State: Madhya Pradesh

Agriculture Contingency Plan: Alirajpur

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**	Central Plateau and Hills Region		
	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)	Central Plateau and Hills Region		
	Agro Climatic Zone (NARP)	Jhabua Hills Zone		
	List all the districts or part thereof falling under the NARP Zone	Jhabua district except Petlabad tehsil , Alirajpur and Manawar of Dhar district		
	Geographic coordinates of district	Latitude	Longitude	Altitude
		$22^0$18'19' N	74°21′9″E	455 MSL
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Zonal Agricultural Research Station, RVSKVV, Jhabua		
	Mention the KVK located in the district	KVK, RVSKVV Farm, Rajgarh Naka, Jhabua - 457 661		

1.2	**Rainfall**	Average (mm)	Rainy days	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	840.9		3rd week of June	4th week of September
	NE Monsoon(Oct-Dec):	7.9		First week of October	First week of October
	Winter (Jan- March)	1.5		-	-
	Summer (Apr-May)	5.2		-	-
	Annual	855.5		-	-

1.3	Land use pattern of the district (latest statistics)	Geographical area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area (000' ha)	318.2	188.1	79.8	74.5	3.6	23.8	0.0	67.5	3.6	3.9

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

Major Soils	Area ('000 ha)	Percent (%) of total
1. Deep soils	49.0	15.4
2. Medium deep soils	90.0	28.3
3. Shallow soils	179.2	56.3

1.5	**Agricultural land use**	Area ('000 ha)	Cropping intensity %
	Net sown area	188.1	124.4
	Area sown more than once	45.9	
	Gross cropped area	234.0	

1.6	**Irrigation**	Area ('000 ha)	Percent (%)	
	Net irrigated area	38.7	20.6	
	Gross irrigated area	38.9	16.6	
	Rainfed area	149.4	79.4	
	Sources of Irrigation	Number	Area ('000 ha)	% area
	Canals	161	4.5	1.9
	Tanks	262	4.6	1.9
	Open wells	7437	13.2	5.6
	Bore wells	317	0.5	0.2
	Lift irrigation			
	Other sources		16.2	6.9
	Pumpsets	13055		
	Micro-irrigation			

	Groundwater availability and use	No. of blocks	% area	Quality of water
	Over exploited			
	Critical			
	Semi- critical			
	Safe		28%	
	Wastewater availability and use			

*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%

Area under major field crops & horticulture etc.

1.7		**Major Field Crops cultivated**	**Area ('000 ha)***					
			Kharif		***Rabi***		**Summer**	**Total**
			Irrigated	***Rainfed***	***Irrigated***	***Rainfed***		
	1	Maize	3.9	37.4	-	-	-	41.3
	2	Urd		55.9				55.9
	3	Cotton	11.3	23.6				34.9
	4	Soybean	9.8	27.1				36.9
	5	Wheat			25.2			25.2
	6	Gram			4.9	8.5		13.4
	7	Paddy	2.9	5.7				8.6
		Horticulture crops - Fruits	**Total area**		**Irrigated**		**Rainfed**	
	1	Orange / Sweet Lime	0.048					
	2	Lemon	0.195					
	3	Mango	0.454					
	4	Guava	0.535					
	5	Papaya	0.206					
	6	Ber	0.314					
	7	Pomegranate	0.199					
	8	Anola	1.419					
	9	Custard Apple	0.266					
	10	Others	0.258					
		Horticultural crops - Vegetables	**Total area, ha**		**Irrigated**		**Rainfed**	
		Potato	0.075					
		Tomato	2.449					
		Lady's Finger	0.230					
		Brinjal	0.176					
		Caulifloer	0.086					
		Cabbage	0.065					

		Green Peas	0.060		
		Spinach	0.021		
		Bottle Guard	0.037		
		Onion	0.285		
		Others	0.198		
		Horticultural crops - Spices	**Total area, ha**		
		Chilly	1.211		
		Ginger	0.097		
		Turmeric	0.056		
		Garlic	0.247		
		Coriander	0.079		
		Fenugreek	0.109		
		Sauf	0.003		
		Others	0.001		
		Flower Crops	**Total area, ha**		
		Mari Gold, Rose and others	0.090		
		Medicinal and Aromatic crops	**Total area, ha**	**Irrigated**	**Rainfed**
	1	Safid Musli, AshwaGandha, SarpGandha, Ratan Jyot and others	0.207		
		Plantation crops	**Total area**	**Irrigated**	**Rainfed**
	1	Jatropha	2.513		2.513
	2				
	3				
		Fodder crops	**Total area**	**Irrigated**	**Rainfed**
	1	Lusern, Sorghum chari, Bajra chari, Barseem etc.	12.503	12.503	-
	2				
	3				
		Total fodder crop area	12.503		
		Grazing land	8.659		
		Sericulture etc	-		
		Others (Specify)	-		

*If break-up data (irrigated, rainfed) is not available, give total area

1.8	**Livestock**	**Number ('000)**
	Cattle	232.3
	Buffaloes total	47.2

	Commercial dairy farms	
	Goat	276.2
	Sheep	3.9
	Others (Camel, Pig, Yak etc.)	1.5

1.9	**Poultry**	
	Commercial	0.010
	Backyard	4622.052

1.10	**Fisheries**	Area (ha)	Yield (t/ha)	Production (tones)
	Brackish water			
	Fresh water	3910	1.00	3910
	Others			

1.11	**Production and Productivity of major crops** (Average of last 3 years: 2006, 07, 08)	**Kharif**		**Rabi**		**Summer**		**Total**	
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)
Crop 1	Maize	161.644	1423					161.644	1423.4
Crop 2	Urd	39.77	609					39.77	608.5
Crop 3	Cotton	19.248	552					19.248	552
Crop 4	Soybean	42.877	1261					42.877	1261
Crop 5	Wheat			82.116	2126			82.116	2126
Others	Paddy	16.117	704					16.117	704
	Gram			7.082	669.6			7.082	669.6
Crop 1	**Horticulture crops - Fruits**								
Crop 2	Orange / Sweet Lime	14.40							
Crop 3	Lemon	52.65							
Crop 4	Mango	90.80							

Crop 5	Guava	240.75							
Crop 6	Papaya	76.22							
Others	Ber	62.80							
	Pomegranate	35.82							
	Aamla	255.42							
	Custard Apple	37.24							
	Others	43.86							
	Horticultural crops - Vegetables								
	Potato	15.00							
	Tomato	440.82							
	Lady's Finger	32.20							
	Brinjal	31.68							
	Caulifloer	18.06							
	Cabbage	13.65							
	Green Peas	4.80							
	Spinach	2.73							
	Bottle Guard	12.95							
	Onion	94.05							
	Others	33.66							
	Horticultural crops - Spices								
	Chilly	96.88							
	Ginger	11.64							
	Turmeric	2.80							
	Garlic	24.70							
	Coriander	1.58							
	Fenugreek	6.54							
	Sauf	0.12							
	Others	0.17							
	Flower Crops								
	Mari Gold, Rose and others	6.74							
	Medicinal and Aromatic crops								
	Safid Musli,	54.16							

	AshwaGandha, SarpGandha, Ratan Jyot and others								

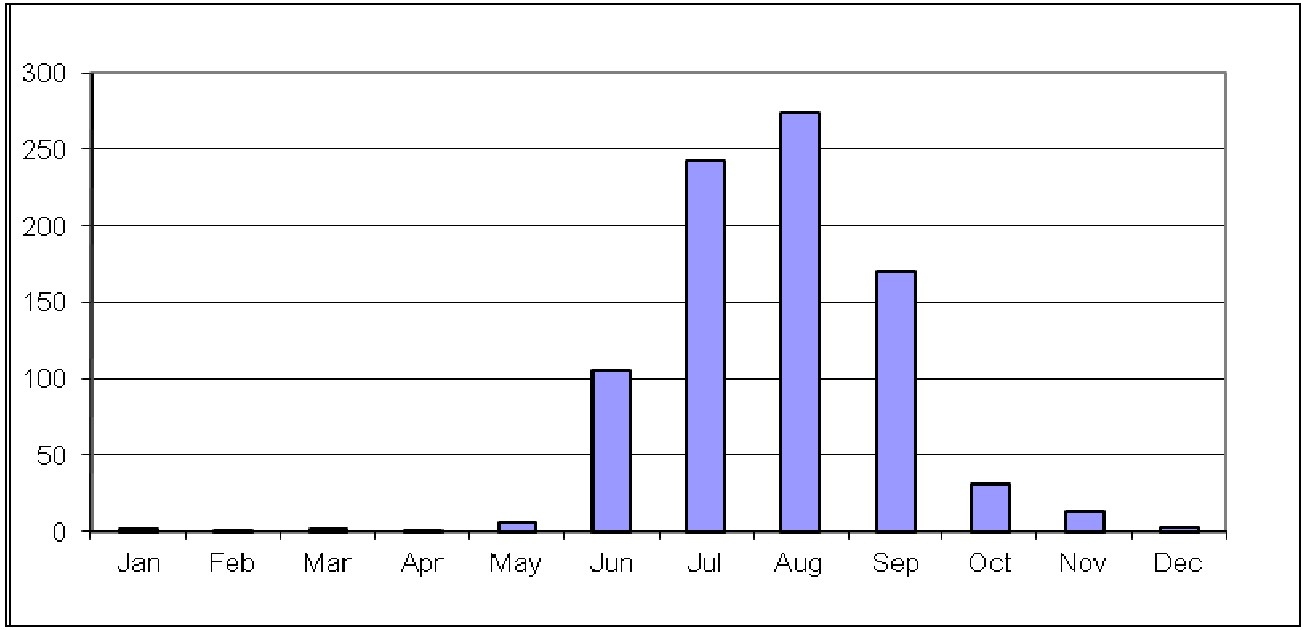
1.12	**Sowing window for 5 major crops (start and end of sowing period)**	Crop 1: _Maize_	2: _black gram	3: _Cotton_	4: __Soybean_	5: _Paddy_
	Kharif- Rainfed	Last week of June to Mid July	Last week of June to Last week of July	Last week of June to first week of July	Last week of June to First week of July	Last week of June to Mid July
	Kharif-Irrigated	-	-	Last week of June to first week of July	-	-
		Wheat	Gram	Maize		
	Rabi- Rainfed	-	First week of October to first November	-	-	-
	Rabi-Irrigated	Mid October to Mid December	First week of October to Mid November	Mid October to last week of November	-	-

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) Girdle beetel ,semilooper in soybean and gram pod borer in chick pea	√		

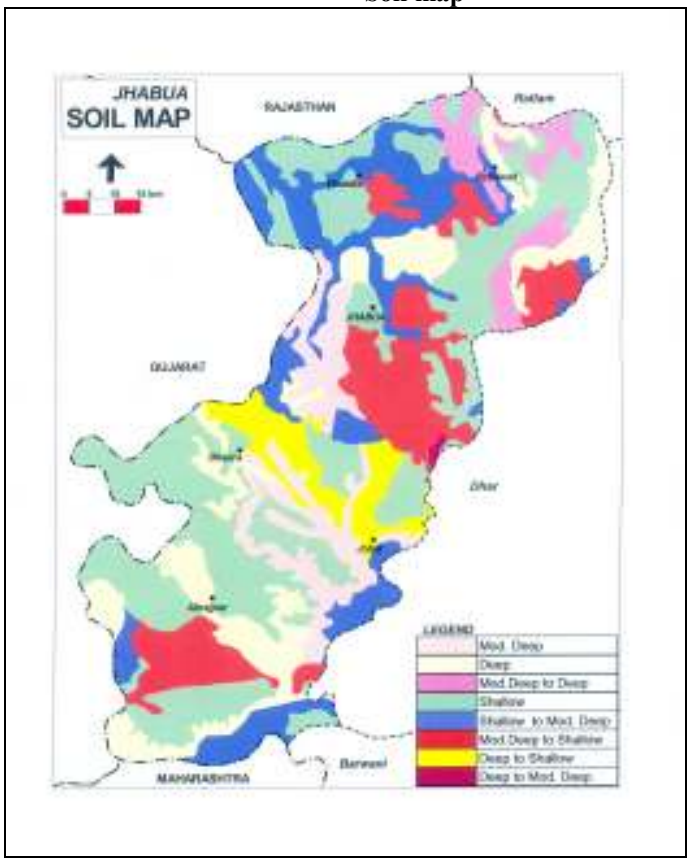
1.14	**Include Digital maps of the district for**	Location map of district with in State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

Annexure I
Location map

Annexure II
Mean Monthly rainfall for Alirajpur



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[a]**	**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 2 weeks 1st week of July	Shallow Soils	Maize	No change (JVM 421, JM 12)	Ridge and furrow sowing	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Black gram	No change (T 9, JU 86)	-	
		Soybean	No change (JS -9560 & JS 9305)	Ridge and furrow sowing	
	Moderate deep soil	Maize	JVM 421, JM 12	Ridge and furrow sowing	
		Cotton	No change	-	
		Soybean	No change (JS -9560 & JS 9305)	Ridge and furrow sowing	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation[a]**	**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 4 weeks 3rd week of July	Shallow Soils	Maize	No change (JVM 421, JM 12)	Ridge and furrow sowing Intercultural operation (Daura)	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Black gram	No change (T 9, JU 86)	Intercultural operation (Daura)	
		Soybean	No change (JS -9560 & JS 9305)	Intercultural operation (Daura)	
	Moderate deep soil	Maize	JVM 421, JM 12	Ridge and furrow sowing Intercultural operation (Daura)	
		Cotton	Black gram- T 9, JU 86	Intercultural operation (Daura)	
		Soybean	Black gram - T 9, JU 86	Ridge and furrow sowing	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation[a]**	**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 6 weeks 1st week of August	Shallow Soils	Maize	Maize sathi (local)	Intercultural operation (Daura)	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Black gram	No change (T 9, JU 86)		
		Soybean	Maize sathi/ Black gram- T 9, JU 86		
	Moderate deep soil	Maize	Maize sathi (local)		
		Cotton	Maize sathi/ Black gram- T 9, JU 86		
		Soybean	Maize sathi/ Black gram- T 9, JU 86		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation[a]**	**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 3st week of August	Shallow Soils	Maize	Maize sathi (local)	Intercultural operation (Daura)	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Black gram	Horse gram		
		Soybean	Maize sathi/ Horse gram		
	Moderate deep soil	Maize	Maize sathi (local)		
		Cotton	Maize sathi		
		Soybean	Maize sathi/ fallow		

***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[a]**	**Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Shallow Soils	Maize	Intercultural operation – daura Life saving irrigation	Sowing of crops in furrow irrigation ridge bed systems (FIRBs)	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Black gram	Intercultural operation – daura Life saving irrigation		
		Soybean	Intercultural operation – daura Life saving irrigation		
	Moderate deep soil	Maize	Intercultural operation – daura Life saving irrigation		
		Cotton	Intercultural operation – daura Life saving irrigation		
		Soybean	Intercultural operation – daura- hoe/ blade harrow Life saving irrigation		

Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation[a]**	**Crop/ cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
1	2	3	4	5	6
At vegetative stage	Shallow Soils	Maize	Maize + Urd intercropping	1% N Spraying, use dora and life saving irrigation in furrow irrigation ridge bed system (FIRBs) if available	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Black gram	Black gram	1% N Spraying, use dora and life saving irrigation in FIRBs, if available	
		Soybean	Soybean	1% N Spraying, use dora and life saving irrigation	
	Moderate deep soil	Maize	Maize + Urd intercropping	1% N Spraying use dora/ desi plaugh for intercultural operation and life saving irrigation.	
		Cotton	Cotton + Soybean intercropping	1% N Spraying, use dora and life saving irrigation, mulching of Polythine sheet , use micro irrigation system	
		Soybean	Soybean + maize	1% N Spraying, use dora and life saving irrigation	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	**Major Farming situation[a]**	**Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measures[d]**	**Remarks on Implementation[e]**
1	2	3	4	5	6
At reproductive stage	Shallow Soils	Maize	Maize	1% N Spraying, and life saving irrigation, intercultural operations	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Black gram	Black gram	-do-	
		Soybean	Soybean	-do-	
	Moderate deep soil	Maize	Maize	-do-	
		Cotton	Cotton + Soybean / Maize	1% N Spraying and life saving irrigation, mulching , micro irrigation system intercultural operations	
		Soybean	Soybean	1% N Spraying and life saving irrigation intercultural operations	

Condition			Suggested Contingency measures		
Terminal drought	**Major Farming situation[a]**	**Crop/cropping system[b]**	**Crop management[c]**	**Rabi Crop planning[d]**	**Remarks on Implementation[e]**
1	2	3	4	5	6
	Shallow Soils	Maize	Maize	Harvest at physiological maturity or sale green cobs (dough stage) and green fodder for cattle's.	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Black gram	Black gram	Mature pods are picking and vegetative parts use as fodder.	
		Soybean	Soybean	Harvest at physiological maturity	
	Moderate deep soil	Maize	Maize	Harvest at physiological maturity or sale green cobs (dough stage) and green fodder for cattle's.	
		Cotton	Cotton + Soybean / maize	Intercultural operation, mulching, life saving irrigation through micro irrigation system	
		Soybean		Harvest at physiological maturity	

2.1.2 Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Crop/ cropping system[g]**	**Change in crop/ cropping System[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
1	2	3	4	5	6
Delayed/ limited release of water in canals due to low rainfall	Shallow Soils	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	• Preferred pre sowing irrigation (Palewa) • Application of IPNM techniques • Irrigation at critical growth stages, branching and seed filling stage • Inter culture operations	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	• Balanced fertilization • Irrigation at critical growth stages	
		Fodder	Berseem, Lucerne	• Adopt improved production technologies	
		Maize	Rabi maize	• Adopt improved production technologies • Used of short duration varieties	
		Vegetables	Tomato, Brinjal	• Used of improved varieties • Adopt improved production technologies	
	Moderate deep soil	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	-Preferred pre sowing irrigation (Palewa) -Dry sowing followed by irrigation -Application of IPNM techniques -Irrigation at critical growth stages, branching and seed filling stage -Inter culture operations	
		Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	-Balanced fertilization -Irrigation at critical growth stages	
		Soybean - Chickpea			
		Soybean-Wheat			

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**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	Shallow Soils	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	• Preferred pre sowing irrigation (Palewa) • Application of IPNM techniques • Irrigation at critical growth stages, branching and seed filling stage • Inter culture operations	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	• Balanced fertilization • Irrigation at critical growth stages	
		Fodder	Berseem, Lucerne	• Adopt improved production technologies	
		Maize	Rabi maize	• Adopt improved production technologies • Used of short duration varieties	
		Vegetables	Tomato, Brinjal	• Used of improved varieties • Adopt improved production technologies	
	Moderate deep soil	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	-Preferred pre sowing irrigation (Palewa) -Dry sowing followed by irrigation -Application of IPNM techniques -Irrigation at critical growth stages, branching and seed filling stage -Inter culture operations	
		Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	-Balanced fertilization -Irrigation at critical growth stages	
		Soybean - Chickpea			
		Soybean-Wheat			

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**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	Shallow Soils	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	• Preferred pre sowing irrigation (Palewa) • Application of IPNM techniques • Irrigation at critical growth stages, branching and seed filling stage • Inter culture operations	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	• Balanced fertilization • Irrigation at critical growth stages	
		Fodder	Berseem, Lucerne	• Adopt improved production technologies	
		Maize	Rabi maize	• Adopt improved production technologies • Used of short duration varieties	
		Vegetables	Tomato, Brinjal	• Used of improved varieties • Adopt improved production technologies	
	Moderate deep soil	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	-Preferred pre sowing irrigation (Palewa) -Dry sowing followed by irrigation -Application of IPNM techniques -Irrigation at critical growth stages, branching and seed filling stage -Inter culture operations	
		Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	-Balanced fertilization -Irrigation at critical growth stages	
		Soybean - Chickpea			
		Soybean-Wheat			

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**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	Shallow Soils	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	• Preferred pre sowing irrigation (Palewa) • Application of IPNM techniques • Irrigation at critical growth stages, branching and seed filling stage • Inter culture operations	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	• Balanced fertilization • Irrigation at critical growth stages	
		Fodder	Berseem, Lucerne	• Adopt improved production technologies	
		Maize	Rabi maize	• Adopt improved production technologies • Used of short duration varieties	
		Vegetables	Tomato, Brinjal	• Used of improved varieties • Adopt improved production technologies	
	Moderate deep soil	Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	-Preferred pre sowing irrigation (Palewa) -Dry sowing followed by irrigation -Application of IPNM techniques -Irrigation at critical growth stages, branching and seed filling stage -Inter culture operations	
		Wheat Soybean -Chickpea Soybean-Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203, Harshita)	-Balanced fertilization -Irrigation at critical growth stages	

2.2 Unusual rains (untimely, unseasonal etc) (for both rainfed and irrigated situations)

Condition	**Suggested contingency measure**			
1	2	3	4	5
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 (specify) Maize	Crop sowing in FIRB system, drainage channels make and joint to main drainage channel, after proper drainage giving urea for better vegetative growth.	Drainage channels make and joint to main drainage channel, after proper drainage giving urea for good cob formation.	Drainage channels make and joint to main drainage channel, use sulphur spray for control of fungal infection	Protect the harvest crop to rains, after rains proper drying of crop harvest in threshing floor and thresh.
Crop2 Cotton	Crop sowing in FIRB system, drainage channels make and joint to main drainage channel, after proper drainage giving urea for better vegetative growth.	Drainage channels make and joint to main drainage channel, after proper drainage giving urea for good flower formation. Spray planofix for flower drop control.	Drainage channels make and joint to main drainage channel, if rain fall forecast then picking should be done before rains come.	Protect the harvest crop to rains
Crop3 Soybean	Crop sowing in FIRB system, drainage channels make and joint to main drainage channel, after proper drainage giving urea for better vegetative growth.	Drainage channels make and joint to main drainage channel, Spray planofix for flower drop control.	Drainage channels make and joint to main drainage channel, use sulphur spray for control of fungal infection	Protect the harvest crop to rains, after rains proper drying of crop harvest in threshing floor and thresh.
Crop4 Black gram	Crop sowing in FIRB system, drainage channels make and joint to main drainage channel, after proper drainage giving urea for better vegetative growth.	Drainage channels make and joint to main drainage channel, Spray planofix for flower drop control.	Drainage channels make and joint to main drainage channel, use sulphur spray for control of fungal infection	Protect the harvest crop to rains, after rains proper drying of crop harvest in threshing floor and thresh.
Crop5 Paddy	After rainfall given nitrogenous fertilizer by ammonium sulphate	After rainfall given nitrogenous fertilizer by ammonium sulphate	Drainage channels make and joint to main drainage channel, use sulphur spray for control of fungal infection	Protect the harvest crop to rains, after rains proper drying of crop harvest in threshing floor and thresh.

Horticulture				
Crop1 Tomato	Crop sowing in FIRB system, drainage channels make and joint to main drainage channel, after proper drainage giving urea for better vegetative growth. One spray of mencozeb 75WP 2gm/l for root rot control.	Drainage channels make and joint to main drainage channel, Spray planofix for flower drop control, and One spray of mencozeb 75WP 2gm/l for root rot control.	Drainage channels make and joint to main drainage channel, picking the matured fruits and shall it.	-
Crop2 Chilli	Crop sowing in FIRB system, drainage channels make and joint to main drainage channel, after proper drainage giving urea for better vegetative growth. One spray of mencozeb 75WP 2gm/l for root rot control.	Drainage channels make and joint to main drainage channel, Spray planofix for flower drop control, and One spray of mencozeb 75WP 2gm/l for root rot	Drainage channels make and joint to main drainage channel, picking the matured fruits and shall it.	-
Crop 3 cauliflower	Crop sowing in FIRB system, drainage channels make and joint to main drainage channel, after proper drainage giving urea for better vegetative growth. One spray of mencozeb 75WP 2gm/l for root rot control.	Drainage channels make and joint to main drainage channel, Spray planofix for flower drop control, and One spray of mencozeb 75WP 2gm/l for root rot	Drainage channels make and joint to main drainage channel, picking the matured fruits and shall it.	-
Heavy rainfall with high speed winds in a short span[2]	**Vegetative stage[k]**	**Flowering stage[l]**	**Crop maturity stage[m]**	**Post harvest[n]**
Crop1 Maize	Crop sowing in FIRB system, Earthing the maize crop, drainage channels make and joint to main drainage channel, after proper drainage giving urea for better vegetative growth.	Drainage channels make and joint to main drainage channel, after proper drainage giving urea for good cob formation.	Drainage channels make and joint to main drainage channel, use sulphur spray for control of fungal infection	Protect the harvest crop to rains, after rains proper drying of crop harvest in threshing floor and thresh.
Crop2 Cotton	Crop sowing in FIRB system, drainage channels make and joint to main drainage channel, after proper drainage giving urea for better vegetative growth.	Drainage channels make and joint to main drainage channel, after proper drainage giving urea for good flower formation. Spray planofix for flower drop control.	Drainage channels make and joint to main drainage channel, if rain fall forecast then picking should be done before rains come.	Protect the harvest crop to rains

Crop3 Soybean	Crop sowing in FIRB system, drainage channels make and joint to main drainage channel, after proper drainage giving urea for better vegetative growth.	Drainage channels make and joint to main drainage channel, Spray planofix for flower drop control.	Drainage channels make and joint to main drainage channel, use sulphur spray for control of fungal infection	Protect the harvest crop to rains, after rains proper drying of crop harvest in threshing floor and thresh.
Crop4 Black gram	Crop sowing in FIRB system, drainage channels make and joint to main drainage channel, after proper drainage giving urea for better vegetative growth.	Drainage channels make and joint to main drainage channel, Spray planofix for flower drop control.	Drainage channels make and joint to main drainage channel, use sulphur spray for control of fungal infection	Protect the harvest crop to rains, after rains proper drying of crop harvest in threshing floor and thresh.
Crop5 Paddy	After rainfall given nitrogenous fertilizer by ammonium sulphate	After rainfall given nitrogenous fertilizer by ammonium sulphate	Drainage channels make and joint to main drainage channel, use sulphur spray for control of fungal infection	Protect the harvest crop to rains, after rains proper drying of crop harvest in threshing floor and thresh.
Horticulture				
Crop1 Tomato	Crop sowing in FIRB system, drainage channels make and joint to main drainage channel, after proper drainage giving urea for better vegetative growth. One spray of mencozeb 75WP 2gm/l for root rot control.	Drainage channels make and joint to main drainage channel, Spray planofix for flower drop control, and One spray of mencozeb 75WP 2gm/l for root rot control.	Drainage channels make and joint to main drainage channel, picking the matured fruits and shall it.	-
Crop2 Chilli	Crop sowing in FIRB system, drainage channels make and joint to main drainage channel, after proper drainage giving urea for better vegetative growth. One spray of mencozeb 75WP 2gm/l for root rot control.	Drainage channels make and joint to main drainage channel, Spray planofix for flower drop control, and One spray of mencozeb 75WP 2gm/l for root rot	Drainage channels make and joint to main drainage channel, picking the matured fruits and shall it.	-
Crop3Cauliflower	Crop sowing in FIRB system, drainage channels make and joint to main drainage channel, after proper drainage giving urea for better vegetative growth. One spray of mencozeb 75WP 2gm/l for root rot control.	Drainage channels make and joint to main drainage channel, Spray planofix for flower drop control, and One spray of mencozeb 75WP 2gm/l for root rot	Drainage channels make and joint to main drainage channel, picking the matured fruits and shall it.	-

Outbreak of pests and diseases due to unseasonal rains	**Vegetative stage[k]**	**Flowering stage[l]**	**Crop maturity stage[m]**	**Post harvest[n]**
Crop1 Maize	Application of proper insecticides to control of sucking pest , stem borer and bihar hairy caterpillar	Use of fungicides to control stalk rot	Use sulphur spray for control of fungal infection	Proper drying of seed or grains before storage. use EDB ampoules (one ampoule / q)
Crop2 Cotton	Control of sucking pest, stem borer fly, American caterpillar, control of root rot and collar rot disease	Control of pink wall worm, sucking pest etc. and control of flower drop.	Control of pink wall worm, sucking pest etc. and control of flower drop.	Proper storage of crop harvest and timely marketing.
Crop3 Soybean	Control of semi looper, blue beetle and girdle beetle	Control of semi looper, blue beetle, girdle beetle, tobacco caterpillar	Control of tobacco caterpillar, control of fungal infection use sulphur dust.	Proper drying of seed or grains before storage.
Crop4 Black gram	Control of semi looper, blue beetle	Control of semi looper, blue bitle, tobacco caterpillar	Pick the mature pods and proper drying it, control the fungal infection use sulphur dust.	Proper drying of seed or grains before storage. use EDB ampoules (one ampoule / q)
Horticulture				
Crop1 Tomato	One spray of mencozeb 75WP 2gm/l for root rot control, control of sucking pests and stem borer.	Control the root rot and early blight, control of sucking pests and stem borer and fruit borer control the flower drop.	Picking the mature fruits and sold. Control the fruit drop. Control the late blight	-
Crop2 Chilli	Control the sucking pest, stem borer and root rot and anthracnose disease	Control the sucking pest, caterpillar and root rot and anthracnose disease and flower drop.	Control the fungal infection.	Proper drying of chilli and store it.

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 (specify) Maize				
Crop2				
Crop3				
Crop4				
Crop5				
Horticulture				
Crop1 (specify)				
Crop2				
Crop3				
Continuous submergence for more than 2 days[2]				
Crop1				
Crop2				
Crop3				
Crop4				
Crop5				
Horticulture				
Crop1 (specify)				
Crop2				
Crop3				
Sea water inundation[3]				
Crop1				
Crop2				
Crop3				
Crop4				
Crop5				

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

Extreme event type	Suggested contingency measure[r]			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave[p]				
Wheat	NA	NA	Light irrigation	Harvest at physiological maturity
Chickpea	NA	NA	-do-	-do-
Crop3				
Crop4				
Crop 5				
Horticulture				
Crop1 (specify)				
Crop2				
Crop3				
Cold wave[q]				
Crop1				
Crop2				
Crop3				
Crop4				
Crop 5				
Horticulture				
Crop1 (specify)				
Crop2				
Crop3				
Frost				
Crop1				
Crop2				
Crop3				
Crop4				
Crop 5				

Horticulture				
Crop1 (specify)				
Crop2				
Crop3				
Hailstorm				
Crop1				
Crop2				
Crop3				
Crop4				
Crop 5				
Horticulture				
Crop1 (specify)				
Crop2				
Crop3				
Cyclone				
Crop1				
Crop2				
Crop3				
Horticulture				
Crop1 (specify)				
Crop2				
Crop3				

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the events	**During the event**	**After the event**
Drought			
Feed and fodder availability	Hay and silage making, storage of locally available roughage	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.
Drinking water	Water treated with quick lime	Use sanitized water	Water treated with quick lime
Health and disease management	Vaccination & deworming	Mineral mixture feeding, keep animals in favorable environment	Vaccination & deworming
Floods			
Feed and fodder availability	Hay and silage making,	Use unconventional feeds; avoid spoiled fodder feeding, use roughages processed with mild acid and alkali.	Feeding green feed/ fodder and conventional feed.
Drinking water	Water and quick lime	Use sanitized water	Water and quick lime
Health and disease management	Vaccination & deworming	Vaccination & deworming , avoid food poisoning by spoiled feed, keeping catles in dry and arable place	Vaccination & deworming, use antidote in poisoning case
Cyclone			
Feed and fodder availability	Hay and silage making,	Use unconventional feeds; avoid spoiled fodder feeding, use roughages processed with mild acid and alkali.	Feeding green feed/ fodder and conventional feed.
Drinking water	Water treated with quick lime	Use sanitized water	Water treated with quick lime
Health and disease management	Vaccination & deworming	Vaccination & deworming , avoid food poisoning by spoiled feed, keeping cattles in dry and airable place	Vaccination & deworming, use antidote in poisoning case
Heat wave and cold wave			
Shelter/environment management	House of animal should be N-S direction, availability of plenty water, animal house window should have provision of curtain to maintain cold and heat wave	Provide favorable environment during heat/ cold wave Heat: availability of plunty of cold water to drink. Keep animal on cool places, two times bathing of animals. Cold: availability of full sun rays in animal shed, keep animal body warm.	Keep environment uniformly to recover animals.
Health and disease management	Availability of antibiotics, B-complex, liver tonic, anti-inflammatory drugs, anti-stress drugs, vaccines etc.	Use suitable drugs depending on condition.	Vaccination & deworming,

2.52 Poultry

	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
Drought			
Shortage of feed ingredients	Storage of local available food grains/feed 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 feed.
Drinking water	Fresh drinking water	Sanitized drinking water	Fresh drinking water
Health and disease management	Vaccination and deworming	Vaccination and deworming	Vaccination and deworming
Floods			
Shortage of feed ingredients	Storage of local available food grains/feed ingredients,	Feed should be protected by fungus, down the curtain of window	Feeding high quality balance feed. Open the curtain for proper aeration and drying of litter.
Drinking water	Fresh drinking water	Sanitized drinking water	Fresh drinking water with quick lime.
Health and disease management	Vaccination and deworming	Vaccination and deworming, use anti fungal and liver tonic during feeding and drinking.	Vaccination and deworming
Cyclone			
Shortage of feed ingredients	Storage of local available food grains/feed ingredients,	Feed should be protected by fungus, down the curtain of window	Feeding high quality balance feed. Open the curtain for proper aeration and drying of litter.
Drinking water	Fresh drinking water	Sanitized drinking water	Fresh drinking water
Health and disease management	Vaccination and deworming	Vaccination and deworming, use anti fungal and liver tonic during feeding and drinking.	Vaccination and deworming
Heat wave and cold wave			
Shelter/environment management	Storage of local available food grains/feed ingredients,	Down the curtain of window, maintain the temperature of shed , lighting in the shed in cold condition	Feeding high quality balance feed.
Health and disease management	Vaccination and deworming	Vaccination and deworming, use anti stress drugs and liver tonic during feeding and drinking.	Vaccination and deworming

2.5.3 Fisheries

	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
Drought			
Shallow water in ponds due to insufficient rains/inflows	All the fish should be marketed	Dry ponds should be treated with lime.	After onset of monsoon and ponds fill with water seedling the fish seed.
Impact of heat and salt load build up in ponds / change in water quality	All the fish should be marketed	Dry ponds should be treated with lime.	After onset of monsoon and ponds fill with water seedling the fish seed.
Any other (specify)			
Floods			
Inundation with flood waters	Keeps net in west wear of ponds	Protect the fish to flow with runoff water	-
Water contamination and changes in BOD	Lime treatment should be done.	Lime treatment and $KMnO_4$ treatment 2 ppm	No seedling of new fish seed
Health and disease management	Lime treatment should be done.	Lime treatment and $KMnO_4$ treatment 2 ppm	No seedling of new fish seed
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
Infrastructure damage	Dust and debris should be clean in west wear.	Continuous Dust and debris cleans in west wear.	-
Cyclone			
Overflow / flooding of ponds	Keeps net in west wear of ponds	Keeps net in west wear of ponds	-
Change in fresh/brackish water ratio	-	-	-
Health and disease management	Lime treatment should be done.	Lime treatment and $KMnO_4$ treatment 2 ppm	No seedling of new fish seed
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
Infrastructure damage	-	-	-
Heat wave and cold wave			
Management of pond environment	Showering of water by pump for proper availability of oxygen in water	Showering of water by pump for proper availability of oxygen in water	-
Health and disease management	$KMnO_4$ treatment 2 ppm	$KMnO_4$ treatment 2 ppm	-