

State: Madhya Pradesh
Agriculture Contingency Plan for District: SEONI

1.0 District Agriculture profile			
1.1	Agro-Climatic/Ecological Zone		
	Agro Ecological Sub Region (ICAR)	Central Highlands (Malwa And Bundelkhand), Hot Subhumid (Dry) Eco-sub region (10.4)	
	Agro-Climatic Zone (Planning Commission)	Central Plateau And Hills Region (VIII)	
	Agro Climatic Zone (NARP)	Kymore Plateau and Satpura Hill Zone (MP-4)	
	List all the districts or part thereof falling under the NARP Zone	Seoni, Jabalpur, Katni, Rewa, Satna, Sidhi, Panna, Singrouli	
	Geographic coordinates of district headquarters	Latitude	Longitude
		22° 06' N	79° 35' E
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Altitude	
		209 msl	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	ADR, ZARS, JNKVV, JABALPUR (M.P.)	
	Mention the KVK located in the district	Programme Coordinator Krishi Vigyan Kendra, Old Nagpur Naka, NH-7 Nagpur Road, Distt. Seoni – 480 661	
1.2	Rainfall	Normal RF(mm)	Normal Onset
		Normal Cessation	
	SW monsoon (June-Sep):	1153.5	2 nd week of June
	NE Monsoon(Oct-Dec):	74.9	1 st week of October
	Winter (Jan- Feb0	45.8	-
	Summer (March-May)	43.4	-
	Annual	1317.6	-

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)	875.4	426.7	328.2	48.2	20.1	40.20	0.0	12.0	27.50	27.5

*Net area sown+ current fallow+ old fallow

1.4	Major Soils (common names like red sandy loam deep soils (etc.))*	Area ('000 ha)	Percent (%) of total
	Deep to Medium Black Soil	223.4	45
	Shallow to medium deep sandy loam soil	124.1	25
	Shallow red black gravelly soil	148.9	30

Source: NBSS & LUP, Nagpur

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	371.7	133
	Area sown more than once	122.0	
	Gross cropped area	493.7	

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	113.7		
	Gross irrigated area	113.7		
	Rainfed area	258.0		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals	79	56.8	49.9
	Tanks	790	8.9	7.8
	Open wells	24367	31.8	27.9
	Bore wells	954	3.3	2.9
	Lift irrigation schemes	NA	0	--
	Micro-irrigation	NA	0.2	--

	Other sources (Reservoirs)	43	13.2	11.6
	Total Irrigated Area		113.7	
	Pump sets	22515		
	No. of Tractors	2436		
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils 08	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited	-		fluoride
	Critical	-		
	Semi- critical	-		Nil
	Safe	8		
	Wastewater availability and use	Nil		
	Ground water quality	Fluoride problem in groundwater in some blocks		
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

1.7 Area under major field crops & horticulture etc. (2008-09)

1.7	Major Field Crops cultivated	Area ('000 ha)							
		Kharif			Rabi			Summer	Total
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
	Rice	-	-	120.4	-	-	-	-	120.4
	Soybean	-	-	110.7	-	-	-	-	110.7
	Kodo kutki	-	-	16.0	-	-	-	-	16.0
	Maize	-	-	11.8	-	-	-	-	11.8
	Pigeonpea (Tur)	-	-	6.7	-	-	-	-	6.7
	Wheat	-	-	-	-	-	106.6	-	106.6
	Chickpea	-	-	-	-	-	45.9	-	45.9
	Lentil	-	-	-	-	-	12.6	-	12.6
	linseed	-	-	-	-	-	10.3	-	10.3
	Pea	-	-	-	-	-	7.6	-	7.6
	Horticulture crops - Fruits	Total area(ha)			Irrigated		Rainfed		
	Orange	75			-		-		
	Mango	66			*		-		
	Leman	22			-		-		

	Guava	12	*	-
	Anola	-	-	1000
	Others (specify)			
	Horticultural crops - Vegetables	Total area(ha)	Irrigated	Rainfed
	Tomato	1070		-
	Onion	437		-
	Brinjal	590		-
	Chili	262		-
	Cucurbits	-		-
	Others (specify)			-
	Medicinal and Aromatic crops	Total area	Irrigated	Rainfed
		-	-	-

	Plantation crops	Total area	Irrigated	Rainfed
		NA	-	-
	Others such as industrial pulpwood crops etc (specify)			
	Fodder crops	Total area (ha)	Irrigated	Rainfed
	Berseem, Chari etc	1395	1395	-
	-	-	-	-
	Others (specify)			
	Total fodder crop area	1395	1395	-
	Grazing land	Nil		
	Sericulture etc	Nil		
	Others (Specify)			

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)			500.20
	Crossbred cattle			NA
	Non descriptive Buffaloes (local low yielding)			NA
	Graded Buffaloes		-	114.80
	Goat			139.70

	Sheep	-	-	0.10			
	Others (Pig and horse)			6.80			
	Commercial dairy farms (Number)			2			
1.9	Poultry	No. of farms	Total No. of birds ('000)				
	Commercial	16	35000				
	Backyard	18910	193.608				
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	
		1051		100		1630	
	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)	6583		0.13 ton/ha		2467.00 ton	
	Others	-		-		-	

1.11 Production and Productivity of major crops

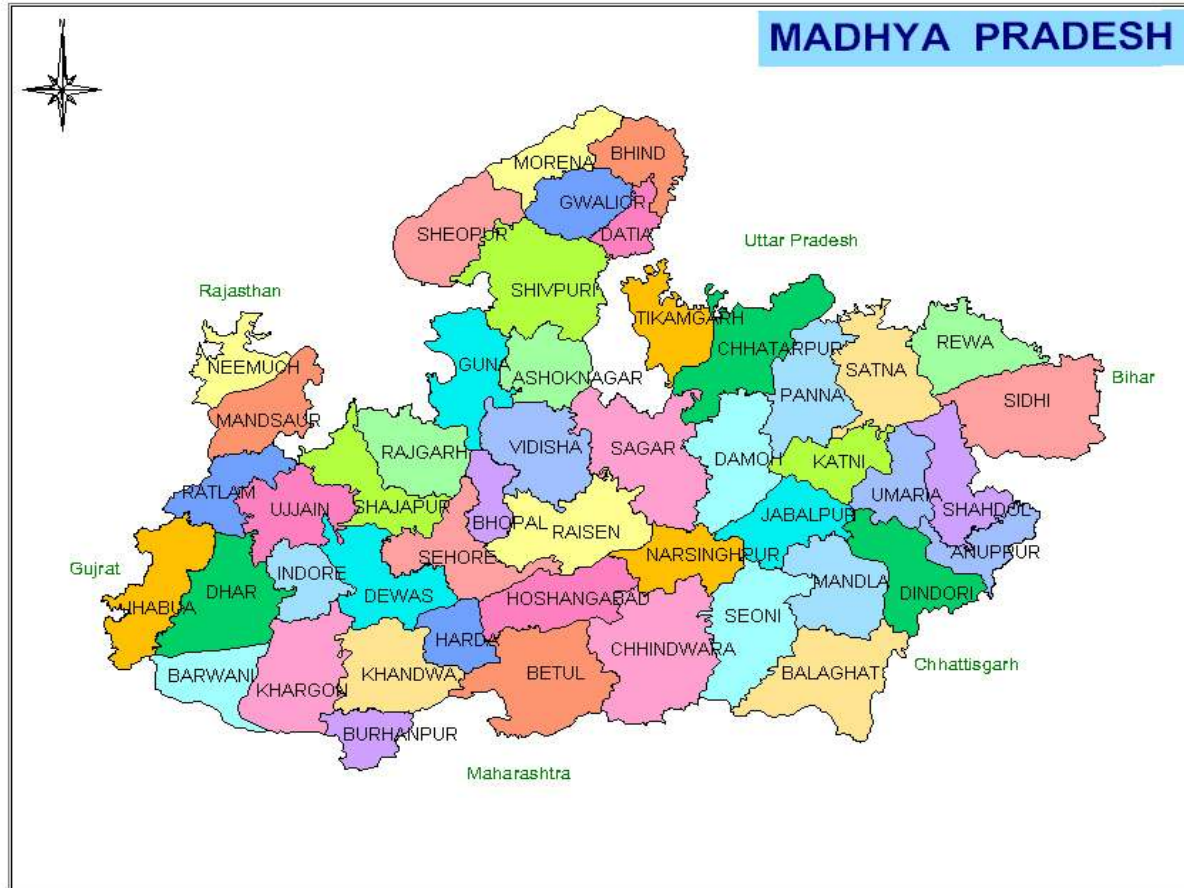
1.11	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder ('000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
	Rice	126.8	1127					126.8	1127	
	Soybean	98.1	969					98.1	969	
	Maize	14.4	1204					14.4	1204	
	Pigeonpea	6.7	1017					6.7	1017	
	Kodo kutki	4.0	205					4.0	205	
	Wheat			95.3	923			95.3	923	
	Chickpea			28.8	625			28.8	625	
	Lentil			4.3	367			4.3	367	
	linseed			3.7	365			3.7	365	
	Pea			2.8	367			2.8	367	
Major Horticultural crops (Crops to be identified based on total acreage) NA.										
	Mango	-	-			52	13000	52	13000	-
	Guava	-	-	22.5	9000			22.5	9000	-
	Aonla	-	-	10	10000			10	10000	-
	Tomato	-	-	46.2	14000			46.2	14000	-
	Potato	-	-	20.1	13000			20.1	13000	-

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Rice	Soybean	Maize	Wheat	Chickpea
	Kharif- Rainfed	2 nd week of June- 2 nd week of August	3 rd week of June- 2 nd week of July	2 nd week of June- 4 th week of June	-	-
	Kharif-Irrigated	2 nd week of June- 2 nd week of August	-	4 th week of May- 2 nd week of June	-	-
	Rabi- Rainfed	-	-	-	2 nd week of October- 1 st week of November	2 nd week of October.- 2 nd week of November
	Rabi-Irrigated	-	-	-	2 nd week of November- 1 st week of December	1 st week of November.- 4 th week of November.

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) Tobacco Caterpillar in Soybean Chickpea pod barer in Chickpea Rice cut worm in Rice		✓	
	Others (specify)			

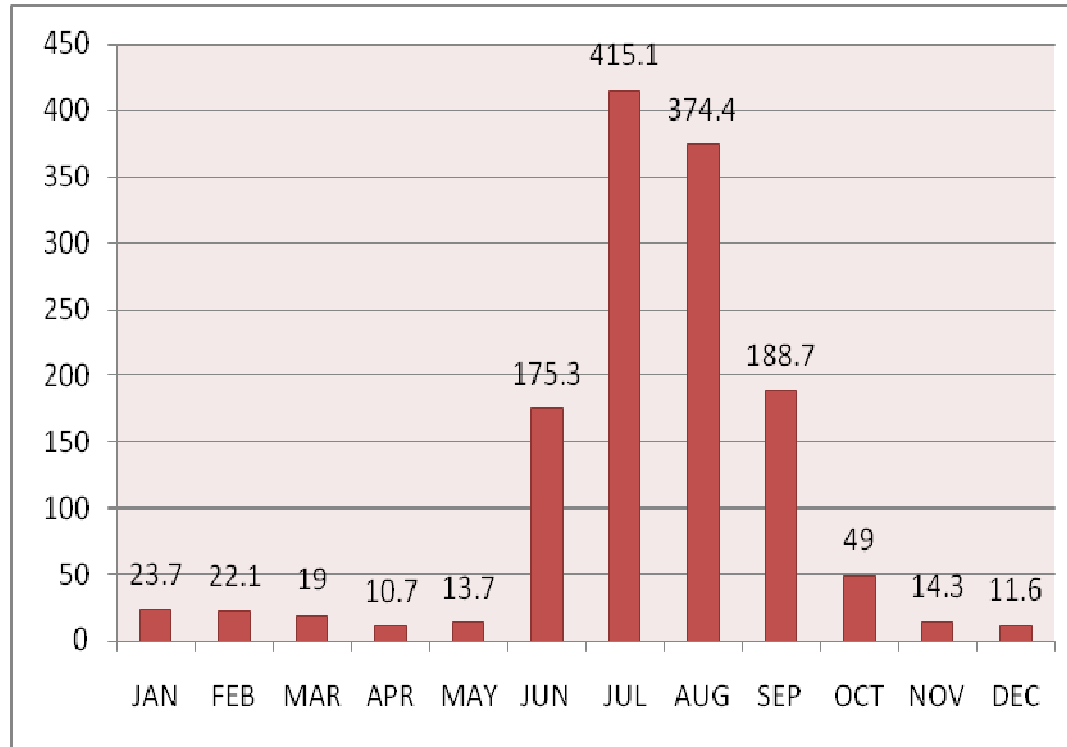
1.14	Include Digital maps of the district for		
		Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

Annexure I

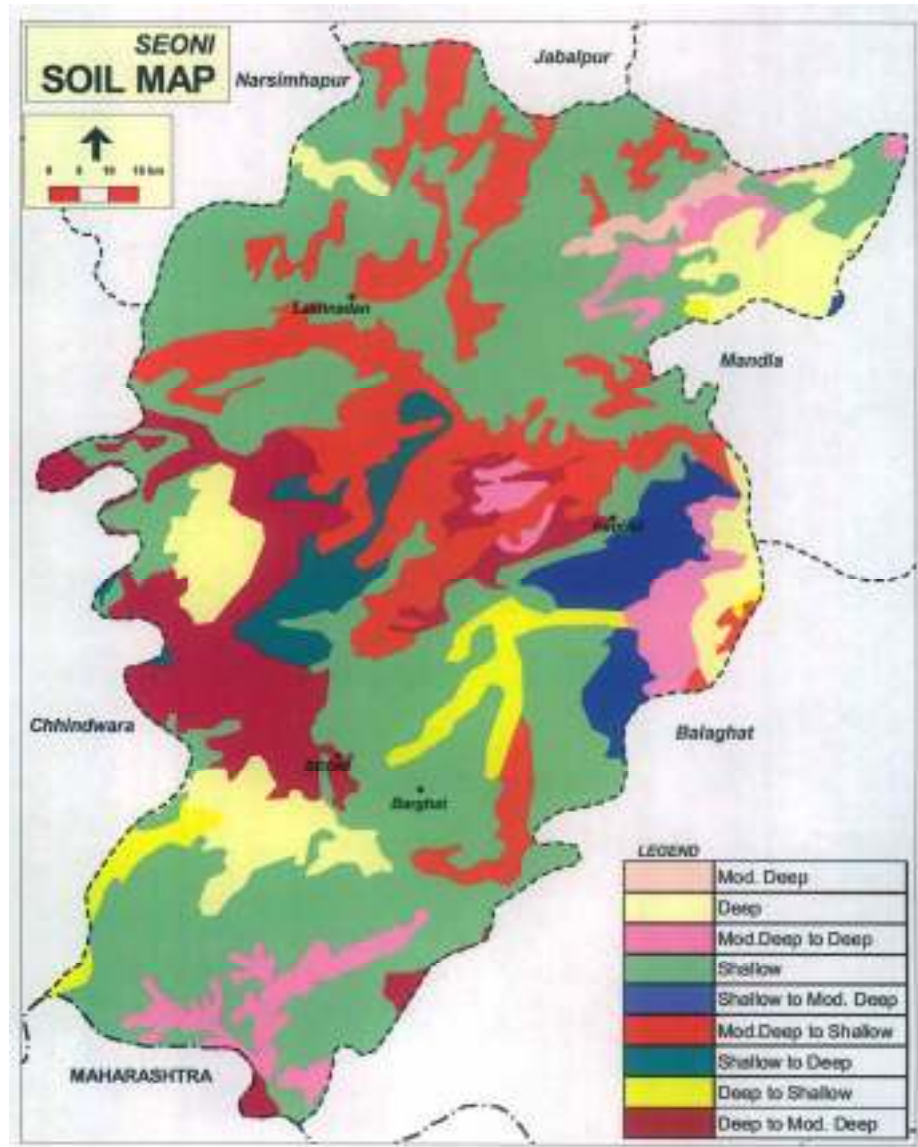




Annexure II



Annexure III



Source: NBSS & LUP, Nagpur

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Suggested Contingency measures	
				Agronomic measures	Remarks on Implementation
Delay by 2 weeks 4th week of June	Deep black soils (1100 mm rainfall)	Rice – Wheat/Chickpea	No Change	<ol style="list-style-type: none"> 1. Sowing on ridge & furrow with closer spacing 2. Adopt recommended package of practices 3. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers 4. Spacing with 20% higher seed rate 5. Under traditional system of planting of 3-4 seedlings of 18-21 ages in 20x10 cm at one place for late mature rice under. 6. For early maturing varieties, adopt 15x15 cm geometry but seedlings are not more than 18 to 21 days old 	Source of seed SAU, NSC & SSC Ongoing scheme like RKVY NREGS etc.
		Soybean – Wheat/Chickpea (Soybean – JS-9305, JS-335, JS-95 60)			
		Maize– Wheat/Chickpea			
	Medium deep sandy loam soils (1100 mm rainfall)	Rice	Choose 100-110 days varieties		
		Maize– Wheat/Chickpea	No Change		
		Soybean			
	Shallow soils (mixed red & black soil with <1000 mm rainfall)	Groundnut			
		Soybean			
		Maize			
		Upland Rice			
		Minor millets			

Condition	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Suggested Contingency measures	
				Agronomic measures	Remarks on Implementation
Delay by 4 weeks 2nd week of July	Deep black soils (1100 mm rainfall)	Rice – Wheat/Chickpea	Greengram/ Sesame	<ol style="list-style-type: none"> 1. Blade harrowing (Bakhar) for moisture conservation. 2. Remove the weeds and 	Source of seed SAU, NSC & SSC Ongoing scheme like RKVY
		Soybean – Wheat/Chickpea	Prefer early maturing varieties or Maize/ Greengram/ Blackgram		

		(Soybean – JS-9305, JS-335, JS-95 60)		<p>use the uprooted weeds as mulch between row of crops for moisture conservation</p> <p>3. Adopt of plant protection as per requirement and rainfall condition</p> <p>4. Under traditional system of planting of 3-4 seedlings of 18-21 ages in 20x10 cm at one place for late mature rice under.</p> <p>5. For early maturing varieties, adopt 15x15 cm geometry but seedlings are not more than 18 to 21 days old.</p>	NREGS etc.
		Maize– Wheat/Chickpea	Greengram/ Blackgram		
	Medium deep sandy loam soils (1100 mm rainfall)	Rice	Choose 100-110 days varieties Or Greengram/ Sesame		
		Maize– Wheat/Chickpea	Greengram/ Blackgram		
		Soybean	Prefer early maturing varieties or Greengram/ Blackgram		
	Shallow soils (mixed red & black soil with <1000 mm rainfall)	Groundnut	Greengram/ Sesame		
		Soybean	Prefer early maturing varieties (JS-95 60) or Greengram/ Blackgram		
		Maize	Greengram		
		Upland Rice	Greengram/ Blackgram/ Sesame		
			Minor millets		

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 6 Weeks 4th week of July	Deep black soils (1100 mm rainfall)	Rice – Wheat/Chickpea	Replace rice with alternate crops like Castor/ Niger/ sesame or Choose rice varieties like JR-201 (< 100 days)	<ol style="list-style-type: none"> Blade harrowing (Bakhar) for moisture conservation Remove the weeds 100 kg seed /ha required for lehi system in rice. Intercropping of niger with pigeonpea 	Source of seed SAU, NSC & SSC Ongoing scheme like RKVY NREGS etc.
		Soybean – Wheat/Chickpea (Soybean – JS-9305, JS-335, JS-95 60)			
		Maize– Wheat/Chickpea			
	Medium deep sandy loam soils (1100 mm rainfall)	Rice	Choose 100-110 days varieties Or Sesame		
		Maize– Wheat/Chickpea	Groundnut		
		Soybean	Early var. of rice up to 100 days or Sesame		
		Groundnut	Sesame		

	Shallow soils (mixed red & black soil with <1000 mm rainfall)	Soybean	Niger/ Kodo & Kutki/ Sesame		
		Maize			
		Upland Rice			
		Minor millets	No change Or Sesame		

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 8 weeks 2nd week of August	Deep black soils (1100 mm rainfall)	Rice – Wheat/Chickpea	Castor/ Niger/ Plan for Rabi Sorghum Choose rice varieties like JR-201 (< 100 days)	1.Blade harrowing (Bakhar) for moisture conservation. 2.Don't sow soybean and maize 3.Intercropping of sesame and niger with pigeonpea	Source of seed SAU, NSC & SSC Ongoing scheme like RKVY NREGS etc.
		Soybean – Wheat/Chickpea (Soybean – JS-9305, JS-335, JS-95 60)			
		Maize– Wheat/Chickpea			
	Medium deep sandy loam soils (1100 mm rainfall)	Rice	Prefer 100-110 days varieties		
		Soybean	Prefer early var. of rice up to 100 days or Niger		
		Maize– Wheat/Chickpea	Niger		
		Groundnut			
	Shallow soils (mixed red & black soil with <1000 mm rainfall)	Soybean	Niger/ Kodo & Kutki/ Sesame		
		Maize			
		Upland Rice			
		Minor millets	No change Prefer short duration varieties		

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
	Deep black soils	Rice – Wheat/Chickpea	Re-sowing & replace with	1. Preparation of	Source of seed

Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	(1100 mm rainfall)	Soybean – Wheat/Chickpea (Soybean – JS-9305, JS-335, JS-95 60)	early maturing varieties in case of poor plant population; Gap filling in rice, maize and soybean.	ridges at every 15-20 lines of crops for the moisture conservation	SAU, NSC & SSC Ongoing scheme like RKVY NREGS etc.
		Maize– Wheat/Chickpea			
		Medium deep sandy loam soils (1100 mm rainfall)			
	Medium deep sandy loam soils (1100 mm rainfall)	Soybean			
		Maize– Wheat/Chickpea			
		Groundnut			
		Shallow soils (mixed red & black soil with <1000 mm rainfall)			
	Shallow soils (mixed red & black soil with <1000 mm rainfall)	Maize			
		Upland Rice			
		Minor millets			

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	Deep black soils (1100 mm rainfall)	Rice – Wheat/Chickpea	Weed management with hand hoe	1. Interculture with Dora/Kulpha/Hand hoe in between rows and use of uprooted weeds use as mulch for moisture conservation 2. Application of FYM and vermicompost at the time of resowing. 3. Preparation of ridges at every 15-20 lines of crops for the moisture conservation	-
		Soybean – Wheat/Chickpea			
		Maize– Wheat/Chickpea			
	Medium deep sandy loam soils (1100 mm rainfall)	Rice	Spraying of 2% Urea in cereals.		
		Soybean			
		Maize– Wheat/Chickpea			
		Groundnut			
	Shallow soils (mixed red & black soil with <1000 mm rainfall)	Soybean	Intercultural operations		
		Maize			
		Upland Rice			
		Minor millets			
			Protective irrigation		

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	Deep black soils (1100 mm rainfall)	Rice – Wheat/Chickpea	Weed management with hand hoe Spraying of 2% Urea in cereals.	1. Interculture with Dora/Kulpha/Hand hoe in between rows and use of uprooted weeds use as mulch for moisture conservation 2. Preparation of ridges at every 15-20 lines of crops for the moisture conservation	-
		Soybean – Wheat/Chickpea			
		Maize– Wheat/Chickpea			
	Medium deep sandy loam soils (1100 mm rainfall)	Rice	Intercultural operations		
		Soybean			
		Maize– Wheat/Chickpea			
		Groundnut			
	Shallow soils (mixed red & black soil with <1000 mm rainfall)	Soybean	Protective irrigation		
		Maize			
		Upland Rice			
		Minor millets			

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
	Deep black soils (1100 mm rainfall)	Rice – Wheat/Chickpea	Harvest crop at physiological maturity	Plan for early rabi cropping like Lentil , mustard & fieldpea can sow after 15 th September	-
		Soybean – Wheat/Chickpea			
		Maize– Wheat/Chickpea			
	Medium deep sandy loam soils (1100 mm rainfall)	Rice		In kharif Fallow fields the Rabi crops like Lentil , mustard & Chickpea can sow after 15 th September.	
		Soybean			
		Maize– Wheat/Chickpea			
		Groundnut			
	Shallow soils (mixed red & black soil with <1000 mm rainfall)	Soybean			
		Maize			
		Upland Rice			
		Minor millets			

2.1.2 Irrigated situation

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall	Low land medium black soils	Rice	Select 100-110 days maturing rice varieties	<p>Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice</p> <p>Follow closer spacing in rice;</p> <p>Reduce the area under irrigated Rice</p> <p>Adopt Rice+Relay cropping/paira or utera crop with any short duration pulses</p> <p>Irrigate at critical stages</p>	Sources of seed SAU, NSC & SSC For Agronomic Ongoing scheme like RKVY NREGS ets.
		Soybean	Medium maturing varieties	<p>Sowing in ridge and furrows</p> <p>Irrigate at critical stages</p>	
Limited release of water in canals due to low rainfall	Low land medium black soil	Rice	Reduce the area of Rice as per availability of water	<p>Adopt closer spacing in rice</p> <p>Reduce the area under irrigated Rice</p> <p>Adopt Rice+Relay cropping/paira or utera crop with any short duration pulses</p>	
		Soybean	Prefer short duration varieties	-	

Non release of water in canals under delayed onset of monsoon in catchment	Low land medium black soil	Rice	Blackgram / Greengram	Adopt Rice+Relay cropping/paira or utera crop with any short duration pulses Sowing of blackgram on ridges & furrows. Prepare furrows with suitable drainage
		Soybean		
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Low land medium black soil	Rice	70 to 100 days var. of Rice through broadcasting or line	Adopt Rice+Relay cropping/paira or utera crop with any short duration pulses Adopt closer spacing
		Soybean	Sowing of short duration crops like Blackgram & sesame.	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	Upland medium black soils	Soybean	Prefer early maturing var. of soybean & rice in limited area.	Reduce the area under irrigated Rice	Sources of seed SAU, NSC & SSC For Agronomic Ongoing scheme like RKVY NREGS etc.
		Rice	Alternate crops like Blackgram / Greengram /Sesame.	Directed seeded rice	

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	Flowering stage	Crop maturity stage	Post harvest
Rice	Drain the excess water as early as possible Apply 20 kg N + 10 kg K /ha	Drain the excess water as early as possible Apply 20 kg N + 10 kg K /ha	Drain the excess water as early as possible Take up suitable plant	Drain out water and spread sheaves loosely in field or field bunds where there is no

	after draining excess water Take up gap filling either with available nursery or by splitting the tillers from the surviving hills Take up suitable plant protection Measures in anticipation of pest & disease out breaks	after draining excess water Take up suitable plant protection Measures in anticipation of pest & disease out breaks	protection measures in anticipation of pest & disease out breaks	water stagnation Spray common salt at 5% on panicles to prevent germination and spoilage of straw from moulds Thresh after drying the sheaves properly Ensure proper grain moisture before storing
Soybean Maize Groundnut Pigeonpea wheat/ Chickpea	Proper Drainage. Care should be taken that rain water does not stagnate in the field. Intercultural operations to provide aeration in soil.	Drainage & application of nutrient. Care should be taken that rain water does not stagnate in the field. Intercultivation for aeration	Drainage & crop harvest of crop physiological maturity to prevent seed germination. Harvesting of in clear weather and shifting of produce in safe place.	Shifting of produce in safer place. Storage after proper drying Protect the produce by tarpaulin kept in T. floor. Sun drying before storage.
Horticulture				
Okra, Cowpea, Cucurbits, Brinjal, Tomato	Plantation in ridge furrow With proper drainage	Drainage & application of nutrient spray	Staking & harvest crop in physiological maturity	Shifting of produce in safer place.
Heavy rainfall with high speed winds in a short span²				
Rice , Soybean, Maize, Groundnut, Pigeonpea, wheat/ Chickpea	Drainage	Drainage & application of nutrient spray	Drainage, crop harvest at Physiological maturity	Shifting of produce in safer place.
Horticulture				
Okra, Cowpea, Cucurbits, Brinjal, Tomato	Drainage & staging	Drainage & application of nutrient spray	Drainage crop harvest of Physiological maturity	Shifting of produce in safer place.
Outbreak of pests and diseases due to unseasonal rains				
Rice	Spraying of Monocrotophos 36 EC 14 ml or Cypermethrin 10 EC 6 ml per 10 liter of water against stem borer	Spraying of Monocrotophos 36 EC 14 ml or Cypermethrin 10 EC 6 ml per 10 liter of water against stem borer	Removal and destruction of infected panicles due to Loose smut	
Soybean	Carry out critical survey of	Carry out critical survey of	Carry out critical survey of	-

	fields for insect and disease attack in crops To control semi-looper spray NSKE 5% or quinalphos 25 EC 20 ml/10 lit.	fields for insect and disease attack in crops To control semilooper spray NSKE 5% or quinalphos 25 EC 20 ml/10 lit.	fields for insect and disease attack in crops	
Wheat	Spray 0.2 % Dithane M-45 WP against wheat rust.	Spray 0.2 % Dithane M-45 WP against wheat rust.		
Chickpea	Spray triazophos 40 % EC @ 1-1.5 l/ha in chickpea against pest incidence. · “T” shaped pegs placed in late sow chickpea field for biological control of pod borer and for chemical control spraying of quinalphos 25 EC or Chlorpyriphos 20 EC C or Methyl Parathion 50 EC @ 600 ml dissolve in 500 L of water should be used. Dusting of Fenvalerate 0.4% or quinalphos 1.5 WP 20-25 per hectare with duster.	Spray triazophos 40 % EC @ 1-1.5 l/ha in chickpea against pest incidence. · “T” shaped pegs placed in late sow chickpea field for biological control of pod borer and for chemical control spraying of Quinolphos 25 EC or Chlorpyriphos 20 EC C or Methyl Parathion 50 EC @ 600 ml dissolve in 500 L of water should be used. Dusting of Fenvalerate 0.4% or quinalphos 1.5 WP 20-25 per hectare with duster.	Spray triazophos 40 % EC @ 1-1.5 l/ha in chickpea against pest incidence. Carry out critical survey of fields for insect and disease attack in crops	
Horticulture				
Okra, Cowpea, Cucurbits, Brinjal, Tomato	Drainage & staking	Drainage & application of nutrient spray	Use of boipesticide such as Neem oil, NPV etc. Crop harvest at Physiological maturity	Shifting of produce in safer place.

2.2 Floods - Not Applicable

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation ¹				
Continuous submergence for more than 2 days ²	NA			

Sea water intrusion ³	
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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
Heat Wave				
Rice	Light and repeated irrigation at the appearance of hair line cracks in soil surface, Correct iron deficiency with 0.5% iron sulphate spray.	Repeated irrigation at the appearance of hair line cracks in soil surface, pounding of water for 15 days after transplanting to check Fe deficiency and for crop establishment.	Repeated irrigation at the appearance of hairline cracks in soil surface	Harvest crop at physiological maturity
Soybean, Pigeonpea, Maize	Protect the crop with the help of light irrigation; wind breaks are necessary where cold and heat wave in regular	Protect the crop with the help of light irrigation; wind breaks are necessary where cold and heat wave in regular	Protect the crop with the help of light irrigation; wind breaks are necessary where cold and heat wave in regular	Harvest at physiological maturity
Horticulture				
Mango , Guava	Protect the crop with the help of light irrigation, wind breaks are necessary where cold and heat wave in regular	Protect the crop with the help of light irrigation; wind breaks are necessary where cold and heat wave in regular	Protect the crop with the help of light irrigation; wind breaks are necessary where cold and heat wave in regular	Harvest at physiological maturity
Cold wave				
Chick pea Wheat	Light irrigation Smoking during night to increase the temperature	Light irrigation Smoking during night to increase the temperature	Light irrigation Smoking during night to increase the temperature	Harvest at physiological maturity
Frost				
Chickpea, Lentil, Pigeonpea	Protect the crop with the help of light irrigation; Smoke generation at night time to rise temperature ; Wind breaks are necessary where cold and heat wave in regular	Protect the crop with the help of light irrigation, Smoke generation at night time to rise temperature ; Wind breaks are necessary where cold and heat wave in regular	Protect the crop with the help of light irrigation, Smoke generation at night time to rise temperature ; Wind breaks are necessary where cold and heat wave in regular	Harvest at physiological maturity
Hailstorm	Not applicable			
Cyclone	Not applicable			

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	<p>As the district is occasionally prone to drought the following practices may be implemented to prevent fodder shortage problem</p> <p>Sowing of cereals (fodder varieties of Sorghum/ Bajra) and leguminous crops (Lucerne, Berseem, Horse gram, Cowpea) during North-East monsoon under dry land system for fodder production.</p> <p>Collection of soybean and chick pea stover for use as feed supplement during drought</p> <p>Preserving the green maize fodder as silage</p> <p>Encourage fodder production with Bajra – stylo-Bajra on rotation basis and also to cultivate short-term fodder crops like sunhemp</p>	<p>Harvest and use biomass of dried up crops (Rice, wheat, Maize, Soybean, Black gram, Green gram, chick pea etc.,) material as fodder</p> <p>Harvest all the top fodder available (Subabul, Glyricidia, Pipol, Prosopis etc) and feed the LS during drought</p> <p>Concentrate ingredients such as Grains, brans, chunnies & oilseed cakes, low grade grains etc. unfit for human consumption should be procured from Govt. Godowns for feeding as supplement for high productive animals during drought</p> <p>Promotion of Horse gram as contingent crop and harvesting it at vegetative stage as fodder</p> <p>Continuous supplementation of minerals and vitamin to prevent infertility.</p> <p>Encourage mixing available kitchen waste with dry fodder while feeding to the milch animals</p>	<p>Encourage progressive farmers to grow multi cut fodder crops of sorghum/bajra/maize with input subsidy</p> <p>Supply of quality stem cuttings of Hybrid napier (CO1), paragrass, guinea grass etc., well before monsoon</p> <p>Encourage growing fodder crops like Berseem in winter and Juar in summer season</p> <p>Flushing the stock to recoup</p> <p>Replenish the feed and fodder banks</p>
Drinking water	<p>Adopt various water conservation methods at village level to improve the ground water level for adequate water supply.</p>	<p>Adequate supply of drinking water.</p> <p>Restrict wallowing of animals in water bodies/resources; Add alum in stagnated water</p>	<p>Watershed management practices shall be promoted to conserve the rainwater. Bleach (0.1%) drinking</p>

	<p>Identification of water resources</p> <p>De-silting of ponds</p> <p>Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals)</p> <p>Construction of drinking water tanks in herding places/village junctions/relief camp locations</p> <p>Community drinking water trough can be arranged in sandies /community grazing areas</p>	bodies	<p>water / water sources</p> <p>Provide clean drinking water</p>
Health and diseases management	<p>Procure and stock emergency medicines and vaccines for important endemic diseases of the area</p> <p>All the stock must be immunized for endemic diseases of the area</p> <p>Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district</p> <p>Adequate refreshment training on draught management to be given to VAS, Jr.VAS, LI with regard to health & management measures</p> <p>Procure and stock multivitamins & area specific mineral mixture</p>	<p>Carryout deworming to all animals entering into relief camps</p> <p>Identification and quarantine of sick animals</p> <p>Constitution of Rapid Action Veterinary Force</p> <p>Performing ring vaccination (8 km radius) in case of any outbreak</p> <p>Restricting movement of livestock in case of any epidemic</p> <p>Tick control measures be undertaken to prevent tick borne diseases in animals</p> <p>Rescue of sick and injured animals and their treatment</p> <p>Organize with community, daily lifting of dung from relief camps</p>	<p>Keep close surveillance on disease outbreak.</p> <p>Undertake the vaccination depending on need</p> <p>Keep the animal houses clean and spray disinfectants Farmers should be advised to breed their milch animals during July-September so that the peak milk production does not coincide with mid summer</p>
Floods	NA		
Cyclone	NA		
Heat wave and cold wave			
Heat wave	<p>i) Plantation around the shed</p> <p>ii) H₂O sprinklers / foggers in the shed</p> <p>iii) Application of white reflector paint on the roof</p> <p>iv) Thatched sheds should be provided as a</p>	<p>Allow the animals early in the morning or late in the evening for grazing during heat waves</p> <p>Feed green fodder/silage / concentrates during day time and roughages / hay during night time in case of heat waves</p>	<p>Feed the animals as per routine schedule</p> <p>Allow the animals for grazing (normal timings)</p>

	shelter to animal to minimize heat stress	Put on the foggers / sprinklers /fans during heat waves in case of high yielders (Jersey/HF crosses) In severe cases, vitamin 'C' and electrolytes should be added in H ₂ O during heat waves.	
Cold wave	Covering all the wire meshed walls / open area with gunny bags/ polyethylene sheets (with a mechanism for lifting during the day time and putting down during night time)	Allow for grazing between 10AM to 3PM during cold waves Add 25-50 ml of edible oil in concentrates and fed to the animal during cold waves Apply / sprinkle lime powder in the animal shed during cold waves to neutralize ammonia accumulation	Feed the animals as per routine schedule Allow the animals for grazing (normal timings)
Insurance	Encouraging insurance of livestock	Listing out the details of the dead animals	Submission for insurance claim and availing insurance benefit Purchase of new productive animals

2.5.2 Poultry

	Suggested contingency measures		
	Before the event	During the event	After the event
Drought			
Shortage of feed ingredients	Storing of house hold grain like maize, broken rice etc, in to use as feed in case of severe drought	Supplementation only for productive birds with house hold grain Supplementation of shell grit (calcium) for laying birds Culling of weak birds	Supplementation to all survived birds
Drinking water		Use water sanitizers or offer cool hygienic drinking water	
Health and disease management	Culling of sick birds. De-worming and vaccination against RD and IBD	Mixing of Vit. A,D,E, K and B-complex including vit C in drinking water (5ml in one litre water)	Hygienic and sanitation of poultry house Disposal of dead birds by burning

			/ burying with lime powder in pit
Floods	NA		
Cyclone	NA		
Heat wave and cold wave			
Shelter/environment management	Heat wave: Provision of proper shelter with good ventilation	In severe cases, foggers/water sprinklers/wetting of hanged gunny bags should be arranged Don't allow for scavenging during mid day	Routine practices are followed
	Cold wave: Provision of proper shelter Arrangement for brooding Assure supply of continuous electricity	Close all openings with polythene sheets In severe cases, arrange heaters Don't allow for scavenging during early morning and late evening	Routine practices are followed
Health and disease management	De-worming and vaccination against RD and fowl pox	Supplementation of house hold grain Provide cool and clean drinking water with electrolytes and vit. C In hot summer, add anti-stress probiotics in drinking water or feed	Routine practices are followed

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event	During the event	After the event
Drought			
Shallow water in ponds due to insufficient rains/inflow	1. Restricted release of water from reservoir. 2. Supplementary water harvest structures like pond and tanks have to be developed. 3. Renovation and maintenance of existing water harvest structures	1. Restrict lifting of water for irrigation purpose of crops 2. Catch the stock, market the produce to reduce the density of population in ponds.	1. Excavate the ponds to increase the depth. 2. Try to release water into the pond if it rains in off-season
Impact of heat & salt load build up in ponds / change in water quality	1. Prepare to release water into the habitat	1. Mixing of water from the water harvest structure like ponds and tanks into the fish habitat.	1. Monitoring the water quality and health of aquatic organisms
Floods	NA		

Cyclone	NA		
Heat wave and cold wave			
Management of pond environment	Good water quality to be maintained, Water depth to be maintained	Recirculation of water and pruning	Water treatment with lime
Health and diseases management	Prophylactic measures to be taken	Maintain good quality water in ponds	Treatment of pond water with lime and medicines