State: Madhya Pradesh

Agriculture Contingency Plan for District : Ratlam

1.0 District Agriculture profile					
1.1	**Agro-Climatic/Ecological Zone**				
	Agro Ecological Sub Region (ICAR)	Subregion :13, AESR :5.2, Western Malawa Plateau, Semi-arid medium to deep Vertisols			
	Agro-Climatic Zone (Planning Commission)	Subzone :24,Agro climatic zone:9.3,Region : Central plateau,			
	Agro Climatic Zone (NARP)	Malawa plateau Agro climatic Zone (ZONE -X)			
	List all the districts or part thereof falling under the NARP Zone	Neemach, Mandsour, Rajgarh, Ujjain,Indore, Dewas, Shajapur, **Ratlam**,Part of Dhar district (Badanawar and Sardarpu tehsil) and Jhabua district(Petalawad tehsil)			
	Geographic coordinates of district headquarters	Latitude		Longitude	Altitude
		23 ^{0} 31'N		75 ^{0} 07'E	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	ZARS, Indore ; RARS , College of Horticulture, Mandsour			
	Mention the KVK located in the district	Krishi Vigyan Kendra, Jaora Distt. Ratlam(M.P.)			
1.2	**Rainfall**	Normal RF(mm)	Normal Rainy days (number)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	881.3	35	Second week of June	Forth week of September
	NE Monsoon(Oct-Dec):	58.1	-		
	Winter (Jan- March)	11.8	-	-	-
	Summer (Apr-May)	10.5	-	-	-
	Annual	939.4		-	-

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
	Area ('000 ha)	486	333	34.3	30.7	28.6	15.2	0.1	41.6	1.3	1.1

1. 4	**Major Soils (common names like red sandy loam deep soils (etc.,)***	**Area ('000 ha)**	**Percent (%) of total**
	1. Deep soils	292.60	60.29
	2. Medium deep soils	41.20	8.50
	3. Shallow soils	151.60	31.21

* 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	333	150
	Area sown more than once	167	
	Gross cropped area	500	

1.6	**Irrigation**	Area (‘000 ha)		
	Net irrigated area	144.3		
	Gross irrigated area	144.7		
	Rainfed area	188.7		
	Sources of Irrigation	Number	Area (‘000 ha)	Percentage of total irrigated area
	Canals		2.4	1.66
	Tanks		3.3	2.30
	Open wells		48.3	33.5
	Bore wells		79.5	55.09
	Lift irrigation schemes		-	
	Micro-irrigation		-	
	Other sources (please specify)		10.8	7.48
	Total Irrigated Area		144.3	
	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		117%	
	Critical			
	Semi- critical			
	Safe			
	Wastewater availability and use			
	Ground water quality			
*over-exploited: groundwater uSesameization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

1.7 Area under major field crops & horticulture (as per latest figures) (Specify year _____ eg., 2008-09)

1.7	S.No.	Major field crops cultivated	Area ('000 ha)							
			Kharif			*Rabi*				
			Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Summer	Grand total
	1	Soybean		198.1	198.1					198.1
	2	Maize		41.3	41.3					41.3
	3	Chickpea					53.1	53.1		53.1
	4	Wheat				46.1		46.1		46.1
	5	Mustard				4.7		4.7		4.7
	Others (specify)									
		Major Horticulture crops								
		Horticulture crops - Fruits								
		Mango								0.505
		Guava								0.625
		orange								1.281
		Lemon								0.715
		Grapes								0.168
		Pomegranate								0.219
		Aamla								0.8
		Papaya								2.605
		Others								1.619
		Horticulture crops - Vegetables								
		Tomato								5.09
		Potato								1.235
		Onion								3.255
		Ladys Finger								2.13
		Brinjal								1.37
		Green Peas								2.25
		Cauliflower								1.39
		Cabbage								1.305
		Kaddu Vargoya								3.65
		Others								3.655
		Horticulture crops - Spices								

		Coriander								0.769
		Chilly								8.43
		Garlic								12.349
		Turmeric								0.254
		Ginger								0.522
		Fenugreek seed								3.621
		Others								2.805
		Horticulture crops - Medicinal and Aromatic								
		Ashwa Gandha								0.118
		Ajwain								0.188
		Isabgol								0.135
		Basil								1.065
		Lkalmegh								0.12
		Sanaya								1.575
		Horticulture crops - Flowers								
		Rose								0.156
		Mari Gold								0.61
		Tube rose								0.081
		Gyadilous								0.05
		Glardiya								0.068
		Bijli								0.101
		Aster								0.081
		Guldawadi								0.433
		Others								0.07
		Fodder crops	**Total**			**Irrigated**			**Rainfed**	
		Total fodder crop area								
		Grazing land								
		Sericulture etc								
		Others (specify)								

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Non descriptive Cattle (local low yielding)	906	82.2	1728
	Crossbred cattle			
	Non descriptive Buffaloes (local low yielding)	1.3	76.1	77.4
	Graded Buffaloes			
	Goat			203.1
	Sheep			9.7
	Others (Camel, Pig, Yak etc.)			21.6
	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**	
	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 ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
Major Field crops (Crops to be identified based on total acreage)										
Crop 1	Soybean	203.8	1029					203.8	1029	
Crop 2	Maize	83.4	2020					83.4	2020	
Crop 3	Chickpea			47.2	889			47.2	889	
Crop 4	Wheat			146.4	3304			146.4	3304	
Crop 5	Mustard			6.9	1482			6.9	1482	
Others										
Major Horticultural crops (Crops to be identified based on total acreage)										
	Horticultural crops - Fruits									
	Mango							13.8	2732.67	
	Guava							91.2	14592.00	
	orange							217	16939.89	
	Lemon							108.3	15146.85	
	Grapes							24.4	14523.81	
	Pomegranate							23.55	10753.42	
	Aamla							61.25	7656.25	
	Papaya							550.6	21136.28	
	Others							96.3	5948.12	
	Horticultural crops - Vegetables									
	Tomato							1603.6	31504.91	
	Potato							217.7	17627.53	
	Onion							534.5	16420.89	
	Ladys Finger							280.3	13159.62	
	Brinjal							212.3	15496.35	
	Green Peas							255.4	11351.11	
	Cauliflower							210.6	15151.08	
	Cabbage							179	13716.48	

	Kaddu Vargoya							587.5	16095.89	
	Others							232.1	6350.21	
	Horticultural crops - Spices									
	Coriander							7.85	1020.81	
	Chilly							141.8	1682.09	
	Garlic							1832.7	14840.88	
	Turmeric							35.5	13976.38	
	Ginger							93.85	17978.93	
	Fenugreek seed							105.35	2909.42	
	Others							22.8	812.83	
	Horticultural crops - Medicinal and Aromatic									
	Ashwa Gandha							0.88	745.76	
	Ajwain							1.4	744.68	
	Isabgol							1.53	1133.33	
	Basil							14.91	1400.00	
	Lkalmegh							0.09	75.00	
	Sanaya								0.63	
	Horticultural crops - Flowers									
	Rose							5.9	3782.05	
	Mari Gold							50.05	8204.92	
	Tube rose							9.45	11666.67	
	Gyadilous							45	90000.00	
	Glardiya							16.5	24264.71	
	Bijli							24.95	24702.97	
	Aster							6.05	7469.14	
	Guldawadi							50.4	11639.72	
	Others							7.9	11285.71	

1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	Crop 1: Soybean	2 Maize:	3: Chickpea	4: Wheat	5: Mustard
	Kharif- Rainfed	3 rd week of June to first fortnight of July	3 rd week of June to first fortnight of July			
	Kharif-Irrigated	--				
	Rabi- Rainfed			First week of Oct. to last week of Octo.	15 Oct – 30 Oct.	15 Oct – 30 Oct
	Rabi-Irrigated			15 Oct. -10 Nov.	15 Oct. -30 Nov.	15 Oct. -10 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)		*	
	Others (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 of Ratlam 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 Rainfed situation

Condition				**Suggested Contingency measures**	
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
Delay by 2 weeks **4th week of June**	Deep soils	Soybean	No change. Prefer varieties like JS – 335, JS93-05, JS 95-60	• Seed treatment by Carbendazim @2gm/kg seed • Use of balanced fertilizer • Timely Intercultural operations to be done • Maintain the optimum plant population	Link NSC,SAU and karshak societies for good quality seed
		Maize	No change. Prefer varieties like Guava -2, Guava Safed-2, DHy-1, Composite JM-12 JM-8, NLD White		
	Shallow soils	Jowar	No change. Prefer varieties like Hy-CSH 13, CSH – 14, JJ 1041, JJ 1022		
		Cotton	No change. Prefer varieties like JK Hy 1,4, 11, Bt cotton varieties		

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 4 weeks **(2nd week of Aug)**	Deep soils	Soybean	No change. Prefer varieties like JS 335, JS 95 – 60, JS 93-05, PK-472, NRC-12, NRC - 37	• Use of treated Seed by 2 gm. Bavistin/ kg seed • Use of bio fertilizer . • Sowing crop against the slope. • Collect the water from lower portion and use it as a life saving irrigation.	Link NSC,SAU and karshak societies for good quality seed Link watersheds andMGREGS for the support of farm pond technology
		Maize	HPQM-1, JM 216, JM 421, NavJot Guava-11, Pissa, Makka-1, Trisulta		
	Shallow soils	Jowar	JJ 1041, JJ 1022, CSh 13,14, JJ 938		
		Cotton	JKHy 1,4,11, Bt Cotton varieties		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
Delay by 6 weeks **(4th week of Aug)**	Deep soils	Soybean	No change. Prefer varieties like JS 335, JS 95 – 60, JS 93-05, PK-472, NRC-12, NRC - 37	• Soybean, Maize & Jowar crops are not sown. • Use of water conservation measures. • If you want to take cotton crop, then it can be cultivated as an intercrop. • Intercultural operations	Link NSC,SAU and karshak societies for good quality seed Link watersheds andMGREGS for the support of farm pond technology
		Maize	HPQM-1, JM 216, JM 421, NavJot Guava- 11, Pissa, Makka-1, Trisulta		
	Shallow soils	Jowar	JJ 1041, JJ 1022, CSh 13,14, JJ 938		
		Cotton	JKHy 1,4,11, Bt Cotton varieties		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
Delay by 8 weeks 2nd week of Sept	Deep soils	Soybean	No change. Prefer varieties like JS 335, JS 95 – 60, JS 93-05, PK-472, NRC-12, NRC - 37	• Conserve soil moisture • Use of treated Seed. • Line sowing. • Proper interculture operation	Link NSC,SAU and karshak societies for good quality seed Link watersheds andMGREGS for the support of farm pond technology
		Maize	HPQM-1, JM 216, JM 421, NavJot Guava- 11, Pissa, Makka-1, Trisulta		
	Shallow soils	Jowar	JJ 1041, JJ 1022, CSh 13,14, JJ 938		
		Cotton	JKHy 1,4,11, Bt Cotton varieties		

Condition	Suggested contingency measures			
Early season drought **(Normal onset)**	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**
1	2	3	4	5
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/ crop stand etc.	Deep soils	Soybean	• Use treated seed. • Intercultural operation between rows. • Make a deep row after each 15 to 20rows. • In nursery condition do not use Nitrogen. • Use anti transpirants Dose?	• Use mulches to reduce loss of water. • Maintain plant water status. • Life saving irrigation if available. • Foliar spray of fertilizers(2% urea during the dry spell)
		Maize		
	Shallow soils	Jowar		
		Cotton		

Condition	Suggested contingency measures			
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**
1	2	3	4	5
At vegetative stage	Deep soils	Soybean	• Weed management through intercultural operation between rows using *doura* • Gap filling with improved variety if the population is <75% of optimum • Resow the crop if the damage will be severe	• Dust mulching through interculture • Green leaf mulch in between crop rows • Life saving irrigation
		Maize		
	Shallow soils	Jowar		
		Cotton		

Condition	Suggested contingency measures			
Mid season drought (long dry spell)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**
1	2	3	4	5
At flowering/ fruiting stage	Deep soils	Soybean	• Use life saving irrigation if available. • Use growth hormones. • Stop use of Nitrogen. • Use wind breaks in the boarder of field	• In situ moisture conservation practices(Ridges and furrows). • Reducing the evapotranspiration by mulching • Use of liquid fertilizers/ spary urea 2% solution during the dry spell • Use of sprinkler irrigation.
		Maize		
	Shallow soils	Jowar		
		Cotton		

Condition	Suggested contingency measures			
Terminal drought	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Rabi planning**
1	2	3	4	5
(Early withdrawal of monsoon)	Deep soils	Soybean	• Reduction of Nitrogen 25-50% then recommended • Urea spary 2% solution. • Life saving irrigation	• Rabi crops like safflower, LenSesame, Linseed, Rainfed wheat and Gram. • Selection of heat tolerant varieties like in Gram JAKI 9218. • Use of Line sowing only. • Seed priming. • Use of short duration varieties.
		Maize		
	Shallow soils	Jowar		
		Cotton		

2.1.2 Drought - Irrigated situation

Condition			Suggested Contingency measures		
Delayed release of water in canals due to low rainfall	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system[c] including variety**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
	Deep soils	Soybean - Wheat	Soybean JS 55-60, JS 93-05, Wheat-Pusa-4	• Ridge and furrow planting • Mulching in crop rows • Irrigation at critical stages of crop • Use micro irrigation systems like sprinkler/drip • Increase water Use	Proper training and guidance to the farmer by KVK/ATMA
		Soybean-gram	Poorna, HI 1518, Gram-JG 130, JG 11, JG226		
		Maize-Jowar	JG-412, Maize –JM 216 JM-8		
	Shallow soils	**NA**			

Condition	Suggested Contingency measures				
Limited release of water in canals due to low rainfall	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system[c] including variety**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
	Deep soils	Soybean - Wheat	Soybean JS 55-60, JS 93-05, Wheat-Pusa-4	• Ridge and furrow planting • Mulching in crop rows • Irrigation at critical stages of crop • Use micro irrigation systems like sprinkler/drip • Increase water Use	Proper training and guidance to the farmer by KVK/ATMA
		Soybean-gram	Poorna, HI 1518, Gram-JG 130, JG 11, JG226		
		Maize-Jowar	JG-412, Maize –JM 216 JM-8		
	Shallow soils	**NA**			

Condition			**Suggested Contingency measures**		
Non release of water in canals under delayed onset of monsoon in catchment	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
1	**2**	**3**	**4**	**5**	**6**
	Deep soils	Soybean - Wheat	Soybean JS 55-60, JS 93-05, Wheat-Pusa-4	• Ridge and furrow planting • Mulching in crop rows • Irrigation at critical stages of crop from rain water	Proper training and guidance to the farmer by KVK/ATMA
		Soybean-gram	Poorna, HI 1518, Gram-JG 130, JG 11, JG226		
		Maize-Jowar	JG-412, Maize –JM 216 JM-8		
	Shallow soils	**NA**			

Condition			**Suggested Contingency measures**		
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system[c] including variety**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
	Deep soils	Soybean - Wheat	Soybean JS 55-60, JS 93-05, Wheat-Pusa-4	• Ridge and furrow planting • Mulching in crop rows • Irrigation at critical stages of crop • Use micro irrigation systems like sprinkler/drip • Increase water Use	Proper training and guidance to the farmer by KVK/ATMA
		Soybean-gram	Poorna, HI 1518, Gram-JG 130, JG 11, JG226		
		Maize-Jowar	JG-412, Maize –JM 216 JM-8		
	Shallow soils	NA			

Condition			**Suggested Contingency measures**		
Insufficient groundwater recharge due to low rainfall	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system[c] including variety**	**Agronomic measures**	**Remarks on Implementation**
1	2	3	4	5	6
	Deep soils	Soybean - Wheat	Soybean JS 55-60, JS 93-05, Wheat-Pusa-4	• Increased seed rate by 20%. • Reducing loss of water by mulching. • Conserve moisture through ridges and furrow system/ BBF. • Use of life saving irrigation through sprinkler/ Alernate furrow system	Proper training and guidance to the farmer by KVK/ATMA
		Soybean-gram	Poorna, HI 1518, Gram-JG 130, JG 11, JG226		
		Maize-Jowar	JG-412, Maize –JM 216 JM-8		
	Shallow soils	**NA**			

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]**
1	2	3	4	5
Crop1 (specify) Soybean				
Maize	Drain the excess water as early as possible Apply 20 kg N + 10 kg K /ha after draining excess water Take up inter cultivation and at optimum soil moisture condition to loosen and aerate the soil and to control weeds Earthenup the crop for anchorage Spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition Take up timely control measures for Pink stem borer, sheath blight and Turcicum leaf blight	Drain the excess water as early as possible Apply 20 kg N + 10 kg K /ha after draining excess water Spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition Take up timely control measures for sheath blight and post flowering stalk rots	Drain the excess water as early as possible Allow the crop to dry completely before harvesting	Harvest the cobs after the they are dried up properly. Dry the grain to optimum moisture condition before storing
Crop3 Jowar	Drain excess water with proper drainage Intercultivation with hoe to improve aeration of the soil Apply 20-30 kg N/ha to regain lost vigor at optimum moisture condition	Drain excess water with proper drainage Intercultivation with hoe to improve aeration of the soil Apply 20-30 kg N/ha to regain lost vigor at optimum moisture condition	Drain excess water with proper drainage Harvest the earheads after they are dried properly or use ear head drier	Dry the grain at optimum moisture content before bagging and marketing
Crop4	1.Drain out excess water	1. Drain out excess water	1. Drain out excess water	1. Dry the produce under sun

cotton	2. Inter cultivation and apply a booster dose of 30 kg urea+ 15 kg MOP per ha 3. In water logged areas spray with urea 2%+ MgSo4 (1%) followed by Annabhedi 5g+Citric acid 0.5g/l 4.Spray and also drench with Copper oxychloride 5. Take up timely control measures against the out break of pests and diseases.	2. Apply 30 kg N + 15 kg K /ha after draining excess water 3. Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals 4. Take up timely control measures against the out break of pests and diseases.	2. Monitor for boll rot. Take up corrective measures 3. Kapas picking should be done carefully to prevent admixtures with waste plant material	before sending to market
Crop5 pigeonpea/Arhar	1. Drain out excess water 2. Apply 20 kg N + 10 kg K /ha after draining excess water 3. Take up inter cultivation at optimum soil moisture condition to loosen and aerate the soil and to control weeds	1. Drain out excess water 2. To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1%. 3. Take up timely control measures against the out break of pests like Spodoptera, Helicoverpa etc.	1. Drain out excess water 2. Allow the crop to dry completely before harvesting	1. Spread the bundles drenched in rain on field bunds or drying floors to quicken the drying 2. Thresh the bundles after they are dried properly 3. Dry the grain to proper moisture per cent before bagging and storing to prevent deterioration in quality during storage
Horticulture				
Heavy rainfall with high speed winds in a short span[2]				
Crop1 Soybean	• Drain excess water • Ridge and furrow system of planting • Top dressing with N 10-20 kg/ha at optimum soil moisture • Intercultivation to loosen the soil and to improve aeration	• Drain excess water • Intercultivation to loosen the soil and improve aeration • Foliar spray with 2% urea/DAP to regain lost vigour	• Drain excess water • Harvesting on a clear sunny day • Shift the produce to safer place	Dry the produce up to 10- 12 % moisture before storage

Crop2 Maize	Drain the excess water as early as possible Apply 20 kg N + 10 kg K /ha after draining excess water Take up inter cultivation and at optimum soil moisture condition to loosen and aerate the soil and to control weeds Earthenup the crop for anchorage Spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition Take up timely control measures for Pink stem borer, sheath blight and Turcicum leaf blight	Drain the excess water as early as possible Apply 20 kg N + 10 kg K /ha after draining excess water Spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition Take up timely control measures for sheath blight and post flowering stalk rots	Drain the excess water as early as possible Allow the crop to dry completely before harvesting	Harvest the cobs after the they are dried up properly. Dry the grain to optimum moisture condition before storing
Crop3 Jowar	Drain excess water with proper drainage Intercultivation with hoe to improve aeration of the soil Apply 20-30 kg N/ha to regain lost vigor at optimum moisture condition	Drain excess water with proper drainage Intercultivation with hoe to improve aeration of the soil Apply 20-30 kg N/ha to regain lost vigor at optimum moisture condition	Drain excess water with proper drainage Harvest the earheads after they are dried properly or use ear head drier	Dry the grain at optimum moisture content before bagging and marketing
Crop4 cotton	Drain out excess water Inter cultivation and apply a booster dose of 30 kg urea+ 15 kg MOP per ha In water logged areas spray with urea 2%+ MgSo4 (1%) followed by Annabhedi 5g+Citric acid 0.5g/l Spray and also drench with Copper oxychloride	Drain out excess water Apply 30 kg N + 15 kg K /ha after draining excess water Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals	Drain out excess water Monitor for boll rot. Take up corrective measures Kapas picking should be done carefully to prevent admixtures with waste plant material	Dry the produce under sun before sending to market

	5. Take up timely control measures against the out break of pests and diseases.	Take up timely control measures against the out break of pests and diseases.		
Crop5 Pigeonpea/Arhar	1. Drain out excess water 2. Apply 20 kg N + 10 kg K /ha after draining excess water 3. Take up inter cultivation at optimum soil moisture condition to loosen and aerate the soil and to control weeds	1. Drain out excess water 2. To spray KNO_3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1%. 3. Take up timely control measures against the out break of pests like Spodoptera, Helicoverpa etc.	1. Drain out excess water 2. Allow the crop to dry completely before harvesting	1. Spread the bundles drenched in rain on field bunds or drying floors to quicken the drying 2. Thresh the bundles after they are dried properly 3. Dry the grain to proper moisture per cent before bagging and storing to prevent deterioration in quality during storage
Horticulture				
Crop1 (specify)Fruits	Proper drainage and removal of excess water from root zone Staking of plants Nutrient application at optimum moisture for better growth	Proper drainage and removal of excess water from root zone Staking of plants Nutrient application at optimum moisture for better growth	Proper drainage and removal of excess water from root zone Spray fungicide like Bavastin @1gm/lit of water after rain as a preventive measure to control fungus disease Go for staking if needed Harvest mature produce on clear sunny day Fallen fruits may be collected, graded and marketed if feasible	Store fruits in well ventilized temporary structures before marketing Market the fruits as early as possible
Crop2 vegetables	Proper drainage and removal of excess water from root zone	Proper drainage and removal of excess water from root zon Spraying the crop with cypermithrin@0.1% to contron fruit borer	Proper drainage and removal of excess water from root zone	

Outbreak of pests and diseases due to unseasonal rains				
Crop1 Soybean	• Early planting to minimize the incidence of girdle beetle and green semilooper • Foliar spray with 5% NSKE or dimethoate 30EC 1 ml/l to protect against semilooper	• Monitor adult moth activity of Spodoptera through pheromone traps (10 traps/ha) • Apply Quinalphos 25 EC 2ml/l or Emamectin benzoate 5 SG 4g/10 lit to control spodoptera	apply spray of insecticides & fungicide for protecting from fungus	
Crop2 Maize	• spray imidachloprit 0.3 ml/l or Dimethoate 1.0 ml/l to control leaf hopper	• Foliar application of Mancozeb @0.25 - 0.4% at 8-10 days interval to control *Turcicum* leaf blight	• TT richoderma mixed with FYM @ 10 g/kg at 10 days prior to its use in the field can be applied to control stalk rot incidence which is likely during post flowering	
Crop3 cotton	Sucking pests, Wilt and root rot, Bacterial leaf blight - Need based plant protection measures to be initiated	Jassids, *Spodoptera*, Wilt and root rot, Bacterial leaf blight, Grey mildew - Need based plant protection measures to be initiated	Grey mildew - Need based plant protection measures to be initiated	
Crop4 Pigeonpea	• Spray triazophos 40 % EC @ 1-1.5 l/ha in chickpea against pest incidence. • "T" shaped pegs placed in late sown chickpea field for biological control of pod borer and for chemical control spraying of Quinolphos 25 EC or Chlorpyriphos	• Spray triazophos 40 % EC @ 1-1.5 l/ha in chickpea against pest incidence. • T" shaped pegs placed in late sown chickpea field for biological control of pod borer and for chemical control spraying of Quinolphos 25 EC or	• Spray triazophos 40 % EC @ 1-1.5 l/ha in chickpea against pest incidence. • Carry out critical survey of fields for insect and disease attack in crops	

	20 EC C or Methyl Parathion 50 EC @ 600 ml dissolve in 500 L of water should be used. Dusting of Felvunerate 0.4% or Endosulphan 4% 15-20 kg or Quinolphos 1.5 WP 20-25 kg /ha with duster.	Chlorpyriphos 20 EC C or Methyl Parathion 50 EC @ 600 ml dissolve in 500 L of water should be used. Dusting of Felvunerate 0.4% or Endosulphan 4% 15-20 kg or Quinolphos 1.5 WP 20-25 kg/ha with duster.		
Crop5 Sorghum	Whorl application of phorate 10G or carbofuran 3 G @ 8-10 kg/ha to control shoot borer attack	• Spray of mancozeb @ 0.25-0.4% at 8-10 days interval to control *Turcicum* leaf blight	Trichoderma mixed with FYM @10g/kg at 10 days prior to its use in the field can be applied to control stalk rot incidence which is likely during post flowering	
Horticulture	NA	NA	NA	NA

2.3 Floods: NA

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	Soybean	Apply water or Sprinkler irrigation	Use water to reduce the temperature or irrigate the crop.	Use water to reduce the temperature or irrigate the Crop.	Harvest the crop at Physiological maturity stage.
Crop2	Maize	- do -			
Crop3	Jowar	- do -			
Crop4	Arahar	- do -			
Crop5	Cotton	- do -			
Horticulture		NA	NA	NA	NA
Cold wave[q]					
Crop1	Soybean	Smoking around the field. Change of microclimate.	Smoking the field. Irrigating the field.	Smoking the field. Use of water for irrigation.	Harvest the crop at physiological maturity stage.
Crop2	Maize				
Crop3	Jowar				
Crop4	Arahar				
Crop5	Cotton				
Horticulture					
Hailstorm					
Crop1	Soybean	Maintain healthy plant. Use meteorological information And get ready for adverse condition Like that.	Maintain healthy plant. Use meteorological information to avoid loss and get prepared for adverse condition.	Timely care of the crop. Use meteorological information to avoid loss and get prepared for adverse condition.	
Crop2	Maize				
Crop3	Jowar				
Crop4	Arahar				
Crop5	Cotton				

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.6 2.5.1 Livestock

	Suggested contingency measures		
	Before the event[s]	**During the event**	**After the event**
Drought			
Feed and fodder availability			
Drinking water			
Health and disease management			
Floods			
Feed and fodder availability			
Drinking water			
Health and disease management			
Cyclone			
Feed and fodder availability			
Drinking water			
Health and disease management			
Heat wave and cold wave			
Shelter/environment management			
Health and disease management			

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				
Shortage of feed ingredients				
Drinking water				
Health and disease management				
Floods				
Shortage of feed ingredients				
Drinking water				
Health and disease management				
Cyclone				
Shortage of feed ingredients				
Drinking water				
Health and disease management				
Heat wave and cold wave				
Shelter/environment management				
Health and disease management				

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			
(ii) Changes in water quality			
(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			
(ii) Water contamination and changes in water quality			
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, huts etc)			
(vi) Any other			
3. Cyclone / Tsunami			
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			
B. Aquaculture			
(i) Changes in pond environment (water quality)			
(ii) Health and Disease management			
(iii) Any other			