State: Madhya Pradesh

Agriculture Contingency Plan: Mandsaur District

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	Subregion :13, AESR :5.2, Western Malawa Plateau, Potential cropping system :3		
	Agro-Climatic Region (Planning Commission)	Subzone :24,Agro climatic zone:9.3,Region : Central plateau, Potential cropping system :3		
	Agro Climatic Zone (NARP)	Malawa plateau Agro climatic Zone		
	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	Latitude	Longitude	Altitude
		$23^0\ 46^{0''}$ to $24^0\ 45^{0''}$ N	$74^0\ 44^{0''}$ to $75^0\ 54^{0''}$ N	453 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	College of Horticulture, Mandsaur - 458 001		
	Mention the KVK located in the district	Krishi Vigyan Kendra, College of Horticulture, Mandsaur		

1.2	**Rainfall**	Average (mm)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	649.8	4^{th} week of June	1^{st} week of September
	NE Monsoon(Oct-Dec):	86.5		
	Winter (Jan- March)	-	-	-
	Summer (Apr-May)	-	-	-
	Annual	792.6	-	-

1.3	**Land use pattern of the district** (latest statistics)	Geographical area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	old fallows
	Area ('000 ha)	551.790	358.7	38.6	73.8	14.3	15.7	0.1	47.7	1.9	1.1

1. 4	**Major Soils (common names like red sandy loam deep soils (etc.,)***	**Area ('000 ha)**	**Percent (%) of total**
	1. Deep soil	342.00	61.88
	2. Medium deep soil	135.60	24.56
	3. Shallow soil	74.60	13.56

* 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	358.7	156
	Area sown more than once	199.7	
	Gross cropped area	558.4	

1.6	**Irrigation**	Area ('000 ha)		
	Net irrigated area	188.2		
	Gross irrigated area	189.2		
	Rainfed area	170.5		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals	8	1.0	
	Tanks	28	2.7	
	Open wells	106052	151.9	
	Bore wells	7606	18.3	
	Lift irrigation schemes	1	-	
	Micro-irrigation			
	Other sources (please specify)	20	14.3	
	Total Irrigated Area		188.2	

	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	-	109%	
	Critical	2		
	Semi- critical	3		
	Safe	-		
	Wastewater availability and use	-		
	Ground water quality	Good		
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

1.7 **Area under major field crops & horticulture etc.**

1.7		**Major Field Crops cultivated**	**Area ('000 ha)***					
			Kharif		***Rabi***		**Summer**	**Total**
			Irrigated	***Rainfed***	***Irrigated***	***Rainfed***		
	1	Soybean		262.0			262.0	262.0
	2	Maize		35.0			35.0	35.0
	3	Wheat			45		45	45
	4	Mustard			31		31	31
	5	Gram			53		53	53
		Horticulture crops - Fruits	**Total Area ('000 ha)***		**Irrigated**		**Rainfed**	
		Mango	0.115					
		Guava	0.357					
		orange	6.615					
		Sweet Lime	0.05					
		Lemon	0.48					
		Pomegranate	0.137					
		Custard Aple	0.018					
		Papaya	0.814					
		Water Melon	0.25					
		Musk Melon	0.97					
		Others	0.329					

		Horticulture crops - Vegetables			
		Tomato	0.354		
		Potato	0.132		
		Ladys Finger	0.252		
		Brinjal	0.17		
		Arwi	0.02		
		Green Peas	0.51		
		Sakar Kund	0.125		
		Cauliflower	0.141		
		Cabbage	0.215		
		Kaddu Vargoya	0.319		
		Leafy vegetables	0.317		
		Bitter guard	0.078		
		Radish	0.075		
		Shalgam	0.008		
		Carrot	0.179		
		Cucumber	0.101		
		French Beans	0.064		
		Barbati	0.039		
		Others	0.062		
		Horticulture crops - Spices			
		Coriander	14.742		
		Chilly	0.888		
		Garlic	8.904		
		Turmeric	0.005		
		Ginger	0.007		
		Sauf	0.005		
		Fenugreek seed	4.973		
		Cumin seeds	0.195		
		Kaloji	0.219		
		Suwa	0.022		
		Others	3.35		

		Horticulture crops - Medicinal and Aromatic			
		Ashwa Gandha	1.08		
		Chandra Sur	2.007		
		Isabgol	6.845		
		Lkalmegh	0.963		
		Sarp Gandha	0.27		
		Shatawari	1.361		
		Gudmar	0.03		
		Others	2.812		
		Horticulture crops - Flowers			
		Rose	0.014		
		Mari Gold	0.065		
		Morga	0.014		
		Tube rose	0.002		
		Gyadilous	0.002		
		Glardiya	0.002		
		Bijli	0.008		
		Guldawadi	0.003		
		Fodder crops	**Total area**	**Irrigated**	**Rainfed**
	1				
	2				
	3				
	4				
	5				
		Total fodder crop area			
		Grazing land	13.981		
		Sericulture etc	-	-	-
		Others (Specify)	-	-	-

Source - Department of Horticulture, Ujjain Division, Ujjain (M.P.)

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Young stock**	**Total ('000)**
	Non descriptive Cattle (local low yielding)	56.7	77.6	77.3	211.6
	Crossbred cattle				
	Non descriptive Buffaloes (local low yielding)	1.7	68.2	126.9	196.8
	Graded Buffaloes				
	Goat				155.5
	Sheep				24.6
	Others (Camel, Pig, Yak etc.)				9.8
	Commercial dairy farms (Number)				
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**		
	Commercial	12	44.812		
	Backyard		5.309		

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)										
	Soybean	189.0	722	-	-	-	-	189.0	722	
	Maize	48.0	1374	-	-	-	-	48.0	1374	
	Wheat	-	-	135.0	2970			135.0	2970	
	Mustard	-	-	34.0	1000			34.0	1000	
	Gram	-	-	32.0	800			32.0	800	
	Others									
Major Horticultural crops (Crops to be identified based on total acreage)										
	Horticultural crops - Fruits									
	Mango							11.5	10000	
	Guava							53.55	15000	
	orange							992.25	15000	
	Sweet Lime							7.5	15000	
	Lemon							57.6	12000	
	Pomegranate							21.92	16000	
	Custard Apple							2.16	12000	
	Papaya							122.1	15000	
	Water Melon							50	20000	
	Musk Melon							194	20000	
	Others							32.82	9975	
	Horticultural crops - Vegetables									
	Tomato							88.5	25000	
	Potato							26.4	20000	
	Ladys Finger							27.72	11000	
	Brinjal							28.9	17000	

	Arwi							4	20000	
	Green Peas							76.5	15000	
	Sakar Kund							25	20000	
	Cauliflower							28.2	20000	
	Cabbage							43	20000	
	Kaddu Vargoya							75.8	23761	
	Leafy vegetables							47.55	15000	
	Bitter guard							15.6	20000	
	Radish							12.75	17000	
	Shalgam							1.36	17000	
	Carrot							21.42	11966	
	Cucumber							20.2	20000	
	French Beans							9.6	15000	
	Barbati							6.6	16923	
	Others							9.3	15000	
	Horticultural crops- Spices									
	Coriander							176.904	1200	
	Chilly							10.656	1200	
	Garlic							62.328	700	
	Turmeric							1	20000	
	Ginger							1.4	20000	
	Sauf							0.05	1000	
	Fenugreek seed							74.595	1500	
	Cumin seeds							1.95	1000	
	Kaloji							3.942	1800	
	Suwa							0.22	1000	
	Others							670	20000	
	Medicinal and Aromatic									
	Ashwa Gandha							7.56	700	
	Chandra Sur							30.105	1500	

	Isabgol							95.83	1400	
	Lkalmegh							11.556	1200	
	Sarp Gandha							27	10000	
	Shatawari							13.61	1000	
	Gudmar							0.51	1700	
	Others							42.18	1500	
	Horticultural crops - Flowers									
	Rose							0.21	1500	
	Mari Gold							1.17	1800	
	Morga							0.112	800	
	Tube rose							0.016	800	
	Gyadilous							0.01	500	
	Glardiya							0.02	1000	
	Bijli							0.096	1200	
	Guldawadi							0.036	1200	

Source - Department of Horticulture, Ujjain Division, Ujjain (M.P.)

1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	Crop 1: _ Soybean	2: Maize	3: Mustard	4: Gram	5: Wheat
	Kharif- Rainfed	25 June- 7 July	25-30 June			
	Kharif-Irrigated		25 June			
	Rabi- Rainfed				15 Oct. to 30 Oct.	
	Rabi-Irrigated			30 Sep. to 30 Oct		1 Nov. to 30 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) Girdle beetle semi loopier in soybean		*	
	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

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[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 (2nd week of july month)*	Moderate deep soil	Local maize	Early soybean JS93-05,JS95-60	Increase seed rate by 20%	Link NSC,SAU and Farmers societies for good quality seed
		Early soybean	Black gram JU 2,JU3,JU86		
		Urd	Green gram JM 721,J 45		
		Medium Maturity maize	Early maize Varieties JM 216		
		Soybean	Early Soybean JS 95-60,JS 93-05		
	Deep soil	Hybrid Maize	Composite Maize JM12,JM16,NLD	-Application of well decomposed organic manure @5-6 t/ha	
		Soybean	Medium maturity JS93-05	Increase the seed rate by 20% Soybean Dibbling in Maize	

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 (Specify month) July 4thWeek	Moderate Deep soil	Local maize	Early Soybean JS 93-05, JS 95-60	Increase seed rate by 20% Use Rh & PSB culture for Seed treatments	Link NSC,SAU and farmers societies for good quality seed
		Early Soybean	Black gram JU 2, JU3, JU86		
		Urd	Green gram JM 721, J 45		
		Medium Maturity maize	Early maize varieties JM 216		
		Soybean	Early Soybean JS 93-05, JS 95-60		
	Deep soil	Hybrid Maize	Composite Maize JM 12, JM 16, NLD		
		Soybean	Medium maturity JS 93-05		

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 (Specify month) August 2nd week	Moderate Deep soil	Local maize	Keep fallow	Conserve moisture for rabi by frequent interculture	Link NSC,SAU and Farmers societies for good quality seed
		Early soybean	-do-		
		Urd / Black gram	-do-		
		Medium Maturity Maize	-do-		
		Soybean	-do-		
	Deep soil	Hybrid Maize	Composite Maize JM12, JM16, NLD		
		Soybean	Medium maturity JS 93-05		

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 (Specify month) Aug. 3rd week	Moderate Deep soil	Local maize	Keep fallow	Conserve moisture for rabi crops by frequent interculture and also to control weeds	Link NSC,SAU and Farmers societies for good quality seed
		Early soybean	Keep fallow		
		Urd / Black gram	Keep fallow		
		Medium maturity maize	Chilies		
		Soybean	Keep fallow		
	Deep soil	Hybrid maize	Chilies	-do-	
		Soybean	Hybrid bajra (pearl millat)		

***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]**
1	2	3	4	5	6
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Moderate deep soil	Local maize	Gap filling with improved varieties if the plant population is less than 75% Timely weeding to control weeds	Soil mulching With bullock Drawn hoe Spray 2% urea or MOP during the dry spell Mulching with organic materials in crop rows Ridge and furrow planting for moisture conservation Life saving irrigation	Link NSC,SAU and Farmers societies for good quality seed Link watersheds MGNREGS for the support of farm pond technology
		Early Soybean			
		Urd			
		Medium maturity maize			
		Soybean			
	Deep soil	Hybrid maize			
		Soybean			

Condition			Suggested Contingency measures		
	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
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period) At vegetative stage	Moderate Deep soil	Local maize Early soybean Urd Medium maturity maize Soybean	Gap filling with improved varieties if the plant population is less than 75% Timely weeding to control weeds	Soil mulching With bullock Drawn hoe Spray 2% urea or MOP during the dry spell Mulching with organic materials in crop rows Ridge and furrow planting for moisture conservation Life saving irrigation	Link NSC,SAU and Farmers societies for good quality seed Link watersheds MGNREGS for the support of farm pond technology
	Deep soil	Hybrid maize Soybean			

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 measues[d]**	**Remarks on Implementation[e]**
1	2	3	4	5	6
At reproductive stage	Moderate Deep soil	Local maize Early soybean Urd Medium maturity maize Soybean	Spray 2% urea or MOP during the dry spell Timely weed control	Life saving irrigation	Link NSC, SAU and Farmers societies for good quality seed. Link watersheds MGNREGS for the support of farm pond technology
	Deep soil	Hybrid maize Soybean			

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
	Moderate Deep soil	Local maize Early soybean Urd Medium maturity maize Soy bean	Spray 2% urea Life saving irrigation If possible reduce leaf per plant Use Anti transparent to check transpiration	If the damage is very severe, plan land preparation of Mustard, chandrsur mustard, Gram.	Link NSC,SAU and Farmers societies for good quality seed Link watersheds MGNREGS for the support of farm pond technology
	Deep soil	Hybrid maize Soybean			

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	Moderate Deep soil	Early soybean	Use short duration varieties of all crops	Reduce loss of water by mulching in crop rows. Increase water Use Efficiency by micro irrigation systems like sprinkler or drip or alternate furrow system Give irrigation at critical crop growth stages	Proper training and guidance to the farmers by KVK/ATMA
		Local maize			
		Green gram			
		Sesamum			
		Soy bean			
		Composite maize			
		Black gram			
		Black gram + maize			
	Deep soil	Soybean			
		Hybrid maize			
		Black gram			
		Soybean + Pigeon pea			

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	Moderate Deep soil	Early soybean Local maize	Use short duration varieties of all crops	Reduce loss of water by mulching in crop rows. Increase water Use Efficiency by micro irrigation systems like sprinkler or drip or alternate furrow system Give irrigation at crtical crop growth stages	Proper training and guidance to the farmer by KVK/ATMA
		Green gram			
		Sesamum			
		Soy bean			
		Composite maize			
		Black gram			
		Black gram + maize			
	Deep soil	Soybean			
		Hybrid maize			
		Black gram			
		Soybean + Pigeon pea			

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	Moderate Deep soil	Early soybean	Use short duration varieties of all crops	Reduce loss of water by mulching in crop rows. Increase water Use Efficiency by micro irrigation systems like sprinkler or drip or alternate furrow system Give irrigation at critical crop growth stages	Proper training and guidance to the farmer by KVK/ATMA
		Local maize			
		Green gram			
		Sesamum			
		Soy bean			
		Composite maize			
		Black gram			
		Black gram + maize			
	Deep soil	Soybean			
		Hybrid maize			
		Black gram			
		Soybean + Pigeon pea			

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	Moderate Deep soil	Early soybean	Use short duration varieties of all crops	Reduce loss of water by mulching in crop rows. Increase water Use Efficiency by micro irrigation systems like sprinkler or drip or alternate furrow system Give irrigation at crtical crop growth stages	Proper training and guidance to the farmer by KVK/ATMA
		Local maize			
		Green gram			
		Sesamum			
		Soy bean			
		Composite maize			
		Black gram			
		Black gram + maize			
	Deep soil	Soybean			
		Hybrid maize			
		Black gram			

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 Any other condition (specify)	Moderate Deep soil	Early soybean	Use short duration varieties of all crops	Reduce loss of water by mulching in crop rows. Increase water Use Efficiency by micro irrigation systems like sprinkler or drip or alternate furrow system Give irrigation at crtical crop growth stages	Proper training and guidance to the farmer by KVK/ATMA
		Local maize			
		Green gram			
		Sesamum			
		Soy bean			
		Composite maize			
		Black gram			
		Black gram + maize			
	Deep soil	Soybean			
		Hybrid maize			
		Black gram			
		Soybean + Pigeon pea			

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) 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 Black gram	Drain the excess water as early as possible Apply 4-5 kg N /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 Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals Take up timely control measures against the out break of pests like *Spodoptera* etc.	Drain the excess water as early as possible Apply 4-5 kg N /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 Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals Take up timely control measures against the out break of pests like *Spodoptera* etc.	Drain the excess water as early as possible Allow the crop to dry completely before harvesting	Spread the bundles drenched in rain on field bunds or drying floors to quicken the drying Thresh the bundles after they are dried properly Dry the grain to proper moisture per cent before bagging and storing to prevent deterioration in quality during storage

Crop4 Green gram	-do-	-do-	-do-	Shifting to safer place
Crop5Sesame				Shifting to safer place
Horticulture				
Crop1 (specify) Tulsi	Drainage of Water	-	Spray of Wetable sulphur	safe placement
Crop2 Kalmegh	Drainage of Water	-	-	safe placement
Crop3 Ashwagandh	Drainage of Water	-	Spray of Mencozeb	safe placement
Crop4 Dil	-	-	Spray of Mencozeb	safe placement
Crop5 Ajawain	-	-	Spray of Mencozeb	safe placement
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 Black gram	Drain the excess water as early as possible Apply 4-5 kg N /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 Spray fungicides like Copper oxy chloride 0.3 % or Carbendazim 0.1 % or	Drain the excess water as early as possible Apply 4-5 kg N /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 Spray fungicides like Copper	Drain the excess water as early as possible Allow the crop to dry completely before harvesting	Spread the bundles drenched in rain on field bunds or drying floors to quicken the drying Thresh the bundles after they are dried properly Dry the grain to

	Mancozeb 0.25% two to three times by rotating the chemicals Take up timely control measures against the out break of pests like *Spodoptera* etc.	oxy chloride 0.3 % or Carbendazim 0.1 % or Mancozeb 0.25% two to three times by rotating the chemicals Take up timely control measures against the out break of pests like *Spodoptera* etc.		proper moisture per cent before bagging and storing to prevent deterioration in quality during storage
Crop4 Green gram	-do-	-do-	-d0-	-do-
Crop5Sesame	Drainage of Water	-	Spray of Mencozeb	-
Horticulture	Drainage of Water			
Crop1 (specify) Tulsi	Drainage of water & needful hoeing	Use of NAA to check flowers drop	Pre harvesting	safe placement
Crop2 kalmegh	Drainage of water & needful hoeing of Water	Use of NAA to check flowers drop	Pre harvesting	safe placement
Crop3 Ashwagandh	Instant drainage	Use of Fungicide	Pre harvesting	-
Crop4 Dil	drainage	-	-	-
Crop5 Ajwain	Drainage and use insecticide	Use of Fungicide	-	-
Outbreak of pests and diseases due to unseasonal rains				
Crop1 Soybean	•	•	•	
Crop2 Maize		Jassids, Wilt and Stalk rot	Post flowering Stalk rots may aggravate if unseasonal rains occurs	
Crop3 Black gram	Spodoptera - Need based plant protection measures to be initiated	Spodoptera, Leaf spots, Powdery mildew - Need based plant protection measures to be initiated	Spodoptera, Rust - Need based plant protection measures to be initiated	
Crop4 Green gram				
Crop5Sesame				
Horticulture				
Crop1 (specify) Tulis	-	Use of Fungicide	use of fungicide	
Crop2 Kalmegh	-	Use of Fungicide	Safer place	safer place
Crop3 Ashwagandh	-	Use of Fungicide	Safer place	safer place
Crop4 DIl	-	-	Safer place	safer place
Crop5 Ajwain	use of insecticide	Use of Fungicide	Safer place	safer place

[k] Such as drainage in black soils, indicate taking up need based inter-culture operations, outbreak of pests/diseases along with their management etc.

[l] Such as drainage in black soils, application of hormones/nutrient sprays to prevent flower drop or promote quick flowering/fruiting and indicate possibility of pest/disease outbreak with need based prophylactic / curative management etc.

[m] Such as drainage in black soils, measures for preventing seed germination etc and Indicate possibility of harvesting at physiological maturity immediately and shifting produce to safer place and protection against pest/disease damage in storage etc.

[n] Such as shifting of produce to safer place for drying and maintaining the quality of grain/fodder and protection against pest/disease damage in storage etc

2.3 Floods : **NA**

Condition	**Suggested contingency measure[o]**			
1	**2**	**3**	**4**	**5**
Transient water logging/ partial inundation[1]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Crop1 (specify)				
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 intrusion[3]				
Crop1				
Crop2				
Crop3				
Crop4				
Crop5				

2.4 Extreme events: Heat wave / Cold wave/Frost/ Hailstorm /Cyclone – Cold wave & Frost

Extreme event type	**Suggested contingency measure[r]**			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave[p]	-	-		-
Crop1 Wheat	-	-		-
Crop2 Gram	-	-		-
Crop3 Mustard	-	-		-
Crop4 Lentil	-	-		-
Crop 5 Linseed	-	-		-
Horticulture	-	-		-
Crop1 (specify) Mathi	-	-		-
Crop2 Coriander	-	-		-
Crop3 Garlic	-	-		-
Cold wave[q]	-	-		-
Crop1 Wheat	-	-	Smoke, Glucose spray	-
Crop2 Gram	-	-	Intense smoking	-
Crop3 Mustard	-	-	smoking	-
Crop4 lentil	-	-	smoking	-
Crop 5 linseed	-	-	smoking	-
Horticulture	-	-		-
Crop1 Methi	-	-	Smoke, cycocil spray	-
Crop2 Coriander	-	-	Smoking	-
Crop3 Garlic	-	-	-	-
Frost	-	-		-
Crop1 Wheat	-	-	Smoking, Glucose spray	-
Crop2 Gram	-	-	Intense smoking	-
Crop3 Mustard	-	-	smoking	-
Crop4 Lentil	-	-	smoking	-
Crop 5 linseed	-	-	smoking	-
Horticulture	-	-	-	-
Crop1 Methi	-	-	Smoking, cycocil and Glucose Spray	-
Crop2 Coriander	-	-	Smoking	-
Crop3 Garlic	-	-	-	-

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

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 airable place	Vaccination & deworming, use antidote in poisoning case
Cyclone: Not occurs in the district			
Feed and fodder availability			
Drinking water			
Health and disease management			
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 het 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 animal.
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,

2.5.2 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: Not occurs in the district			
Shortage of feed ingredients			
Drinking water			
Health and disease management			
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: Not occurs in the district			
Overflow / flooding of ponds			
Change in fresh/brackish water ratio			
Health and disease management			
Loss of stock and inputs (feed, chemicals etc.)			
Infrastructure damage	-	-	-
Heat wave and cold wave			
Management of pond environment	Showering of water by pump for proper O_2 in water	Showering of water by pump for proper O_2 in water	-
Health and disease management	$KMnO_4$ treatment 2 ppm	$KMnO_4$ treatment 2 ppm	-