State: MADHYA PRADESH

Agriculture Contingency Plan: MORENA District

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	Madhya Bharat plateau and Bundelkhand uplands		
	Agro-Climatic Region (Planning Commission)	Central Plateau and Hills Region (VIII)		
	Agro Climatic Zone (NARP)	Grid Zone (M P-7)		
	List all the districts or part thereof falling under the NARP Zone	Morena, Bhind, Gwalior(1/2 W), Shivpuri, Sagar, Sheopur and Guna		
	Geographic coordinates of district	Latitude	Longitude	Altitude
		26º 30' 04.53'N	77º 59' 36.11 E	195 M
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Zonal Agricultural Research Station (RVSKVV), Near Commissioner office A-B Road , Morena -476001 (M. P.)		
	Mention the KVK located in the district	Krishi Vigyan Kendra, ZARS, P.O. Jaora khurd, A B road Morena - 476001		
1.2	**Rainfall**	Average (mm)	Normal Onset	Normal Cessation
	SW monsoon (June-Sep):	645.0	4th week of June	First week of October, 40MW
	NE Monsoon(Oct-Dec):	28		
	Winter (Jan- March)	23.5	-	-
	Summer (Apr-May)	10.2	-	-
	Annual	706.7	-	-

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)	501.6	268.7	50.6	40.1	18.9	22.5	0.0	89.6	11.5	5.8

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**

	1. Deep soil	406.60	81.58
	2. Medium deep soils	39.80	8.04
	3. Shallow soils	51.20	10.38

* mention color, depth and texture (heavy, light, sandy, loamy, clayey etc) and give vernacular name, if any, in brackets

1.5	**Agricultural land use**	Area (‘000 ha)	Cropping intensity %
	Net sown area	262.7	128
	Area sown more than once	74.6	
	Gross cropped area	337.3	

1.6	**Irrigation**	Area (‘000 ha)		
	Net irrigated area	167.0		
	Gross irrigated area	166.7		
	Rain fed area	96.0		
	Sources of Irrigation	Number	Area (‘000 ha)	Percentage of total irrigated area
	Canals	9	68.0	38.4
	Tanks	52	1.4	0.8
	Open wells	21019	48.4	27.4
	Bore wells	2128	580.1	32.8
	Lift irrigation schemes	-	-	-
	Micro-irrigation	06	0.8	0.4
	Other sources (please specify)		176.7	
	Total Irrigated Area			
	Pump sets	19925		
	No. of Tractors			
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils 7/6	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited	07	100	Alkaline water in some pockets
	Critical	-	-	-
	Semi- critical	-	-	-
	Safe	-	27% of ground water is exploited	-
	Wastewater availability and use	1	4570	-
	Ground water quality	Good		
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

1.7 Area under major field crops & horticulture etc.

1.7	Major field crops cultivated	Area (000 ha)					
		Kharif		Rabi		Summer	Total
		Irrigated	Rain fed	Irrigated	Rain fed	Irrigated	
	Pearl millet	-	86.0	-	-		86.0
	Mustard	-	-	165.0	-		165.0
	Wheat	-	-	86.3	-		86.3
	Sesamum	-	4.6	-	-		4.6
	Pigeon pea	-	10.3	-	-		10.3
	Horticulture crops – Fruits						
	Guava	0.75				-	
	Mango	0.25				-	
	Horticulture crops – Vegetables						
	Potato	2.009				-	
	Tomato	0.432				-	
	Onion	0.062				-	
	Horticulture crops – Spices-						
	Chili	0.345				-	
	Ginger	0.011					
	Garlic	0.143					
	Coriander	0.070				-	
	Medicinal and aromatic crops						
	Turmeric	0.005		0.005		-	
	Aswagandha	0.026					
	Basil	0.003					
	Flower						
	Mari Gold	0.033					
	Rose	0.014				-	
	Plantation crops	**Total area (ha)**		**Irrigated(ha)**		**Rain fed**	
	Jetrofa	0.004		-		0.004	
	Fodder crops	**Total area(ha)**		**Irrigated(ha)**		**Rain fed**	
	MP chari	0.0013		0.0013		-	
	Cluster bean	0.0126		0.0126		-	
	Lucerne	0.0013		0.0013		-	
	Total fodder crop area(000 ha)*	0.089					
	Grazing land(000 ha)*	89.58					
	Sericulture etc.	**-**		**-**		**-**	
	Others (Specify)	**-**		**-**		**-**	

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Non descriptive Cattle (local low yielding)	111.4	92.198	176.3
	Crossbred cattle			
	Non descriptive Buffaloes (local low yielding)	30.1	185.9	323.7
	Graded Buffaloes			
	Goat	138.1		142.8
	Sheep	28.9		30.8
	Others (Camel, Pig, Yak etc.)	0.46		13.9
	Commercial dairy farms (Number)			

1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**
	Commercial	22	75.7
	Backyard	-	28.7

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)	
	49	**12**	**49**	**-**	**-**	

ii) Inland (Data Source: Fisheries Department)	**No. Farmer owned ponds**	**No. of Reservoirs**	**No. of village tanks**
	9110	**-**	**235**

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)	12.0	12.5	150.0
Others			

1.11 Production and Productivity of major crops

1.11	**Production and Productivity of major crops** (Average of last 3 years: 2006, 07, 08)	**Kharif**		**Rabi**		**Summer**		**Total**	
		Production (t)	Productivity (kg/ha)	Production (t)	Productivity (kg/ha)	Production (t)	Productivity (kg/ha)	Production (t)	Productivity (kg/ha)
	Pearl millet	160885	1800	-	-	-	-	160885	1800
	Sesame	3833	680	-	-	-	-	3833	680
	Pigeon pea	3241	950	-	-	-	-	3241	950
	Blackgram	191	440	-	-	-	-	191	440
	Greengram	158	510	-	-	20	400	178	910
	Mustard	-	-	207019	1500	-	-	207019	1500
	Wheat	-	-	258291	3300	-	-	258291	3300
	Gram	-	-	5714	1370	-	-	5714	1370
	Pea	-	-	488	730	-	-	488	730
	Sugarcane	-	-	27790	48500	-	-	27790	48500
	Taramira	-	-	1184	1000	-	-	1184	1000
	Barley	-	-	3423	1760	-	-	3423	1760
	Major Horticultural crops								
	Potato		--	-	-	-	-	-	-
	Tomato		40000	-	-	-	-	-	-
	Brinjal		35000	-	-	-	-	-	-
	Okra		25000	-	-	-	-	-	-
	Chili		15000	-	-	-	-	-	-
	Cauliflower		25000	-	-	-	-	-	-
	Coriander		2000	-	-	-	-	-	-

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 inundation	-	-	√
	Pests and diseases (specify)	-	√	-

1.12	**Sowing window for 5 major crops (start and end of sowing period)**	Bajra	Sesamum	Mustard	Wheat	Gram
	Kharif- Rain fed	25th June to 10th July 26-28MW	1st July to 15th July 27-29MW	-	-	-
	Kharif-Irrigated	11th July to 31st July	15th July to 31st July	-	-	-
	Rabi- Rain fed	28-31MW-	29-31MW-	25th September to 15th October 39-42MW	15th to 31st October 42-22MW	1st to 15th October 40-42MW
	Rabi-Irrigated	-	-	15th to 25th October 42-43MW	10th to 20th November 45-47MW	15th to 31st October 42-44MW

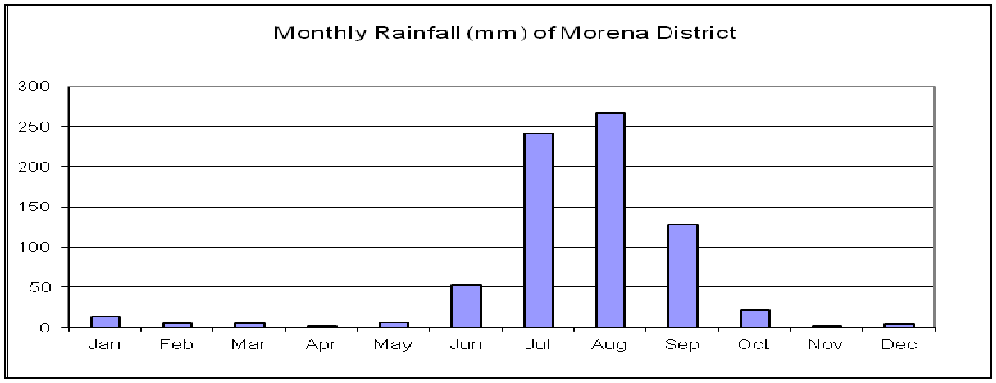
1.14	**Include Digital maps of the district for (Enclose all the maps)**	Location map of district with in State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

Annexure I

Location Map of Morena District

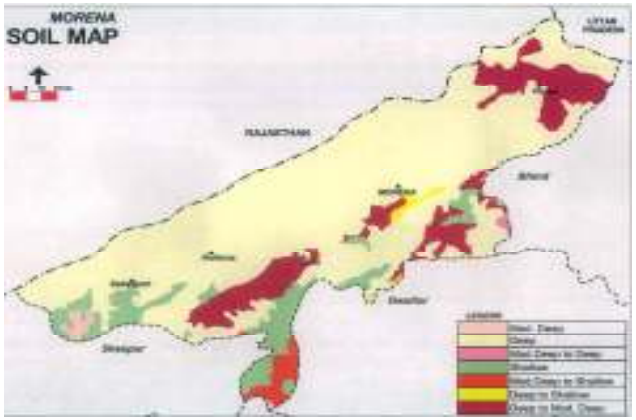
Annexure II

Mean annual rainfall



Annexure III

Soil Map



(Source: NBSS&LUP, Amravati Road, Nagpur)

2.0 Strategies for weather related contingencies
2.1 Drought
2.1.1 Rain fed situation

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
Delay by 2 weeks 1st week of July	Deep Soils	Pear millet :JVB 3, ICTP-8203, JBV-2, HHB 447	No Change	-Gap filling with improved varieties -Cultivate the fields and manage the weeds utilizing pre monsoon showers.	Link Seed farms agriculture universities NSC, (NREGS), (IWMP), (RKVY), (NFSM), for the support of good quality seed and other needed inputs.
		Sesamum JT 21, JT 22, JT 55, TKG 8, TKG-306			
		Pigeon pea – UPAS 120, Pusa 9, RVA 28, ICPL 88039			
		Green gram: JM 721, TJM 3, TM 99-37,			
	Moderate deep soils	Pear millet :JVB 3, ICTP-8203, JBV-2, HHB 447			
		Sesamum JT 21, JT 22, JT 55, TKG 8			
		Pigeon pea – UPAS 120, Pusa 9, TJT 501, RVA 28, ICPL 88039			
		Green gram: JM 721, TJM 3, TM 99-37			

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Crop / Cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
Delay by 4 weeks 3rd week of July	Deep Soils	Pear millet :JVB 3**,** ICTP-8203, JBV-2, HHB 447,	No Change	- Gap filling with improved varieties - Cultivate the fields and manage the weeds utilizing pre monsoon showers	Link Seed farms agriculture universities NSC, (NREGS), (IWMP), (RKVY), (NFSM), for the support of good quality seed and other needed inputs
		Sesamum JT 21, JT 22, JT 55, TKG 8	do		
		Pigeon pea – UPAS 120, Pusa 9, TJT 501, RVA 28, ICPL 88039	green gram/ pearl millet		
		Green gram: JM 721, TJM 3, TM 99-37,	No Change		
	Moderate deep soils	Pear millet :JVB 3**,** ICTP-8203, JBV-2, HHB 447,	No Change		
		Sesamum JT 21, JT 22, JT 55, TKG 8	do		
		Pigeon pea – UPAS 120, Pusa 9, RVA 28, ICPL 88039	green gram/ pearl millet		
		Green gram: JM 721, TJM 3, TM 99-37,	do		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
Delay by 6 weeks 1st week of August	Deep Soils	Pear millet :JVB 3, ICTP-8203, JBV-2, HHB 447,	Pearl millet for Fodder / grain	- Cultivate the fields and manage the weeds and conserve the moisture	Link Seed farms agriculture universities NSC, (NREGS), (IWMP), (RKVY), (NFSM), for the support of good quality seed and other needed inputs
		Sesamum JT 21, JT 22, JT 55, TKG 8	Fodder crops / fallow		
		Toriya – JT-1, PT-303	Fallow		
		Green gram: JM 721, TJM 3, TM 99-37,	Fallow/ Pearl millet		
	Moderate deep soils	Pear millet :JVB 3, ICTP-8203, JBV-2, HHB 447,	Pearl millet for Fodder / grain		
		Sesamum JT 21, JT 22, JT 55, TKG 8	Fodder crops / fallow		
		Green gram: JM 721, TJM 3, TM 99-37,	Fallow/ Pearl millet		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
Delay by 8 weeks 3rd week of August	Deep Soils	Pear millet :JVB 3, ICTP-8203, JBV-2, HHB 447,	Fallow / plan for rabi crops	- Cultivate the fields and manage the weeds and conserve the moisture	Link Seed farms agriculture universities NSC, (NREGS), (IWMP), (RKVY), (NFSM), for the support of good quality seed and other needed inputs
		Sesamum JT 21, JT 22, JT 55, TKG 8			
		Green gram: JM 721, TJM 3, TM 99-37,			
	Moderate deep soils	Pear millet :JVB 3, ICTP-8203, JBV-2, HHB 447,			
		Sesamum JT 21, JT 22, JT 55, TKG 8			
		Green gram: JM 721, TJM 3, TM 99-37,			

Condition			**Suggested Contingency measures**		
Early season drought **(Normal onset)**	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks 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.	Deep Soils	Pear millet :JVB 3, ICTP-8203, JBV-2, HHB	-Weed control Life saving irrigation through use of sprinklers -Spray of anti transpirant	-Mulching in crop rows Gap filling with the seedlings -Earthing of plants - collection of runoff in water bodies	Link M.P.agro Industries, Private Dealers through Deptt. Of Farmers welfare &Agril. Dev, of M.P for various inputs.on subsidized rates Link watersheds and NREGS for the support of farm pond technology.
		Sesamum JT 21, JT 22, JT 55, TKG 8			
		Green gram: JM 721, TJM 3, TM 99-37,			
	Moderate deep soils	Pear millet :JVB 3, ICTP-8203, JBV-2, HHB 447,			

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**	**Remarks on Implementation**
1	2	3	4	5	6
At vegetative stage	Deep Soils	Pear millet :JVB 3, ICTP-8203, JBV-2, HHB 447,	Life saving irrigation , irrigation through micro systems like sprinklers if possible -Spray 2% urea during the dry spell	-Mulching in crop rows -Earthing up operation Top dressing of 20-30kg N/ha	Link M. P. Agro Industries, Private Dealers through Dept. Of Farmers welfare & Agril. Dev, of M.P for various inputs on subsidized rates Link watersheds and NREGs for the support of farm pond technology
		Sesamum JT 21, JT 22, JT 55, TKG 8			
		Pigeon pea – UPAS 120, Pusa 9, TJT 501, RVA 28, ICPL 88039			
		Green gram: JM 721, TJM 3, TM 99-37,			
	Moderate deep soils	Pear millet :JVB 3, ICTP-8203, JBV-2, HHB 447,			

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
1	2	3	4	5	6
At reproductive stage	Deep Soils	Pear millet :JVB 3, ICTP-8203, JBV-2, HHB 447,	Spray 2% urea or MOP during the dry spell Life saving irrigation	Soil Mulching by hoeing Earthing up operation	Link M. P. Agro Industries, Private Dealers through Deptt. Of Farmers welfare & Agril. Dev, of M.P for various inputs on subsidized rates Link watersheds and NREGs for the support of farm pond technology
		Sesamum JT 21, JT 22, JT 55, TKG 8			
		Pigeon pea – UPAS 120, Pusa 9, TJT 501, RVA 28, ICPL 88039			
		Green gram: JM 721, TJM 3, TM 99-37,			
	Moderate deep soils	Pear millet :JVB 3, ICTP-8203, JBV-2, HHB 447,			

Condition			Suggested Contingency measures		
Terminal drought	**Major Farming situation**	**Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
1	2	3	4	5	6
	Deep Soils	Pear millet :JVB 3, ICTP-8203, JBV-2, HHB 447,	-Give life saving irrigation for kharif crop -20% leaves of the plant(Lower leaves) of the plants may be removed to reduce the transpiration	-Cultivate field &conserve moisture -Seeds of wheat, gram be soaked in water for 12-15 hours before sowing -Seed treatment -Dry sowing followed by sprinkler irrigation for germination and crop development.	Link M.P.Agro Industries, Private Dealers through Deptt. Of Farmers welfare &Agril. Dev, of M.P for various inputs on subsidized rates. Link watersheds and NREGs for the support of farm pond technology
		Sesamum JT 21, JT 22, JT 55, TKG 8			
		Pigeon pea – UPAS 120, Pusa 9, TJT 501, RVA 28, ICPL 88039			
		Green gram: JM 721, TJM 3, TM 99-37,			
	Moderate deep soils	Pear millet :JVB 3, ICTP-8203, JBV-2, HHB 447,			

2.1.2 Drought - Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	**Crop/cropping system**	**Change in crop/ cropping system**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
Delayed release of water in canals due to low rainfall	Deep Soils	Wheat	No change	• Selection of short duration varieties • Soil mulching • irrigation at critical crop growth stages • Use of micro irrigation systems	Link M.P.agro Industries, Private Dealers through Deptt. Of Farmers welfare &Agril. Dev, of M.P.on subsidized rates
		Mustard			
		Gram			
		Berseem			
	Moderate deep soils	Wheat			
		Mustard			
		Gram			
		Berseem			

Condition			Suggested Contingency measures		
	Major Farming situation	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
Limited release of water in canals due to low rainfall	Deep Soils	Wheat	No change	• Mulching, in crop rows • Selection of short duration varieties • Soil mulching • Irrigation at critical crop growth stages • Use of micro irrigation systems	Link M.P.agro Industries, Private Dealers through Deptt. Of Farmers welfare &Agril. Dev, of M.P.on subsidized rates
		Mustard			
		Gram			
		Berseem			
	Moderate deep soils	Wheat			
		Mustard			
		Gram			
		Berseem			

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/ cropping system**	**Change in crop/ cropping system**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
Delayed release of water in canals due to low rainfall	Deep Soils	Wheat	No change	• Application of organic manure FYM @5 t/ha and Wormi compost @2t/ha • Use sprinkler method for irrigating the crops • Irrigation at critical crop growth stages • Mulching the crop rows	Link M.P.agro Industries, Private Dealers through Deptt. Of Farmers welfare &Agril. Dev, of M.P.on subsidized rates Training of farmers through KVK
		Mustard			
		Gram			
		Berseem			
	Moderate deep soils	Wheat			
		Mustard			
		Gram			
		Berseem			

Condition			Suggested Contingency measures		
	Major Farming situation	**Crop/cropping system**	**Change in crop/ cropping system**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
Non release of water in canals under delayed onset of monsoon in catchment	Deep Soils	Wheat	No change	• Selection of short duration varieties • Soil mulching • Use of micro irrigation systems utilizing own source of water • Irrigation at critical crop growth stages	Link M.P.agro Industries, Private Dealers through Deptt. Of Farmers welfare & Agril. Dev. of M.P.on subsidized rates Training of farmers through KVK
		Mustard			
		Gram			
		Berseem			
	Moderate deep soils	Wheat			
		Mustard			
		Gram			
		Berseem			

Condition			Suggested Contingency measures		
	Major Farming situation	**Crop/ cropping system**	**Change in crop/ cropping system**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Deep Soils	Wheat, Barley, Gram Dry Sowing	Fallow - Mustard	• Application of organic manure FYM @5 t/ha and Wormi compost @2t/ha • Use sprinkler method for irrigating the crops • Irrigation at critical crop growth stages • Mulching the crop rows	Link M. P. Agro Industries, Private Dealers through Deptt. Of Farmers welfare &Agril. Dev, of M. P. on subsidized rates
		Mustard	Fallow – Gram		
		Gram	Fallow – Pea		
		Berseem	Fallow - Coriander		
	Moderate deep soils	Wheat	Fallow – Potato		
		Mustard	Fallow – Gram		
		Gram	Fallow – Pea		
		Berseem	Fallow - Coriander		

Condition			Suggested Contingency measures		
	Major Farming situation	**Crop/cropping system**	**Change in crop/ cropping system**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
Insufficient groundwater recharge due to low rainfall	Deep Soils	Wheat	Fallow - Mustard	-Selection of short duration varieties -Soil mulching -irrigation at critical crop growth stages -Use of micro irrigation systems	M. P. Agro Industries, Private Dealers through Deptt. Of Farmers welfare &Agril. Dev, of M. P. on subsidized rates Training of farmers through KVK and ATMA
		Mustard	Fallow – Gram		
		Gram	Fallow – Pea		
		Berseem	Fallow - Coriander		
	Moderate deep soils	Wheat	Fallow - Potato		
		Mustard	Fallow – Gram		
		Gram	Fallow – Pea		
		Berseem	Fallow - Coriander		

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**
1	2	3	4	5
Pearlmillet	• Drain stagnated water at the earliest and apply 20 kg N / ha after draining excess water • Take up the gap filling by transplanting • Inter row cultivation at optimum field moisture condition • In case of severe damage, prefer re sowing with short duration hybrids	• Drain stagnated water at the earliest and apply 20 kg N / ha after draining excess water • Intercultivation at optimum field moisture condition	• Drain stagnated water at the earliest • Tie the lodged plants as bundles with leaves • Harvest ear heads on clear sunny day	Maintain optimum moisture of the grain by drying in sun or driers
Sesamum	Application of fungicides (Carbendazim @1 g/l water) to check dumping off	-Immediate provision of draining of water -Application N-fertilizers just after drainage	• Earthing and application of fungicides (Carbendazim @1 g/l water) • Stop harvesting till weather is clear	
Pigeon pea	• Drain stagnated water at the earliest and apply 20 kg N / ha after draining excess water • Take up the gap filling with short duration varieties • Intercultivation at optimum field moisture condition • In case of severe damage, prefer resowing with short duration hybrids	• Drain stagnated water at the earliest and apply 20 kg N / ha after draining excess water • Intercultivation at optimum field moisture condition • Application of Prophenophos 50 % EC @ 1.5 lit/ha for pod borer management	Foliar spray of 2% Urea, DAP and KNO3	• Spread the bundles drenched in the rain on field bunds / drying floors to quicken drying • Thresh bundles after they are dried properly • Dry the grain to proper moisture content before bagging and storing

Horticulture				
Fruit crops	Proper nutrition and protect of trees from insect pest and disease .Proper application of irrigation	Immediate made provision of drainage of water *Application n-fertilizers just after drainage , if need apply plant hormones	Fruit harvest at proper stage. Care from insect pest and disease. Proper nutrition and irrigation.	Grading , shorting and produce placed in proper way to avoid rotten .
Vegetables	Proper nutrition and protect of crops from insect pest and disease .Proper application of irrigation	Immediate made provision of drainage of water *Application n-fertilizers just after drainage, if need apply growth hormones and micronutrient. Application of pesticide according to appereance of insect pests at ETL level	Crop harvest at proper stage according to market need. Care from insect pest and disease. Proper nutrition and irrigation .	Stored properly .Timely send to market to avoid quality deteriorations
Heavy rainfall with high speed winds in a short span				
Pearlmillet	Proper drainage and removal of excess water from root zone	Proper drainage and removal of excess water from root zone	Proper drainage and removal of excess water from root zone	
Sesamum	Remove excess water from the field. Maintain plant population . Balance fertilizer Used wind brake.	Remove excess water from the field	Remove excess water from the field	Well dry the produce up to 10-12 %moisture before storage
Pigeon pea	Remove excess water from the field. Maintain plant population . Balance fertilizer Use wind brake.	Remove excess water from the field	Remove excess water from the field	Well dry the produce up to 10-12 %moisture before storage
Horticulture				
Fruit crops	-Remove excess water from the field. -Maintained plant population. -Balance fertilizer. -Use wind brake	Remove excess water from the field. Maintained plant population. Balance fertilizer. Use wind brake	Remove excess water from the field	
Vegetables	Remove excess water from the field. Maintained plant population. Balance fertilizer. Use wind brake	Remove excess water from the field . maintained plant population . Balance fertilizer Use wind brake	Remove excess water from the field	

Outbreak of pests and diseases due to unseasonal rains (Give detailed plant protection measures-crop wise)				
Pearlmillet				
Sesamum		**Insect pest :-** leaf eating caterpillar -quinolphos @2ml/lit **Disease:-** Alternaria blight spray COC 3g/lit		
Pigeon pea		Drenching with carbendazim 0.1% at plant base to control wilt Foliar application of acephate 1.5 gm / lit or Miticide to prevent sterility mosaic virus	Drench with carbendazim 0.1% at plant base to control wilt	Quick drying to prevent molds
Horticulture				
Fruit crops	-Clean cultivation. -Proper monitoring , -Use of light trap /Pheromone trap , Use control measure according to situation	Clean cultivation. -Proper monitoring , -Use of light trap /Pheromone trap , Use control measure according to situation	Clean cultivation. -Proper monitoring , -Use of light trap /Pheromone trap , Use control measure according to situation	Clean cultivation. -Proper monitoring , -Use of light trap /Pheromone trap , Use control measure according to situation
Vegetables	Clean cultivation. -Proper monitoring , -Use of light trap /Pheromone trap , Use control measure according to situation	Clean cultivation. -Proper monitoring , -Use of light trap /Pheromone trap , Use control measure according to situation	Clean cultivation. -Proper monitoring , -Use of light trap /Pheromone trap , Use control measure according to situation	Clean cultivation. -Proper monitoring , -Use of light trap /Pheromone trap , Use control measure according to situation

2.3 Floods - NA

Condition	Suggested contingency measure			
Transient water logging/ partial inundation	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**

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	Provide artificial shade and maintain soil moisture	Maintain soil moisture	Light irrigation	Harvested rainwater, wells ;surface irrigation
Mustard	Light irrigation	Light irrigation	Light irrigation	
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	
Vegetables	Protect the seedlings by providing the shed Arrangement of wind breaks	Light irrigation at night hours	Application of N-fertilizers	
Cold wave				
Wheat	Light irrigation	Light irrigation	Light irrigation	Harvest at physiological maturity
	Smoking during night	Smoking during night	Smoking during night	
Mustard	Light irrigation	Light irrigation	Light irrigation	
	Smoking during night	Smoking during night using waste straw etc	Smoking during night	
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.

Frost				
	Wheat	Light irrigation Smoking during night	Light irrigation Smoking during night	Light irrigation Smoking during night
	Chick pea	-do-	-do-	-do-
Horticulture				
Fruits	Light irrigation Smoking during night	Light irrigation Smoking during night	Light irrigation Smoking during night	
Vegetables	-do-	-do-	-do-	
Hailstorm				
Horticulture				
Cyclone				
Horticulture				

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

Drought	**Suggested contingency measures**		
1	2	3	4
	Before the event[s]	**During the event**	**After the event**
Feed and fodder availability	Adoption of fodder bank. Use of surplus fodder for silage. Urea treatment : 4 kg Urea + 75 litter of water solution spray on 100 fodder Insurance	Use of reserve fodder . Use of stored silage. Balance ration Use of chaffed fodder . Transportation of fodder from ad joining districts if excess there Use unconventional feeds as a source of roughage, use urea treated roughage, use urea molasses block as a source of nitrogen and energy. Use low quality processed with mild acid and alkali treatment	Feeding green feed/ fodder and conventional feed. Regularly Sprinkling of water on live stock body . Use of wet *bhusa*. Availing the insurance. Separation of unproductive livestock
Drinking water	Provision of hygienic supply of water Storage of water in the tank for drinking Excavations of bore wells .	Judicious use of stored water . Use of potassium permanganate 1ppm , Heat treatment of Water before use.	Ensure the cleanlinell of drinking water Water treated with quick lime
Health and disease management	Deworming , regular vaccination of HS , BQ and FMD provision of mineral mixture	Treatment of sick animal through camp. Isolation of sick animals	Culling of sick animal Vaccination & deworming
Floods			
Feed and fodder availability	Adoption of fodder bank Hay and silage making	Use unconventional feeds -Use of reserve fodder	Regularly Sprinkling of water on live stock body .

	Insurance. Repair of animal shed Shifting of animals from the flood area	-Balance ration -Use of chaffed fodder -use roughages processed with mild acid and alkali -Transportation excess fodder from ad joining district	-Feeding green feed/ fodder and conventional feed -use of wet bhusa. -Availing the insurance. ----Separation of unproductive livestock
Drinking water	Ensure availability of clean hygienic water Water be treated with quick lime lime	Clean water Water after boiling / alum treatment	Ensure the cleanliness of drinking water
Health and disease management	Regular vaccination of HS , BQ and FMD provision of mineral mixture preparation of water proof shed provision of dry fodder ,Deworming	Treatment of sick animal through camp. solation of sick animals. Treatment of sick animals in houses	Culling of sick animal -use antidote in poisoning case
Cyclone	**(Not occur in the district)** NA		NA
Feed and fodder availability	-		
Drinking water	-		
Health and disease management	-		
cold wave			
Shelter/environment management	House of animal should be N-S direction Plan of proper housing Collection of waste gunny bags for shelter	availability of full sun rays in animal shed, keep animal body warm Use of gunny bags to cover the windows during night hours	Adopt curative measures to obtain the milk production level Keep environment uniformly to recover animal
Health and disease management	Ensure storage of antibiotics, B-complex, liver tonic, anti-inflammatory drugs, anti-stress drugs, vaccines etc for the event Storage for balanced ration	Treatment of sick animals Balanced ration Use of warm water Inhalation of *Eucalyptus* water	Vaccination & deworming Culling of sick animals
Heat wave			
Shelter/environment management	Provision of proper shade Provision of trees Reflector paints over roof , two times bathing of animals	Provision of cold water Keep environment uniformly to recover animal	Vaccination & deworming
Health and disease management	-Ensure storage of antibiotics, B-complex, liver tonic, anti-inflammatory drugs, anti-stress drugs, vaccines etc for the event -Use suitable drugs depending on condition.	Vaccination & deworming	

2.5.2 Poultry

	Suggested contingency measures			**Convergence/linkages with ongoing programs, if any**
	Before the event[a]	**During the event**	**After the event**	
1	2	3	4	5
Drought	Insurance of birds	**Keep watch on mortality and adopt measures**	**Materialized the benefit of insurance**	
Shortage of feed ingredients	-Storage of food ingredients	Mineral mixture feeding, use unconventional feed in feeding of poultry ration, use animal protein source like fish meal, silk worm pupa, blood meal by products of slaughter house etc, ration should be made from locally available feed ingredients.	Feeding high quality balance fee	
Drinking water	-Storage of Sanitized drinking water	Judicious use of stored water	Fresh drinking water	
Health and disease management	Deworming,Vaccination Deticking of shed Provision of rapid growing strain	Use of high weight gain breeding stock Treatment of sick birds	Vaccination and deworming Culling of sick birds	
Floods				
Shortage of feed ingredients	-Storage of poultry feed --Storage of mineral mixture	Use of stored feed Offer dry feed Avoid dampness in feed to minimize the chances of aflotoxins	Open the curtain for proper aeration and drying of litter. Optimum feeding to maintain egg production and proper weight	
Drinking water	Storage of clean drinking water			
Health and disease management	Provision of Vaccination Deworming	Proper Vaccination and deworming, use anti fungal and liver tonic during feeding and drinking	Culling of sick birds Vaccination and deworming	
Cyclone: Not occur in the district				
Shortage of feed ingredients	-	-	-	
Drinking water	-	-	-	
Health and disease management	-	-	-	

Heat wave and cold wave				
Shelter/environment management	-Repair of sheds -Use of sprinklers for maintenance of temperature -Storage of local available food grains/feed ingredients	-Down the curtain of windows -lighting in the shed in cold condition -maintain the temperature of shed	Feeding high quality balance feed	Culling of sick birds
Health and disease management	Deworming Vaccination	Vaccination and deworming, use anti stress drugs and liver tonic during feeding and drinking.	Vaccination and deworming	
		Deworming		
		Deticking		

[a] based on forewarning wherever available

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
1	2	3	4
1) Drought			
A. Capture			
Marine	-	-	-
Inland			
(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
(iii) Any other	-	-	-
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow			
(ii) Impact of salt load build up in ponds / change in water quality			
(iii) Any other			
2) Floods			
A. Capture			
Marine			
Inland			
(i) Average compensation paid due to loss of human life			
(ii) No. of boats / nets/damaged			
(iii) No.of houses damaged			
(iv) Loss of stock			
(v) Changes in water quality			
(vi) Health and diseases			
B. Aquaculture			
(i) Inundation with flood water	Keeps net in west wear 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	Lime treatment should be done.	Lime treatment and $KMnO_4$ treatment 2 ppm	No seedling of new fish seed
(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.	-
(vi) Any other			
3. Cyclone / Tsunami : No any possibilities of event in the district			
A. Capture	-	-	-
Marine	-	-	-
(i) Average compensation paid due to loss of fishermen lives	-	-	-

(ii) Avg. no. of boats / nets/damaged	-	-	-
(iii) Avg. no. of houses damaged	-	-	-
Inland	-	-	-
B. Aquaculture	-	-	-
(i) Overflow / flooding of ponds	-	-	-
(ii) Changes in water quality (fresh water / brackish water ratio)	-	-	-
(iii) Health and diseases	-	-	-
(iv) Loss of stock and inputs (feed, chemicals etc)	-	-	-
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)	-	-	-
(vi) Any other	-	-	-
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	-
(iii) Any other	-	-	-

[a] based on forewarning wherever available