State: Madhya Pradesh

Agriculture Contingency Plan for District: Bhind

1.0 District Agriculture profile					
1.1	**Agro-Climatic/Ecological Zone**				
	Agro Ecological Sub Region (ICAR)	Malwa Plateau, Vindhyan scrupland and narmada valley			
	Agro-Climatic Zone (Planning Commission)	Agro climatic zone 8.1 ; Region: Gird			
	Agro Climatic Zone (NARP)	Zone VII -Gird			
	List all the districts or part thereof falling under the NARP Zone	Morena, Bhind, Gwalior(1/2 W), Shivpuri and Guna			
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude	
		22 ^{0}43 ' N	76 ^{0} 54 E	618 m	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	ZARS: RVSKVV,ZARS,Morena			
	Mention the KVK located in the district	KVK, RVSKVV, Etawa Road, Bhind dist. 477 001			
1.2	**Rainfall**	Average (mm)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	612.7	2nd week of June	3 rd week of September	
	NE Monsoon(Oct-Dec):	21.4	-	-	
	Winter (Jan- March)	22.8	-	-	-
	Summer (Apr-May)	9.5	-	-	-
	Annual	786.4	-	-	-

1.3	**Land use pattern of the district** (latest statistics)	Geographical area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows (old fallow)
	Area ('000 ha)	445.2	320.8	8.9	27.2	15.9	11.8	0.6	21.8	21.7	6.5

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	350.40	78.69
	2. Medium deep soils	77.00	17.34
	3. Shallow soils	17.20	3.97

* mention colour, 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	320.8	107
	Area sown more than once	24.0	
	Gross cropped area	344.8	

1.6	**Irrigation**	Area ('000 ha)		
	Net irrigated area	105.1		
	Gross irrigated area	105.5		
	Rainfed area	215.7		
	Sources of Irrigation	Number	Area ('000 ha) Gross	Percentage of total irrigated area
	Canals	3	18.2	17.3
	Tanks	7	0.4	-
	Open wells	9967	66.9	63.4
	Bore wells	781	18.1	17.1
	Lift irrigation schemes		-	
	Micro-irrigation			
	Other sources (please specify)	1.9	18.0	17.0
	Total Irrigated Area		105.5	
	Pump sets			
	No. of Tractors			

	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited			
	Critical			
	Semi- critical			
	Safe		25% of ground water is exploited	
	Wastewater availability and use			
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

1.7 Area under major field crops & horticulture (as per latest figures)

1.7	**S. No.**	**Major field crops cultivated**	**Area ('000 ha)**							
			Kharif			***Rabi***				
			Irrigated	**Rainfed**	**Total**	**Irrigated**	**Rainfed**	**Total**	**Summer**	**Grand total**
	1	Paddy	-	10.27	**10.27**	-	-	-	-	**10.27**
	2	Jowar	-	7.06	**7.06**	-	-	-	-	**7.06**
	3	Bajra	-	28.33	**28.33**	-	-	-	-	**28.33**
	4	Arhar	-	3.55	**3.55**	-	-	-	-	**3.55**
	5	Til	-	8.20	**8.20**	-	-	-	-	**8.20**
	6	Wheat	-	-	-	84.12	-	**84.12**	-	**84.12**
	7	Oat	-	-	-	-	5.31	**5.31**	-	**5.31**
	8	Gram	-	-	-	19.90	-	**19.90**	-	**19.90**
	9	Pea	-	-	-	3.18	-	**3.18**	-	**3.18**
	10	Lentil	-	-	-	3.97	-	**3.97**	-	**3.97**
	11	Mustard	-	-	-	-	176.70	**176.70**	-	**176.70**

S. No.	**Horticulture crops - Fruits**	**Area ('000 ha)**		
		Total	**Irrigated**	**Rainfed**
1	Different Fruits eg. Aonla, Guava, Lime, Ber Jackfruits etc.	0.878	0.878	-
	Horticulture crops - Vegetables	**Total**	**Irrigated**	**Rainfed**
1	Different Vegetables eg. Brinjal, Tomato, Potato, Veg Pea etc	3.140	3.140	-
Others (specify)	Different Spices eg. Chilli, Garlic, Coriander etc.	0.850	0.850	-
	Medicinal and Aromatic crops	**Total**	**Irrigated**	**Rainfed**
1	Different Medicinal and Aromatic plants	0.030	0.030	-
Others (specify)	Different Flowers e.g Marigold, Desi Rose	0.055	0.055	-
	Plantation crops	**Total**	**Irrigated**	**Rainfed**
1	Different Plantation crops	-	-	-
	Fodder crops	**Total**	**Irrigated**	**Rainfed**
1	Different Fodder crops			
	Total fodder crop area			
	Grazing land	16.245	-	**16.245**
	Sericulture etc	-	-	-
	Others (specify)	-	-	-

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Young stock**	**Total ('000)**
	Non descriptive Cattle (local low yielding)	46.5	58.5	57.7	162.7
	Crossbred cattle				
	Non descriptive Buffaloes (local low yielding)	4.2	129.9	122.1	256.2
	Graded Buffaloes				
	Goat				156.3
	Sheep				27.8
	Others Horses, Pig, Yak etc.)				20.0
	Commercial dairy farms (Number)				
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**		
	Commercial				
	Backyard				

1.10	**Fisheries** (Data source: Chief Planning Officer)						
	A. Capture						
	i) Marine (Data Source: Fisheries Department)	**No. of fishermen**	**Boats**		**Nets**		**Storage facilities (Ice plants etc.)**
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
		-	-	-	-	-	-
	ii) Inland (Data Source: Fisheries Department)	**No. Farmer owned ponds**		**No. of Reservoirs**		**No. of village tanks**	
				0			
	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)						
	Others						

1.11 Production and Productivity of major crops (Average of last 5 years: 2004, 05, 06, 07, 08; specify years)

1.11	Name of crop	**Kharif**		**Rabi**		**Summer**		**Total**		**Crop residue as fodder** ('000 tons)
		Production (MT)	Productivity (kg/ha)	Production (MT)	Productivity (kg/ha)	Production (MT)	Productivity (kg/ha)	Production (MT)	Productivity (kg/ha)	
Major Field crops (Crops to be identified based on total acreage)										
Crop 1	Paddy	18.820	1831	-	-	-	-	**18.820**	**1831**	-
Crop 2	Jowar	7.562	1071	-	-	-	-	**7.562**	**1071**	-
Crop 3	Bajra	30.062	1061	-	-	-	-	**30.062**	**1061**	-
Crop 4	Arhar	1.883	529	-	-	-	-	**1.883**	**529**	-
Crop 5	Moong	0.384	249	-	-	-	-	**0.384**	**249**	-
Crop 6	Urid	0.136	239	-	-	-	-	**0.136**	**239**	-
Crop 7	Til	3.873	472	-	-	-	-	**3.873**	**472**	-
Crop 8	Wheat	-	-	185.325	2203	-	-	**185.325**	**2203**	-
Crop 9	Oat	-	-	10.699	2013	-	-	**10.699**	**2013**	-
Crop 10	Gram	-	-	24.500	1231	-	-	**24.500**	**1231**	-
Crop1 1	Pea	-	-	1.667	524	-	-	**1.667**	**524**	-
Crop 12	Lentil	-	-	2.237	563	-	-	**2.237**	**563**	-
Crop 13	Linseed	-	-	-	-	-	-	**-**	**-**	-
Crop 14	Mustard	-	-	226.716	1283	-	-	**226.716**	**1283**	-

Major Horticultural crops (Crops to be identified based on total acreage)										
Crop 1	Fruits	-	-	-	-	-	-	**3073.00**	**3500000**	-
Crop 2	Vegetables	-	-	-	-	-	-	**9420.00**	**3000000**	
Crop 3	Spices	-	-	-	-	-	-	**1003.00**	**1180000**	-
Crop 4	Medicinal and Aromatic Plants	-	-	-	-	-	-	**5.400**	**180000**	-
Crop 5	Flowers	-	-	-	-	-	-	**4.400**	**80000**	-

1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	Crop 1: Bajra	2: Paddy	3: Wheat	4: Gram	5: Mustard
	Kharif- Rainfed	IInd Fortnight of July				
	Kharif-Irrigated		Ist Fortnight of July			
	Rabi- Rainfed				IInd Fortnight of Oct	Ist Fortnight of Oct
	Rabi-Irrigated			Ist Fortnight of Nov		

1.13	**What is the major contingency the district is prone to?** (Tick mark)	**Regular**	**Occasional**	**None**
	Drought		√	
	Flood		-	√
	Cyclone		-	√
	Hail storm		√	
	Heat wave		√	
	Cold wave		√	
	Frost		√	
	Sea water intrusion		-	√
	Pests and disease outbreak (specify)		√	

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

Annexure I
Location map

Annexure II
Mean annual rainfall

Annexure III
Soil Map of Bhind

(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[a]**	**Normal Crop / Cropping system[b]**	**Change in crop / cropping system[c] including variety**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
1	2	3	4	5	6
Delay by 2 weeks 1st week of July	Deep Soils	1. Pearl millet	Hy Bajara, JVB 3**,** ICTP-8203, JBV-2, HHB 447	Sow the crop against the slope Increasing seed rate Follow field cultivation Practices for control of weeds and moisture conservation	Seed of short duration variety should be supply timely
		2. Paddy	Paddy (Pusa Sugandha-3, Pusa Sugandha-5, IR-36, JR-201)		
		3. Til	Til JT 21, JT 22, JT 55, TKG 8		
		4. Arhar	Arhar UPAS 120, Pusa 9, TJT 501, RVA 28, ICPL 88039		
		5. Sorghum	CSH- 5,6,9,13,14,18 (Hybrid) JJ-236, JJ-235, JJ-741, JJ-938, JJ-1022 (Composite)		
	Moderate deep black soil	1. Pearl millet	Hy Bajara, JVB 3**,** ICTP-8203, JBV-2, HHB 447		
		2. Paddy	Paddy (Pusa Sugandha-3, Pusa Sugandha-5, IR-36, JR-201)		
		3. Til	Til JT 21, JT 22, JT 55, TKG 8		
		4. Arhar	Arhar UPAS 120, Pusa 9, TJT 501, RVA 28, ICPL 88039		
		5. Sorghum	CSH- 5,6,9,13,14,18 (Hybrid) JJ-236, JJ-235, JJ-741, JJ-938, JJ-1022 (Composite)		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation[a]**	**Crop / Cropping system[b]**	**Change in crop / cropping system[c] including variety**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
1	2	3	4	5	6
Delay by 4 weeks 3rd week of July	Deep Soils	1. Pearl millet	Hy Bajara, JVB 3**,** ICTP-8203, JBV-2, HHB 447	Sow the crop against the slope Use short duration varieties of the crop Increase seed rate Follow field cultivation Practices for control of weeds and moisture conservation Upper part of the leaves of paddy seedling to be removed	Seed of short duration variety should be supply timely
		2. Paddy	Paddy (Pusa Sugandha-3, Pusa Sugandha-5, IR-36, JR-201)		
		3. Til	Til JT 21, JT 22, JT 55, TKG 8		
		4. Arhar	Arhar UPAS 120, Pusa 9, TJT 501, RVA 28, ICPL 88039		
		5. Sorghum	CSH- 5,6,9,13,14,18 (Hybrid) JJ-236, JJ-235, JJ-741, JJ-938, JJ-1022 (Composite)		
	Moderate deep black soil	1. Pearl millet	Hy Bajara, JVB 3**,** ICTP-8203, JBV-2, HHB 447		
		2. Paddy	Paddy (Pusa Sugandha-3, Pusa Sugandha-5, IR-36, JR-201)		
		3. Til	Til JT 21, JT 22, JT 55, TKG 8		
		4. Arhar	Arhar UPAS 120, Pusa 9, TJT 501, RVA 28, ICPL 88039		
		5. Sorghum	CSH- 5,6,9,13,14,18 (Hybrid) JJ-236, JJ-235, JJ-741, JJ-938, JJ-1022 (Composite)		

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	1. Pearl millet	Hy Bajara, JVB 3**,** ICTP-8203, JBV-2, HHB 447	Cultivate the fields and manage the weeds and conserve the moisture Upper part of the leaves of paddy seedling to be removed	Link Seed farms agriculture universities NSC, (NREGS), (IWMP), (RKVY), (NFSM), for the support of good quality seed and other needed inputs
		2. Paddy	Paddy (Pusa Sugandha-3, Pusa Sugandha-5, IR-36, JR-201)		
		3. Til	Til JT 21, JT 22, JT 55, TKG 8		
		4. Arhar	Arhar UPAS 120, Pusa 9, TJT 501, RVA 28, ICPL 88039		
		5. Sorghum	CSH- 5,6,9,13,14,18 (Hybrid) JJ-236, JJ-235, JJ-741, JJ-938, JJ-1022 (Composite)		
	Moderate deep soils	1. Pearl millet	Hy Bajara, JVB 3**,** ICTP-8203, JBV-2, HHB 447		
		2. Paddy	Paddy (Pusa Sugandha-3, Pusa Sugandha-5, IR-36, JR-201)		
		3. Til	Til JT 21, JT 22, JT 55, TKG 8		
		4. Arhar	Arhar UPAS 120, Pusa 9, TJT 501, RVA 28, ICPL 88039		
		5. Sorghum	CSH- 5,6,9,13,14,18 (Hybrid) JJ-236, JJ-235, JJ-741, JJ-938, JJ-1022 (Composite)		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Change in crop/ cropping system[c]**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
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,	Toria (JT-7)	• Use short duration crop • Field cultivation Practices for control of weeds and moisture conservation during monsoon	Seed of mid duration variety should be supply timely
		Sesamum JT 21, JT 22, JT 55, TKG 8			
		Paddy (Pusa Sugandha-3, Pusa Sugandha-5, IR-36, JR-201)			
	Moderate deep black soil	Pear millet :JVB 3, ICTP-8203, JBV-2, HHB 447,			
		Sesamum JT 21, JT 22, JT 55, TKG 8			
		Paddy (Pusa Sugandha-3, Pusa Sugandha-5, IR-36, JR-201)			

***Matrix for specifying condition of early season drought due to delayed onset of monsoon (2, 4, 6 & 8 weeks) compared to normal onset (2.1.1)**

Normal onset (Month and week)	**Month and week for specifying condition of early season drought due to delayed onset of monsoon**			
	Delay in onset of monsoon by			
	2 wks	**4 wks**	**6 wks**	**8 wks**
June 1st wk	June 3rd wk	July 1st wk	July 3rd wk	Aug 1st wk
June 2nd wk	June 4th wk	July 2nd wk	July 4th wk	Aug 2nd wk
June 3rd wk	July 1st wk	July 3rd wk	Aug 1st wk	Aug 3rd wk
June 4th wk	July 2nd wk	July 4th wk	Aug 2nd wk	Aug 4th wk
July 1st wk	July 3rd wk	Aug 1st wk	Aug 3rd wk	Sep 1st wk
July 2nd wk	July 4th wk	Aug 2nd wk	Aug 4th wk	Sep 2nd wk

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 transparent	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			
		Paddy (Pusa Sugandha-3, Pusa Sugandha-5, IR-36, JR-201)			
		Sorghum: CSH- 5,6,9,13,14,18 (Hybrid) JJ-236, JJ-235, JJ-741, JJ-938, JJ-1022 (Composite)			
	Moderate deep soils	Pear millet :JVB 3, ICTP-8203, JBV-2, HHB			
		Sesamum JT 21, JT 22, JT 55, TKG 8			
		Paddy (Pusa Sugandha-3, Pusa Sugandha-5, IR-36, JR-201)			
		Sorghum: CSH- 5,6,9,13,14,18 (Hybrid) JJ-236, JJ-235, JJ-741, JJ-938, JJ-1022 (Composite)			

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	Weed control Life saving irrigation through use of sprinklers Spray of anti transparent	Breaking of upper earth crust i.e.soil mulching in crop rows 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			
		Paddy (Pusa Sugandha-3, Pusa Sugandha-5, IR-36, JR-201)			
		Sorghum: CSH- 5,6,9,13,14,18 (Hybrid) JJ-236, JJ-235, JJ-741, JJ-938, JJ-1022 (Composite)			
	Moderate deep soils	Pear millet :JVB 3, ICTP-8203, JBV-2, HHB			
		Sesamum JT 21, JT 22, JT 55, TKG 8			
		Paddy (Pusa Sugandha-3, Pusa Sugandha-5, IR-36, JR-201)			
		Sorghum: CSH- 5,6,9,13,14,18 (Hybrid) JJ-236, JJ-235, JJ-741, JJ-938, JJ-1022 (Composite)			

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
1	2	3	4	5	6
At flowering/ fruiting stage	Deep Soils	Pear millet :JVB 3, ICTP-8203, JBV-2, HHB	• 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, TKG8			
		Paddy (Pusa Sugandha-3, Pusa Sugandha-5, IR-36, JR-201)			
		Sorghum: CSH- 5,6,9,13,14,18 (Hybrid) JJ-236, JJ-235, JJ-741, JJ-938, JJ-1022 (Composite)			
	Moderate deep soils	Pear millet :JVB 3, ICTP-8203, JBV-2, HHB			
		Sesamum JT 21, JT 22, JT 55, TKG8			
		Paddy (Pusa Sugandha-3, Pusa Sugandha-5, IR-36, JR-201)			
		Sorghum: CSH- 5,6,9,13,14,18 (Hybrid) JJ-236, JJ-235, JJ-741, JJ-938, JJ-1022 (Composite)			

Condition			**Suggested Contingency measures**		
Terminal drought (Early withdrawal of monsoon)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
1	2	3	4	5	6
	Deep Soils	Pear millet :JVB 3, ICTP-8203, JBV-2, HHB	• 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			
		Paddy (Pusa Sugandha-3, Pusa Sugandha-5, IR-36, JR-201)			
		Sorghum: CSH-5,6,9,13,14,18 (Hybrid) JJ-236, JJ-235, JJ-741, JJ-938, JJ-1022 (Composite)			
	Moderate deep soils	Pear millet :JVB 3, ICTP-8203, JBV-2, HHB			
		Sesamum JT 21, JT 22, JT 55, TKG 8			
		Paddy (Pusa Sugandha-3, Pusa Sugandha-5, IR-36, JR-201)			
		Sorghum: CSH-5,6,9,13,14,18 (Hybrid) JJ-236, JJ-235, JJ-741, JJ-938, JJ-1022 (Composite)			

2.1.2 Drought - Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/ cropping system[g]**	**Change in crop/ cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
1	2	3	4	5	6
Delayed release of water in canals due to low rainfall	Deep Soils	1. Wheat	Wheat - MP 4010	• Selection of short duration varieties • Soil mulching • irrigation at critical crop growth stages • Use of micro irrigation systems using own source of water supply	Link M.P.agro Industries, Private Dealers through Deptt. Of Farmers welfare &Agril. Dev, of M.P.on subsidized rates
		2. Mustard	Mustard - Pusa Jaikisan		
		3. Gram	Gram -JG-16		
		4. Fallow			
	Moderate deep soils	1. Wheat	Wheat - MP 4010		
		2. Mustard	Mustard - Pusa Jaikisan		
		3. Gram	Gram -JG-16		
		4. Fallow			

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/ cropping system[g]**	**Change in crop/ cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
1	2	3	4	5	6
Limited release of water in canals due to low rainfall	Deep Soils	1. Wheat	Wheat (JW-173)	• Selection of short duration varieties • Soil mulching • irrigation at critical crop growth stages • Use of micro irrigation systems using own source of water supply	Seed of mid duration variety should be supply timely
		2. Mustard	Mustard (Pusa Bold)		
		3. Gram	Gram (JG-11)		
		4. Fallow			
	Moderate deep soils	1. Wheat	Wheat (JW-173)		
		2. Mustard	Mustard (Pusa Bold)		
		3. Gram	Gram (JG-11)		
		4. Fallow			

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/ cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
1	2	3	4	5	6
Non release of water in canals under delayed onset of monsoon in catchment	Deep Soils	1. Wheat	Wheat (JW-173)	Selection of short duration varieties Soil mulching irrigation at critical crop growth stages Use of micro irrigation systems using own source of water supply	Seed of mid duration variety should be supply timely
		2. Mustard	Mustard (Pusa Bold)		
		3. Gram	Gram (JG-11)		
		4. Fallow			
	Moderate deep soils	1. Wheat	Wheat (JW-173)		
		2. Mustard	Mustard (Pusa Bold)		
		3. Gram	Gram (JG-11)		
		4. Fallow			

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/ cropping system[g]**	**Change in crop/ cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
1	2	3	4	5	6
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Deep Soils	1. Wheat	Wheat (JW-173)	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 Dept. Of Farmers welfare &Agril. Dev, of M. P. on subsidized rates
		2. Mustard	Mustard (Pusa Bold)		
		3. Gram	Gram (JG-11)		
	Moderate deep soils	1. Wheat	Wheat (JW-173)		
		2. Mustard	Mustard (Pusa Bold)		
		3. Gram	Gram (JG-11)		

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/ cropping system[g]**	**Change in crop /cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
1	2	3	4	5	6
Insufficient groundwater recharge due to low rainfall	Deep Soils	1. Wheat	Wheat (JW-173)	Application of organic manure FYM @5 t/ha and vermi 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
		2. Mustard	Mustard (Pusa Bold)		
		3. Gram	Gram (JG-11)		
	Moderate deep soils	1. Wheat	Wheat (JW-173)		
		2. Mustard	Mustard (Pusa Bold)		
		3. Gram	Gram (JG-11)		

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[k]**	**Flowering stage[l]**	**Crop maturity stage[m]**	**Post harvest[n]**
Crop1 Bajra	Drainage of excess water	Drainage of excess water	Drainage of excess water	Storage in safe place
Crop2 Til	Drainage of excess water	Drainage of excess water	Drainage of excess water	Storage in safe place
Crop3 Paddy	Drainage of excess water	Drainage of excess water	Drainage of excess water	Storage in safe place
Crop4 Arhar	Drainage of excess water	Drainage of excess water	Drainage of excess water	Storage in safe place
Horticulture	Drainage of excess water	Drainage of excess water	Drainage of excess water	
Crop1 Brinjal	Drainage of excess water	Drainage of excess water	Drainage of excess water	Storage in safe place
Crop2 Tomato	Drainage of excess water	Drainage of excess water Stacking of plants	Drainage of excess water Stacking of plants	Storage in safe place

Crop3 Chilli	Drainage of excess water	Drainage of excess water Stacking of plants	Drainage of excess water Stacking of plants	Storage in safe place
Crop4 Cucurbitaceous crops	Drainage of excess water	Drainage of excess water Stacking of plants	Drainage of excess water Stacking of plants	Storage in safe place
Heavy rainfall with high speed winds in a short span[2]				
Crop1 Bajra	Drainage of excess water Stacking of plants	Drainage of excess water Stacking of plants	Drainage of excess water Stacking of plants	Storage in safe place
Crop2 Til	Drainage of excess water Stacking of plants	Drainage of excess water Stacking of plants	Drainage of excess water Stacking of plants	Storage in safe place
Crop3 Paddy	Drainage of excess water Stacking of plants	Drainage of excess water Stacking of plants	Drainage of excess water Stacking of plants	Storage in safe place
Crop4 Arhar	Drainage of excess water Stacking of plants	Drainage of excess water Stacking of plants	Drainage of excess water Stacking of plants	Storage in safe place
Horticulture	Drainage of excess water Stacking of plants	Drainage of excess water Stacking of plants	Drainage of excess water Stacking of plants	
Crop1 Brinjal	Drainage of excess water Stacking of plants	Drainage of excess water Stacking of plants	Drainage of excess water Stacking of plants	Storage in safe place
Crop2 Tomato	Drainage of excess water Stacking of plants	Drainage of excess water Stacking of plants	Drainage of excess water Stacking of plants	Storage in safe place
Crop3 Chilli	Drainage of excess water Stacking of plants	Drainage of excess water Stacking of plants	Drainage of excess water Stacking of plants	Storage in safe place
Crop4 Cucurbitaceous crops	Drainage of excess water Stacking of plants	Drainage of excess water Stacking of plants	Drainage of excess water Stacking of plants	Storage in safe place

Outbreak of pests and diseases due to unseasonal rains				
Crop1 Bajra	-	Downy mildew	Cob caterpillar	-
Crop2 Til	-	Phyllodi	-	-
Crop3 Paddy	Paddy blast, Gundhi bug	Gundhi bug	-	Army warm
Crop4 Arhar	-	Stem borer	Stem and pod borer	
Horticulture				
Crop1 Brinjal	Fruit and stem borer	Fruit and stem borer	Fruit and stem borer	-
Crop2 Tomato	Leaf curl	Leaf curl	Leaf curl	-
Crop3 Chilli	Leaf curl	Leaf curl	Leaf curl	-
Crop4 Cucurbitaceous crops	Powdery and downy mildew	Powdery and downy mildew	Powdery and downy mildew	-

2.3 Floods - NA

Condition	Suggested contingency measure[o]			
Transient water logging/ partial inundation[1]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Crop1 Bajra	-	-	-	-
Crop2 Til	-	-	-	-
Crop3 Paddy	-	-	-	-
Crop4 Arhar	-	-	-	-
Horticulture				
Crop1 Brinjal	-	-	-	-
Crop2 Tomato	-	-	-	-
Crop3 Chilli	-	-	-	-
Crop4 Cucurbitaceous crops	-	-	-	-
Continuous submergence for more than 2 days[2]				
Crop1 Bajra	-	-	-	-
Crop2 Til	-	-	-	-
Crop3 Paddy	-	-	-	-
Crop4 Arhar	-	-	-	-
Horticulture				
Crop1 Brinjal	-	-	-	-
Crop2 Tomato	-	-	-	-
Crop3 Chilli	-	-	-	-
Crop4 Cucurbitaceous crops	-	-	-	-
Sea water intrusion[3]				
Crop1 Bajra	-	-	-	-
Crop2 Til	-	-	-	-
Crop3 Paddy	-	-	-	-
Crop4 Arhar	-	-	-	-
Horticulture				
Crop1 Brinjal	-	-	-	-
Crop2 Tomato	-	-	-	-
Crop3 Chilli	-	-	-	-
Crop4 Cucurbitaceous crops	-	-	-	-

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[p]				
Crop1 Wheat	-	-	-	**Early harvesting**
Horticulture				
Crop1 Onion	-	-	**Irrigation**	-
Cold Wave[q]				
Crop1 Gram	-	Irrigation	Irrigation	-
Crop2 Mustard	-	Spread of smoking at early in the morning	Spread of smoking at early in the morning	-
Crop3				
Horticulture				
Crop1 Potato	-	Spread of smoking at early in the morning	Spread of smoking at early in the morning	-
Crop2 Onion	-	Spread of smoking at early in the morning	Spread of smoking at early in the morning	-
Crop3 Garlic	-	Spread of smoking at early in the morning	Spread of smoking at early in the morning	-
Frost				
Crop1 Gram	-	Irrigation	Irrigation	-
Crop2 Mustard	-	Spread of smoking at early in the morning	Spread of smoking at early in the morning	-
Horticulture				
Crop1 Potato	-	Spread of smoking at early in the morning	Spread of smoking at early in the morning	-
Crop2 Onion	-	Spread of smoking at early in the morning	Spread of smoking at early in the morning	-
Crop3 Garlic	-	Spread of smoking at early in the morning	Spread of smoking at early in the morning	-
Hailstorm				
Crop1 Gram	-	-	-	-
Crop2 Mustard	-	-	-	-

Horticulture				
Crop1 Potato	-	-	-	-
Crop2 Onion	-	-	-	-
Crop3 Garlic	-	-	-	-
Cyclone				
Crop1 Gram	-	-	-	-
Crop2 Mustard	-	-	-	-
Horticulture				
Crop1 Potato	-	-	-	-
Crop2 Onion	-	-	-	-
Crop3 Garlic	-	-	-	-

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

Drought	**Suggested contingency measures**		
	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 Insurance. Repair of animal shed Shifting of animals from the flood area	Use unconventional feeds -Use of reserve fodder -Balance ration -Use of chaffed fodder -use roughages processed with mild acid and alkali -Transportation excess fodder from ad joining district	Regularly Sprinkling of water on live stock body . -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	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

	preparation of water proof shed provision of dry fodder ,Deworming		
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**	
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		

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
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	-	-	-