Vetted by NBSS & LUP

State: MADHYA PRADESH

Agriculture Contingency Plan for District: Chhindwara

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	Central Highlands (Malwa And Bundelkhand) (10.4)		
	Agro-Climatic Zone (Planning Commission)	Central Plateau and Hills Region (VIII)		
	Agro Climatic Zone (NARP)	Satpura Plateau Zone (MP- 9)		
	List all the districts or part thereof falling under the NARP Zone	Chhindwara, Betul, Hoshangabad		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		22° 4' 0" N	78° 56' 0" E	675 MSL
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	ZARS, Chandangaon, Chhindwara		
	Mention the KVK located in the district	Programme Coordinator Krishi Vigyan Kendra Chandangaon Distt. Chhindwara – 480001		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	-		
1.2	**Rainfall**	Normal RF(mm)	Normal Onset	Normal Cessation
	SW monsoon (June-September):	443.0	2nd week of June	1st week of October
	NE Monsoon (October-December):	404.0	-	-
	Winter (January- February)	58.0	-	-
	Summer (March-May)	105.0	-	-
	Annual	1010.0	-	-

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)	1184.9	555.5	479.5	53.6	52.0	17.6	0.0	26.7	40.7	30.4

*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 geographical area
	Deep soils	448.4	37.8
	Medium deep soils	79.3	6.7
	Shallow soils	655.9	55.4
	Total	1183.6	100
1.5	**Agricultural land use**	Area ('000 ha)	Cropping intensity %
	Net sown area	484.4	128
	Area sown more than once	135.5	
	Gross cropped area	619.9	

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

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	126.8		
	Gross irrigated area	150.4		
	Rainfed area	357.6		
	Sources of Irrigation	**Number**	**Area ('000 ha)**	**Percentage of total irrigated area**
	Canals		10.8	7.03
	Tanks	69	4.2	2.77
	Open wells	86282	92.8	61.2
	Bore wells	7280	36.7	24.2
	Lift irrigation schemes	-	-	-
	Micro-irrigation	-	-	-
	Other sources (reservoir)	52	5.90	3.8
	Total Irrigated Area		150.4	

	Pump sets	97195		
	No. of Tractors	3623		
	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	01	-	-
	Safe	10	-	-
	Wastewater availability and use	-	-	-
	Ground water quality			
*over-exploited: groundwater uSesameization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

1.7 Area under major field crops & horticulture etc.

1.7	**Major Field Crops cultivated**	**Area ('000 ha)**							
		Kharif			***Rabi***			**Summer**	**Total**
		Irrigated	***Rainfed***	**Total**	***Irrigated***	***Rainfed***	**Total**		
	Soybean	-	-	146.3	-	-	-	-	146.3
	Maize	-	-	92.08	-	-	-	-	92.08
	Cotton	-	-	27.5	-	-	-	-	27.5
	Sorghum	-	-	26.9	-	-	-	-	26.9
	Rice	-	-	19.9	-	-	-	-	19.9
	Wheat	-	-	-	-	-	60.4	-	60.4
	Chickpea	-	-	-	-	-	33.0	-	33.0
	Sugarcane	-	-	-	-	-	5.9	-	5.9
	Pea	-	-	-	-	-	3.9	-	3.9

	Horticulture crops - Fruits	**Total area ('000 ha)**
	Orange	10.541
	Guava	0.025
	Mango	0.068

	Water Chestnut	0.323
	Horticultural crops - Vegetables	**Total area ('000 ha)**
	Potato	3.199
	Chili	1.551
	Garlic	1.909
	Ginger	1.169
	Onion	1.112
	Others (specify)	

	Medicinal and Aromatic crops	**Total area**	**Irrigated**	**Rainfed**
	Not Applicable			

	Plantation crops	**Total area**
	NA	-
	Others such as industrial pulpwood crops etc (specify)	-
	Fodder crops	**Total area**
	NA	-
	Others (specify)	NA
	Total fodder crop area	-
	Grazing land	-
	Sericulture etc	-
	Others (Specify)	-

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Non descriptive Cattle (local low yielding)			701.5
	Crossbred cattle	NA	NA	NA
	Non descriptive Buffaloes (local low yielding)	NA	NA	NA
	Graded Buffaloes	-	-	165.7
	Goat	-	-	277.5

	Sheep	-	-	1.6
	Others (Pig, horse etc)	-	-	66.7
	Others (Duck)	NA	NA	NA
	Commercial dairy farms (Number)			NA
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**	
	Commercial		4070083	
	Backyard			

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)	6856.5		668.8
	Others			

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

1.11 Production and Productivity of major crops

1.11	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder (‘000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
Major Field crops (Crops to be identified based on total acreage)										
	Soybean	168.5	1207	-	-	-	-	168.5	1207	-
	Sorghum	5092	197	-	-	-	-	5092	197	-
	Maize	175.3	2076	-	-	-	-	175.3	2076	-
	Cotton	49.4	1442	-	-	-	-	49.4	1442	-
	Groundnut	37.8	1359	-	-	-	-	37.8	1359	-
	Wheat	-	-	173.35	1941	-	-	173.35	1941	-
	Chickpea	-	-	38.75	1145	-	-	38.75	1145	-
	Pea	-	-	1.82	464	-	-	1.82	464	-
	Sugarcane	-	-	42.04	6335	-	-	42.04	6335	-
Major Horticultural crops (Crops to be identified based on total acreage) NA										
Crop 1	-	-	-	-	-	-	-	-	-	-

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

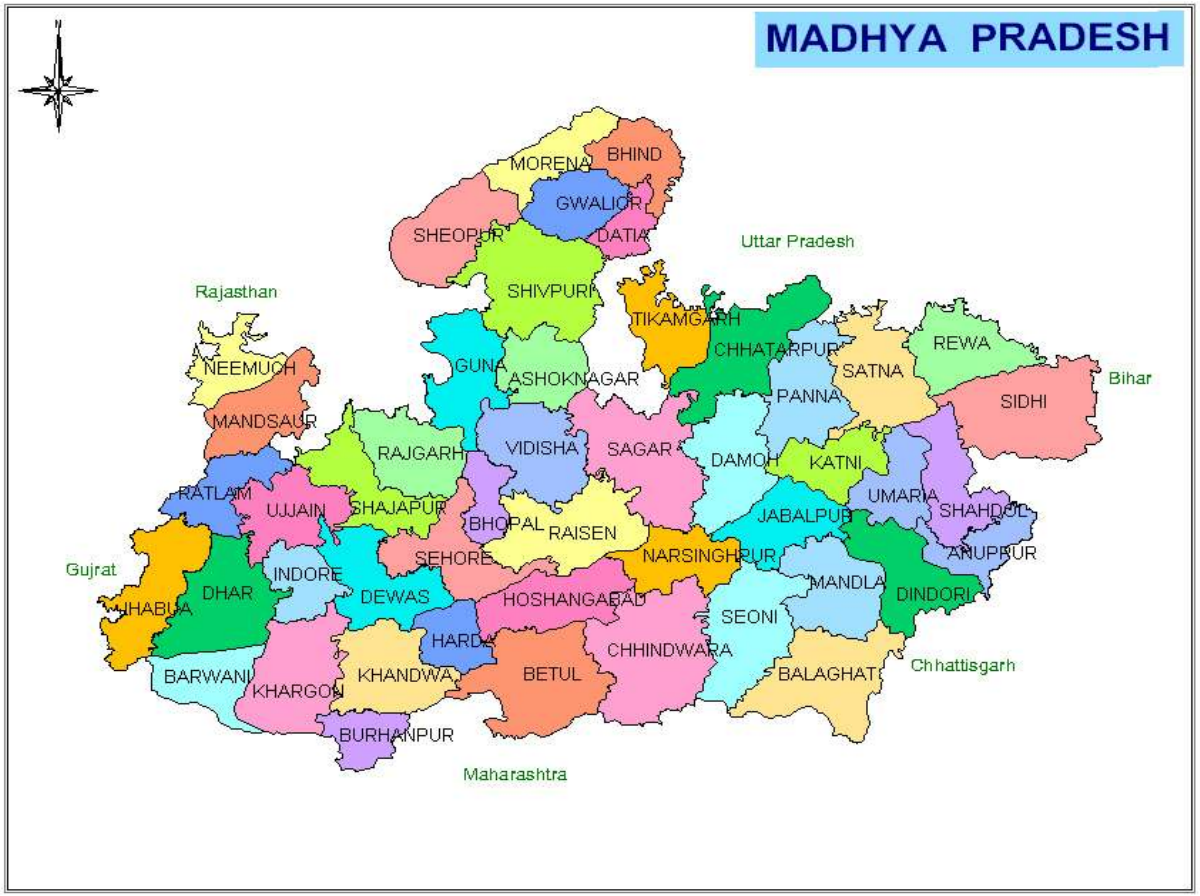
1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	**Soybean**	**Maize**	**Sorghum**	**Cotton**	**Rice**	**Wheat**	**Chickpea**
	Kharif- Rainfed	2nd week of June 1st week of July	2nd week of June – 4th week of June	2nd week of June 1st week of July	3rd week of June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

							October.	October
	Rabi-Irrigated	-		-		-	3rd week of October- 2nd week of November	3rd week of October- 4th 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)	√		

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


MADHYA PRADESH
MORENA
BHIND
GWALIOR
SHEOPUR
DATIA
Uttar Pradesh
Rajasthan
SHIVPURI
TIKAMGARH
CHHATARPUR
REWA
NEEMUCH
GUNA
ASHOKNAGAR
SATNA
Bihar
PANNA
SIDHI
MANDSAUR
RAJGARH
VIDISHA
SAGAR
DAMOH
KATNI
RATLAM
UJJAIN
SHAJAPUR
BHOPAL
RAISEN
UMARIA
JABALPUR
SHAHDOL
SEHORE
NARSINGHPUR
ANUPPUR
Gujrat
INDORE
DHAR
DEWAS
HOSHANGABAD
MANDLA
DINDORI
JHABUA
SEONI
HARDA
CHHINDWARA
BARWANI
KHANDWA
BETUL
BALAGHAT
Chhattisgarh
KHARGON
BURHANPUR
Maharashtra


AGROCLIMATIC ZONES
BUNDELKHAND
CENTRAL NARMADA VALLEY
CHATTISGARH PLAIN BALAGHAT
GRID REGION
JHABUA HILLS
KYMORE PLATEAU SATPURA HILLS
MALWA PLATEAU
NIMAR PLAINS
NOTHERN HILL REGION OF CHATTISGARH
SATPURA PLATEAU
VINDHYA PLATEAU
AGROCLIMATIC ZONES OF MADHYA PRADESH
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RAJGARH
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DAMOH
KATNI
UMARIA
SHAHDOL
SHAJAPUR
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JABALPUR
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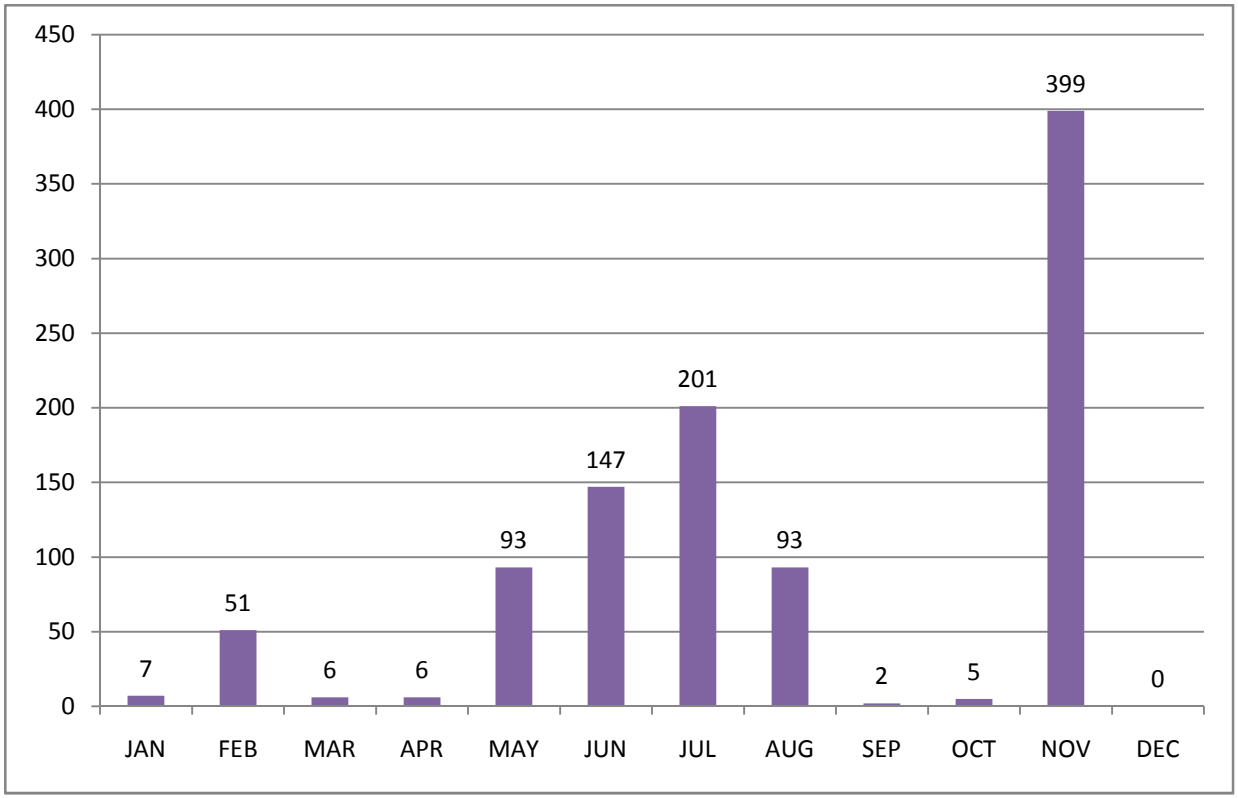
SEHORE
NARSIMHAPUR
ANUPPUR
INDORE
DEWAS
DINDORI
JHABUA
DHAR
HOSHANGABAD
MANDLA
HARDA
SEONI
CHHINDWARA
WEST NIMAR
EAST NIMAR
BETUL
BALAGHAT
BARWANI
BURHANPUR
0
45
90
180
Kilometers

Annexure II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147
201
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2
5
399
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JAN
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OCT
NOV
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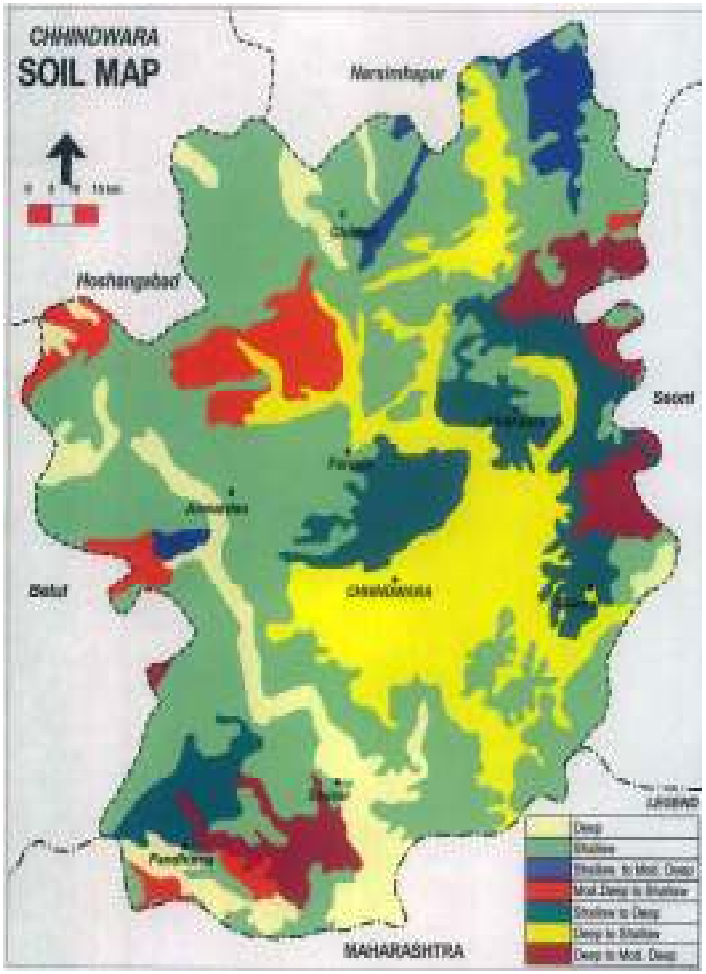
Annexure-III

Soil Map of Chhindwara district



Source: NBSS & LUP, Nagpur

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**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks **4th week of June**	Rainfed, shallow red sandy loam soils	Soybean-Chickpea	No Change	1. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) @/kg seed followed by treated with biofertilizers 2. Application of Zinc 25 kg/ha after every 4 crop cycle 3. Dora/Kulpha/Hand hoe for weeding between the row of crops	SAU, Beej Nigam, NSC
		Maize-Wheat			
		Rice-Wheat			
		Sorghum			
		Blackgram			
		Greengram			
	Deep to medium deep soils	Soybean-Chickpea			
		Maize-Wheat			
		Rice-Wheat			
		Cotton			
		Sorghum			
		Blackgram			
		Greengram			

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 4 weeks **2nd week of July**	Rainfed, shallow red sandy loam soils	Soybean-Chickpea Maize-Wheat Rice-Wheat Sorghum Blackgram Greengram	Prefer to sow Pigeonpea, Greengram, Blackgram and Sesame instead of soybean, maize and sorghum Change to late and short duration variety of Redgram (Pragti, Jagrati,Asha ,Number-148, JKM-7, JA-4, ICPL-85063 (Laxmi) , JKM-189) Blackgram – JU-2,JU-3,JU-86,T-9,JBG 23,LBG684,TAU-1, Berkha, PU-30,35,19 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 Sesame- TKG -306, TKG-35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1	1. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) @/kg seed followed by treated with biofertilizers 2. Application of Zinc 25 kg/ha after every 4 crop cycle 3. Application of bioferlizer and potash fertilizer under late sown condition 4. Sowing of Sesame and Blackgram as intercrop 5. Blade harrowing (Bakhar),to remove weeds.	SAU, Beej Nigam, NSC
	Deep to medium deep soils	Soybean-Chickpea Maize-Wheat Rice-Wheat Cotton Sorghum Blackgram Greengram			

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**	Rainfed, shallow red sandy loam soils	Soybean-Chickpea Maize-Wheat Rice-Wheat Sorghum Blackgram Greengram	Prefer to sow Pigeonpea, Greengram, Blackgram and Sesame instead of soybean, maize, sorghum, cotton and rice Change to late and short duration variety of Redgram (Pragti, Jagrati,Asha ,Number-148, JKM-7, JA-4, ICPL-85063 (Laxmi) , JKM-189) Blackgram – JU-2,JU-3,JU-86,T-9,JBG 23,LBG684,TAU-1, Berkha, PU-30,35,19 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 Sesame- TKG -306, TKG-35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1	1. Blade harrowing (Bakhar), to remove weeds. 2. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) @/kg seed followed by treated with biofertilizers 3. Application of Zinc 25 kg/ha after every 4 crop cycle 4. Application of bioferlizer and potash fertilizer under late sown condition 5. Sowing of Sesame and Blackgram as intercrops	SAU, Beej Nigam, NSC
	Deep to medium deep soils	Soybean-Chickpea Maize-Wheat Rice-Wheat Cotton Sorghum Blackgram Greengram			

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**	Rainfed, shallow red sandy loam soils	Soybean-Chickpea Maize-Wheat Rice-Wheat Sorghum Blackgram Greengram	Prefer to sow Pigeonpea, Greengram, Blackgram and Sesame instead of soybean, maize, sorghum, cotton and rice Change to late and short duration variety of Redgram (Pragti, Jagrati,Asha ,Number-148, JKM-7, JA-4, ICPL-85063 (Laxmi) , JKM-189) Blackgram – JU-2,JU-3,JU-86,T-9,JBG 23,LBG684,TAU-1, Berkha, PU-30,35,19 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 Sesame- TKG -306, TKG-35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1	1. Blade harrowing (Bakhar), to remove weeds. 2. Conservation of excess rain water in high rainfall area and use as life saving irrigation according to situation. 3. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) @/kg seed followed by treated with biofertilizers 4. Application of Zinc 25 kg/ha after every 4 crop cycle 5. Application of bioferlizer and potash fertilizer under late sown condition 6. Sowing of sesame and blackgram as intercrops	SAU, Beej Nigam, NSC
	Deep to medium deep soils	Soybean-Chickpea Maize-Wheat Rice-Wheat Cotton Sorghum Blackgram Greengram			

Condition			Suggested Contingency measures		
Early season	**Major Farming**	**Normal Crop/cropping**	**Crop management**	**Soil nutrient & moisture**	**Remarks on**

drought **(Normal onset)**	**situation**	**system**		**conservation measures**	**Implementation**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Deep to shallow soils	Soybean- Chickpea Maize-Wheat Rice-Wheat Pigeonpea Sorghum Blackgram Greengram	Resowing of crop with early duration varieties Gap filling	1. Storage of water in lower side of the field and make use for life saving irrigation 2. Dora/Kulpha/Hand hoeing in between rows and use of removed weeds use as mulch for moisture conservation 3. Apply 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	-

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**
Vegetative stage **At flowering/ fruiting stage**	Deep to shallow soils	Soybean-Chickpea Maize-Wheat Rice-Wheat Pigeonpea Sorghum Blackgram Greengram	Life saving irrigation through sprinklers Interculture Foliar application of 2% urea and MOP	1. Storage of water in lower side of the field and make use for life saving irrigation 2. Dora/Kulpha/Hand hoeing in between rows and use of removed weeds use as mulch for moisture conservation 3. Apply 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 **5.** Mulching	-

Condition			**Suggested Contingency measures**		
Terminal drought (Early withdrawal of	**Major Farming situation**	**Normal Crop/cropping**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**

monsoon)		**system**			
	Deep to shallow soils	Soybean-Chickpea Maize-Wheat Rice-Wheat Pigeonpea/ Sorghum/ Blackgram/ Greengram	Protective irrigation Harvest crop at physiological stage	1. Plan for early rabi crop planning with Lentil Linseed, Chickpea, irrigated and un irrigated Wheat 2. Selection of short duration of varieties with increased seed rate up to 25% 3. Line sowing of Lentil, Linseed, Chickpea in moisture zone 4. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed then after treated with biofertilizers. 5. Sowing of small seeded grains mix with FYM and vermicompost 6. Apply light irrigation to *Kharif* crops for proper grain filling if required, this will helpful in field preparation for *Rabi* crops	

2.1.2 Irrigated situation- Not applicable

Condition			**Suggested Contingency measures**		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delayed release of water in canals due to low rainfall	Not applicable				
Limited release of water in canals due to low rainfall					
Non release of water in canals under delayed onset of monsoon in catchment					
Lack of inflows into tanks due to					

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
insufficient /delayed onset of monsoon					

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Insufficient groundwater (open wells and borewells) recharge due to low rainfall	Deep to shallow soils	Rice	Replace upland rice with lesser water required crops viz., Soybean, Blackgram, Sesame Plan for relay or utera cropping with any short duration pulse	**Rice**- Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice Adopt furrow irrigation and use of micro-irrigation system	
		Soybean-Chickpea Maize-Wheat	Chickpea should be sown under residual moisture immediately after harvest of soybean or give p re sowing irrigation to chickpea		
			Prefer short duration low water requirement varieties of wheat. Protective irrigation at CRI stage in wheat.		

2.2 Unusual rains (untimely, unseasonal etc]) (for both rain fed 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**
Soybean, Maize, Cotton	Provide drainage care should be taken that rain water does not stagnate in the field.	Change 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.	Produce should be placed under shade. or protect the produce by tarpaulin kept in T flown

Wheat	Care should be taken that rain water does not stagnate in the field and not allow to top dressing of nitrogenous fertilizers.	Care should be taken that rain water does not stagnate in the field and not allow to top dressing of nitrogenous fertilizers	Proper drainage should be provided and adopt all plant protection measures	-
Chickpea	Care should be taken that rain water does not stagnate in the field. -Planting in ridge and furrow. -Interculture operation for aeration.	Care should be taken that rain water does not stagnate in the field. -Planting in ridge and furrow. -Interculture operation for aeration. - Spray of 2% DAP.	Drain excess rain water from field. -Harvesting of crop in clear weather. -Keep the harvested produce in safe place.	- Produce should be placed under shade. Protect the produce by tarpaulin kept in T floor. Sun dry of the produce.
Horticulture	NA			
Heavy rainfall with high speed wind in a short span	NA			
Outbreak of pests and diseases due to unseasonal rains				
Rice	Control Rice hispa by clipping of seedlings Tips- to remove eggs masses of stem borers and rice hispa-or apply cholorpyriphos 20 EC @500 ml/ha. **Disease**- control bacterial leaf blight, leaf streak, brown spot, by applying streptocycline (250ppm).	For same pest apply trichogramma or crysopha @ 40000-50000 eggs/ha. Use NPV 250 LE/ha Use Bt formulations 1 lt./ha. **Disease** control of bacterial leaf blight, leaf streak, brown spot by applying streptocycline (250ppm).	Control of important Disease viz. rice blast Brown spot, false smut etc by applying Propiconzol (0.6ml/lit)/ Henzconazole(0.2%) etc.	Well drying prior to storage place should be of moisture proof rodent proof etc.
Soybean	Carry out critical survey of fields for insect and disease attack in crops	Carry out critical survey of fields for insect and disease attack in crops	Carry out critical survey of fields for insect and disease attack in crops	-
Wheat	Spray 0.2 % mancozeb 76% WP against wheat rust.	Spray 0.2 % mancozeb 76% WP against wheat rust.	-do-	
Chickpea	Spray triazophos 40 % EC @ 1-1.5 l/ha in chickpea against	Spray triazophos 40 % EC @ 1-1.5 l/ha in chickpea against	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 Parathiyan 50 EC @ 600 ml dissolve in 500 L of water should be used. Dusting of fenvalerate 0.4% or Endosulphan 4% 15-20 kg or quinalphos 1.5 WP 20-25 per hectare with duster.	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 Parathiyan 50 EC @ 600 ml dissolve in 500 L of water should be used. Dusting of fenvalerate 0.4% or Endosulphan 4% 15-20 kg or quinalphos 1.5 WP 20-25 per hectare with duster.	pest incidence. Carry out critical survey of fields for insect and disease attack in crops	
Horticulture	Not applicable			

2.3 Floods - Not Applicable

Condition	**Suggested contingency measures**			
Transient water logging/ partial inundation	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Continuous submergence for more than 2 days	**Not Applicable**			
Sea water intrusion				

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,	Repeated irrigation at the appearance of hair line cracks in soil surface, pounding of water for 15 days after	Repeated irrigation at the appearance of hairline cracks in soil surface	Harvest crop at physiological maturity

	Correct iron deficiency with 0.5% iron sulphate spray.	transplanting to check Fe deficiency and for crop establishment.		
Blackgram,Greengram Soybean	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 Smoke generation at night time to rise temperature	Light irrigation Smoke generation at night time to rise temperature	Light irrigation Smoke generation at night time to rise 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				

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	As the district is occasionally prone to drought the following practices may be implemented to	Harvest and use biomass of dried up crops (Rice, wheat, Maize, Soybean, Black gram,	Encourage progressive farmers to grow multi cut fodder crops of

	prevent fodder shortage problem 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. Collection of soybean and chick pea stover for use as feed supplement during drought Preserving the green maize fodder as silage Encourage fodder production with Bajra – stylo-Bajra on rotation basis and also to cultivate short-term fodder crops like sunhemp	Green gram, chick pea etc.,) material as fodder Harvest all the top fodder available (Subabul, Glyricidia, Pipol, Prosopis etc) and feed the LS during drought 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 Promotion of Horse gram as contingent crop and harvesting it at vegetative stage as fodder Continuous supplementation of minerals and vitamin to prevent infertility. Encourage mixing available kitchen waste with dry fodder while feeding to the milch animals	sorghum/bajra/maize with input subsidy Supply of quality stem cuttings of Hybrid napier (CO1), paragrass, guinea grass etc., well before monsoon Encourage growing fodder crops like Berseem in winter and Juar in summer season Flushing the stock to recoup Replenish the feed and fodder banks
Drinking water	Adopt various water conservation methods at village level to improve the ground water level for adequate water supply. Identification of water resources De-silting of ponds Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals)	Adequate supply of drinking water. Restrict wallowing of animals in water bodies/resources; Add alum in stagnated water bodies	Watershed management practices shall be promoted to conserve the rainwater. Bleach (0.1%) drinking water / water sources Provide clean drinking water

	Construction of drinking water tanks in herding places/village junctions/relief camp locations Community drinking water trough can be arranged in sandies /community grazing areas		
Health and diseases management	Procure and stock emergency medicines and vaccines for important endemic diseases of the area All the stock must be immunized for endemic diseases of the area Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district Adequate refreshment training on draught management to be given to VAS, Jr.VAS, LI with regard to health & management measures Procure and stock multivitamins & area specific mineral mixture	Carryout deworming to all animals entering into relief camps Identification and quarantine of sick animals Constitution of Rapid Action Veterinary Force Performing ring vaccination (8 km radius) in case of any outbreak Restricting movement of livestock in case of any epidemic Tick control measures be undertaken to prevent tick borne diseases in animals Rescue of sick and injured animals and their treatment Organize with community, daily lifting of dung from relief camps	Keep close surveillance on disease outbreak. Undertake the vaccination depending on need 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
Floods	**NA**		
Cyclone	NA		
Heat wave and cold wave			
Heat wave	i) Plantation around the shed ii) H_2O 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	Allow the animals early in the morning or late in the evening for grazing during heat waves Feed green fodder/silage / concentrates during day time and roughages / hay during night time in case of heat waves Put on the foggers / sprinklers /fans during heat weaves in case of high yielders (Jersey/HF crosses)	Feed the animals as per routine schedule Allow the animals for grazing (normal timings)

		In severe cases, vitamin 'C' and electrolytes should be added in H_2O 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