacter in Rice & Okra. Maximum use of organic manure	
	High rainfall, shallow depth, light textured sandy & acidic soil.	Upland Rice (sole), Pigeonpea (Sole) , Maize (Sole), Pigeonpea + Maize, Pigeonpea + Sorghum,	Upland Rice (Sole), Soybean , Groundnut, Rice + Pigeonpea, Rice + Okra, Rice + Maize, Pigeonpea + Groundnut, Pigeonpea + Maize, Pigeonpea + Sorghum		
	Less rainfall,	Upland Rice (Sole),	Upland Rice (Sole),		

	shallow depth, light textured sandy & acidic soil.	Pigeonpea (Sole) , Maize (Sole), Pigeonpea + Maize	Soybean , Groundnut, Rice + Pigeonpea, Rice + Okra, Rice + Maize Pigeonpea + Groundnut, Pigeonpea + Maize, Pigeonpea + Sorghum **Upland Rice var**. BVD-109, BVD-110, Bandana, Anjali, **Pigeonpea var.** Bahar, BR-65 **Maize var.** Suwan-1, HQPM-1 **Sorghum var.** CSV-1616 **Finger millet var.** A-404 **Soybean var.** Birsa soya-1, JS-335, Birsa Safed soya.-2 **Groundnut var.** BG-2, BG-3, B bold **Okra var.** Arka Anamika		

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 4 weeks	High rainfall, shallow iron rich , light textured sandy & acidic	Upland Rice (Sole), Finger millet (Sole), Pigeonpea + Sorghum,	Upland Rice (Sole), Finger millet (sole), Groundnut, Soybean,	Dry seeding with 15% to 20% higher seed rate Seed treatment with Rhizobium in pulse	Supply of Seed through NFSM

3rd week of July	soil.	Pigeonpea + Maize,	Rice + Pigeonpea, Rice + Okra, Rice + Maize, Pigeonpea + Groundnut, Pigeonpea + Maize, Pigeonpea + Sorghum	Seed treatment with Azotobacter in Rice & Okra. Maximum use of organic manure	
	High rainfall, shallow depth, light textured sandy & acidic soil.	Upland Rice (sole), Pigeonpea (Sole) , Maize (Sole), Pigeonpea + Maize, Pigeonpea + Sorghum,	Upland Rice (Sole), Soybean , Groundnut, Rice + Pigeonpea, Rice + Okra, Rice + Maize, Pigeonpea + Groundnut, Pigeonpea + Maize, Pigeonpea + Sorghum		
	Less rainfall, shallow depth, light textured sandy & acidic soil.	Upland Rice (Sole), Pigeonpea (Sole) , Maize (Sole), Pigeonpea + Maize	Upland Rice (Sole), Soybean , Groundnut, Rice + Pigeonpea, Rice + Okra, Rice + Maize Pigeonpea + Groundnut, Pigeonpea + Maize, Pigeonpea + Sorghum		

Condition			**Suggested Contingency measures**		
Early season	**Major Farming**	**Normal Crop / Cropping**	**Change in crop /**	**Agronomic**	**Remarks on**

drought (delayed onset)	situation[a]	system[b]	cropping system[c] including variety	measures[d]	Implementation[e]
Delay by 6 weeks 1st week of August	High rainfall, shallow iron rich , light textured sandy & acidic soil.	Upland Rice (Sole), Finger millet (Sole), Pigeonpea + Sorghum, Pigeonpea + Maize,	Upland Rice (Sole), Finger millet (sole), Groundnut, Soybean, Rice + Pigeonpea, Rice + Okra, Rice + Maize, Pigeonpea + Groundnut, Pigeonpea + Maize, Pigeonpea + Sorghum	Dry seeding with 15% to 20% higher seed rate Seed treatment with Rhizobium in pulse Seed treatment with Azotobacter in Rice & Okra. Maximum use of organic manure	Supply of Seed through NFSM
	Less rainfall, shallow depth, light textured sandy & acidic soil.	Upland Rice (Sole), Pigeonpea (Sole) , Maize (Sole), Pigeonpea + Maize	Upland Rice (Sole), Soybean , Groundnut, Rice + Pigeonpea, Rice + Okra, Rice + Maize Pigeonpea + Groundnut, Pigeonpea + Maize, Pigeonpea + Sorghum		

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 8 weeks 3rd week of August	High rainfall, shallow iron rich , light textured sandy & acidic soil.	Upland Rice (Sole), Finger millet (Sole), Pigeonpea + Sorghum, Pigeonpea + Maize,	Upland Rice (Sole), Finger millet (sole), Groundnut, Soybean, Rice + Pigeonpea, Rice + Okra, Rice + Maize,	Dry seeding with 15% to 20% higher seed rate Seed treatment with Rhizobium in pulse Seed treatment with Azotobacter in Rice & Okra.	Supply of Seed through NFSM

			Pigeonpea + Groundnut, Pigeonpea + Maize, Pigeonpea + Sorghum	Maximum use of organic manure	
	Less rainfall, shallow depth, light textured sandy & acidic soil.	Upland Rice (Sole), Pigeonpea (Sole) , Maize (Sole), Pigeonpea + Maize	Upland Rice (Sole), Soybean , Groundnut, Rice + Pigeonpea, Rice + Okra, Rice + Maize Pigeonpea + Groundnut, Pigeonpea + Maize, Pigeonpea + Sorghum		

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 1st week of July	High rainfall, shallow iron rich , light textured sandy & acidic soil MEDIUM LAND	Rice, Finger millet, Pigeonpea, Sorghum, Maize, Pigeonpea + Sorghum Pigeonpea + Maize	Rice, Finger millet, Groundnut, Soybean, Maize Rice + Green manure	Raising of Nursery through mat method in Rice Seed treatment with Rhizobium in pulses, Seed treatment with Azotobacter in Rice , Maximum use of organic manure	
	Less rainfall, shallow depth, light textured sandy & acidic soil.	Rice, Pigeonpea, Maize Pigeonpea + Maize Pigeonpea + Sorghum	Rice, Soybean, Groundnut, Maize Rice + Green manure		

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 4 weeks 3rd week of July	High rainfall, shallow iron rich, light textured sandy & acidic soil.	Rice, Finger millet, Pigeonpea, Sorghum, Maize, Pigeonpea + Sorghum Pigeonpea + Maize	Rice, Finger millet, Groundnut, Soybean, Maize Rice + Green manure	Raising of Nursery through mat method in Rice, Seed treatment with Rhizobium in pulses, Seed treatment with Azotobacter in Rice, Maximum use of organic manure	Supply of Seed through NFSM
	Less rainfall, shallow depth, light textured sandy & acidic soil.	Rice, Pigeonpea, Maize Pigeonpea + Maize Pigeonpea + Sorghum	Rice, Soybean, Groundnut, Maize Rice + Green manure		

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 6 weeks 1st week of August	High rainfall, shallow iron rich , light textured sandy & acidic soil	Rice, Finger millet, Pigeonpea, Sorghum, Maize, Pigeonpea + Sorghum Pigeonpea + Maize	Rice, Finger millet, Groundnut, Soybean, Maize Rice + Green manure	Raising of Nursery through mat method in Rice, Seed treatment with Rhizobium in pulses, Seed treatment with Azotobacter in Rice , Maximum use of organic manure	Supply of Seed through NFSM

	Less rainfall, shallow depth, light textured sandy & acidic soil.	Rice, Pigeonpea, Maize Pigeonpea + Maize Pigeonpea + Sorghum	Rice, Soybean, Groundnut, Maize Rice + Green manure		

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 8 weeks 3rd week of August	High rainfall, shallow iron rich , light textured sandy & acidic soil	Rice, Finger millet, Pigeonpea, Sorghum, Maize, Pigeonpea + Sorghum Pigeonpea + Maize	Rice, Finger millet, Groundnut, Soybean, Maize Rice + Green manure	Raising of Nursery through mat method in Rice, Seed treatment with Rhizobium in pulses, Seed treatment with Azotobacter in Rice , Maximum use of organic manure	Supply of Seed through NFSM
	Less rainfall, shallow depth, light textured sandy & acidic soil.	Rice, Pigeonpea, Maize Pigeonpea + Maize Pigeonpea + Sorghum	Rice, Soybean, Groundnut, Maize Rice + Green manure		

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	High rainfall, shallow iron rich , light textured	Rice	Rice	Raising of Nursery through mat method	

1st week of July	sandy & acidic soil LOW LAND			in Rice,	
	Less rainfall, shallow depth, light textured sandy & acidic soil.	Rice	Rice **Rice var.** MTU-7029, MTU-1001, BPT-5204, Rajendra Mansuri		

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 3rd week of July	High rainfall, shallow iron rich , light textured sandy & acidic soil	Rice	Rice	Raising of Nursery through mat method in Rice	Supply of Seed through NFSM
	Less rainfall, shallow depth, light textured sandy & acidic soil.	Rice	Rice **Rice var**. Lalat, MTU-1010, Abhishek, Pro agro-6444		

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	High rainfall, shallow iron rich , light textured sandy & acidic soil	Rice	Rice	Raising of Nursery through mat method in Rice,	Supply of Seed through NFSM

1st week of August	Less rainfall, shallow depth, light textured sandy & acidic soil.	Rice	Rice **Rice var**. Lalat, MTU-1010, Abhishek, Pro agro-6444		

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	High rainfall, shallow iron rich , light textured sandy & acidic soil	Rice	Rice	Short to medium duration variety should be sown behind the plough.	Supply of Seed through NFSM
3rd week of August	Less rainfall, shallow depth, light textured sandy & acidic soil.	Rice **Rice var**. MTU-7029, Bhojna	Rice **Rice var**. Lalat, MTU-1010, Abhishek, Pro agro-6444		

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 measues[d]**	**Remarks on Implementation[e]**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	High rainfall, shallow iron rich , light textured sandy & acidic soil UP LAND AND MID LAND	Rice, Finger millet, Pigeonpea, Blackgram, Sorghum, Niger, Green gram Pigeonpea + Sorghum Pigeonpea + Maize	Gap filling Re sowing	Maximum use of compost, Contour bunding, Terracing	Supply of Seed through NFSM, Construction of percolation tank through IWSM

	Less rainfall, shallow depth, light textured sandy & acidic soil.	Rice, Pigeonpea, Blackgram, Maize, Sorghum, Niger, Green gram Pigeonpea + Maize Pigeonpea + Sorghum			

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	High rainfall, shallow iron rich , light textured sandy & acidic soil	Rice, Finger millet, Pigeonpea, Blackgram, Sorghum, Niger, Green gram Pigeonpea + Sorghum Pigeonpea + Maize	Life saving irrigation, Gap filling, Postponment of top dressing	Maximum use of compost, Contour bunding, Terracing	Construction of Water, conservation structures through IWMP
	Less rainfall, shallow depth, light textured sandy & acidic soil.	Rice, Pigeonpea, Blackgram, Maize, Sorghum, Niger, Green gram Pigeonpea + Maize Pigeonpea + Sorghum	Life saving irrigation, Gap filling, postponement of top dressing		

Condition			**Suggested Contingency measures**		
Mid season drought (long	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measuRes[d]**	**Remarks on Implementation[e]**

dry spell)					
At flowering/ fruiting stage	High rainfall, shallow iron rich , light textured sandy & acidic soil	Rice, Finger millet, Pigeonpea, Blackgram, Sorghum, Niger, Green gram Pigeonpea + Sorghum Pigeonpea + Maize	Life saving irrigation	Conservation of water on watershed basis	Construction of Water conservation structures through IWMP
	Less rainfall, shallow depth, light textured sandy & acidic soil.	Rice, Pigeonpea, Blackgram, Maize, Sorghum, Niger, Green gram Pigeonpea + Maize Pigeonpea + Sorghum			

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]
	High rainfall, shallow iron rich , light textured sandy & acidic soil	Rice, Finger millet, Pigeonpea, Blackgram, Sorghum, Niger, Green gram Pigeonpea + Sorghum Pigeonpea + Maize	Life saving irrigation, Harvest at physiological maturity stage, Pigeonpea harvested for vegetable purpose	Linseed, Lentil, Horse gram, Cow pea, Field bean	Construction of Water conservation structures through IWMP
	Less rainfall,	Rice, Pigeonpea,			

	shallow depth, light textured sandy & acidic soil.	Blackgram, Maize, Sorghum, Niger, Green gram, Pigeonpea + Maize Pigeonpea + Sorghum			

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 measues[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** High rainfall, shallow iron rich , light textured sandy & acidic soil	Rice	Gap filling Re sowing	Maximum use of compost	Supply of Seed through NFSM Construction of percolation tank through IWSM
	Less rainfall, shallow depth, light textured sandy & acidic soil.	Rice			

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	High rainfall, shallow iron rich , light textured sandy & acidic soil	Rice	Life saving irrigation, Gap filling & postponement of top dressing	Maximum use of compost	Supply of Seed through NFSM Construction of Water conservation structures through IWMP
	Less rainfall, shallow depth, light textured sandy & acidic soil.	Rice			

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
At flowering/ fruiting stage		Rice	Life saving irrigation		Construction of Water conservation structures through IWMP
	High rainfall, shallow depth, light textured sandy & acidic soil.	Rice			
	Less rainfall, shallow depth, light textured sandy & acidic soil.	Rice			

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]**

	High rainfall, shallow iron rich , light textured sandy & acidic soil	Rice	Life saving irrigation Harvest at physiological maturity stage	Linseed, Lentil, Horse gram, Cow pea, Field bean, Wheat, Chickpea	Construction of Water conservation structures through IWMP
	Less rainfall, shallow depth, light textured sandy & acidic soil.	Rice			

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					

1.2 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**	**Flowering stage**	**Crop maturity stage**	**Post harvest**
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 ridge			
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- 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		YVM Control- Carbofuran 3G @ 3 gm/m2		
French bean	Rust disease Control- Mancozeb 2.5 kg/ ha			

2.3 Floods

Condition	**Suggested contingency measure[o]**			
Transient water logging/ partial inundation[1]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
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 to 15cm ht. Irrigation Intercultivation,		Harvest in dry weather

		Mulching with weeds		
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 management	Mass vaccination and de worming	Provide shades to animals and water as much as possible. Treatment of diseased animals and proper disposal of carcasses.	Treatment of diseased animals and provide vitamin and mineral supplement to regain strength and vigour.

[s] based on forewarning wherever available

2.5.2 Poultry

	Suggested contingency measures	**Convergence/linkages with ongoing programs, if any**

	Before the event[a]	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.

[a] based on forewarning wherever available