

State: Madhya Pradesh

Agriculture Contingency Plan for District: Narsinghpur

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 (10.1)	
	Agro-Climatic Zone (Planning Commission)	Central Plateau And Hills Region (VIII)	
	Agro Climatic Zone (NARP)	Central Narmada valley (MP-6)	
	List all the districts or part thereof falling under the NARP Zone	Narsinghpur and Hoshangabad	
	Geographic coordinates of district headquarters	Latitude	Longitude
		22° 45' to 23° 15' N	78° 38' to 79° 38' E
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	ZARS, JNKVV, Jabalpur	
	Mention the KVK located in the district	Programme Coordinator, Krishi Vigyan Kendra Shashtri Bhawan Station Gunj area Distt. Narsinghpur -487001	
1.2	Rainfall	Normal RF(mm)	Normal Onset (specify week and month)
	SW monsoon (June-Sep):	1142.4	2 nd week of June
	NE Monsoon(Oct-Dec):	54.8	-
	Winter (Jan -Feb)	30.1	-
	Summer (March-May)	15.8	-
	Annual	1243.1	-

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)	513.6	312.9	136.5	24.7	23.7	14.6	0.2	1.0	3.9	5.3

* Net sown area + current fallow + old fallow

1.4	Major Soils (common names like red sandy loam deep soils (etc.,))*	Area ('000 ha)	Percent (%) of total
	Deep Soil (Heavy soil)	332.6	64.8
	Medium deep soil (Medium soil)	23.6	4.6
	Shallow soil (Light Soil)	156.0	30.4

Sources:- NBSS & LUP, Nagpur

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	303.7	128
	Area sown more than once	84.7	
	Gross cropped area	388.4	

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

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	177.8		
	Gross irrigated area	178.5		
	Rainfed area	125.9		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals	13	1.1	0.62
	Tanks	1	0.0	0.00
	Open wells	25895	92.7	51.91

	Bore wells	4730	77.3	43.29
	Lift irrigation schemes	NA		
	Micro-irrigation	NA		
	Other sources (reservoir)	08	7.40	4.14
	Total Irrigated Area		178.5	
	Pump sets	25094		
	No. of Tractors	4380		
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils 06	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited			
	Critical			
	Semi- critical			
	Safe	06	100	Normal
	Wastewater availability and use			
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

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

1.7	Major Field Crops cultivated	Area ('000 ha)							
		Kharif			Rabi			Summer	Total
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	NA	
	Soybean	-		98.5	-	-	-	-	98.5
	Pigeonpea	-		27.8	-	-	-	-	27.8
	Blackgram	-		14.0	-	-	-	-	14.0
	Rice	-		13.0	-	-	-	-	13.0
	Sorghum			2.4					2.4
	Chickpea	-	-	-			136.2	-	136.2
	Wheat	-	-	-			71.5	-	71.5
	Lentil	-	-	-			29.6	-	29.6
	Sugarcane	-	-	-			23.9		23.9
	Pea	-	-	-			12.8	-	12.8
	Summer Greengram	-	-	-	-	-	-	30.0	30.0

	Horticulture crops - Fruits	Total area (ha.)	Irrigated	Rainfed
	Mango	475		475
	Guava	270		270
	Citrus	290		290
	Others (specify)	270		270

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

	Horticultural crops - Vegetables	Total area (ha)	Irrigated	Rainfed
	Potato	588		
	Okra	259		
	Onion	700		
	Brinjal	525		
	Sweet Potato	124		
	Tomato	486		
	Spices			
	Corriander	884		
	Chilli	190		
	Others (specify)			
	Medicinal and Aromatic crops	Total area	Irrigated	Rainfed

	Plantation crops	Total area (ha)	Irrigated	Rainfed
	Others such as industrial pulpwood crops etc (specify)			
	Fodder crops	Total area (ha)	Irrigated	Rainfed
	Total fodder crop area			
	Grazing land	23700		
	Sericulture etc			
	Others (Specify)			

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)	-	-	278.1
	Crossbred cattle	-	-	NA
	Non descriptive Buffaloes (local low yielding)	-	-	NA
	Graded Buffaloes	-	-	85.4
	Goat	-	-	67.5
	Sheep	-	-	1.4
	Others (Pig + Horse)	-	-	7.7
	Commercial dairy farms (Number)			NA
1.9	Poultry	No. of farms	Total No. of birds ('000)	
	Commercial	-	-	
	Backyard	-	63275	

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		
	22 (84.76 ha)		13 (298.0 ha)		133 (199.0 ha)		
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)	581.8		1450 kg/ha (rural) 86 kg/ha (Reservoirs)		510 mt	
	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)	
Major Field crops (Crops to be identified based on total acreage)										
	Soybean	103.1	1580	-	-	NA	-	103.1	1580	
	Pigeonpea	34.0	1310	-	-	-	-	34.0	1310	

	Blackgram	8.3	566	-	-	-	-	8.3	566	
	Rice	13.7	1087	-	-	-	-	13.7	1087	
	Sorghum	6.96	1814					6.9	1814	
	Wheat	-	-	173.5	3056			173.5	3056	
	Gram	-	-	150.4	1099			150.4	1099	
	Lentil	-	-	17.4	564			17.4	564	
	Pea	-	-	7.8	602			7.8	602	
	Sugarcane			105.1	4874			105.1	4874	
Major Horticultural crops (Crops to be identified based on total acreage)										
Horticulture crops - Vegetable										
	Potato									
	Okra									
	Brinjal									
	Sweet Potato									
	Tomato									
	Spices									
	Corriander									
	Chilli									
	Others (specify)									

(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	Pigeonpea	Blackgram	Rice	Greengram
	Khariif- Rainfed	3 rd week of June – 1 st week of July	3 rd week of June – 2 nd week of July	1 st week of July – 2 nd week of July	1 st week of July – 2 nd week of July	1 st week of July – 2 nd week of July
	Khariif-Irrigated	-	-	-	2 nd week of July – 4 th week of July	-
		Chickpea	Lentil	Wheat	Pea	Sugarcane
	Rabi- Rainfed	1 st week of October –	1 st week of October-	-	-	-

		2 nd week of October	-2 nd week of October			
	Rabi-Irrigated	2 nd week of October – 2 nd week of November	2 nd week of October- 2 nd week of November	2 nd week of October – 4 th week of December	2 nd week of September -2 nd week of October	1 st week of October- 1 st week of March

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. Wilt in pulse crop			
	2. YVM in Blackgram, Greengram,soybean,lentil,okra etc			
	3. Sterility in Pigeonpea	√		
	4. Pod borer in pulse	√		
	5. Smut in Sugarcane & Wheat		√	
	Others (specify)			

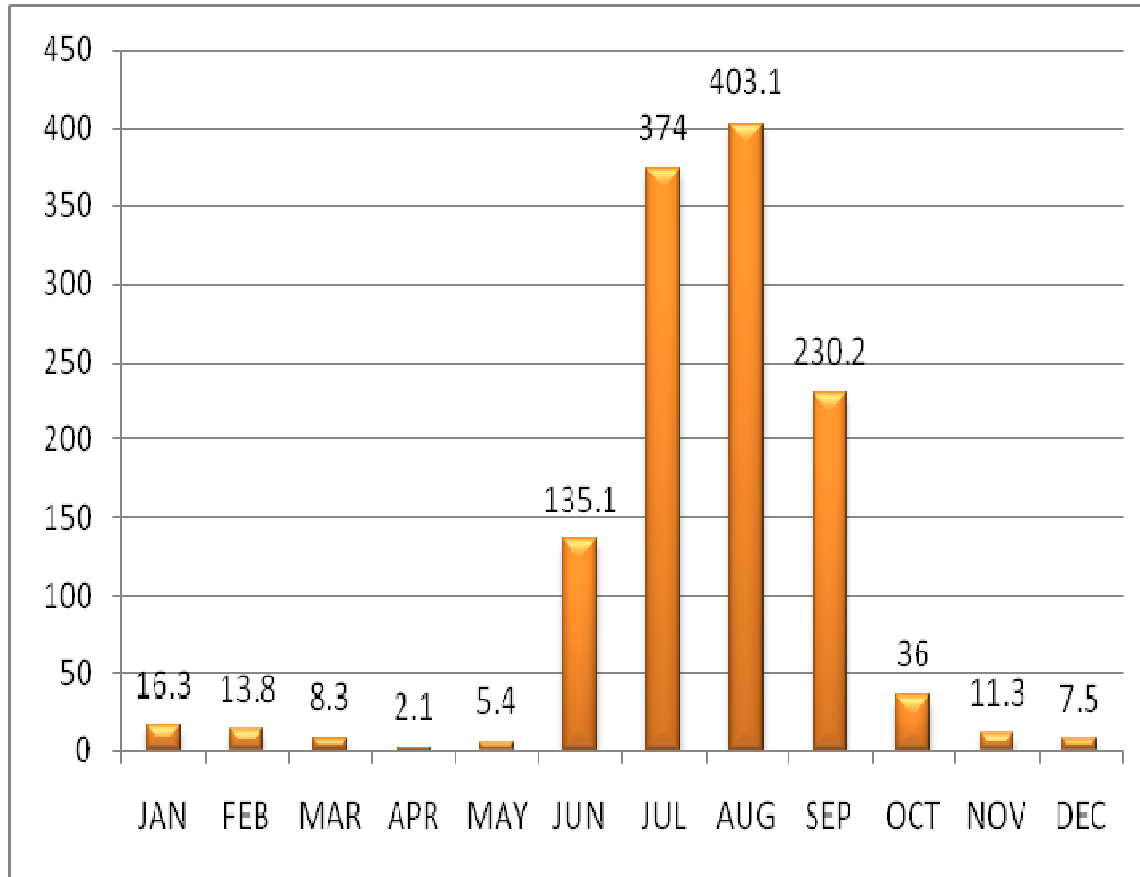
1.14	Include Digital maps of the district for		
		Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

Annexure I

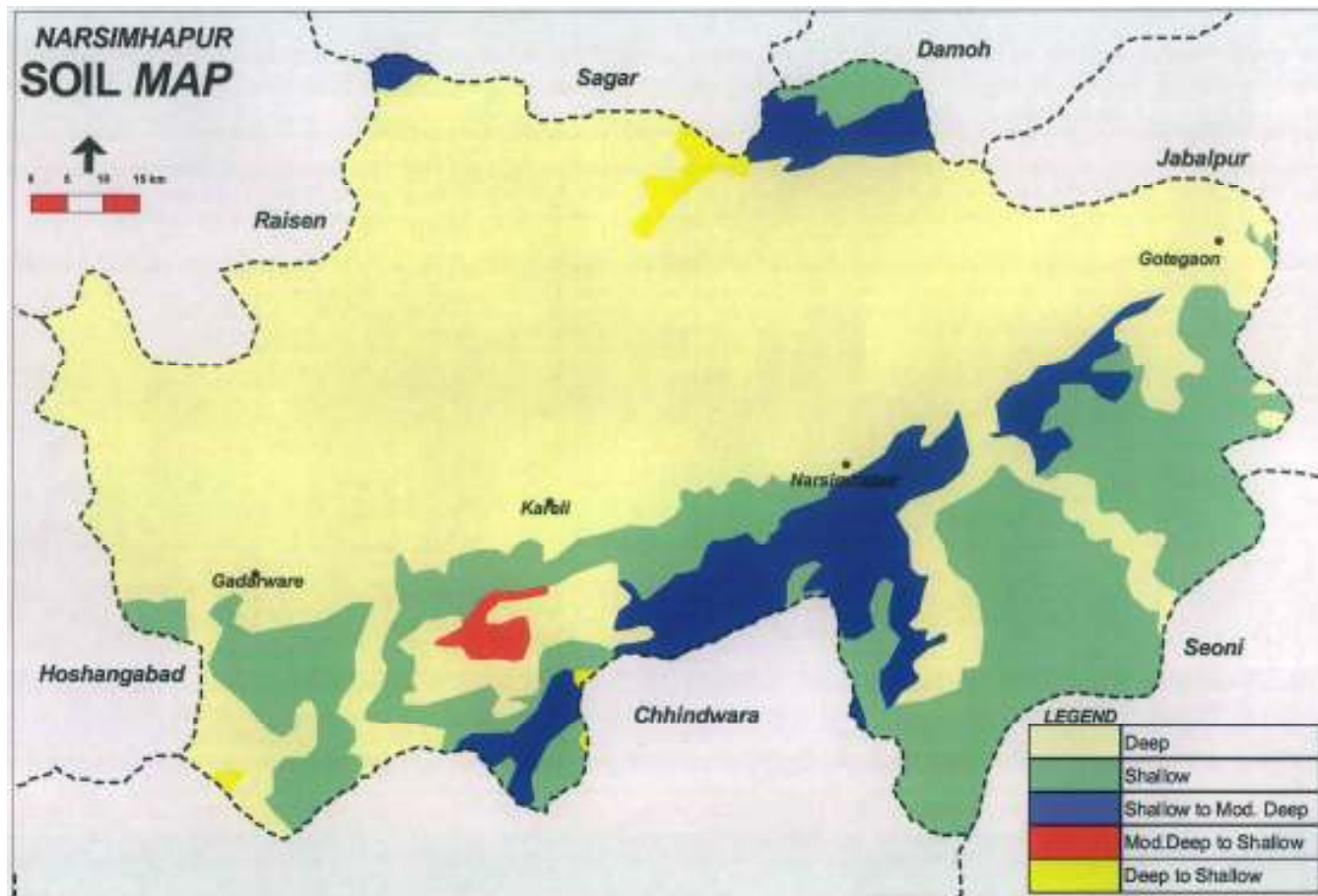




Annexure II



Annexure III



Source: NBSS & LUP, Nagpur

as2.0 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 4 th week of June	Deep to medium deep black Soils	Soybean	No change	Timely weeding	Linkage with SAU, NSC, Beej Nigam and farmers societies for seed availability.
		Rice		For early maturing varieties, adopt 15x15 cm geometry but seedlings are not more than 18 to 21 days old	
		Maize		-	
	Light sandy soil	Pigeonpea	No change		
		Maize			
		Sorghum			

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 2 nd week of July	Deep to Medium deep black Soils	Soybean	Donot prefer soybean Prefer alternate crops like Sesame/ Blackgram/ Greengram	1. Blade harrowing (Bakhar) for moisture conservation 2. Timely weeding 3. Use uprooted weeds as mulch for moisture conservation	Linkage with SAU, NSC, Beej Nigam and farmers societies for seed availability.
		Rice	Rice - JR-201, JR-503, vandna, pornnima, Ananda, Narendr 97, Govinda Dry sowing or Sesame/ Blackgram/ Greengram Sesame - TKG -306, TKG -20, TKG -27, TKG-35, JGS-8, JT-7, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1, N-		

			32. Blackgram – JU-2,JU-3,JU-86,T-9, JBG-623, LBG684,TAU-1 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		
		Maize	Prefer alternate crops like Sesame/ Blackgram/ Greengram		
		Pigeonpea	Pigeonpea :Pragti ,Jagrati, Asha , Number-148, JKM-7, JA-4, ICPL-85063 (Laxmi) , JKM-189		
	Light sandy soil	Pigeonpea	Pigeonpea :Pragti ,Jagrati, Asha , Number-148, JKM-7, JA-4, ICPL-85063 (Laxmi) , JKM-189		
		Maize	Prefer alternate crops like Sesame/ Blackgram/ Greengram		
		Sorghum	Prefer alternate crops like Blackgram/ Greengram		

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)					
Delay by 6 weeks 4 th week of July	Deep to Medium deep black Soils	Soybean	Donot prefer soybean Prefer alternate crops like Sesame/ Blackgram/ Greengram	Blade harrowing (Bakhar) for moisture conservation Timely weeding	Linkage with SAU, NSC, Beej Nigam and farmers societies for seed availability.
		Rice	Rice - JR-201, JR-503, vandna, porrnima, Ananda, Narendr 97, Govinda Dry sowing Or Sesame/ Blackgram/ Greengram	Use uprooted weeds as mulch for moisture conservation	

			<p>Sesame - TKG -306, TKG -20, TKG -27, TKG-35, JGS-8, JT-7, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1, N-32.</p> <p>Blackgram – LBG-20, PDU-1, JU-2, PU-30,35, TAU-93-2, JU-3, JU-86, T-9, JBG-623, BG-684, TAU-1</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>		
		Maize	Prefer alternate crops like Sesame/ Blackgram/ Greengram/ Niger		
		Pigeonpea			
	Light sandy soil	Pigeonpea			
		Maize			
		Sorghum			

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 2 nd week of August	Deep to Medium deep black Soils	Soybean	<p>Donot prefer soybean</p> <p>Prefer to sow alternate crops like Sesame/ Blackgram/ Greengram/ Niger</p>	<p>Blade harrowing (Bakhar) for moisture conservation</p> <p>Timely weeding</p> <p>Use uprooted weeds as mulch for moisture conservation</p> <p>Preparation of field for <i>Rabi</i> crops.</p>	Linkage with SAU, NSC, Beej Nigam and farmers societies for seed availability.
		Rice	<p>Prefer to sow alternate crops like Sesame/ Blackgram/ Greengram/ Niger</p> <p>Sesame - TKG -306, TKG -20, TKG -27, TKG-35, JGS-8, JT-7, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1, N-32.</p>		

			Blackgram – LBG-20, PDU-1, JU-2, PU-30,35, TAU-93-2, JU-3, JU-86, T-9, JBG-623, BG-684, TAU-1 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 Niger: JNC-6, JNC-9		
		Maize	Prefer alternate crops like Sesame/ Blackgram/ Greengram/ Niger		
		Pigeonpea			
	Light sandy soil (Light Soil)	Pigeonpea			
		Maize			

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measues	Remarks on Implementation
Early season drought (Normal onset)					
*Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Deep Black Soil	Soybean-Wheat/Chickpea	Gap filling	Mulching Intercultivation Weed management Maintain optimum plant population	Linkage with SAU, NSC, Beej Nigam and farmers societies for seed availability.
		Rice	If population is less than <75% prefer resowing		
		Maize			
		Pigeonpea	Thinning out the extra seedlings per hill;		
	Medium Black soil	Soybean-Wheat/Chickpea/ Pigeonpea	*Sesame-Wheat/Chickpea		
			*Niger+Wheat/ Chickpea		
Shallow black soils	Soybean-Wheat/Chickpea	Incase of severe drought spell resowing with Greengram+Maize(4:2)/			

			Blackgram+ Sesame/ Pigeonpea		
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- Sesame and Niger can be sown in semi *rabi* or *rabi* season.

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 measues	Remarks on Implementation
At vegetative stage	Deep to medium deep black soils	Soybean- Wheat/Chickpea/Sugarcane	Thinning out the extra seedlings per hill; Incase of severe drought spell and complete crop failure occurs then resow with Sesame + Greengram (2:4) / Niger	Manual weed control+Intercropping. Interculture operation for moisture conservation;	-
		Pigeonpea			
		Maize			
	Light sandy soil (Light Soil)	Pigeonpea			
		Maize			
		Sorghum			

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 Soil	Soybean-Wheat/Chickpea	Folair application with 2% Urea & MOP	Mulching Interculture; Life Saving Supplemental Irrigation	-
	Medium Black soil				
	Light sandy soil				

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation

	Deep Black Soils	Soybean	Preparation field and preference for sowing of early rabi crops like field pea, linseed, lentil, mustard.	Life Saving Supplemental Irrigation	Sources of seed SAU, NSC & SSC For Agronomic measures the ongoing scheme like RKVY NREGS etc
	Medium Black soils				
	Light sandy soils				

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/ limited release of water in canals due to low rainfall	Deep Black Soil	Soybean-Wheat/ Chickpea	Prefer alternate crops like semi Rabi sesame/ Chickpea/ Wheat Go for delayed sowing with early maturing varieties In case of severe shortage of water in canals, plan for sowing of soybean with short duration varieties (JS-335, JS-9560)	Mulching, Mechanical weed control Pre sowing irrigation is given for good germination	Sources of seed SAU, NSC & SSC For Agronomic measures the ongoing scheme like RKVY NREGS etc.
	Medium Black soil				
	Light sandy soil				

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	Deep Black Soils	Soybean/ Pigeonpea/ Blackgram/ Greengram	Fallow-Chickpea/ Linseed/ Lentil Sorghum: Prefer dual	Interculture operation. Provide life saving irrigation at critical stages.	Training programme to farmers by ATMA, FTC.
	Medium Black soil				

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Light sandy soil			purpose varieties/ hybrids	Pre sowing irrigation is given for good germination Blackgram/ Greengram: Adopt <i>in-situ</i> moisture conservation practices at 30DAS	

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Deep black soils	Soybean-Wheat+ Chickpea	Fallow-Chickpea/ Linseed/ Lentil In case of soybean, adopt sowing on ridges and give one pre sowing irrigation and if necessary one irrigation at critical stage i.e., pod development to be given	Interculture operation. Mulching. Provide the irrigation by sprinkler method	Training programmes to farmers by ATMA, FTC.
	Medium black soils	Soybean-Wheat+ Chickpea			
	Light sandy soils	Soybean-Wheat+ Chickpea			

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	Deep black soils	Soybean-Wheat+ Chickpea	Fallow-Chickpea/ Linseed / Lentil Chickpea should be sown with residual moisture after harvest of soybean or give pre sowing irrigation to chickpea	Interculture Irrigate the crop at critical stages and if possible with sprinklers Mulching.	Training programme to farmers by ATMA, FTC
	Medium black soils	Soybean-Wheat+ Chickpea			
	Light sandy soils	Soybean-Wheat+ Chickpea			

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Any other condition (specify)	Restricted use of irrigation, water irrigation of crops only at critical stages and use of micro-irrigation like drip sprinkler.			Adopt furrow irrigation and use of micro-irrigation system	

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
Soybean, Pigeonpea	Provide drainage care should be taken that rain water does not stagnate in the field. Interculture operation to loosen the soil to improve aeration in soil.	Change care should be taken that rain water does not stagnate in the field. Interculture operation to loosen the soil to improve aeration in soil.	Care should be taken that rain water does not stagnate in the field. Harvesting of crop in clear weather.	Produce should be placed under shade. or protect the produce by tarpaulin kept in T floor.
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. Interculture operation	Proper drainage should be provided and adopt all plant protection measures. Harvesting of crop in clear weather.	- Produce should be placed under shade. or protect the produce by tarpaulin kept in T floor
Chickpea	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. Interculture operation	Proper drainage should be provided and adopt all plant protection measures. Harvesting of crop in clear weather.	Produce should be placed under shade. or protect the produce by tarpaulin kept in T floor
Horticulture				
Tomato	Staking of plant be done	Staking of plant be done		

Condition	Suggested Contingency measures			
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures
Heavy rainfall with high speed winds in a short span²				
Pigeonpea	<ul style="list-style-type: none"> September sowing of Pigeonpea, if, previous pigeonpea crop is completely damaged Gap filling, if needed Removal of excess water 	<ul style="list-style-type: none"> Strengthening of Drainage system Sowing of alternative rabi maize or other crops like chilly\ tomato\ brinjal if totally damaged 	<ul style="list-style-type: none"> Strengthening of Drainage system Subsequent if totally damaged Harvest at physiological maturity 	Storage at safer place
Horticulture				
Mango	<ul style="list-style-type: none"> Strengthening of Drainage system Replanting of crop if substantially damaged 	<ul style="list-style-type: none"> Strengthening of Drainage system Drenching with copper fungicides 	<ul style="list-style-type: none"> Strengthening of Drainage system Harvesting at proper time 	Immediate sale of fruits and safe transportation
Outbreak of pests and diseases due to unseasonal rains				
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	Proper storage with seed treatment with neem oil (5ml/kg grain /seed)
Wheat	Spray 0.2 % mancozeb 76% WP against wheat rust.	Spray 0.2 % mancozeb 76% WP against wheat rust.	Carry out critical survey of fields for disease attack in crops	
Chickpea	Spray t 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	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 or Quinalphos 1.5	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	-

Condition	Suggested Contingency measures				Remarks on Implementation
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	
	per hectare with duster.	WP 20-25 per hectare with duster.			
Horticulture					
Vegetables	Pest monitoring & spray of insecticide as per need pest monitoring & spray of insecticide as per need				

2.3 Floods.-NA.

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation	Not applicable			
Continuous submergence for more than 2 days				
Soybean	After draining the submerge water, washing off vegetative cover will remove the mud collected on vegetative surfaces.			
Pigeonpea				
Rice				
Greengram				
Sesame				
Horticulture				
Vegetables	After draining the submerge water, washing off vegetative cover will remove the mud collected on vegetative surfaces.			
Sea water intrusion³	Not applicable			

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

Extreme event type	Suggested contingency measure ^r			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave				
Wheat,Chickpea,Mustard Lentil,Linseed, 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	Protect the crop with the help of light irrigation
Horticulture	Not applicable			
Cold wave				
Wheat,Chickpea,Lentil Pigeonpea,Linseed Musturd	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
Horticulture	NA			
Frost				
Wheat Chickpea Linseed Pigeonpea Musturd	Give 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
Horticulture				
Vegetables	Give light irrigation, Smoke generation at night time to rise temperature	Give light irrigation, Smoke generation at night time to rise temperature	Give light irrigation, Smoke generation at night time to rise temperature	
Hailstorm				

Wheat, Chickpea, Lentil, Pigeonpea Linseed, Mustard	-	Light and frequent irrigation	<ul style="list-style-type: none"> • Apply 10% additional nitrogen • Light and frequent irrigation 	Timely harvesting and shifting of produce to safer place in case of early forewarning
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 Chickpea, 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>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>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>	
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