State: MADHYA PRADESH
Agriculture Contingency Plan 2010-11 District: Burhanpur

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro ecological Sub Region (ICAR)	Madhya Bharat plateau , western Malwa plateau, eastern Gujarat plain, Vindhyan and Satpura range and Narmada valley		
	Agro-Climatic Region (Planning Commission)	Western Plateau and Hills region (IX)		
	Agro Climatic Zone(NARP)	Nimar valley Agro climatic Zone (MP-11)		
	List all the Districts or part thereof falling under the NARP Zone	East Nimar, Burhanpur, West Nimar, Dhar and Bharwani		
	Geographic coordinates of district	Latitude	Longitude	Altitude
		24^0 00 10.45 N	80^0 42 56.94E	432.33M
	Name and address of the concerned ZRS/ZARS/RARS/RRS/RRTTS	ZARS B.M.College of Agriculture campus Khandwa Jaswari Road, Khandwa (M.P.)-450001 MP-		
	Mention the KVK located in the district	Krishi Vigyan Kendra, Bahadarpur Road, Near Indian Oil Petrol Pump, Burhanpur Dist., Pin-450 331		
1.2	**Rainfall**	**Average**	**Normal Onset**	**Normal Cessation**
	SW monsoon (June-Sep)	883.6	June IIIrd week 25 MW	August IInd week 33MW
	NE Monsoon (Oct.-Dec.)	66.1	-	-
	Winter(Jan-March)	19.4	-	-
	Summer(April-May)	10.4	-	-
	Annual	978.9	-	-

Source - The figures have been corrected as per given in Agriculture Statistics 2009 published by Directorate of Farmers welfare and Agricultural Development , M.P.,Bhopal .

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**	**Old fallows**
	Area ('000 ha)	342.7	104.4	202.0	15.8	10.4	0.8	0.00	6.2	1.3	1.8

Source – Directorate of Farmers welfare and Agriculture, Development of Madhya Pradesh, Bhopal, Agriculture Statistics 2009.

1. 4	**Major Soils (common names like red sandy loam deep soils (etc.,)***	**Area ('000 ha)**	**Percent (%) of total**
	Deep soils	377.20	35.48
	Medium deep soils	195.00	18.34
	Shallow soils	491.20	46.17

1.5	**Agricultural land use**	**Area ('000 ha)**	**Cropping intensity %**
	Net sown area	104.4	114.0
	Area sown more than once	14.6	
	Gross cropped area	119.0	

Area under major field crops & horticulture etc.

1.6	**Irrigation**	**Area ('000 ha)**		
	Net irrigated area	36.7		
	Gross irrigated area	43.4		
	Rain fed area	60.9		
	Sources of Irrigation	**Number**	**Area ('000 ha)**	**Percentage of total irrigated area**
	Canals	4	0.3	
	Tanks	0.0	0.0	
	Open wells	14761	25.9	
	Bore wells	3386	15.0	
	Lift irrigation schemes	-		
	Micro-irrigation	-		
	Other sources (please specify)		15.4	
	Total Irrigated Area		43.4	
	Pump sets			
	No. of Tractors			
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	**No. of blocks/ Tehsils**	**Number**	**Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)**
	Over exploited	-	-	-
	Critical	-	-	-
	Semi- critical		71%	
	Safe			
	Wastewater availability and use			
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

1.7	Major field Crops cultivated	Area ('000 ha)		
		Total area	**Irrigated**	**Rain fed**
	Soybean	14.3		14.3
	Cotton	46.0		46.0
	Sorghum	12.1		12.1
	Pigeon pea	3.10		3.10
	Wheat	9.5	9.5	
	Gram	3.1	3.1	
	Horticulture Crops-Fruits			
	Mango	0.028		
	Guava	0.045		
	Orange	0.018		
	Banana	18.250		
	Lemon	0.030		
	Papaya	0.025		
	Others	0.105		
	Horticulture Crops-Vegetables			
	Potato	0.022		
	Onion	0.042		
	Tomato	0.090		
	Horticulture Crops-Spices			
	Chilly	0.275		
	Coriander	0.112		
	Ginger	0.040		
	Garlic	0.040		
	Flower crops			
	Marigold	0.060		
	Medicinal and Aromatic crops			
	Fodder crops			
	Total fodder crop area			
	Grazing land			
	Sericulture etc			
	Others (Specify)			

Livestock	Number ('000)			
	Male	Female	Young stock	Total
Non descriptive Cattle (local low yielding)	37.1	18.1	22.04	77.6
Crossbred cattle				
Non descriptive Buffaloes (local low yielding)	1.7	11.6	11.0	24.3
Graded Buffaloes				
Goat				40
Sheep				9.1
Others (Camel, Pig, Yak etc.)				1.5
Commercial dairy farms (Number)				
Poultry	**No.of farms**		**Total number of birds**	
Commercial	-			
Backyard				

Source – Economical survey of Madhya Pradesh, 2007-08. Directorate of Economics & Statistics, Madhya Pradesh.

1.10	**Fisheries** (Data source: Chief Planning Officer)					
	A. Capture					
	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)	
	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)**	
	Brackish water (Data Source: MPEDA/ Fisheries Department)						
	Fresh water (Data Source: Fisheries Department)	338		0.9		0.304	

1.11	**Production and Productivity of Major crops(Av. Of last 3 years)**	**Kharif**		**Rabi**		**Summer**		**Total**	
		Production ('000t)	**Productivity (kg/ha)**	**Production ('000t)**	**Productivity (kg/ha)**	**Production ('000t)**	**Productivity (kg/ha)**	**Production ('000t)**	**Productivity (kg/ha)**

	Soybean	9.5	666					9.5	666
	Cotton	22.0	479					22.0	479
	Sorghum	16.4	1352					16.4	1352
	Arhar	3.2	1057					3.2	1057
	Wheat			18.4	2029			18.4	2029
	Gram			2.5	799			2.5	799
	Horticulture Crops-Fruits								
	Mango								
	Guava							0.560	20000
	Orange							0.810	18000
	Banana							0.360	20000
	Lemon							1003.750	55000
	Papaya								
	Others								
	Horticulture Crops-Vegetables								
	Potato							0.440	20000
	Onion							0.840	20000
	Tomato							1.485	16500
	Horticulture Crops-Spices								
	Chilly							22.00	80000
	Coriander							0.112	1000
	Ginger							1.00	25000
	Garlic							0.280	7000
	Flower crops								
	Marigold							0.60	10000
	Medicinal and Aromatic crops								
	Fodder crops								
	Total fodder crop area								
	Grazing land								
	Sericulture etc								
	Others (Specify)								

1.12	**Sowing window for 5 major crops (start and end of sowing period)**	**Cotton**	**Soybean**	**Sorghum**	**Wheat**	**Gram**

	Kharif-Rainfed	3 rd week of June to 2nd week of July 25-28MW	3 rd week of June to 2nd week of July 25-28MW	3 rd week of June to 2nd week of July 25-28MW	-	-
	Kharif-Irrigated	I st week of May to 2 nd week of July 19-28MW	2 nd week of June to last week of July 24-31MW	2 nd week of June to last week of July 24-31MW	-	
	Rabi-Rainfed	-	-	-		
	Rabi-Irrigated	-	-	-	2 nd week of October to Last week of December 41-52MW	I st week of October to Last week of November 40-48MW

1.13	What is the major contingency is prone to?	Regular	Occasional	None
	Drought	-	✓	-
	Flood	-	-	✓
	Cyclone	-	-	✓
	Hail storm	-	-	✓
	Heat wave	-	✓	-
	Cold wave	-	-	✓
	Frost	-	-	✓
	Sea water inundation	-	-	✓
	Pest and diseases(specify)	-	✓	-

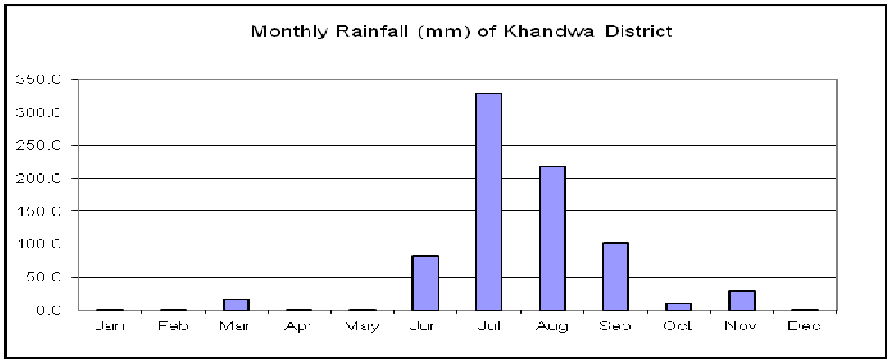
1.14	**Include Digital maps of the district for**	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

Annexure I

Location map

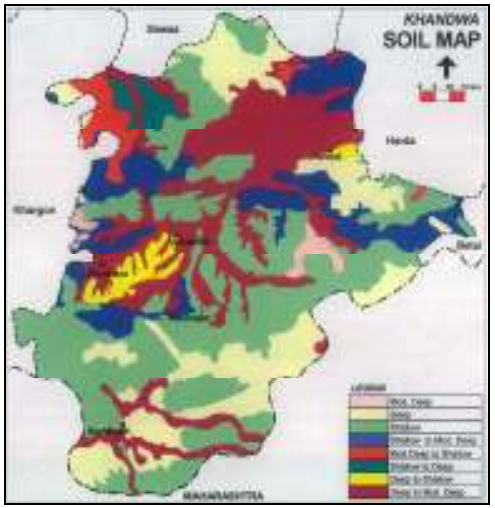
Annexure II

Mean Monthly rainfall



Annexure III

Soil Map



(Source: NBSS&LUP, Amravati Road, 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**	**Crop/ cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remark on implementation**
1	2	3	4	5	6
Delay by 2 weeks (July 1st wk) 27MW	Shallow soils	Soybean	No change	Sowing of drought resistant early maturing JS 93 05, JS 95 60, JS -335 Making field free of weeds full utilization of water and nutrients by the crops	JNKVV, RVSKVV, Seed corporation)
		Pigeonpea	No change	Sowing of short duration disease resistant variety JKM 189, Making field free of weeds full utilization of water and nutrients by the crops	
		Sorghum	No change	Sowing of dual purpose high yielding Sorghum variety JJ-1022,JJ 1041, Making field free of weeds full utilization of water and nutrients by the crops	
	Moderate Deep Soils	Cotton	No change	Sowing of short duration Bt varieties, Making field free of weeds full utilization of water and nutrients by the crop	Seeds seed corporation, Agriculture universities
		Soybean	No change	Sowing of short duration Varieties(JS 9560) Making field free of weeds full utilization of water and nutrients by the crops,	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/ cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remark on implementation**
1	2	3	4	5	6
Delay by 4 weeks (3^{rd} week of July)	Shallow soils	Soybean	Maize	Maize varieties like- Chandan makka safed-2, chandan 3, JVM- 421. Making field free of weeds full utilization of water and nutrients by the crops	JNKVV, RVSKVV, Seed corporation)
		Pigeonpea	No change	Sowing of short duration disease resistant variety JKM 189, Making field free of weeds full utilization of water and nutrients by the crops	
		Sorghum	No change	Sowing of dual purpose high yielding Sorghum variety JJ-1022,JJ 1041, Making field free of weeds full utilization of water and nutrients by the crops	
	Moderate Deep Soils	Cotton	No change	Sowing of short duration Bt varieties, Making field free of weeds full utilization of water and nutrients by the crop	Seeds seed corporation, Agriculture universities
		Soybean	Soybean and Maize	Sowing of short duration Varieties(JS 9560). Maize varieties like- Chandan makka safed-2, chandan 3, JVM- 421. Making field free of weeds full utilization of water and nutrients by the crops	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/ cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remark on implementation**
1	2	3	4	5	6
Delay **by 6** weeks (1st week of August)	Shallow soils	Soybean	Fallow / vegetables	Making field free of weeds, sowing of vegetable, full utilization of water and nutrients by the crops	JNKVV, RVSKVV, Seed corporation)
		Pigeonpea	-do-	Sowing of short duration disease resistant variety JKM 189, Making field free of weeds full utilization of water and nutrients by the crops	
		Sorghum	-do-	Sowing of dual purpose high yielding Sorghum variety JJ-1022,JJ 1041, Making field free of weeds full utilization of water and nutrients by the crops	
	Moderate Deep Soils	Cotton	Fallow / vegetables	Sowing of vegetables, Making field free of weeds full utilization of water and nutrients by the crops	Seeds seed corporation, Agriculture universities
		Soybean	-do-	Sowing of vegetables, Making field free of weeds full utilization of water and nutrients by the crops	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/ cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remark on implementation**
1	2	3	4	5	6
Delay by 8 weeks (3rd week of August)	Shallow soils	Soybean	Fallow/ plan for rabi crops /green manuring	Adopt moisture conservation practices	Seeds seed corporation, Agriculture universities
		Pigeonpea	-do-		
		Sorghum	-do-		
	Moderate Deep Soils	Cotton	Fallow/ plan for rabi crops /green manuring	-do-	
		Soybean	-do-	-do-	

Condition			**Suggested Contingency measures**		
Early season drought (Normal onset)	**Major Farming situation**	**Crop/ cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remark on implementation**
1	2	3	4	5	6
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Shallow soils	Soybean	Gap filling with seed , spray 2% solution of DAP water during the dry spell Spraying of PMA@ 3 ppm solution during dry spell	Frequent intercultural operations and mulching with green leaves or other material.	Assured availability of certified seed , MoP/ DAP/ PMA
		Pigeonpea	Gap filling with seed	-do-	Micro irrigation system - Source of water will be from wells /tube wells
		Sorghum	-do-	-do-	
	Moderate Deep Soils	Cotton	Life saving irrigation, Interculture operation Dora , Foliar application of 2% solution of Urea or DAP or plain water during draught period	Making field free of weeds full utilization of water and nutrients by the crops	
		Soybean	-do-	-do-	

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell, consecutive 2 weeks rainless(>2.5 mm period)	**Major Farming situation**	**Crop/ cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remark on implementation**
1	2	3	4	5	6
At vegetative stage	Shallow soils	Soybean	Interculture operation Dora , Foliar application of 2% solution of Urea or DAP with water during draught period. Spray prophenophos 40EC@2 ml/l of water to control girdle beetle.	Life saving irrigation, Making field free of weeds full utilization of water and nutrients by the crops	Micro irrigation system - Source of water will be from wells /tube wells
		Pigeonpea	Interculture operation Dora , Foliar application of 2% solution of Urea or DAP with water during draught period.		
		Sorghum	-do-		
	Moderate Deep Soils	Cotton	-do-		
		Soybean	-do-		

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell)	**Major Farming situation**	**Crop/ cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remark on implementation**
1	2	3	4	5	6
At reproductive stage	Shallow soils	Soybean	20% defoliation in soybean and use as mulching Foliar application of 2% DAP solution	Life saving irrigation, Making field free of weeds full utilization of water and nutrients by the crops	Micro irrigation system - Source of water will be from wells /tube wells
		Pigeonpea	-do-		
		Sorghum	Delay the spray of urea till optimum soil moisture availability 20% defoliation of lower leaves and use as mulching		
	Moderate Deep Soils	Cotton	Foliar application of 2% DAP solution		
		Soybean	-do-		

Condition			**Suggested Contingency measures**		
Terminal drought	**Major Farming situation**	**Crop/ cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remark on implementation**
1	2	3	4	5	6
	Shallow soils	Soybean	Wherever water resources are available such as pond, wells etc. protective irrigation can be provided to the crop	Repeated interculture operations to keep the field weed free and use of organic mulches *Glyricidia* leaves, uprooted weeds keeping roots upwards.	Micro irrigation system - Source of water will be from wells /tube wells
		Pigeonpea			
		Sorghum			
	Moderate Deep Soils	Cotton			
		Soybean			

2.1.1Drought- Irrigated situation

Condition			**Suggested Contingency measures**		
	Major Farming situation	**Crop/ cropping system**	**Change in crop/ cropping system**	**Agronomic measures**	**Remark on implementation**
1	2	3	4	5	6
Delayed release of water in canals due to low rainfall	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Moderate Deep Soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
		Cotton	No change	Irrigation at critical growth stage	-

Condition			**Suggested Contingency measures**		
	Major Farming situation	**Crop/ cropping system**	**Change in crop/ cropping system**	**Agronomic measures**	**Remark on implementation**
1	2	3	4	5	6
Limited release of water in canals due to low rainfall	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Moderate Deep Soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
		Cotton	No change	Irrigation at critical growth stage	

Condition			**Suggested Contingency measures**		
	Major Farming situation	**Crop/ cropping system**	**Change in crop/ cropping system**	**Agronomic measures**	**Remark on implementation**
1	2	3	4	5	6
Non release of water in canals under delayed onset of monsoon in catchment	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Moderate deep Soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	
		Cotton	No change	Irrigation at critical growth stage	

Condition			**Suggested Contingency measures**		
	Major Farming situation	**Crop/ cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remark on implementation**
1	2	3	4	5	6
Lack of inflows into tank due to insufficient/delayed onset of monsoon	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Moderate deep Soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
		Cotton	No change	Irrigation at critical growth stage	-

Condition	Major Farming situation	Crop/ cropping system	Change in crop/ cropping system	Agronomic measures	Remark on implementation
1	2	3	4	5	6
Insufficient ground water recharge due to low rainfall	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Moderate deep Soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
		Cotton	No change	Irrigation at critical growth stage	

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

Condition- Continuous high rainfall in a short span leading to water logging				
	Suggested contingency measure			
	Vegetative stage	**Flowering stage**	**Crop maturity stage**	**Post harvest**
1	2	3	4	5
Soybean	• Drain excess water • Top dressing with N 10-20 kg/ha at optimum soil moisture	• Drain excess water • Intercultivation to loosen the soil and improve aeration • Foliar spray with 2% urea/DAP to regain lost vigour	• Drain excess water • Harvesting on a clear sunny day • Shift the produce to safer place	Maintain optimum moisture content in grain by drying before bagging and marketing
Cotton	• Drain excess water • Top dressing with N 10-20 kg/ha at optimum soil moisture or • Foliar spray with 2% urea after cessation of rains • Intercultivation at optimum soil moisture to loosen the soil and improve aeration	• Drain excess water • Remove and destroy *Parthenium hysterophorus* and other weeds to minimize the incidence of mango mealy bug • Multinutrient or hormonal spray to promote flowering • Adopt need based plant protection measures	• Drain excess water • Timely picking of cotton	• Protect picked cotton in storage from drenching and soiling • Drying of wet cotton and marketing
Wheat	• Drain excess water • Top dressing of nitrogenous fertilizers 20-30kg/ha at optimum soil moisture to gain vigour	• Drain excess water • Top dressing of nitrogenous fertilizers 20-30kg/ha at optimum soil moisture to gain vigour • Adopt need based plant protection measures	• Drain excess water • Adopt need based plant protection measures • Harvest on a clear sunny day	Maintain optimum moisture of grain by drying
Chickpea	• Drain excess water • Foliar spray with 2% urea after cessation of rains	• Drain excess water • Foliar spray with 2% urea after cessation of rains	• Drain excess water • Timely harvest of produce on a clear sunny day	Shifting to safer place and drying of the produce before bagging and storage
Horticulture				
Mango	• Drain excess water • Intercultivation at optimum soil moisture to loosen the soil and improve aeration • Spray 2% urea 2-3 times at 7-10 days interval	• Drain excess water • Intercultivation at optimum soil moisture to loosen the soil and improve aeration • Spray 2% urea 2-3 times at 7-10 days interval	• Drain excess water • Harvest mature fruits as soon as possible • Spray of Wettable Sulphur@ 5 gm/l to reduce the incidence of powdery mildew	• Store the fruits in well ventilated place before it can be marketed • Spray Dithane M-45 3% or Bavistin 1% against anthracnose
Banana	• Open deep trenches between	• Open deep trenches between	• Open deep trenches between	Grade the good quality fruit

Condition- Continuous high rainfall in a short span leading to water logging				
	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
1	2	3	4	5
	plant rows to improve drainage • Foliar spray of 2% potassium sulphate followed by1% potassium nitrate after 15 days • Spray 0.1% propiconazole, 0.2% carbendazim and 0.25% mancozeb as prophylactic measure to control outbreak of sigatoka leaf spot at 15 days interval	plant rows to improve drainage • Foliar spray of 2% potassium sulphate followed by1% potassium nitrate after 15 days • Spray 0.1% propiconazole, 0.2% carbendazim and 0.25% mancozeb as prophylactic measure to control outbreak of sigatoka leaf spot at 15 days interval	plant rows to improve drainage • At bunch development stage, give 2% potassium sulphate spray on bunch twice at 15 days interval • Spray 0.1% propiconazole, 0.2% carbendazim and 0.25% mancozeb as prophylactic measure to control outbreak of sigatoka leaf spot at 15 days interval	bunches for ripening and marketing
Papaya	• Drain excess water • Intercultivation at optimum soil moisture to loosen the soil and improve aeration • Spray 2% urea 2-3 times at 7-10 days interval	• Drain excess water • Intercultivation at optimum soil moisture to loosen the soil and improve aeration • Spray 2% urea 2-3 times at 7-10 days interval	• Drain excess water • Harvest mature fruits as soon as possible	Store the fruits in well ventilated place before it can be marketed
Condition-Heavy rainfall with high speed wind in a short span				
Soybean	• Drain excess water • Top dressing with N 10-20 kg/ha at optimum soil moisture	• Drain excess water • Intercultivation to loosen the soil and improve aeration • Foliar spray with 2% urea/DAP to regain lost vigour	• Drain excess water • Harvesting on a clear sunny day • Shift the produce to safer place	Maintain optimum moisture content in grain by drying before bagging and marketing
Cotton	• Drain excess water • Top dressing with N 10-20 kg/ha at optimum soil moisture or • Foliar spray with 2% urea after cessation of rains • Intercultivation at optimum soil moisture to loosen the soil and improve aeration	• Drain excess water • Remove and destroy *Parthenium hysterophorus* and other weeds to minimize the incidence of mango mealy bug • Multinutrient or hormonal spray to promote flowering • Adopt need based plant protection measures	• Drain excess water • Timely picking of cotton	• Protect picked cotton in storage from drenching and soiling • Drying of wet cotton and marketing
Wheat	• Drain excess water • Top dressing of nitrogenous	• Drain excess water • Top dressing of nitrogenous	• Drain excess water • Adopt need based plant	Maintain optimum moisture of grain by drying

Condition- Continuous high rainfall in a short span leading to water logging				
	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
1	2	3	4	5
	fertilizers 20-30kg/ha at optimum soil moisture to gain vigour	fertilizers 20-30kg/ha at optimum soil moisture to gain vigour • Adopt need based plant protection measures	protection measures • Harvest on a clear sunny day	
Chickpea	• Drain excess water • Foliar spray with 2% urea after cessation of rains	• Drain excess water • Foliar spray with 2% urea after cessation of rains	• Drain excess water • Timely harvest of produce on a clear sunny day	Shifting to safer place and drying of the produce before bagging and storage
Horticulture				
Mango	• Drain excess water • Intercultivation at optimum soil moisture to loosen the soil and improve aeration • Spray 2% urea 2-3 times at 7-10 days interval • Staking to provide good anchorage to the plants (upto 2-3 years of planting)	• Drain excess water • Intercultivation at optimum soil moisture to loosen the soil and improve aeration • Spray 2% urea 2-3 times at 7-10 days interval	• Drain excess water • Harvest mature fruits as soon as possible • Spray of Wettable Sulphur@ 5 gm/l to reduce the incidence of powdery mildew	• Store the fruits in well ventilated place before it can be marketed • Spray Dithane M-45 3% or Bavistin 1% against anthracnose
Banana	• Open deep trenches between plant rows to improve drainage • Foliar spray of 2% potassium sulphate followed by1% potassium nitrate after 15 days • Spray 0.1% propiconazole, 0.2% carbendazim and 0.25% mancozeb as prophylactic measure to control outbreak of sigatoka leaf spot at 15 days interval	• Open deep trenches between plant rows to improve drainage • Foliar spray of 2% potassium sulphate followed by1% potassium nitrate after 15 days • Spray 0.1% propiconazole, 0.2% carbendazim and 0.25% mancozeb as prophylactic measure to control outbreak of sigatoka leaf spot at 15 days interval	• Open deep trenches between plant rows to improve drainage • At bunch development stage, give 2% potassium sulphate spray on bunch twice at 15 days interval • Spray 0.1% propiconazole, 0.2% carbendazim and 0.25% mancozeb as prophylactic measure to control outbreak of sigatoka leaf spot at 15 days interval	Grade the good quality fruit bunches for ripening and marketing
Papaya	• Drain excess water • Intercultivation at optimum soil moisture to loosen the soil and improve aeration	• Drain excess water • Intercultivation at optimum soil moisture to loosen the soil and improve aeration	• Drain excess water • Harvest mature fruits as soon as possible	Store the fruits in well ventilated place before it can be marketed

Condition- Continuous high rainfall in a short span leading to water logging				
	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
1	2	3	4	5
	• Spray 2% urea 2-3 times at 7-10 days interval	• Spray 2% urea 2-3 times at 7-10 days interval		
Outbreak of pests and diseases due to unseasonal rains				
Soybean	• Early planting to minimize the incidence of girdle beetle and green semilooper • Foliar spray with 5% NSKE or dimethoate 30EC 1 ml/l to protect against semilooper	• Monitor adult moth activity of Spodoptera through pheromone traps (10 traps/ha) • Apply Quinalphos 25 EC 2ml/l or Emamectin benzoate 5 SG 4g/10 lit to control spodoptera	-	-
Cotton	Provide drainage for removing stagnant water and drench plant base with COC 0.3% or carbendazim 0.1% to prevent *Fusarium* wilt	• Foliar spray of sulphur @ 2.5 g/l to minimize grey mildew incidence • Spray streptocycline sulphate 6g/10lit + COC 30g/10 lit to control BLB incidence • Soil application of magnesium sulphate @20-25 kg/ha or foliar spray 0.5-1% magnesium sulphate and 1% urea as soon as the reddening symptoms appear • Correct N status through foliar application of 2% urea or DAP at boll development stage to reduce leaf reddening	• Foliar spray of sulphur 2.5g/1it to reduce grey mildew incidence • Spray carbendazim 0.1% immediately after cessation of rains to protect from boll rot • Drying of wet cotton to prevent molds	-
Wheat	Spray 0.2 % mancozeb 76% WP against wheat rust.	Spray 0.2 % mancozeb 76% WP against wheat rust	Spray 0.2 % mancozeb 76% 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	• Spray triazophos 40 % EC @ 1-1.5 l/ha in chickpea against pest incidence. • T" shaped pegs placed in late sown chickpea field for	• Spray triazophos 40 % EC @ 1-1.5 l/ha in chickpea against pest incidence. • Carry out critical survey of fields for insect and disease	-

Condition- Continuous high rainfall in a short span leading to water logging				
	Suggested contingency measure			
	Vegetative stage	**Flowering stage**	**Crop maturity stage**	**Post harvest**
1	2	3	4	5
	biological control of pod borer and for chemical control spraying of Quinolphos 25 EC or Chlorpyriphos 20 EC C or Methyl Parathion 50 EC @ 600 ml dissolve in 500 L of water should be used. Dusting of Felvunerate 0.4% or Endosulphan 4% 15-20 kg or Quinolphas 1.5 WP 20-25 kg /ha with duster.	biological control of pod borer and for chemical control spraying of Quinolphos 25 EC or Chlorpyriphos 20 EC C or Methyl Parathion 50 EC @ 600 ml dissolve in 500 L of water should be used. Dusting of Felvunerate 0.4% or Endosulphan 4% 15-20 kg or Quinolphas 1.5 WP 20-25 kg/ha with duster.	attack in crops	
Horticulture				
Mango	Spray imidacloprid 0.3 ml or dimethoate 1 ml/l to control leaf hopper Drench the seedlings with COC 0.3% against root rot	Spray imidacloprid 0.3 ml or dimethoate 1 ml/l to control leaf hopper	Spray Dithane M-45 3 g/l or carbendazim 1 g/l against anthracnose spray sulphur 0.5% to control powdery mildew	Maintain aeration in storage to prevent fungal infection and blackening of fruits
Banana	Soil drenching with COC @ 3g/l to avoid rhizome rotting	Spray Dithane M-45 3g/l or propiconazole 1ml/l, 2-3 times against sigatoka leaf spots	Soil drenching with COC @ 3g/l to avoid rhizome rotting	-
Papaya				

2.3 Floods – Not Occurs

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				
Wheat	• Light irrigation • Provision of Wind breaks	Light irrigation	Light irrigation	Harvest at physiological maturity
Chickpea	-do-	-do-	-do-	-do-
Horticulture				
Fruits	• Protect the seedlings by providing the shed • Arrangement of wind breaks	• Bordeaux paste to exposed bark branches of the tree to protect from Sun scorching • Mulching around the base of trunk of the tree	• Bordeaux paste to exposed bark • branches of the tree to protect from Sun scorching • Mulching around the base of trunk of the tree	• Harvesting of crop as early as possible and marketed or keep in cold store • Store the produce in shed or safe place.
Vegetables	• Protect the seedlings by providing the shed • Arrangement of wind breaks	Light irrigation at night hours	Application of N-fertilizers	Harvest and marketed as early as possible
Cold wave				
Chick pea	• Light irrigation • Smoking during night	• Light irrigation • Smoking during night	• Light irrigation • Smoking during night	Harvest at physiological maturity
Wheat	-do-	-do-	-do-	-do-
Horticulture				
Fruits	• Light irrigation • Smoking during night	• Light irrigation • Smoking	• Light irrigation • Smoking	• Harvesting of crop as early as possible and marketed or keep in cold store • Store the produce in shed or safe place.
Vegetables	• Light irrigation	• Light irrigation	• Light irrigation	Harvest and marketed as early as possible

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
	• Smoking during night	• Smoking during night	• Smoking during night	
Frost				
Wheat	-do-	-do-	-do-	Harvest at physiological maturity
Chick pea	-do-	-do-	-do-	-do-
Horticulture				
Fruits	• Light irrigation • Smoking during night	• Light irrigation • Smoking during night	• Light irrigation • Smoking during night	• Harvesting of crop as early as possible and marketed or keep in cold store • Store the produce in shed or safe place.
Vegetables	-do-	-do-	-do-	Harvest and marketed as early as possible
Hailstorm				
Wheat	Re-sowing in case of severe damage	Light and frequent irrigation	• Apply 10% additional nitrogen • Light and frequent irrigation	Timely harvesting and shifting of produce to safer place in case of early forewarning
Chick pea	-do-	-do-	-do-	-do-
Horticulture				
Fruits	Not applicable	Prune damaged branches and twigs and apply Bordeaux paste 1% to avoid fungal infections	• Prune damaged branches and twigs and apply Bordeaux paste 1% to avoid fungal infections • Apply hormonal spray NAA 20ppm + 1% urea to prevent flower drop	Immediate harvesting, grading and marketing of produce
Vegetables	Re-sowing in case of severe damage	Light and frequent irrigation	• Apply 10% additional nitrogen • Light and frequent irrigation	Timely harvesting and shifting of produce to safer place in case of early forewarning
Cyclone : NA				

2.2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measure		
	Before the event[s]	**During the event**	**After the event**
1	2	3	4
Drought			
Feed and fodder availability	Availability of fodder and mineral mixture ensured	Complete feed block using local residues.	Urea-molasses treatment of roughage to increase its feed value
Drinking water	Arrange potable water supply for all the cattle camps in accordance with the total number of cattle admitted in these camps	Arrange water supply for all the cattle camps in accordance with the total number of cattle admitted in these camps	Arrange water supply for all the cattle camps in accordance with the total number of cattle admitted in these camps
Health and disease management	Dosing be done to deworm for better feed conservation efficiency. The hygiene should be given top priority	Be sure that sanitation and cleanliness measures in cattle camps are adequate	Be sure that sanitation and cleanliness measures in cattle camps are adequate
Floods			
Feed and fodder availability	Practice of feeding chopped straw along with oil seed cake/chunni/rice bran be used	Feed be protected from fungal contamination where moisture is high	Urea-molasses treatment of roughage to increase its feed value, damaged grain can be diverted as livestock feed.
Drinking water	Arrange clean and potable water supply for all the cattle camps in accordance with the total number of cattle admitted in these camps	Arrange clean and potable water supply for all the cattle camps in accordance with the total number of cattle admitted in these camps	Arrange clean and potable water supply for all the cattle camps in accordance with the total number of cattle admitted in these camps
Health and disease management	Vaccination should be done well in advance. The hygiene should be given top priority	Keep animals under shade to the extent possible. The hygiene should be given top priority	Keep animals under shade to the extent possible. The hygiene should be given top priority
Cyclone Not Occurs	-	-	-
Feed and fodder availability	-	-	-
Drinking water	-	-	-
Health and disease management	-	-	-
Heat wave and cold wave	-	-	-
Shelter/environment management	Protective measures should be done for preventing extreme heat and cold wave	Protective measures should be done for preventing extreme heat and cold wave	Protective measures should be done for preventing extreme heat and cold wave
Health and disease management	-	-	-

2.5.2 Poultry

	Suggested contingency measure		
	Before the event[s]	**During the event**	**After the event**
1	2	3	4
Drought			
Shortage of feed ingredients	Ensure proper feed and mineral mixture	Ensure proper feed and mineral mixture	Ensure proper feed and mineral mixture
Drinking water	Arrange potable water supply for all the cattle camps in accordance with the total number of cattle admitted in these camps	Arrange potable water supply for all the cattle camps in accordance with the total number of cattle admitted in these camps	Arrange potable water supply for all the cattle camps in accordance with the total number of cattle admitted in these camps
Health and disease management	Periodic check up of birds may be done for infectious disease	Periodic check up of birds may be done for infectious disease.	Periodic check up of birds may be done for infectious disease
Heat wave and cold wave			
Shelter/environment management	Cover the sheds with paddy straw and arrange sprinklers/fans and foggers in sheds, as per needs. Protective measures should be done for preventing extreme heat and cold wave	Protective measures should be done for preventing extreme heat and cold wave. Cover the sheds with paddy straw and arrange sprinklers/fans and foggers in sheds, as per needs.	-
Health and disease management	Periodic check up of birds may be done for infectious disease like bird flue and adopt suitable control measures like culling of birds flue infected poultry and burn them	Periodic check up of birds may be done for infectious disease like bird flue and adopt suitable control measures like culling of birds flue infected poultry and burn them	-

2.5.3 Fisheries

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
1	2	3	4
1) Drought			
A. Capture	NA		
Marine	NA	-	-
Inland	NA		
(i) Shallow water depth due to insufficient rains/inflow	• All the fish should be marketed • Shifting of small sized fishes to i small storage water bodies such as Plastic or cemented structures	• Harvesting of fish • Shifting of small sized fishes to in small storage water bodies such as Plastic or cemented structures • Provision of net-shed over the tank • Dry ponds should be treated with lime	• - Safe disposal of first event of runoff for storage of only clean water • Waste ware should be protected by net for stay of fishes in the tank. • After onset of monsoon and ponds fill with water seedling the fish seed
(ii Impact of heat and salt load build up in ponds / change in water quality	Apply the lime to neutralize the concentrated water	Apply the lime to neutralize the concentrated water	• Safe disposal of first event of runoff for storage of only clean water • Waste ware should be protected by net for stay of fishes in the tank. • After onset of monsoon and ponds fill with water seedling the fish seed •
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	-	Aeration	Rain Gun (Oxygen)
(ii) Impact of salt load build up in ponds / change in water quality	-	-	-
2) Floods			

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
1	2	3	4
NA			
B. Aquaculture			
(i) Inundation with flood water	Keeps net in waste weir of ponds	Protect the fish to flow with runoff water	
(ii) Water contamination and changes in water quality	Lime treatment should be done.	Lime treatment and $KMnO_4$ treatment 2 ppm	No seedling of new fish seed
(iii) Health and diseases	-do-	-do-	-do-
(iv) Loss of stock and inputs (feed, chemicals etc)	Manufactured feed should be given in ponds	Manufactured feed should be given in ponds	Natural feed should be available in ponds
(v) Infrastructure damage (pumps, aerators, huts etc)	Dust and debris should be clean in west wear.	Continuous Dust and debris cleans in west wear.	-
3. Cyclone / Tsunami : No any possibilities of event in the district			
NA	-	-	-
4. Heat wave and cold wave			
A. Capture			
Marine	-	-	-
Inland	Net-shed	-	-
B. Aquaculture			
(i) Changes in pond environment (water quality)	Showering of water by pump for proper O_2 in water	Showering of water by pump for proper O_2 in water	-
(ii) Health and Disease management	$KMnO_4$ treatment 2 ppm	$KMnO_4$ treatment 2 ppm	-