State: Madhya Pradesh

Agriculture Contingency Plan for District: Satna

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	Rewa, Sidhi, Satna, Panna, Jabalpur, Katni, Seoni		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		23° 58' to 25° 12' N	80° 21' to 81° 23' E	313 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Regional Agricultural Research Station , Rewa (M.P.)		
	Mention the KVK located in the district	Programme Coordinator (NGO), Krishi Vigyan Kendra, Majhgawan, Distt. Satna (M.P.)		

1.2	**Rainfall**	Normal RF(mm)	Normal Onset	Normal Cessation
	SW monsoon (June-Sep)	950.1	2nd week of June	1st week of October
	NE Monsoon(Oct-Dec)	56.7		
	Winter (Jan- Feb)	49.1		
	Summer (Mar.-May)	21.8		
	Annual	1077.7		

1.3	Land use pattern of the district	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)	742.4	341.3	203.7	66.8	20.3	48.9	3.4	14.5	26.20	17.30

1. 4	**Major Soils**	**Area ('000 ha)**	**Percent (%) of total**
	1. Deep soils	390.8	53.4
	2. Medium deep soils	126.4	17.02
	3. Shallow soils	220.0	29.6

Source: NBSS & LUP, Nagpur

1.5	**Agricultural land use**	Area ('000 ha)	Cropping intensity %
	Net sown area	341.3	134
	Area sown more than once	114.9	
	Gross cropped area	456.2	

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

1.6	**Irrigation**	Area ('000 ha)		
	Net irrigated area	125.2		
	Gross irrigated area	127.2		
	Rainfed area	216.1		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Bore wells	15162	59.5	47.01
	Open wells	16166	36.2	28.6
	Canals	59	7.1	5.6
	Tanks	97	2.6	2.0
	Lift irrigation schemes			
	Micro-irrigation			
	Other sources (Reservoirs)	951	21.8	17.2
	Total Irrigated Area		127.2	
	Pump sets			
	No. of Tractors			
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils 08	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited			
	Critical			
	Semi- critical	01		
	Safe	07		

	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)**							
		Kharif			***Rabi***			**Summer**	**Total**
		Irrigated	**Rainfed**	**Total**	**Irrigated**	**Rainfed**	**Total**		
	Rice			73.4					73.4
	Soybean			54.2					54.2
	Blackgram			18.4					18.4
	Pigeonpea			13.0					13.0
	Wheat						125.6		125.6
	Chickpea						86.5		86.5
	Lentil						28.7		28.7
	Linseed						4.8		4.8
	Horticulture crops - Fruits	**Total area ('000 ha)**			**Irrigated**		**Rainfed**		
	Mango	1.1							
	Guava	0.054							
	Citrus	0.012							
	Water chestnet	0.09							
	Horticultural crops - Vegetables	**Total area**			**Irrigated**		**Rainfed**		
	Tomato	1.2							
	Potato	1.8							
	Cauliflower	0.03							
	Chilli	0.4							
	Onion	2.2							

	Medicinal and Aromatic crops	**Total area**	**Irrigated**	**Rainfed**
	Ashwagandha	0.04	0.04	

	Turmeric	0.02	0.02	

	Plantation crops	**Total area (000 ha)**	**Irrigated**	**Rainfed**
	Fodder crops	**-**	**-**	**-**
	Total fodder crop area	-	-	-
	Grazing land	-	-	-
	Sericulture etc	-	-	-

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Non descriptive Cattle (local low yielding)			661.9
	Crossbred cattle			-
	Non descriptive Buffaloes (local low yielding)			-
	Graded Buffaloes			160.7
	Goat			180.1
	Sheep			18.8
	Others (Pig + Horse)			16.0
	Commercial dairy farms (Number)			
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**	
	Commercial	15	30.5	
	Backyard	200	5.0	

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**
	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)			

1.11 Production and Productivity of major crops (Average of last 5 years: 2004 - 08)

1.11	Name of crop	**Kharif**		**Rabi**		**Summer**		**Total**		**Crop residue as fodder** ('000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
Major Field crops (Crops identified based on total acreage)										
	Rice	74.5	821					74.5	821	
	Soybean	17.8	546					17.8	546	
	Blackgram	5.2	309					5.2	309	
	Pigeonpea	5.1	396					5.1	396	
	Wheat			131.3	1021			131.3	1021	
	Chickpea			49.5	526			49.5	526	
	Lentil			13.5	414			13.5	414	
	Linseed			1.5	298			1.5	298	
	Mustard			0.7	319			0.7	319	
Major Horticultural crops (Crops identified based on total acreage)										
	Tomato				21000					
	Chili				10700					
	Onion				22500					
	Potato				60000					
	Cauliflower				40000					

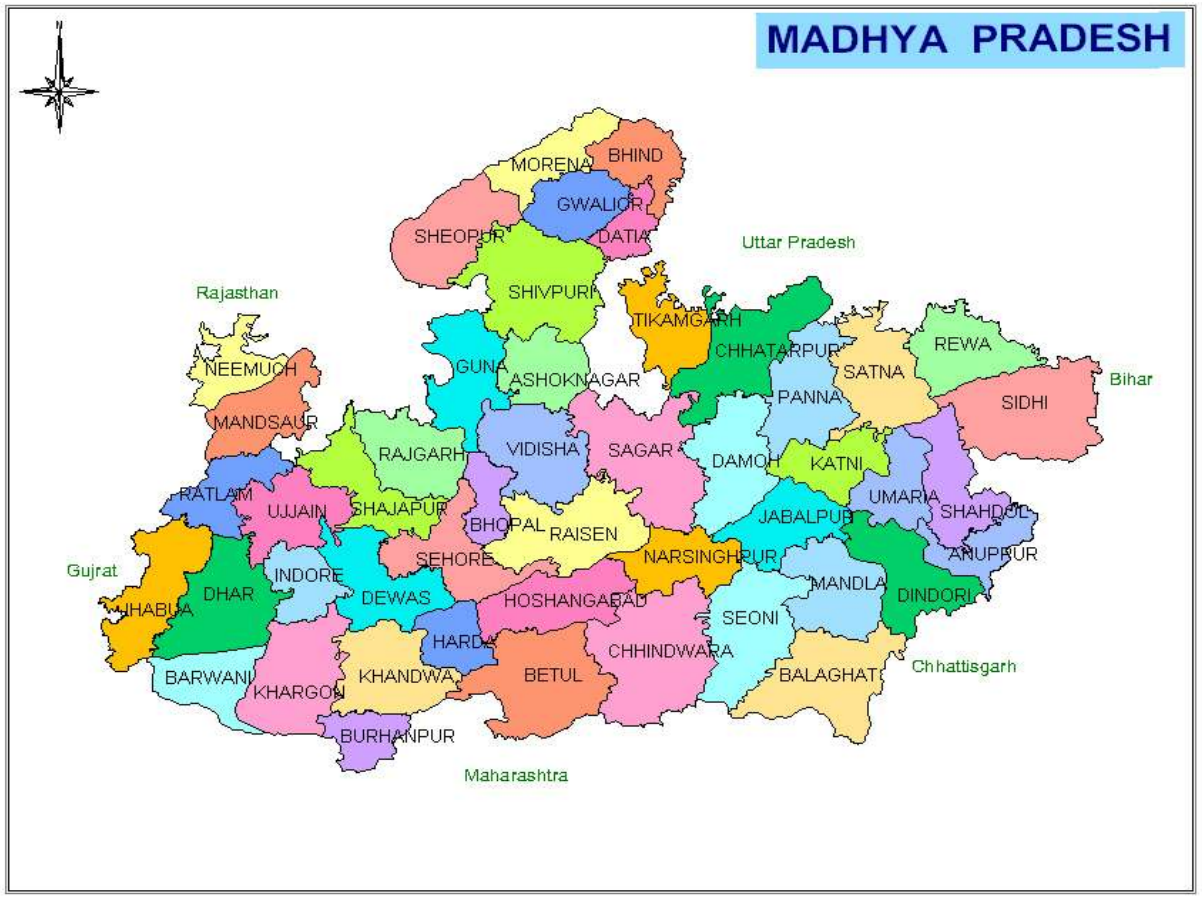
(Source : Agriculture Statistics 2009, Directorate of Farmer Welfare and Agriculture Development Madhya Pradesh, Bhopal)

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

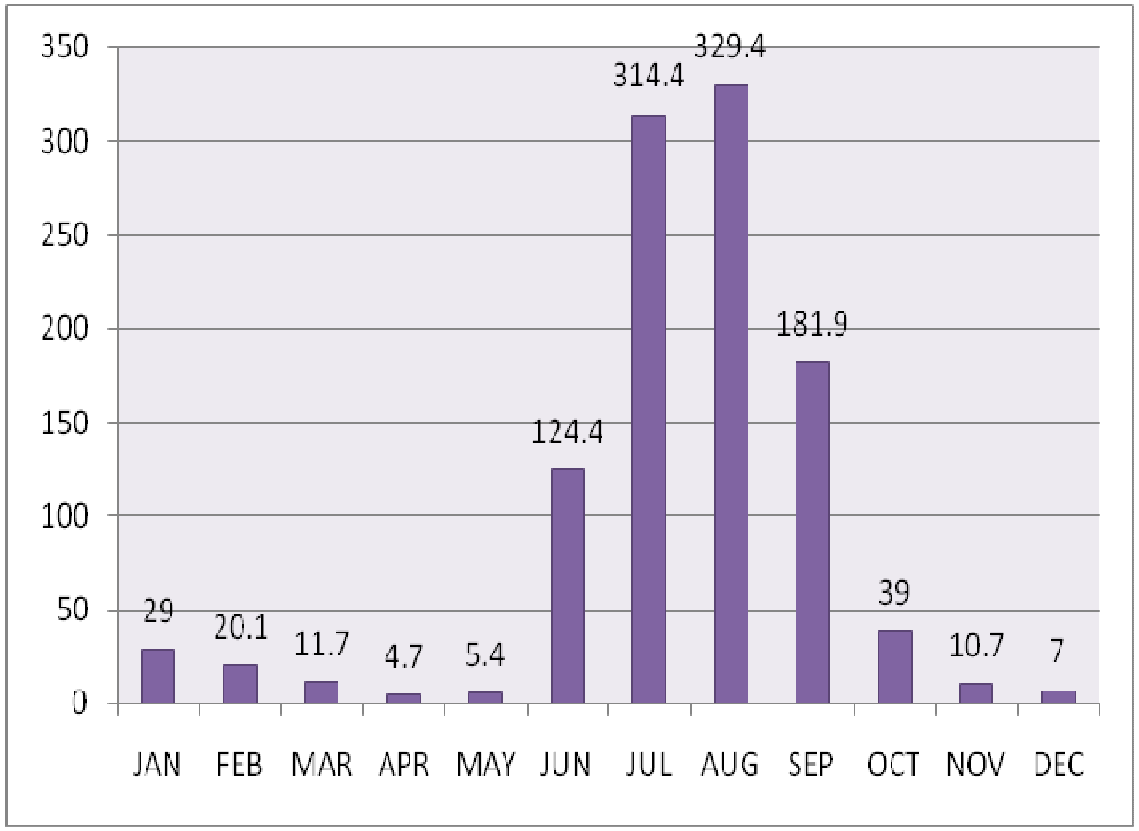
Annexure I



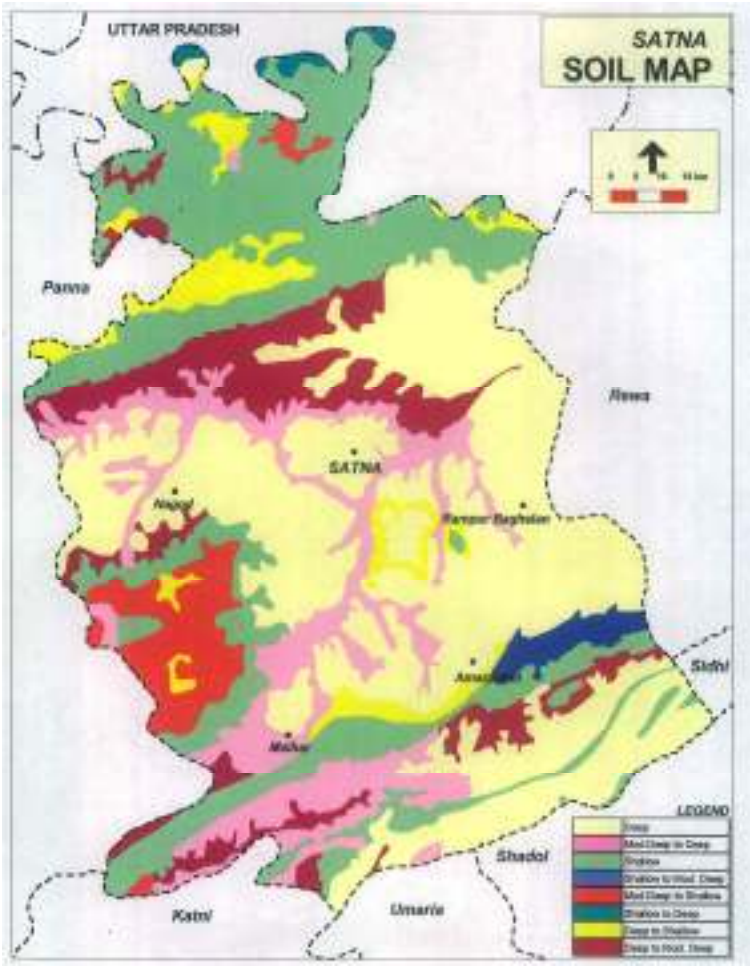

AGROCLIMATIC ZONES
BUNDELKHAND
CENTRAL NARMADA VALLEY
CHATTISGARH PLAIN BALAGHAT
GRID REGION
JHABUA HILLS
KYMORE PLATEAU SATPURA HILLS
MALWA PLATEAU
NIMAR PLAINS
NOTHERN HILL REGION OF CHATTISGARH
SATPURA PLATEAU
VINDHYA PLATEAU
AGROCLIMATIC ZONES OF MADHYA PRADESH
N
W
E
S
MORENA
BHIND
GWALIOR
SHEOPUR
DATIA
SHIVPURI
TIKAMGARH
CHHATARPUR
REWA
GUNA
ASHOKNAGAR
PANNA
SATNA
SIDHI
NIMACH
MANDSAUR
RAJGARH
VIDISHA
SAGAR
DAMOH
KATNI
UMARIA
SHAHDOL
SHAJAPUR
RATLAM
UJJAIN
BHOPAL
JABALPUR
RAISEN
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

Mean Monthly rainfall (mm)



Annexure III



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[c] including variety**	**Agronomic measures[d]**	**Remarks onImplementation**
Delay by 2 weeks 4th week of June	Bunded lowlands deep soils	Rice-Wheat Soybean - Chickpea	No Change **Rice-**Upland: IR-36, JR-201, JR-503, Vandna, Poornima, Ananda, Narendra 97, Govinda and Hybrid rice JRH 4, 5 and 8 Lowland: WGL-32100, MR-219, Mahamaya, IR-36,IR-64, HMT, Swarna, Madhuri, Pusa Basmati, Karnal basmati, Pusa sugandha3,4,and5 and Hybrid rice (PRH-10,PA6201, PHB71, Pro Agro 6444) **Soybean**- JS-335, JS 80-21, JS 97-42, JS 94-60, JS 93 05 **Pigeonpea -** Asha ,No-148,JKM-7, JA-4,ICPL-85063(Laxmi) , JKM-189 (Shallow soils) **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 **Blackgram –** JU-2, JU-3, JU-86, T-9, JBG-623, LBG684, TAU-1, Berkha, PU-30,35,19	1. Selection of higher production potential varieties; Conservation of excess rain water in high rainfall areas and use as life saving irrigation according to situation. 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. 5. Timely weeding is done and use of weeds as mulch between row of crops for moisture conservation 6. 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.	-
	Bunded lowlands medium deep soils	Rice-Wheat Soybean - Chickpea			
	Unbunded uplands shallow soils	Rice-Wheat Soybean- Chickpea			

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 4 weeks 2nd week of July	Bunded lowlands deep soils	Rice-Wheat Soybean-Chickpea	**Rice –** IR-36 JR-201, Poornima , JR-503, Vandna **Pigeonpea-** Pragati, Jagriti, Asha, Number-148,JKM-7, JA-4,Type-21-Pusa 855, ICPL-85063(Laxmi), JKM-189 **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 **Blackgram –** JU-2,JU-3,JU-86,T-9,JBG-623, LBG 684, TAU-1, Berkha,PU-30,35,19	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 4. Use of balanced fertilizer and biofertilizer according to recommendation to crop and application of zinc in deficient soil. 5. Sowing of crops against the slope depend on crops. 6 .Timely weeding is done and use of weeds as mulch between row of crops for moisture conservation 7. Adoption of plant protection as per requirement 8. 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 days old.	SAU's, Beej Nigam & NSC
	Bunded lowlands medium deep soils	Rice-Wheat Soybean-Chickpea			
	Unbunded uplands shallow soils	Rice-Wheat Soybean-Chickpea			

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 6 weeks	Bunded lowlands deep soils	Rice-Wheat	Don't sow the rice and soybean. sowing of	1. Use of blade harrow (Bakhar) for moisture conservation and	SAU's, Beej Nigam & NSC

4th week of July		Soybean - Chickpea	alternate crops Sesame, Niger, Castor, Kodo millet	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 15x15 cm geometry but seedlings are not more than 18-21 day old.	
	Bunded lowlands medium deep soils	Rice-Wheat			
		Soybean - Chickpea			
	Unbunded uplands shallow soils	Rice-Wheat			
		Soybean - Chickpea			

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8 weeks 2nd week of August	Bunded lowlands deep soils	Rice-Wheat	Keep the land fallow for Rabi crops	1. Use of blade harrow (Bakhar) for moisture conservation for Rabi sowing	SAU's, Beej Nigam & NSC
		Soybean - Chickpea			
	Bunded lowlands medium deep soils	Rice-Wheat			
		Soybean - Chickpea			
	Unbunded uplands	Rice-Wheat			

	shallow soils	Soybean - Chickpea			

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
	Bunded lowlands deep soils	Rice-Wheat	Re sowing of varieties of medium to early group in ridge and furrow after seed treatment. Gap filling is done if possible. Timely weeding and intercultural operations	1. Use of blade harrow (Bakhar) for moisture conservation for Rabi crops and destroy of weed in late onset of monsoon 2. Adaptation of moisture conservation practice; Conservation of excess rain water in high rainfall areas and use as life saving irrigation according to situation 3. Use of balanced fertilizer and bio-fertilizer according to recommendation to crop and application of zinc in deficient soil.	SAU's, Beej Nigam & NSC
		Soybean-Chickpea			
	Bunded lowlands medium deep soils	Rice-Wheat			
		Soybean - Chickpea			
	Unbunded uplands shallow soils	Rice-Wheat			
		Soybean - Chickpea			

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At vegetative stage	Bunded lowlands deep soils	Rice-Wheat	Protective irrigation. Intercultural operation and weeding. Mulching between crop rows. Thinning and gap filling.	1. Storage of water in lower side of the field and make use for life saving irrigation in *Rabi* 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	-
		Soybean- Chickpea			
	Bunded lowlands medium deep soils	Rice-Wheat			
		Soybean- Chickpea			
	Unbunded	Rice-Wheat			

	uplands shallow soils	Soybean - Chickpea		holding capacity 4. Ridges are made after 15-20 lines of crops for the moisture conservation	

Condition			**Suggested Contingency measures**		
Terminal drought	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation[e]**
(Early withdrawal of monsoon)	Bunded lowlands deep soils	Rice-Wheat Soybean - Chickpea	1. Moisture conservation practice adopt and destroy the weed under early withdrawal of monsoon for rabi season 2. Apply light irrigation to *Kharif* crops for proper grain filling if required, this will helpful in field preparation for *Rabi* crops. 3. Harvesting of crops at physiological maturity	1. Preference will be given on sowing of rabi crops like Lentil, Linseed, Chickpea. 2. Diversification of crops. 3. Line sowing of Lentil, Linseed, Chickpea in moist zone	-
	Bunded lowlands medium deep soils	Rice-Wheat Soybean- Chickpea			
	Unbunded uplands shallow soils	Rice-Wheat Soybean - Chickpea			

2.1.2 Drought - Irrigated situation

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	Medium deep 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	SAU's, Beej Nigam & NSC
		Rice - Chickpea	Soybean –Chickpea		
	Red Sandy clay loam soils	Rice-Wheat	Soybean-Wheat		
		Rice - Chickpea	Soybean – Chickpea		

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Limited release of water in canals due to low rainfall	Medium deep 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	SAU's, Beej Nigam & NSC
		Rice - Chickpea	Soybean –Chickpea		
	Red Sandy clay loam soils	Rice-Wheat	Soybean-Wheat		
		Rice - Chickpea	Soybean – Chickpea		

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Limited release of water in canals due to low rainfall	Medium deep 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	SAU's, Beej Nigam & NSC
		Rice - Chickpea	Soybean –Chickpea		
	Red Sandy clay loam soils	Rice-Wheat	Soybean-Wheat		
		Rice - Chickpea	Soybean – Chickpea		

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Non release of water in canals under delayed onset of monsoon in catchment	Medium deep Sandy clay loam soils	Rice-Wheat	Soybean- Greengram	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	SAU's, Beej Nigam & NSC
		Rice -Chickpea	Soybean or Pigeonpea		
	Red Sandy clay loam soils	Rice-Wheat	Soybean or Pigeonpea		
		Rice –Chickpea	Soybean or Blackgram		

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	Medium deep 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	SAU's, Beej Nigam & NSC
		Soybean-Chickpea	Blackgram or Pigeonpea		
	Red Sandy clay loam soils	Rice-Wheat	Soybean-wheat		
		Soybean- Chickpea	Pigeonpea-Blackgram		

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	Medium deep Sandy clay loam soils	Rice-Wheat	Sowing of pulses & oilseeds in place of cereals Prefer short duration low water requirement varieties of wheat.	Chickpea should be sown with residual moisture after harvest of soybean or give p re sowing irrigation to chickpea. Protective irrigation at CRI stage in 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	SAU's, Beej Nigam & NSC
		Rice –Chickpea			
	Red Sandy clay loam soils	Rice-Wheat			
		Rice – Chickpea			

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, Blackgram, 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				
Out break of pests and diseases due to unseasonal rains				
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	-
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	-
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 Quinolphos 25 EC or Chlorpyriphos 20 EC C or Methyle Parathiyan 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 Quinolphos 25 EC or Chlorpyriphos 20 EC C or Methyle Parathiyan 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**			
Transient water logging/ partial inundation	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Continuous submergence for more than 2 days				
Sea water intrusion				

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				
Rice	Light and repeated irrigation at the appearance of hair line cracks in soil surface, Correct iron deficiency with 0.5% iron sulphate spray.	Repeated irrigation at the appearance of hair line cracks in soil surface, pounding of water for 15 days after transplanting to check Fe deficiency and for crop establishment.	Repeated irrigation at the appearance of hairline cracks in soil surface	Harvest crop at physiological maturity
Soybean, Pigeonpea,	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	Light irrigation	Light irrigation	Light irrigation	Harvest at physiological

Wheat	Smoking during night	Smoking during night	Smoking during night	maturity
Frost				
Chickpea, Lentil, Pigeonpea	Protect the crop with the help of light irrigation, Smoking during night to increase temperature wind breaks are necessary where cold and heat wave in regular.	Protect the crop with the help of light irrigation; Smoking during night to increase temperature; wind breaks are necessary where cold and heat wave in regular	Protect the crop with the help of light irrigation; Smoking during night to increase temperature; wind breaks are necessary where cold and heat wave in regular	Harvest at physiological maturity
Hailstorm	Not applicable			
Cyclone	Not applicable			

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event	During the event	After the event
Drought			
Feed and fodder availability	As the district is occasionally prone to drought the following practices may be implemented to 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, gram 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	Harvest and use biomass of dried up crops (Rice, wheat, Maize, Soybean, Black gram, 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	Encourage progressive farmers to grow multi cut fodder crops of 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

		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	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 Desilting of ponds Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals) 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	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
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	Carryout de-worming 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	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-

	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	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	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) In severe cases, vitamin 'C' and electrolytes should be added in H_2O during heat waves.	Feed the animals as per routine schedule Allow the animals for grazing (normal timings)
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	Routine practices are followed

		morning and late evening	
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