

State: Madhya Pradesh

Agriculture Contingency Plan for District: Rewa

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 (10.3)		
	Agro-Climatic Region (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	Jabalpur, Rewa, Sidhi, Satna, Panna, Katni, Seoni		
	Geographic coordinates of district headquarters Rewa	Latitude	Longitude	Altitude
		22 ^o .38' to 24 ^o .20' N	80 ^o .28' to 82 ^o .12' E	275 Msl
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Regional Agricultural Research Station , JNKVV, Rewa (M.P.)		
Mention the KVK located in the district	Programame Coordinator, Krishi Vigyan Kendra, Kuthulia Farm, Distt. Rewa – 486001			

1.2	Rainfall	Normal RF(mm)	Normal Onset	Normal Cessation
	SW monsoon (June-Sep)	1025.3	2 nd week of June	1 st week of October
	NE Monsoon(Oct-Dec)	53.6		
	Winter (Jan- Feb)	43.9		
	Summer (March-May)	20.3		
	Annual	1143.1		

1.3	Land use pattern of the district	Geographical Area (000 ha)	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)	628.8	352.2	85.7	61.4	26.9	5.5	1.5	34.4	37.6	23.6

1.4	Major Soils	Area ('000 ha)	Percent (%) of total
	1. Deep black soils	475.4	75.4
	2. Medium deep black soils	55.4	8.8
	3. Shallow (black/ mixed red and black) soils	99	15.7

Source: NBSS & LUP, Nagpur

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	352.2	136
	Area sown more than once	126.2	
	Gross cropped area	478.4	

(Source: Agriculture Statistics 2009, Directorate of Farmer Welfare and Agriculture Development Madhya Pradesh, Bhopal)

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	86.2		
	Gross irrigated area	96.6		
	Rainfed area	266		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals	41	12.4	12.9
	Tanks	321	1.6	1.6
	Open wells	12129	27.2	28.3
	Bore wells	7276	35.5	
	Lift irrigation schemes			
	Micro-irrigation			
	Other sources (Reservoir)	10	19.9	20.7
	Total Irrigated Area		96.60	
	Pump sets			
	No. of Tractors			
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils 09	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited			
	Critical			

	Semi- critical			
	Safe	09		
	Wastewater availability and use			
	Ground water quality	Hard water		
*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)							
		<i>Kharif</i>			<i>Rabi</i>			Summer	Total
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
	Rice			132.9					132.9
	Soybean			29.7					29.7
	Sorghum			16.2					16.2
	Pigeonpea			13.4					13.4
	Blackgram			11.1					11.1
	Wheat						147.2		147.2
	Chickpea						57.1		57.1
	Lentil						25.3		25.3
	Linseed						13.1		13.1
	Barley						4.7		4.7
	Horticulture crops - Fruits	Total area(ha)			Irrigated			Rainfed	
	Mango	1.595							
	Guava	0.042							
	Orange	0.002							
	Water Chestnut	0.079							
	Horticultural crops - Vegetables	Total area(ha)			Irrigated			Rainfed	
	Tomato	0.208							
	Potato	1.338							
	Cauliflower	0.091							
	Chilli	0.202							
	Onion	1.019							
	Medicinal and Aromatic crops	Total area			Irrigated			Rainfed	

	Ashwagandha	0.045	0.045	
	Turmeric	0.021	0.021	
	Plantation crops	Total area (000 ha)	Irrigated	Rainfed
	Mango	1.5	0.5	1.0
	Guava	1.2	0.85	0.35
	Citrus	0.5	0.5	0.0
	Aonla	1.3	0.5	0.8
	Fodder crops	Total area	Irrigated	Rainfed
	Berseem	0.70	0.70	
	MP chari	0.35	0.35	
	Total fodder crop area			
	Grazing land			
	Sericulture etc			

(Source : Agriculture Statistics 2009, Directorate of Farmer Welfare and Agriculture Development Madhya Pradesh, Bhopal)

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)			735
	Crossbred cattle			
	Non descriptive Buffaloes (local low yielding)			
	Graded Buffaloes			176
	Goat			173
	Sheep			22
	Others (Pig & horse)			24
	Commercial dairy farms (Number)			
1.9	Poultry	No. of farms	Total No. of birds ('000)	
	Commercial		3.54	
	Backyard			

1.10	Fisheries (Data source: Chief Planning Officer)			
	A. Capture-			
	i) Marine (Data Source: Fisheries)	No. of fishermen	Boats	Nets
				Storage facilities

Department)		Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	(Ice plants etc.)
ii) Inland (Data Source: Fisheries Department)	No. Farmer owned ponds	No. of Reservoirs		No. of village tanks		
	16	150		800		
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)	2615	2		0.852		

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)	
	Rice	102.7	785							
	Soybean	12.6	606							
	Pigeonpea	6.4	480							
	Blackgram	3.9	480							
	Sorghum	11.9	737							
	Wheat			140.8	980					
	Chickpea			53.7	889					
	Lentil			8.2	335					
	Linseed			3.4	235					
	Mustard			1	378					
Major Horticultural crops (Crops identified based on total acreage)										
	Tomato				21000					
	Chili				107 00					
	Onion				225 00					
	Potato				600 00					

	Cauliflower			40000					
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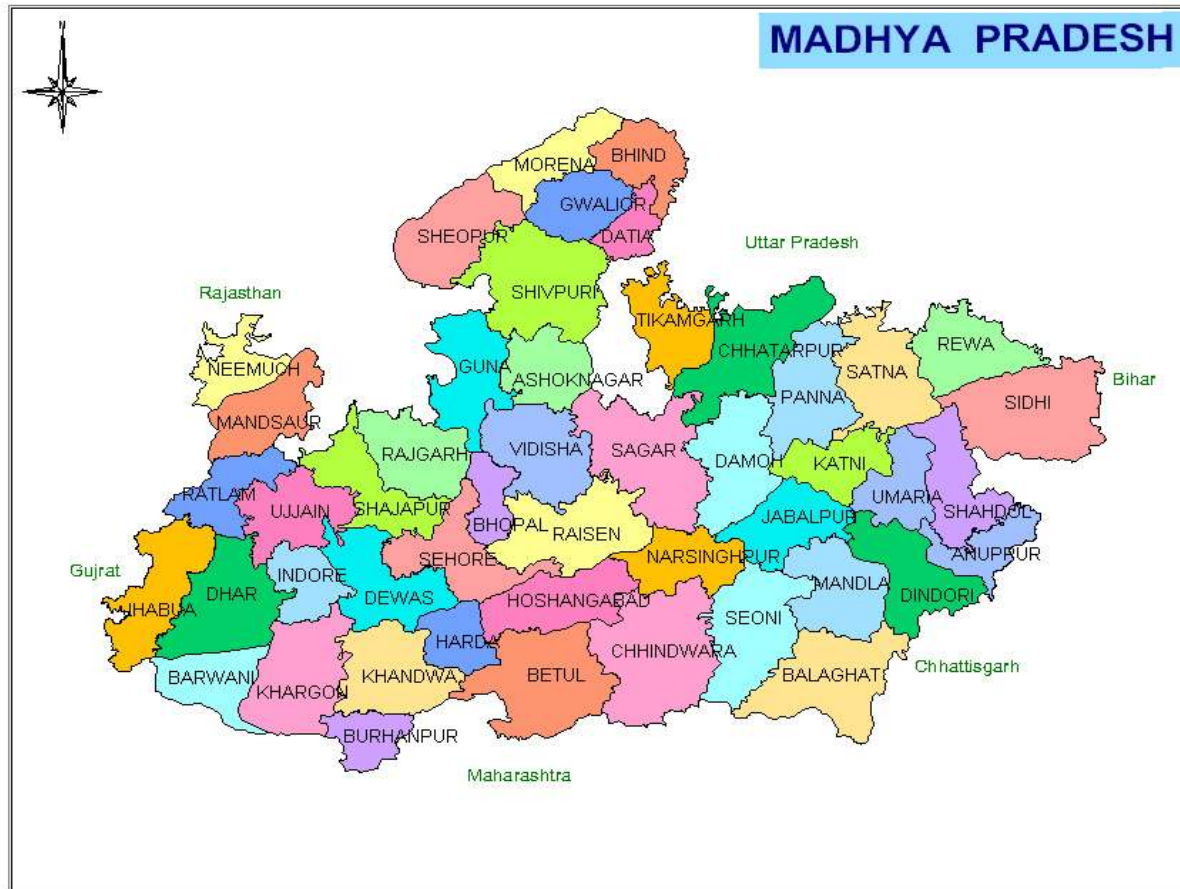
(Source : Agriculture Statistics 2009, Directorate of Farmer Welfare and Agriculture Development Madhya Pradesh, Bhopal)

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Kharif- Rice	Soybean	Blackgram/ Greengram	Pigeonpea	
	Kharif- Rainfed	3 rd week of June – 2 nd week of July	3 rd week of June – 1 st week of July	1 st week of July – 2 nd week of July	3 rd week of June - 2 nd week of July	
	Kharif-Irrigated	3 rd week of June – 3 rd week of July	3 rd week of June – 1 st week of July	1 st week of July – 2 nd week of July	3 rd week of June- 2 nd week of July	
		Rabi- Wheat	Chickpea	Lentil	Linseed	Mustard
	Rabi- Rainfed	1 st week of November - 3 rd week of November	3 rd week of October - 3 rd week of November	3 rd week of October - 4 th week of October	3 rd week of October - 4 th week of October	3 rd week of October - 4 th week of October
Rabi-Irrigated	3 rd week of November - 2 nd week of December	3 rd week of November - 4 th week of November	3 rd week of October - 4 th week of October	4 th week of October to 2 nd week of November	3 rd week of October - 4 th week of October	

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 Paddy cut worm in Rice		√

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

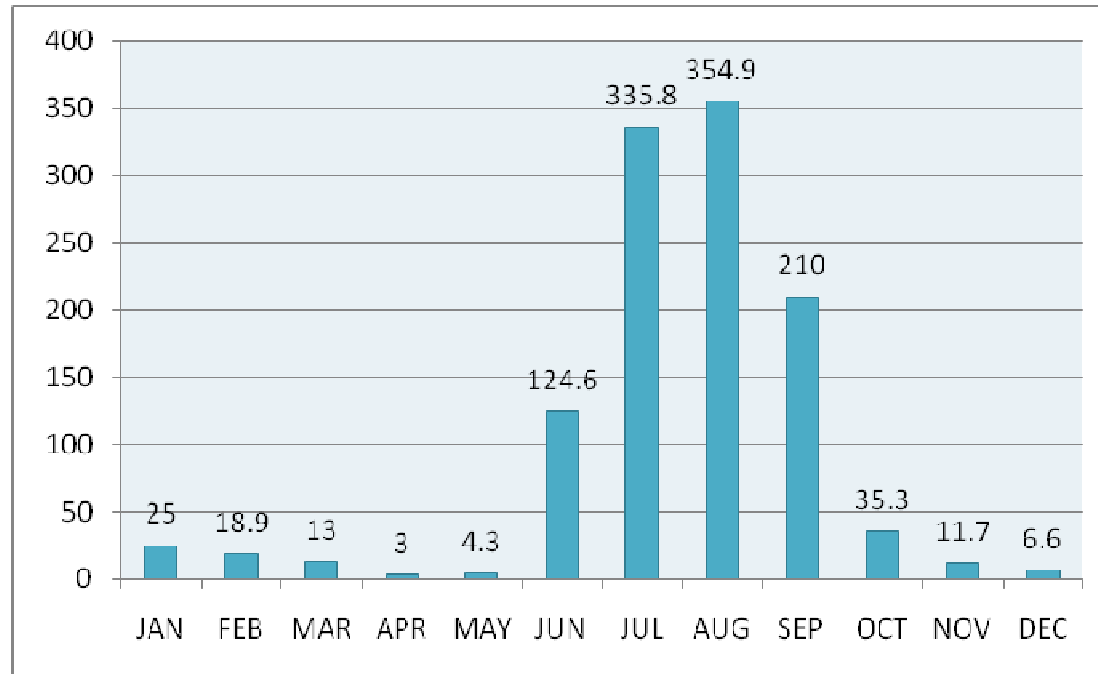
Annexure I



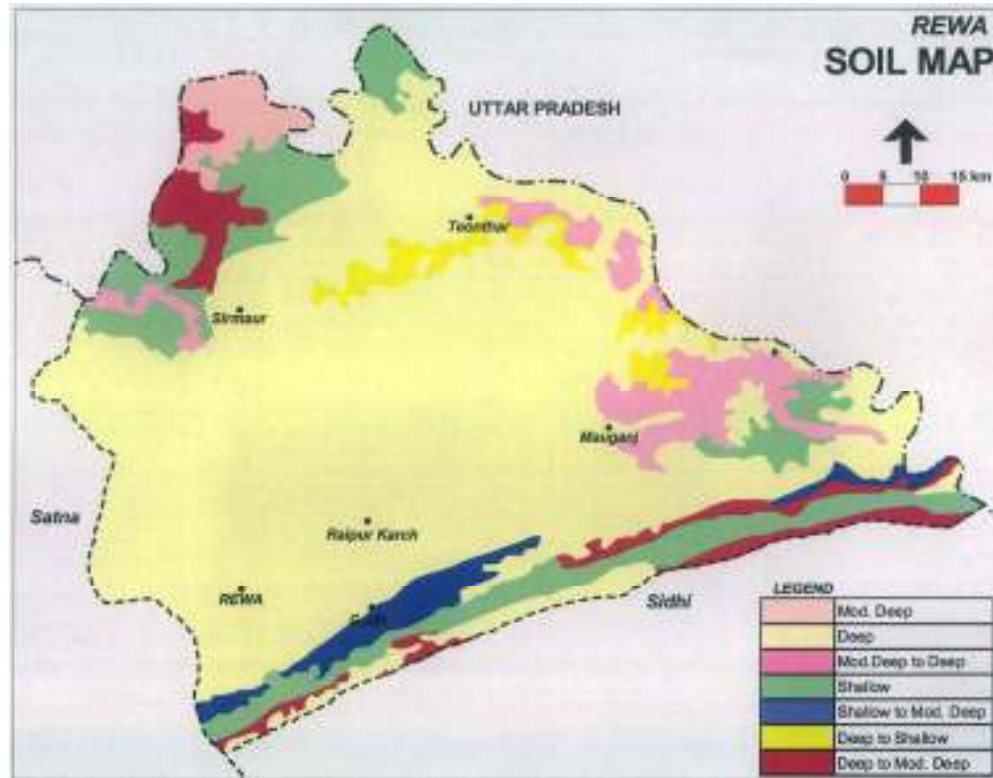


Annexure II

Mean annual rainfall (mm)



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
Early season drought (delayed onset)					
Delay by 2 weeks 4 th week of June	Bunded low lands deep to medium deep black soils	Rice-Wheat	No Change Rice -Upland field: IR-36, JR-201, JR-503, Vandna, Poornima, Ananda, Narendra 97, Govinda and Hybrid rice JRH 4, 5 and 8 Lowland field: WGL-32100, MR-219, Mahamaya, IR-36,IR-64, HMT, Swarna, Madhuri, Pusa Basmati, Karnal Basmati, Pusa sugandha3,4, and 5 and Hybrid rice (PRH-10, PA6201, PHB71, Pro Agro 6444)	<ol style="list-style-type: none"> 1. Use of blade harrow (Bakhar) for moisture conservation and destroy of weed under late onset of monsoon 2. Selection of high production potential varieties. 3. Adaptation of moisture conservation practice. Conservation of excess rain water in high rainfall areas and use as life saving irrigation according to situation. 4. Seed treatment with mixture of Thiram (1.5g) + Carbendazim (1.5g) /kg seed followed by treated with biofertilizers 5. Use of balanced fertilizer and biofertilizer according to recommendation to crop and application of zinc in deficient soil. 6. Sowing of crops against the slope. 7. Timely weeding is done and use of weeds as mulch between row of crops for moisture conservation 8. Adoption of plant protection as per requirement 9. Under traditional system of planting of 3-4 seedlings of 18-21 day ages in 20x10 cm at one place for late mature rice. For early mature varieties plating in 15x15 cm geometry but seedlings are not more than 18-21 day old. 	
		Soybean – Chickpea	Soybean - JS-335, JS 80-21, JS 97-42, JS 94-60, JS 9305 Pigeonpea - Asha, No-148, JKM-7, JA-4, ICPL-85063(Laxmi), JKM-189		

Unbunded upland shallow soils	Rice-Wheat Rice - Chickpea	No Change Rice-Upland field: IR-36, JR-201, JR-503, Vandna, Poornima, Ananda, Narendra 97, Govinda and Hybrid rice JRH 4, 5 and 8	<ol style="list-style-type: none"> 1. Use of blade harrow (Bakhar) for moisture conservation and destroy of weed under late onset of monsoon 2. Selection of high production potential varieties. 3. Adaptation of moisture conservation practice. Conservation of excess rain water in high rainfall areas and use as life saving irrigation according to situation. 4. Seed treatment with mixture of Thiram (1.5g) + Carbendazim (1.5g) /kg seed followed by treated with biofertilizers 5. Use of balanced fertilizer and biofertilizer according to recommendation to crop and application of zinc in deficient soil. 6. Sowing of crops against the slope. 7. Timely weeding is done and use of weeds as mulch between row of crops for moisture conservation 8. Adoption of plant protection as per requirement 9. Under traditional system of planting of 3-4 seedlings of 18-21 day ages in 20x10 cm at one place for late mature rice. For early mature varieties plating in 15x15 cm geometry but seedlings are not more than 18-21 day old.
	Pigeonpea	Pigeonpea- Asha, No-148, JKM-7, JA-4, ICPL-85063(Laxmi), JKM-189	<ol style="list-style-type: none"> 1. Use of blade harrow (Bakhar) for moisture conservation and destroy of weed under late onset of monsoon
	Blackgram	Blackgram – JU-2, JU-3, JU-86, T-9, JBG-623, LBG 684, TAU-1, Berkha, PU-30,35,19	<ol style="list-style-type: none"> 2. Selection of high production potential varieties.
	Greengram	Greengram- Pusa Vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2, Tarme-1, L.G.450, T.M.98-50, JM-98-90,	<ol style="list-style-type: none"> 3. Adaptation of moisture conservation practice. Conservation of excess rain water in high rainfall areas and use as life saving irrigation according to situation.

		PDM 11, 54 and 139	4. Seed treatment with mixture of Thiram (1.5g) + Carbendazim (1.5g) /kg seed followed by treated with biofertilizers
	Sorghum	No change	
	Niger	No change	

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 2 nd week of July	Bunded low lands deep to medium deep black soils	Rice-Wheat Soybean– Chickpea	<p>Rice – IR-36 JR-201, Poornima , JR-503, Vandna</p> <p>Pigeonpea- Pragati ,Jagriti,,Asha ,Nmuber-148,JKM-7,JA-4,Type-21-Pusa-855, ICPL-85063 (Laxmi), JKM-189</p> <p>Greengram Pusa Vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2,Tarme-1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139</p> <p>Blackgram – JU-2,,JU-3,,JU-86,T-9, JBG-623, LBG684, TAU-1, Berkha,PU-30,35,19</p>	<ol style="list-style-type: none"> 1. Use of blade harrow (Bakhar) for moisture conservation and destroy of weed under late onset of monsoon 2. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers 3. Use of balanced fertilizer and biofertilizer according to recommendation to crop and application of zinc in deficient soil. 4. Sowing of crops against the slope depend on crops. 5. Timely weeding is done and use of weeds as mulch between row of crops for moisture conservation 6. Adoption of plant protection as per requirement as rainfall condition 7. Under traditional system of planting of 3-4 seedlings of 18-21 ages in 20x10 cm at one place for late mature rice. For early mature varieties plating in 15x15 cm geometry but seedlings are not more than 18-21 day old. 	Source of seed is SAU's and Beej Nigam

Delay by 4 weeks 2 nd week of July	Unbunded upland shallow soils	Rice –wheat	Selection of short duration Rice – IR-36 JR-201, Poornima , JR- 503, Vandna	<ol style="list-style-type: none"> 1. Use of blade harrow (Bakhar) for moisture conservation and destroy of weed under late onset of monsoon 2. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers 3. Use of balanced fertilizer and biofertilizer according to recommendation to crop and application of zinc in deficient soil. 4. Sowing of crops against the slope depend on crops. 5. Timely weeding is done and use of weeds as mulch between row of crops for moisture conservation 6. Adoption of plant protection as per requirement as rainfall condition 7. Under traditional system of planting of 3-4 seedlings of 18-21 ages in 20x10 cm at one place for late mature rice under. For early mature varieties plating in 15x15 cm geometry but seedlings are not more than 18-21 day old. 	Source of seed is SAU's and Beej Nigam
		Pigeonpea	Pigeonpea- Pragati, Jagriti, Asha, ,Nmuber-148,JKM-7,JA- 4,Type-21-Pusa-855, ICPL- 85063 (Laxmi), JKM-189		
		Blackgram	Blackgram – JU-2,JU-3,JU-86,T- 9, JBG-623,LBG684,TAU-1, Berkha,PU-30,35,19		
		Greengram	Greengram- Pusa Vishal, K851, JM721, Jawahar 99 -37, Hum- 1, Hum-2,Tarme-1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139		
		Sorghum	No change		

		Niger	No change		
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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 6 weeks 4 th week of July	Bunded low lands deep to medium deep black soils	Rice-Wheat	Sowing of alternate crops, Sesame, Niger, Castor , Kodo millet	1. Use of blade harrow (Bakhar) for moisture conservation and destroy of weed in late onset of monsoon 2. For high production adaptation of recommended package of practice. 3. 100 kg seed /ha required for lehi system in rice. 4. Don't sow soybean and maize 5. Intercropping of greengram, blackgram, chickpea, sesame and niger with pigeonpea	Source of seed is SAU's and Beej Nigam
		Soybean – Chickpea			
	Unbunded upland shallow soils	Rice – Wheat			
		Rice – Chickpea			
		Pigeonpea			
		Blackgram			
		Greengram			
Sorghum					
Niger					

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) Delay by 8 weeks 2 nd week of August	Bunded low lands deep to medium deep black soils	Rice-Wheat	Prefer Niger, Kodo millet crops with suitable short duration varieties	1. Use of blade harrow (Bakhar) for moisture conservation and destroy of weed in late onset of monsoon. 2. Intercropping of greengram, blackgram, chickpea, sesame and niger with pigeonpea	Source of seed is SAU's and Beej Nigam
		Soybean – Chickpea			
	Unbunded upland shallow soils	Rice – Wheat	Niger		
		Rice – Chickpea			
Pigeonpea					
Blackgram					

		Greengram			
		Sorghum			
		Niger			

Condition	Major Farming situation ^a	Normal Crop/cropping system ^b	Suggested Contingency measures		
			Crop management ^c	Soil nutrient & moisture conservation measues ^d	Remarks on Implementation ^e
Early season drought (Normal onset)					
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Bunded low lands deep to medium deep black soils	Rice-Wheat	1. Timely weeding is done and use of weeds as mulch between row of crops for moisture conservation 2. Gap filling 3. Re sowing by early crop variety 4. <i>In-situ</i> moisture conservation	Use of blade harrow (Bakhar) for moisture conservation and destroy of weed in late onset of monsoon	Source of seed is SAU's and Beej Nigam
		Soybean – Chickpea			
	Unbunded upland shallow soils	Rice – Wheat			
		Rice – Chickpea			
		Pigeonpea			
		Blackgram			
		Greengram			
Sorghum					
Niger					

Condition	Major Farming situation ^a	Normal Crop/cropping system ^b	Suggested Contingency measures		
			Crop management ^c	Soil nutrient & moisture conservation measues ^d	Remarks on Implementation ^e
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)					
At vegetative stage	Bunded low lands deep to medium deep black soils	Rice-Wheat	Life saving irrigation. Use of hand hoe for weed management.	1. Storage of water in lower side of the field and make use for life saving irrigation in <i>Rabi</i> crops 2. Practice of Dora/Kulpha/Hand	-
		Soybean – Chickpea			

	Unbunded upland shallow soils	Rice – Wheat		hoe in between rows and use of removed weeds use as mulch for moisture conservation 3. Use of FYM and vermicompost at the time of sowing for increase of water holding capacity 4. Ridges are made after 15-20 lines of crops for the moisture conservation	
		Rice – Chickpea			
		Pigeonpea			
		Blackgram			
		Greengram			
		Sorghum			
Niger					

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 flowering/ fruiting stage	Bunded low lands deep to medium deep black soils	Rice-Wheat	Life saving irrigation. Use of hand hoe for weed management.	1. Storage of water in lower side of the field and make use for life saving irrigation in <i>Rabi</i> crops 2. Practice of Dora/Kulpha/Hand hoe in between rows and use of removed weeds use as mulch for moisture conservation 3. Use of FYM and vermicompost at the time of sowing for increase of water holding capacity 4. Ridges are made after 15-20 lines of crops for the moisture conservation	-
		Soybean – Chickpea			
	Unbunded upland shallow soils	Rice – Wheat			
		Rice – Chickpea			
		Pigeonpea			
		Blackgram			
		Greengram			
		Sorghum			
Niger					

Condition	Major Farming situation ^a	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management ^c	Rabi Crop planning ^d	Remarks on Implementation ^e
Terminal drought (Early withdrawal of monsoon)	Bunded low lands deep to medium deep black soils	Rice-Wheat	1. Moisture conservation practice adopt and destroy the weed under early withdrawal of monsoon for rabi season 2. Diversification of crops 3. Apply light irrigation to <i>Kharif</i> crops for proper grain filling if required, this will helpful in field preparation for <i>Rabi</i> crops	Preference will be given to sowing of Lentil, Linseed, Chickpea, irrigated and un irrigated wheat	Source of seed is SAU's and Beej Nigam
		Soybean – Chickpea			
	Unbunded upland shallow soils	Rice – Wheat			
		Rice – Chickpea			
		Pigeonpea			
		Blackgram			
		Greengram			
		Sorghum			
Niger					

2.1.2 Drought - 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	Sandy clay loam soils	Rice-Wheat	Soybean-wheat	Adopt furrow irrigation and use of micro-irrigation system such as drip and sprinkler system, Adaptation of soil and water conservation practices. Control the soil erosion	Source of seed is SAU's and Beej Nigam
		Soybean – Chickpea	Blackgram –Chickpea		
	Shallow soils	Rice-Wheat	Soybean-wheat		
		Rice - Chickpea	Blackgram –Chickpea		

Condition	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Suggested Contingency measures	
				Agronomic measures	Remarks on Implementation
Limited release of water in canals due to low rainfall	Sandy clay loam soils	Rice-Wheat	Soybean-wheat	Adopt furrow irrigation and use of micro-irrigation system such as drip and sprinkler system, Adaptation of soil and water conservation practices. Control the soil erosion	Source of seed is SAU's and Beej Nigam
		Soybean – Chickpea	Blackgram –Chickpea		
	Shallow soils	Rice-Wheat	Soybean-wheat		
		Rice - Chickpea	Blackgram –Chickpea		

Condition	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Suggested Contingency measures	
				Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	Sandy clay loam soils	Rice-Wheat	Soybean-Wheat	Adopt furrow irrigation and use of micro-irrigation system such as drip and sprinkler system, Adaptation of soil and water conservation practices. Control the soil erosion	
		Soybean – Chickpea	Blackgram – Chickpea		
	Shallow soils	Rice-Wheat	Soybean-Wheat		
		Rice -Chickpea	Blackgram – Chickpea		

Condition	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Suggested Contingency measures	
				Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Sandy clay loam soils	Rice-Wheat	Soybean-Wheat	Adopt furrow irrigation and use of micro-irrigation system such as drip and sprinkler system, Adaptation of soil and water conservation practices. Control the soil erosion	
		Soybean – Chickpea	Blackgram – Chickpea		
	Shallow soils	Rice-Wheat	Soybean-Wheat		
		Rice -Chickpea	Blackgram – Chickpea		

Condition	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Suggested Contingency measures	
				Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	Sandy clay loam soils	Rice-Wheat	Soybean-Wheat	Adopt furrow irrigation and use of micro-irrigation system such as drip and sprinkler system, Adaptation of soil and water conservation practices. Control the soil erosion	
		Soybean – Chickpea	Blackgram – Chickpea		
	Shallow soils	Rice-Wheat	Soybean-Wheat		
		Rice -Chickpea	Blackgram – Chickpea		

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

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Continuous high rainfall in a short span leading to water logging				
Rice	Drain the excess water as early as possible Apply 20 kg N + 10 kg K /ha 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	Drain the excess water as early as possible Apply 20 kg N + 10 kg K /ha after draining excess water Take up suitable plant protection Measures in anticipation of pest & disease out breaks	Drain the excess water as early as possible Take up suitable plant protection measures in anticipation of pest & disease out breaks	Drain out water and spread sheaves loosely in field or field bunds where there is no 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, Wheat, Chickpea	Provide drainage, Care should be taken that rain water does not stagnate in the field.	Care should be taken that rain water does not stagnate in the field. Intercultivation for aeration.	Drain excess water. Harvesting of in clear weather and shifting of produce in safe place.	Produce should be placed under shade. or protect the produce by tarpaulin kept in T. floor. Sun drying before storage
Heavy rainfall with high speed wind in a short span				

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 fields for insect and disease attack in crops To control semi-looper spray NSKE 5% or Quinalphos 25 EC 20 ml/10 lit.	Carry out critical survey of fields for insect and disease attack in crops To control semilooper spray NSKE 5% or Quinalphos 25 EC 20 ml/10 lit.	Carry out critical survey of 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 sown 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 sown 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. Carry out critical survey of fields for insect and disease attack in crops	

2.3 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				
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
Heat Wave				
Rice	Light irrigation Provision of wind breaks	Light irrigation Provision of wind breaks	Light irrigation Provision of wind breaks	Harvest at physiological maturity
Soybean, Pigeonpea	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	Light irrigation Smoking during night	Light irrigation Smoking during night	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	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	Harvest at physiological maturity

	cold and heat wave in regular		wave in regular	
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</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>

		<p>vitamin to prevent infertility.</p> <p>Encourage mixing available kitchen waste with dry fodder while feeding to the milch animals</p>	
Drinking water	<p>Adopt various water conservation methods at village level to improve the ground water level for adequate water supply.</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>	<p>Adequate supply of drinking water.</p> <p>Restrict wallowing of animals in water bodies/resources; Add alum in stagnated water bodies</p>	<p>Watershed management practices shall be promoted to conserve the rainwater. Bleach (0.1%) drinking 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</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>

		dung from relief camps	
Floods	NA		
Cyclone	NA		
Heat wave and cold wave			
Heat wave	<ul style="list-style-type: none"> i) Plantation around the shed ii) H₂O sprinklers / foggers in the shed iii) Application of white reflector paint on the roof iv) Thatched sheds should be provided as a shelter to animal to minimize heat stress 	<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>Put on the foggers / sprinklers /fans during heat waves in case of high yielders (Jersey/HF crosses)</p> <p>In severe cases, vitamin ‘C’ and electrolytes should be added in H₂O during heat waves.</p>	<p>Feed the animals as per routine schedule</p> <p>Allow the animals for grazing (normal timings)</p>
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)	<p>Allow for grazing between 10AM to 3PM during cold waves</p> <p>Add 25-50 ml of edible oil in concentrates and fed to the animal during cold waves</p> <p>Apply / sprinkle lime powder in the animal shed during cold waves to neutralize ammonia accumulation</p>	<p>Feed the animals as per routine schedule</p> <p>Allow the animals for grazing (normal timings)</p>
Insurance	Encouraging insurance of livestock	Listing out the details of the dead animals	<p>Submission for insurance claim and availing insurance benefit</p> <p>Purchase of new productive animals</p>

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	Routine practices are followed

		drinking water or feed	
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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	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Prepare to release water into the habitat 	<ol style="list-style-type: none"> 1. Mixing of water from the water harvest structure like ponds and tanks into the fish habitat. 	<ol style="list-style-type: none"> 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