State: Rajasthan
Agriculture Contingency Plan for District: Baran

1.0 District Agriculture profile					
1.1	Agro-Climatic/Ecological Zone				
	Agro Ecological Sub Region (ICAR)	Central Highlands (Malwa), Gujarat Plain And Kathiawar Peninsula, Semi-Arid Eco-Region (5.2)			
	Agro-Climatic Zone (Planning Commission)	Central Plateau Hills Region (VIII)			
	Agro Climatic Zone (NARP)	Humid South Eastern Plain Zone (RJ-9)			
	List all the districts or part thereof falling under the NARP Zone	Baran kota and Jhalawar			
	Geographic coordinates of district headquarters	**Latitude**	**Longitude**	**Altitude**	
		25^0 1'N	76 ^{0}52'E	262	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Agriculture Research Station, Ummedganj, Post Box No. 7,G.P.O. Nayapura, KOTA - 324 001 (Rajasthan)			
	Mention the KVK located in the district	Krishi Vigyan Kendra, Station Road, Anta, Distt. Baran-325 502			
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):	692.3	36.9	Last week of June (26 week)	2nd week of Sept (37 week)
	NE Monsoon(Oct-Dec):	43.2	2.0		
	Winter (Jan- March)	9.4	1.8		-
	Summer (Apr-May)	16.7	1.4		-
	Annual	761.6	42.1		-

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)	699.461	366.253	216.03	25.895	35.918	15.501	0.333	39.531	13.409	19.715

1. 4	**Major Soils (common names like red sandy loam deep soils (etc.,)***	**Area (‘000 ha)**	**Percent (%) of total**
	Deep-Black-Clayey	466.19	65.65
	Deep-Brown-Loamy	100.23	14.33
	Red-Gravelly-Loam hilly	200.25	28.63

1.5	**Agricultural land use**	**Area (‘000 ha)**		**Cropping intensity %**
	Net sown area	333.129		158
	Area sown more than once	194.767		
	Gross cropped area	527.896		
1.6	**Irrigation**	**Area (‘000 ha)**		
	Net irrigated area	282.755		
	Gross irrigated area	296.176		
	Rainfed area	231.72		
	Sources of Irrigation	**Number**	**Area (‘000 ha)**	**Percentage of total irrigated area**
	Canals		66.471	22.44
	Tanks	237	3.435	1.16
	Open wells	29255	34.664	11.70
	Bore wells	9358	177.818	60.04
	Lift irrigation schemes	-	-	-
	Micro irrigation	-	-	-
	Other sources	Check dams & rivers	13.788	4.66
	Total Irrigated Area		296.176	100
	Pump sets	34664		
	No. of Tractors	7371		
	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	4	51	Suitable for irrigation
	Critical	1	8	Suitable for irrigation
	Semi- critical	-	-	-
	Safe	2	41	Suitable for irrigation

	Wastewater availability and use	-	-	-
	Ground water quality	-		
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

1.7 Area under major field crops & horticulture (2008-09)

1.7	Major field crops cultivated	Area ('000 ha)							
		Kharif			*Rabi*				
		Irrigated	**Rainfed**	**Total**	**Irrigated**	**Rainfed**	**Total**	**Summer**	**Grand total**
	Soybean	2.192	206.516	208.708	-	-	-	-	208.708
	Maize	0.007	12.226	12.233	-	-	-	-	12.233
	Paddy	6.233	0.008	6.401	-	-	-	-	6.401
	Rapeseed & Mustard	-	-	-	105.438	3.000	108.438	-	108.438
	Wheat	-	-	-	95.786	0.016	95.802	-	95.802
	Coriander	-	-	-	90.535	0.148	90.683	-	90.683
	Gram	-	-	-	3.089	0.493	3.582	-	3.582

Horticulture crops - Fruits		Area ('000 ha)		
		Total	**Irrigated**	**Rainfed**
	Guava	0.236	0.236	-
	Mango	0.199	0.199	-
	Aonla	0.133	0.0133	-
	Lime	0.068	0.068	-
	Orange	0.006	0.006	-
Horticulture crops - Vegetables		**Total**	**Irrigated**	**Rainfed**
	Brinjal	0.350	0.350	-
	Gobhi	0.231	0.231	-
	Tomato	0.181	0.181	-
	Chilli	0.142	0.142	-
	Cucurbits	0.133	0.133	-
	Okra	0.108	0.108	-
	Potato	0.032	0.032	-
	Garlic	5.310	5.310	-
Medicinal and Aromatic crops		**Total**	**Irrigated**	**Rainfed**
	Nigella	0.024	0.024	-
	Ashwagandha	0.012	-	0.012

	Plantation crops	Total	Irrigated	Rainfed
		Nil	**Nil**	-
	Fodder crops	**Total**	**Irrigated**	**Rainfed**
	Lucern	0.310	0.310	-
	Chari jowar	0.050	0.050	-
	Berseem	0.007	0.007	
	Total fodder crop area	0.367	0.367	
	Grazing land	35.918	-	35.918
	Sericulture etc	-	-	-
	Others (specify)	-	-	-

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)	-	-	329.006
	Crossbred cattle	-	-	-
	Non descriptive Buffaloes (local low yielding)	-	-	190.154
	Graded Buffaloes	-	-	-
	Goat	-	-	329.512
	Sheep	-	-	12.471
	Others (Camel, Pig, Yak etc.)	-	-	12.729
	Commercial dairy farms (Number)			0.012
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**	
	Commercial	-	67.108	
	Backyard	-	-	

1.10	**Fisheries** (Data source: Chief Planning Officer)							
	A. Capture							
	i) Marine (Data Source: Fisheries Department)	**No. of fishermen**	**Boats**		**Nets**		**Storage facilites (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**		
		NIL		Baran	2 (484)	Baran	51 (399)	
	B. Culture							
		Water Spread Area ('000ha)		**Yield (t/ha)**		**Production ('000 tons)**		
	i) **Brackish water** (Data Source: MPEDA/	NA		NA		-		

	Fisheries Department)			
	ii) **Fresh water** (Data Source: Fisheries Department)	1403	Village pond 1500 to 2000 kg./haLakes 50-150 kg./ha	
	Others			

1.11 Production and Productivity of major crops (Average of 5 years: 2004-08)

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)										
1	Soybean	199.212	1463	-	-	-	-	199.212	1463	Information not available
2	Maize	35.42	1347	-	-	-	-	35.42	1347	
3	Paddy	8.471	3755	-	-	-	-	8.741	3755	
4	Mustard	-	-	218.119	1421	-	-	218.119	1421	
5	Wheat	-	-	229.875	3122	-	-	229.875	3122	
6	Coriander	-	-	76.441	1252	-	-	76.441	1252	
7	Gram	-	-	5.09	1159	-	-	5.09	1159	
Major Horticultural crops (Crops to be identified based on total acreage)										
1	Brinjal	0.162	6247	0.174	4000	0.014	4243	0.350	5046	Information not available
2	Cole crops	0.104	4207	0.127	3488	-	-	0.231	3835	
3	Tomato	0.112	5321	0.228	2447	0.026	4308	0.366	3459	
4	Chilli	0.136	919	0.006	2167	-	-	0.142	999	
5	Cucurbits	-	-	-	-	0.048	4083	0.048	4083	
6	Okra	0.091	4780	0.060	3617	0.030	3571	0.181	4177	
7	Garlic	-	-	5.310	6678	-	-	5.310	6678	
8	Potato	-	-	0.174	4244	-	-	0.174	4244	
9	Guava	-	-	-	-	-	-	0.236	97240	
10	Mango	-	-	-	-	-	-	0.199	1170	
11	Aonla	-	-	-	-	-	-	0.133	2016	
12	Onion	-	-	0.023	4870	-	-	0.023	4870	

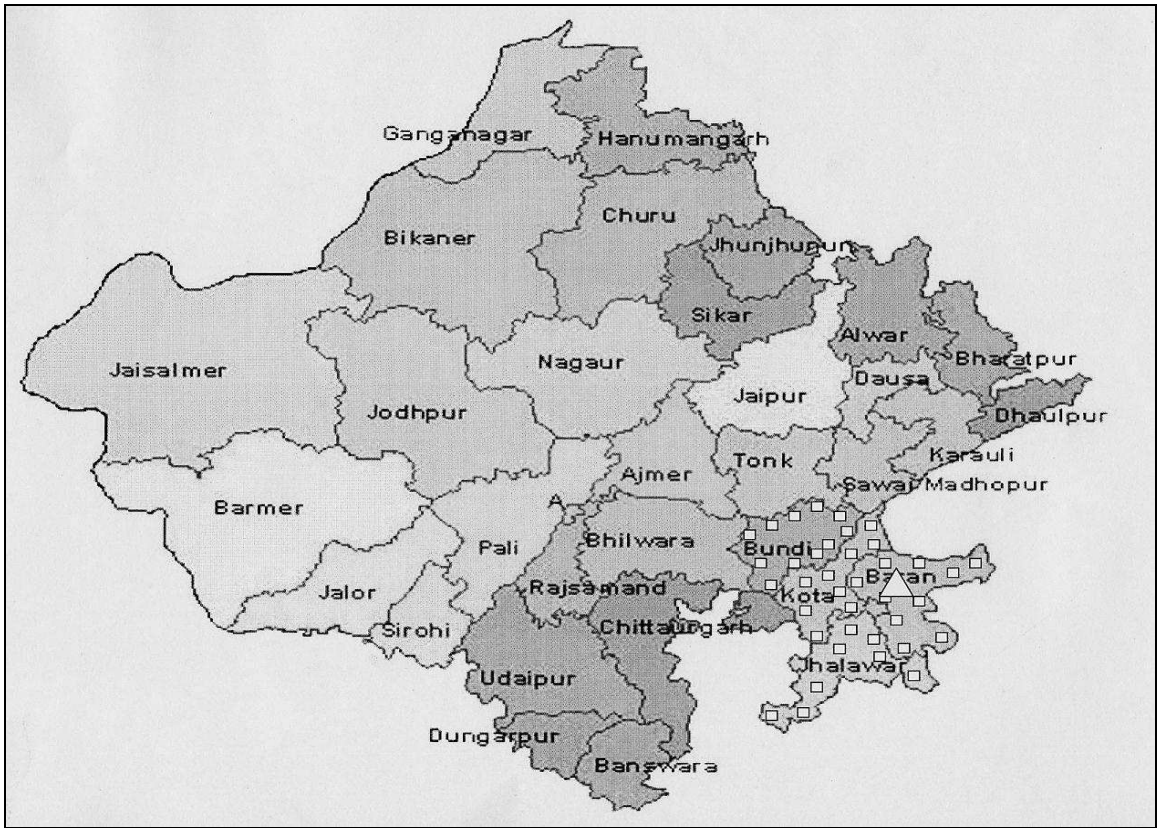
1.12	**Sowing window for 5 major field crops(start and end of normal sowing period)**	**Soybean**	**Maize**	**Wheat**	**Mustard**	**Coriander**
	Kharif- Rainfed	4th week June to 2nd week of July	4th week June to 2nd week of July	-	-	-
	Kharif-Irrigated	4th week June to 2nd week of July	3rd week of June to 1st week of July	-	-	-
	Rabi- Rainfed	-	-	4th week of Oct. to 2nd week of Nov.	4th week of Sept. to 2nd week of Oct.	2nd week of Oct. to 2nd week of Nov.
	Rabi-Irrigated	-	-	1-3rd week of Nov.	1st -4th wk. of Oct.	2nd week of Oct. to 2nd week of Nov.

1.13	**What is the major contingency the district is prone to?** (Tick mark)	**Regular**	**Occasional**	**None**
	Drought	-	√	-
	Flood	-	-	√
	Cyclone	-	-	√
	Hail storm	-	-	√
	Heat wave	√	-	-
	Cold wave	-	√	-
	Frost	-	√	-
	Sea water intrusion	-	-	√
	Pests and disease outbreak (Tobacco Caterpillar in soybean, Yellow Mosaic Virus in soybean and kharif pulses)	-	-	√
	Others	-	-	-

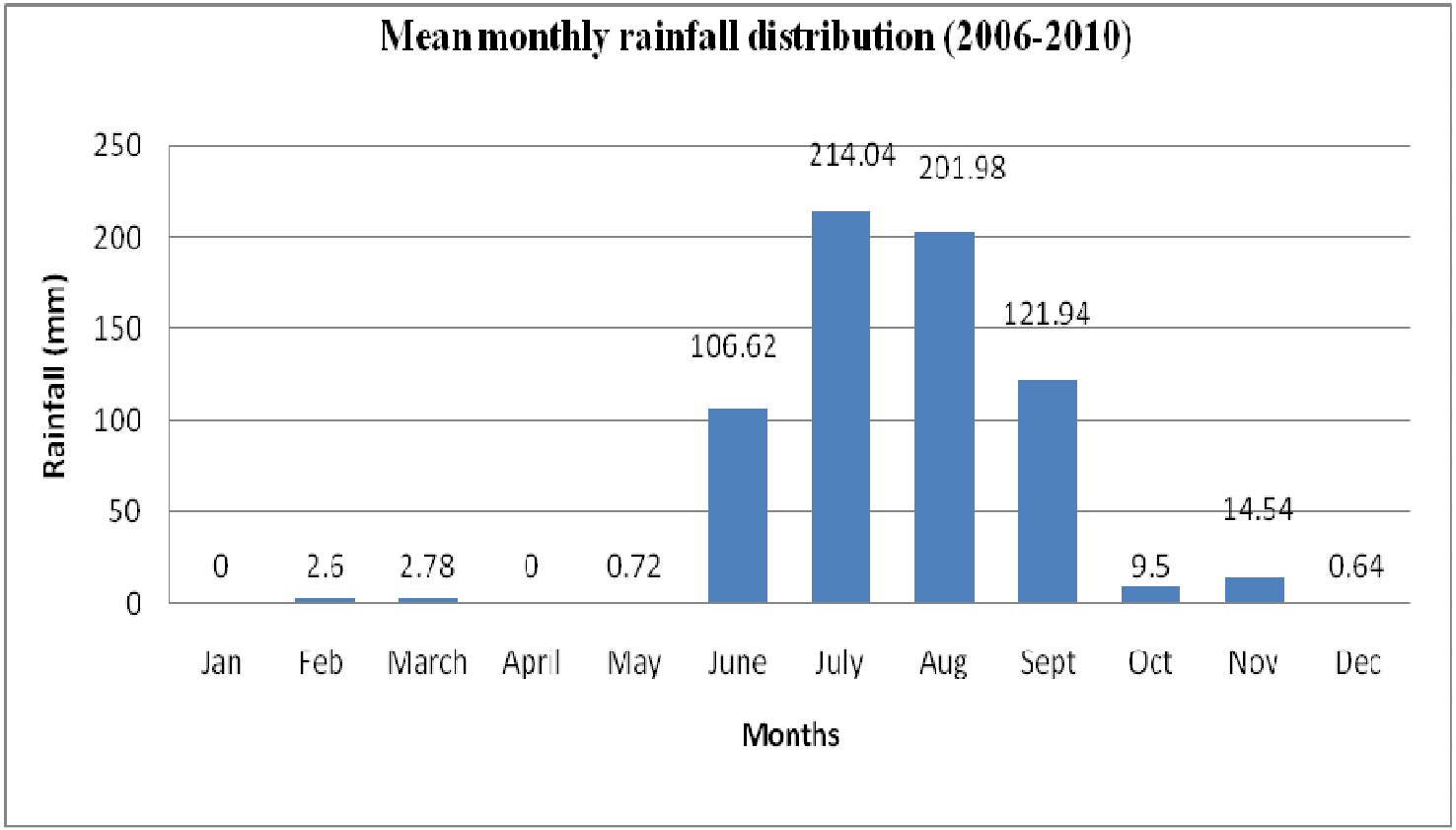
1.14	**Include Digital maps of the district for**	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

Annexure 1

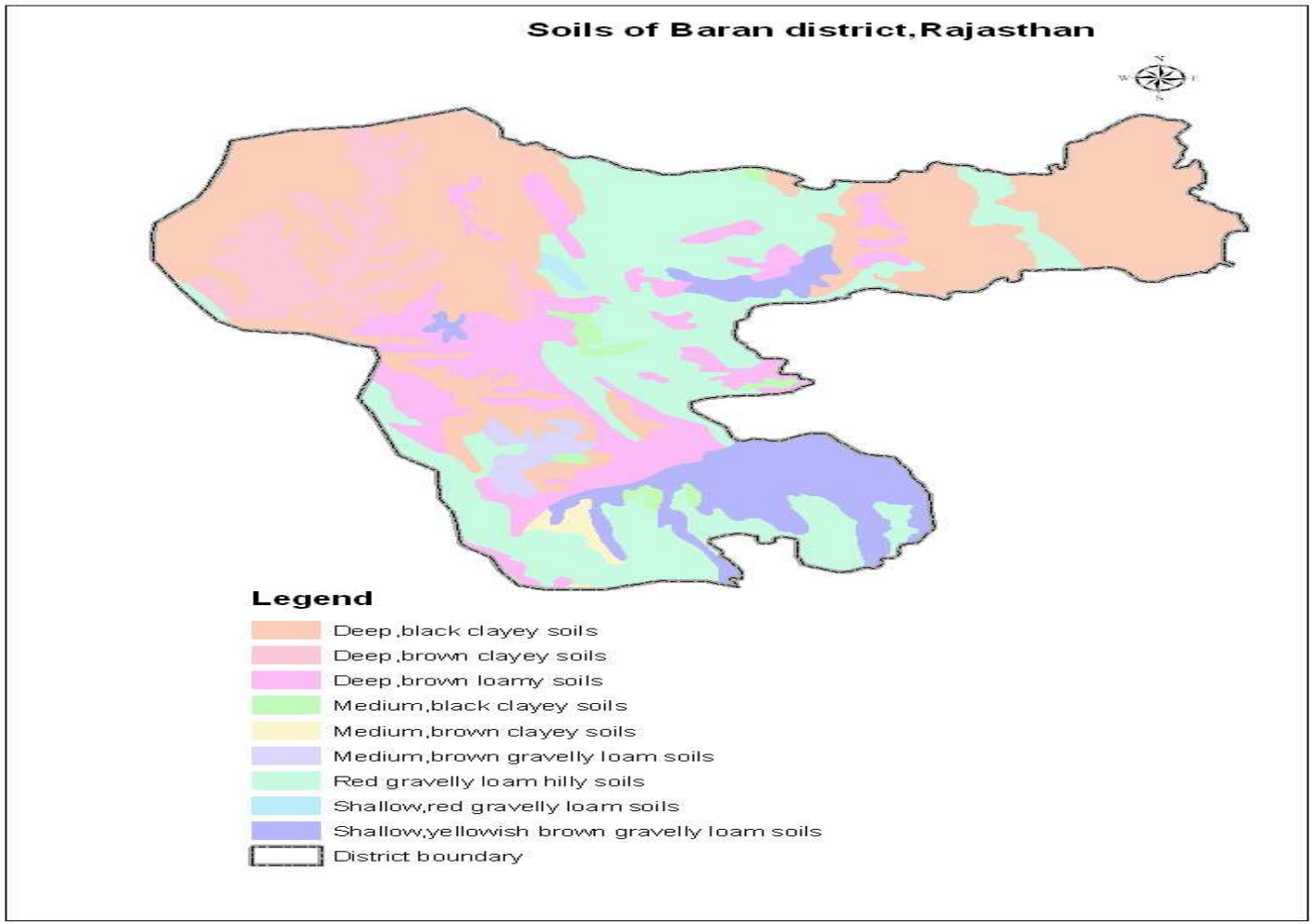
Location map of Baran district



Annexure 2
Mean monthly rainfall graph of Baran district



Annexure 3
Soil map



Source: NBSS&LUP, Regional Centre, Udaipur

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation (kharif)

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation[a]**	**Normal Crop / Cropping system[b]**	**Change in crop / cropping system[c] including variety**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
Delay by 2 weeks (July 2nd week)	1 Deep black clayey	Soybean (JS 335, NRC-37, MACS-450,JS 93-05, JS 95-60, Pratap Soya-1, Pratap soya-2	No change Soybean (JS 93-05, JS 95-60, Pratap Soya-1, Pratap soya-2, Pratap Raj-24	• Intercropping of soybean+maize (4:2)	• Supply of seed through RSSC/NSC/ other agencies
		Maize (Ageati-76, Navjyot, Pratap hybrid Makka-1, Pratap Makka-3, Pratap Makka-5, PEHM 2, Mahi Kanchan)	No change Maize (Pratap hybrid Makka-1, Pratap Makka-3, Pratap Makka- 5, PEHM 2, Mahi Kanchan)	• Intercropping of soybean+maize (4:2) • Dry Sowing	
		Urdbean (Krishna, T-9, PU-19, KU 96-3)	No change Urdbean (Krishna, T-9, PU-19, KU 96-3)	-	
		Mungbean K 851, ML 267	No change Mungbean K 851, ML 267	-	
		Sesamum (TC25, Pratap, RT-103, RT 46, RT 123, RT 125)	No change Sesamum (TC25, Pratap, RT-103, RT 46, RT 123, RT 125)		

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation[a]**	**Normal Crop / Cropping system[b]**	**Change in crop / cropping system[c] including variety**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
Delay by 2 weeks (July 2nd week)	Deep brown loamy	Soybean (JS 335, NRC-37, MACS-450,JS 93-05, JS 95-60, Pratap Soya-1,	No change Soybean (JS 93-05, JS 95-60,	• Intercropping of soybean +maize (4:2)	• Supply of seed through RSSC/NSC

		Pratap soya-2	Pratap Soya-1, Pratap soya-2, Pratap Raj-24		• Availability of seed drill for inter cropping from government schemes
		Maize (Ageati-76, Navjyot, Pratap hybrid Makka-1, Pratap Makka-3, Pratap Makka-5, PEHM 2, Mahi Kanchan)	No change Maize (Pratap hybrid Makka-1, Pratap Makka-3, Pratap Makka- 5, PEHM 2, Mahi Kanchan)	• Intercropping of soybean +maize (4:2) • Dry Sowing	
		Urdbean (Krishna, T-9, PU-19, KU 96-3)	No change Urdbean (Krishna, T-9, PU-19, KU 96-3)	-	
		Mungbean K 851, ML 267	No change Mungbean K 851, ML 267	-	
		Sesamum (TC25, Pratap, RT-103, RT 46, RT 123, RT 125)	No change Sesamum (TC25, Pratap, RT-103, RT 46, RT 123, RT 125)		

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]**
Delay by 4 weeks (July 4th week)	Deep black clayey	Soybean (JS 335, JS 93-05, JS 95-60, Pratap Soya-1, Pratap soya-2	Soybean (JS 93-05, Pratap Soya-1, Pratap Soya-2, JS 95-60) or Urdbean (T-9, PU-19, KU-96-3) or Sesamum (TC-25, RT-46, RT-123, RT-125)	• Use of 10-15% higher seed rate in soybean	• Supply of seed through RSSC/NSC/ other agency • Construction of Farm pond through NREGA, RKVY
		Urdbean (Krishna, T-9, PU-19, KU 96-3)	Urdbean (Krishna, T-9, PU-19, KU 96-3)	-	
		Mungbean K 851, ML 267	Mungbean K 851, ML 267	-	
		Sesamum (TC25, Pratap, RT-103, RT 46, RT 123, RT 125)	Sesamum (TC-25, RT-103, RT 46, RT 123, RT 125)	-	
	Deep brown loamy	Soybean (JS 335, JS 93-05, JS 95-60, Pratap Soya-1, Pratap soya-2	Soybean (JS 93-05, Pratap Soya-1, Pratap Soya-2, JS 95-60) or Urdbean (T-9, PU-19, KU-96-3) or Sesamum (TC-25, RT-46, RT-123, RT-125)	• Use of 10-15% higher seed rate in soybean	
		Urdbean (Krishna, T-9, PU-19,	Urdbean (Krishna, T-9, PU-19, KU	-	

		KU 96-3)	96-3)		
		Mungbean K 851, ML 267	Mungbean K 851, ML 267	-	
		Sesamum (TC25, Pratap, RT-103, RT 46, RT 123, RT 125)	Sesamum (TC-25, RT-103, RT 46, RT 123, RT 125)	-	

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]**
Delay by 6 weeks (Aug 2nd week)	Deep black clayey	Fallow-Mustard	Sorghum Fodder (Raj Chari-1, Raj Chari-2, Pratap Chari-1080, SSG-59-3)- fallow or Mungbean (K-851, RMG-62) – fallow or Fallow – Toria/Taramira/ Mustard/Gram/Coriander/ safflower/linseed on conserved moisture	• Use of bakhar for field moisture conservation • Field bunding	• Supply of seed through RSSC/NSC/ other agency • • Construction of Farm pond through NREGA, RKVY
	Deep brown loamy	Fallow-Mustard	Sorghum Fodder (Raj Chari-1, Raj Chari-2, Pratap Chari-1080, SSG-59-3)- fallow or Mungbean (K-851, RMG-62) – fallow Or Fallow – Toria/Taramira/ Mustard/Gram/Coriander/ safflower/linseed on conserved moisture	• Use of bakhar for field moisture conservation • Field bunding	

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]**
Delay by 8 weeks (Aug 4th week)	Deep black clayey	Fallow-Mustard	Fallow – Toria/Taramira/ Mustard/Gram/Coriander/ safflower/linseed on conserved	• Use of bakhar for field moisture conservation	• Supply of seed through RSSC/NSC/ other agency • Construction of Farm pond

			moisture	• Field bunding	through NREGA, RKVY
	Deep brown loamy	Fallow-Mustard	Fallow – Toria/Taramira/ Mustard/Gram/Coriander/safflower/ linseed on conserved moisture	• Use of bakhar for field moisture conservation • Field bunding	

Condition			Suggested Contingency measures		
Early season drought (Normal onset)	Major Farming situation[a]	Normal 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.	Deep black clayey	Soybean	• If germination is less than 50% then farmers should go for re-sowing with early maturing varieties using 25% higher seed rate • If plant population is more thant 75% go for gap filling.	• Hoeing by hand hoe to develop soil mulch • Removal of weeds in time. • In situ mulching of weeds	• Crop insurance • Availability of inter-culture implements i.e. wheel hand hoe through RKVY
		Maize	• If germination is less than 50% then go for gap filling with urdbean/mungbean • If plant population is more that 75% go for transplanting of thinned plants/or gap filling with same cultivar	• Hoeing by hand hoe to develop soil mulch • Removal of weeds in time. • In situ mulching of weeds	
		Urdbean/ Mungbean	• If germination is less than 50% then go for re-sowing with early maturing varieties otherwise gap fill with improved seeds	• Hoeing by hand hoe to develop soil mulch • Removal of weeds in time. • In situ mulching of weeds	
		Sesamum	• If germination is less than 50% then go resowing with alternate crop	• Hoeing by hand hoe to develop soil mulch • Removal of weeds in time. • In situ mulching of weeds	
	Deep brown loamy	Soybean	• If germination is less than 50% then farmers should go for re-sowing with early maturing varieties using 25% higher seed rate	• Hoeing by hand hoe to develop soil mulch • Removal of weeds in time. • In situ mulching of weeds	

			• If plant population is more than 75% go for gap filling.		
		Maize	• If germination is less than 50% then go for gap filling with urdbean/mungbean • if plant population is more than 75% go for transplanting of thinned plants	• Hoeing by hand hoe to develop soil mulch • Removal of weeds in time. • In situ mulching of weeds	
		Urdbean/ Mungbean	• If germination is less than 50% then go for re-sowing with early maturing varieties	• Hoeing by hand hoe to develop soil mulch • Removal of weeds in time. • In situ mulching of weeds	
		Sesamum	• If germination is less than 50% then go for gap filling	• Hoeing by hand hoe to develop soil mulch • Removal of weeds in time. • In situ mulching of weeds	

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation[a]**	**Normal Crop/ cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
At vegetative stage	Deep black clayey	Soybean	• Life saving Irrigation • Thinning of plants by 30 to 50% • Weeding & hoeing	• Mulching in the crop rows. • Use of anti-transpirants like kaolin • Spray 2% urea after the relief of dry spell	• Crop insurance • Availability of inter-culture implements can be procured from RKVY
		Maize	• Life saving Irrigation • Thinning of plants by 30 to 50% • Weeding & hoein	• Use of green mulch in the rows • Spray of 2% urea after relief of dry spell • Use of anti-transpirants like kaolin	
		Urdbean/ Mungbean	• Weeding & hoeing	• Use of anti-transparent like kaolin. • Spray of 2% urea after relief of dry spell • Mulching in crop rows	
		Sesamum	• Weeding & hoeing	• Use of anti-transpirants like kaolin. • Spray of 2% urea after relief of dry spell	

				• Use of green mulch in the rows	
	Deep brown loamy	Soybean	• Life saving Irrigation • Thinning of plants by 30 to 50% • Weeding & hoeing	• Mulching in crop rows. • Spray of 2% urea after relief of dry spell • Use of anti-transpirants like kaolin.	
		Maize	• Life saving Irrigation • Thinning of plants by 30 to 50% • Weeding & hoei	• Use of green material as mulch. • Spray of 2% urea • Use of anti-transpirants like kaolin.	
		Urdbean/ Mungbean	• Weeding & hoeing	• Use of anti-transparent like kaolin.	
		Sesamum	• Weeding & hoeing	• Use of anti-transpirants like kaolin.	

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell)	**Major Farming situation[a]**	**Normal Crop/ cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
At flowering/ fruiting stage	Deep black clayey	Soybean		• Spray of 0.1% thio urea • Life saving Irrigation from farmpond water • Alternate furrow irrigation	Link watersheds and NREGS for the support of farm pond technology
		Maize	• Removal of lower leaves for fodder • Harvest cobs for table purpose (if market is available) and for green fodder • Harvesting of green cobs and green fodder	• Spray of 0.1% thio urea • Life saving Irrigation by the harvested rainwater • Alternate furrow irrigation	
		Urdbean/ Mungbean		• Spray of 2% urea • Life saving Irrigation by the harvested rainwater	
		Sesamum		Life saving Irrigation by the harvested rainwater Alternate furrow irrigation	
	Deep brown loamy	Soybean		• Spray of 0.1% thio urea • Life saving Irrigation from farm pond	

				• Alternate furrow irrigation	
		Maize	• Removal of lower leaves for fodder • Harvest cobs for table purpose (if market is available) and for green fodder • Harvesting of green cobs and green fodder	• Spray of 0.1% thio urea • Life saving Irrigation by the harvested rainwater • Furrow irrigation	
		Urdbean/ Mungbean		• Spray of 2.0% urea • Life saving Irrigation by the harvested rainwater	
		Sesamum		Life saving Irrigation by the harvested rainwater	

Condition			**Suggested Contingency measures**		
Terminal drought (Early withdrawal of monsoon)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Rabi Crop planning[d]**	**Remarks on Implementation[e]**
	Deep black clayey	Soybean	• Life saving Irrigation • If the damage will be severe, harvest for fodder	Plan for land preparation of rabi crops like chickpea, Mustard/taramira	Link watersheds and NREGS for the support of Farm pond technology
		Maize	• Life saving Irrigation from rain water harvesting • Removal of lower leaves for fodder • Harvesting of green cobs and green fodder	Plan forland preparation of rabicrops like chickpea/lentil/mustard/ Taramira	
		Urdbean/ Mungbean	Life saving irrigation from rainwater harvesting	-do-	
		Sesamum	Life saving irrigation from rainwater harvesting	-do-	
	Deep brown loamy	Soybean	• Life saving Irrigation from rainwater harvesting	-do-	
		Maize	• Life saving Irrigation by the harvested rainwater • Removal of lower leaves for fodder • Harvesting of green cobs and green fodder	-do-	
		Urdbean/ Mungbean	Life saving irrigation from rainwater harvesting	-do-	
		Sesamum	-do-	-do-	

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]**
Delayed release of water in canals due to low rainfall	Deep black clayey	Soybean/Maize-wheat	Soybean/Maize –wheat/ barley/gram/ coriander / linseed Wheat : Raj 3077, HI 8498, Raj 3765, Raj 4037, Raj 3777, HI 1531, LoK-1 Coriander : RCr-20, 436, 480, 684, CS-6 Gram : C-235, Dahod yellow, Pratap chana – 1, GNG 469, GNG 683, KAK 2 Barley: RD-2552, RD-2052 Linseed : Pratap Alsi-1, RL-914, Meera, Kiran	• Upcoming irrigation from farm pond water for sowing of crops • Irrigation by pressurized irrigation system If feasible or furrow method • Irrigation at critical crop growth stages	Lin k watershed programmes for the support of farm pond technology
		Paddy-wheat	Paddy-Wheat Wheat: Raj-3777, Lok-1, Raj-3765	• Upcoming irrigation from farm pond water for sowing of crops • Upcoming irrigation from farm pond water for sowing of crops • Sprinkler or drip or Furrow irrigation • Use of Roto till drill for sowing	
	Deep brown loamy	Soybean/Maize-wheat	Soybean/Maize –wheat/ barley/gram/ coriander / linseed Wheat : Raj 3077, HI 8498, Raj 3765, Raj 4037, Raj 3777, HI 1531, LoK-1 Coriander : RCr-20, 436, 480, 684, CS-6 Gram : C-235, Dahod yellow, Pratap chana – 1, GNG 469, GNG 683, KAK 2 Barley: RD-2552, RD-2052 Linseed : Pratap Alsi-1, RL-914, Meera, Kiran	• Irrigation by sprinkler or drip or Alternate furrow f • Upcoming irrigation from farm pond water for sowing of crops • Irrigation at critical crop growth stages	
		Paddy-wheat	Paddy-Wheat Wheat: Raj-3777, Lok-1, Raj-3765	• Irrigation by Sprinkler/drip system if feasible or furrow method • Use of Roto till drill for sowing	

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]**
Non release of water in canals under delayed onset of monsoon in catchment	Deep black clayey	Soybean/Maize-Wheat/Gram Or Fallow-Mustard	Soybean/Maize-Gram/ Coriander/ Or Fallow-Mustard/Gram/ Coriander	• Irrigation by sprinkler/dripsystem if feasible • Soil stirring for dust mulch • Weed removal • Use of anti transparent i.e. Kaolin • Spray of urea at 2-3% as per recommendation • Spray of thio urea 0.1%	Construction of Rain water harvesting structures with the support of watershed programmes and NREGS
	Deep brown loamy	Soybean/Maize-Wheat/Gram Or Fallow-Mustard	Soybean/Maize-Gram/ Coriander/ Or Fallow-Mustard/Gram/ Coriander	• Irrigation by Sprinkler or drip if water is available from other sources • Soil stirring for dust mulch • Weed removal • Use of anti transparent i.e. Kaolin • Spray of urea at 2-3% as per recommendation • Spray of thio urea 0.1%	

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]
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Deep black clayey	No Sowing and water is used for drinking of Animals and other domestic use	If adequate moisture is available for germination sowing of crops i.e. mustard, Gram, Lentil, Taramira, Safflower in Tank beds	• Soil stirring for dust mulch • Weed removal • Spray of urea @ 2-3% as per recommendation • Spray of thio urea 0.1%	Deepening of Tanks under NREGA if tanks are kept fallow
	Deep brown loamy	No Sowing and water is used for drinking of Animals and other domestic use	If adequate moisture is available for germination sowing of crops i.e. mustard, Gram, Lentil, Taramira, Safflower in Tank beds	• Soil stirring for dust mulch • Weed removal • Spray of urea @ 2-3% as per recommendation • Spray of thio urea 0.1%	

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]**
Insufficient groundwater recharge due to low rainfall	Deep black clayey	Soybean/Maize-Wheat	Soybean/Maize-Gram/Coriander/Linseed/ Lentil/Mustard/Durum Wheat	• Irrigation by sprinkler or drip system If feasible • Conjunctive use of surface rainwater with ground water • Irrigation at critical growth stages with water saving technologies • Soil stirring for dust mulch • Timely weed removal • Spray of Thiourea 0.1%	• Link watersheds,NREGA for the support of farm pond technology

2.2 Un-timely (unseasonal) rains- Situation does not exist

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]**
Horticulture		**NA**		
Vegetables		**NA**		
Heavy rainfall with high speed winds in a short span[2]		**NA**		

Outbreak of pests and diseases due to unseasonal rains	**Disease**	**Control**	**Insect/pest**	**Control**
NA	**NA**	**NA**	**NA**	**NA**

2.3 Floods

Condition	**Suggested contingency measure[o]**			
Transient water logging/ partial inundation[1]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Soybean	Drain excess water by proper drainage Intercultivation with hoe to improve the aeration and to control weeds Apply 20kg N/ha at optimum moisture content	Drain excess water by proper drainag Intercultivation with hoe to improve soil aeration and to control weeds Apply multi nutrient or hormonal spray Plano fix to promote flowering	Drain excess water by proper drainage as early as possible Harvest at physiological maturity on clear sunny day	Dry the produce up to 10-12% moisture level before storage /bagging
Maize	Drain excess water by proper drainage Earthling up of crop for anchorage Intercultivation with hoe to improve the aeration and to control weeds Apply 20kg N/ha at optimum	Drain excess water by proper drainage Earthing up of crop for anchorage Intercultivation with hoe to improve soil aeration and to control weeds Apply multi nutrient or hormonal spray to promote flowering	Drain excess water by proper drainage as early as possible Harvest green cobs from dislodged plants for immediate marketing Shift the produce into the shed	Harvest the cobs after they are dried up properly Dry the grains up to 10-12% moisture level before storage /bagging

	moisture content			
Paddy	Drain excess water by proper drainage Take up gap filling either with available nursery or from splitting the tillers from the surviving hills Intercultivation with hoe to improve the aeration of soil and to control weeds Apply 240 kg N/ha at optimum moisture content Micro nutrient deficiency corrections for Zn and Fe foliar application of 0.2% of ZnSO4,Fe SO4 two to three timesat 4-5 days interval	Drain excess water by proper drainage Need based micronutrient spray Apply 40-50kg N/ha as booster dose at optimum moisture content Spray Zn SO4 0.2% if it is less than 45 days after transplanting	Tie the group of fallen plants in small bundles to avoid grain damage in ear heads Protect against false smut and gain discoloration	Dry the grain up to 10-12% moisture level before storage /bagging Spray common salt (5%) on panicles to prevent germination and spoilage of straw from the moulds Quick drying against discoloration
Horticulture				
Kharif vegetable	Drain excess water from the field as soon as possible Interculture the field to loosen the soil and to improve aeration	Drain excess water from the field as early as possible Staking the plants Multi nutrient application to promote flowering	Drain excess water from the field as early as possible Drain excess water from the field as early as possible Harvest on clear sunny day	Shift the produce safely to the shed Market the produce as early as possible
Cucurbits	-do—	-do	-do	-do-
Orchards	Drain excess water from the basin/field Apply N10-20kgN/ha to regain vigor Need based plant protection	Drain excess water with proper drainage Application of N-fertilizers (10-20KgN/ha) Need based plant protection Spray planofix to promote flowering	Fruit harvest at proper stage	Grading , shorting and produce placed in proper way to avoid rotten

Continuous submergence for more than 2 days[2]				
Soybean	Drain excess water by proper drainage Intercultivation with hoe to improve the aeration and to control weeds Apply 20kg N/ha at optimum moisture content	Drain excess water by proper drainage Intercultivation with hoe to improve soil aeration and to control weeds Apply multi nutrient or hormonal spray Plano fix to promote flowering	Drain excess water by proper drainage as early as possible Harvest at physiological maturity on clear sunny day	Dry the produce up to 10-12% moisture level before storage /bagging
Maize	Drain excess water by proper drainage Earthling up of crop for anchorage Intercultivation with hoe to improve the aeration and to control weeds Apply 20kg N/ha at optimum moisture content	Drain excess water by proper drainage Earthing up of crop for anchorage Intercultivation with hoe to improve soil aeration and to control weeds Apply multi nutrient or hormonal spray to promote flowering	Drain excess water by proper drainage as early as possible Harvest green cobs from dislodged plants for immediate marketing Shift the produce into the shed	Harvest the cobs after they are dried up properly Dry the grains up to 10-12% moisture level before storage /bagging
Paddy	Drain excess water by proper drainage Take up gap filling either with available nursery or from splitting the tillers from the surviving hills Intercultivation with hoe to improve the aeration of soil and to control weeds Apply 240 kg N/ha at optimum moisture content Micro nutrient deficiency corrections for Zn and Fe foliar application of 0.2% of ZnSO4,Fe SO4 two to three timesat 4-5 days interval	Drain excess water by proper drainage Need based micronutrient spray Apply 40-50kg N/ha as booster dose at optimum moisture content Spray Zn SO4 0.2% if it is less than 45 days after transplanting	Tie the group of fallen plants in small bundles to avoid grain damage in ear heads Protect against false smut and gain discoloration	Dry the grain up to 10-12% moisture level before storage /bagging Spray common salt (5%) on panicles to prevent germination and spoilage of straw from the moulds Quick drying against discoloration

Horticulture				
Kharif vegetable	Proper drainage	Proper drainage	Proper drainage	Proper drainage
Cucurbits	Proper drainage	Proper drainage	Proper drainage	Proper drainage
Orchards	Proper drainage	Proper drainage	Proper drainage	Proper drainage
Sea water inundation[3]	**Not applicable**			

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]				
Mungbean/urdbean	Application of irrigation	Light and frequent irrigation	Light and frequent irrigation	Picking of pods at physiological maturity
Horticulture				
Tomato	Cultivation in control conditions	Light and frequent irrigation at evening	Light and frequent irrigation at evening	Picking of fruits at physiological maturity
Brinjal	Cultivation in control conditions	Light and frequent irrigation at evening	Light and frequent irrigation at evening	Picking of fruits at physiological maturity
Cucurbits	Cultivation in control conditions	Light and frequent irrigation at evening	Light and frequent irrigation at evening	Picking of fruits at physiological maturity
Okra	-	Light and frequent irrigation at evening	Light and frequent irrigation at evening	Picking of fruits at physiological maturity
Cold wave[q]	**Situation rare exists in the district**			
Wheat	-	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	NA
Mustard	-	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	NA
Gram	-	• Burning of farm waste for Smoke • light irrigation • Spray of sulphuric acid 0.1%	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	NA
Coriander	-	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	NA
Horticulture				
Tomato	-	• Burning of farm waste for Smoke,	• Burning of farm waste for Smoke,	NA

		• light irrigation • Spray of sulphuric acid 0.1%	• light irrigation • Spray of sulphuric acid 0.1%	
Potato	-	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	NA
Brinjal	-	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	NA
Frost				NA
Wheat	-	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	NA
Mustard	-	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	NA
Gram	-	• Burning of farm waste for Smoke • light irrigation • Spray of sulphuric acid 0.1%	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	NA
Coriander	-	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	NA
Horticulture				
Tomato	-	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	NA
Potato	-	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	NA
Brinjal	-	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	• Burning of farm waste for Smoke, • light irrigation • Spray of sulphuric acid 0.1%	NA
Hailstorm	**Not applicable**			
Cyclone	**Not applicable**			

2.5 Contingent strategies for livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Drought			
Feed and Fodder availability	As the district is occasionally prone to drought the under mentioned measures may be taken to enhance the availability of feed and fodder base at the village/ household level Sowing of horsegram/Lucerne etc., during NE monsoon Preservation green maize fodder as silage All the crop residues especially Bajra Karabi, paddy/Wheat/barley straw/ Chopped sewan/Dhaman/Bharut/ Dry leaves of Jharberi/ Groundnut bhusa should be stored properly in the farm of hay at individual farmer level. Harvest the top fodder (Khejari, Neem, Subabul, Acasia, Pipol etc) and create fodder banks at village level Establishment of silvi-pastoral system in CPRs with ***Stylosanthus hamata*** and ***Cenchrus ciliaris*** as grass with ***Leucaena leucocephala*** as tree component Top dressing of N in 2-3 split doses @ 20-25 kg N/ha in CPRs with the monsoon pattern for higher biomass production Increase area under short duration fodder crops of sorghum/bajra/maize(UP chari, MP chari, HC-136, HD-2, GAINT BAJRA, L-74, K-677, Ananad/African Tall, Kisan composite, Moti, Manjari, B1-7 etc.,) on farmers fields with some input subsidy Avoid burning of wheat straw Harvesting and collection of perennial vegetation particularly grasses which grow during monsoon Proper drying, bailing and densification of harvested grass Capacity building and preparedness of the stakeholders and official staff for the extreme events	Harvest and use all the failed crop (Maize, Blackgram, Sorghum, Ground nut, Cluster bean, Wheat, Barley, Green gram, Soybean etc.,) material as fodder and feed the Livestock. Use judiciously the karabi, Preserved sewan /Dhaman /Bharut, Wheat straw, Lopped Khejari High productive animals should be Supplemented with tree fodder Available feed and fodder should be cut from CPRs and stall fed in order to reduce the energy requirements of the animals Provision of emergency grazing/feeding (Cow-calf camps or other special arrangements to protect high productive & breeding stock) Available kitchen waste should be mixed with dry fodder while feeding Arrangements should be made for mobilization of small ruminants across the districts where no drought exits Subsidized loans should be provided to the livestock keepers for procurement of feed	Flushing the stock to recoup Replenish the feed and fodder banks

Floods	Harvest all the possible wetted grain (Sorghum, Wheat, Groundnut etc) and use as animal feed. Don't allow the animals for grazing in case of early fore warning (EFW) Incase of EFW, shift the animals to safer places.	Treatment of the sick, injured and affected animals through arrangement of mobile emergency veterinary hospitals / rescue animal health workers. Diarrhea out break may happen arrangement should be made to mitigate the problem Protect the animals from heavy rains and thunder storms In severe cases un-tether **or** let loose the animals Arrange transportation of highly productive animals to safer place Spraying of fly repellants in animal sheds	Repair of animal shed Deworm the animals through mass camps Vaccinate against possible out breaks Proper disposable of the dead animals / carcasses by burning / burying with line powder in pit Bleach / chlorinate (0.1%) drinking water or water resources Collect drowned crop material, dry it and store for future use Sowing of above mention short duration fodder crops in unsown and water logged areas Application of urea (20-25kg/ha) in the CPR's to enhance the bio mass production.
Heat & Cold wave	Arrangement for protection from **heat wave** i) Provision shed with bamboo/thatched material ii) Plantation around the shed iii) H_2O sprinklers / foggers in the shed **iv)** Application of white reflector paint on the roof **Cold wave :** Covering all the wire meshed walls / open area with gunny bags/ polyethylene sheets (with a mechanism for lifting during the day time and putting down during night time)	Allow the animals early in the morning or late in the evening for grazing during heat waves Allow for grazing between 10AM to 3PM during cold waves Feed green fodder/silage / concentrates during day time and roughages / hay during night time in case of heat waves Add 25-50 ml of edible oil in concentrates and fed to the animal during cold waves Put on the foggers / sprinkerlers during heat weaves and heaters during cold waves	Feed the animals as per routine schedule Allow the animals for grazing (normal timings)

		In severe cases, vitamin 'C' and electrolytes should be added in H_2O during severe heat waves. Apply / sprinkle lime powder in the animal shed during cold waves to neutralize ammonia accumulation	
Health and Disease management	Procure and stock emergency medicines and vaccines for important endemic diseases of the area All the stock must be immunized for endemic diseases of the area Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district Adequate refreshment training on draught management to be given to VAS, Jr.VAS, LI with regard to health & management measures. Procure and stock multivitamins & area specific mineral mixture	Carryout deworming to all animals entering into relief camps Identification and quarantine of sick animals Constitution of Rapid Action Veterinary Force Performing ring vaccination (8 km radius) in case of any outbreak Restricting movement of livestock in case of any epidemic Rescue of sick and injured animals and their treatment Organize with community, daily lifting of dung from relief camps	Keep close surveillance on disease outbreak. Undertake the vaccination depending on need Keep the animal houses clean and spray disinfectants Farmers should be advised to breed their milch animals during July-September so that the peak milk production does not coincide with mid summer
Insurance	Encouraging insurance of livestock	Listing out the details of the dead animals	Submission for insurance claim and availing insurance benefit Purchase of new productive animals
Drinking water	Identification of water resources Desilting of ponds Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals) Construction of drinking water tanks in herding places/village junctions/relief camp locations Community drinking water trough can be arranged in shandies /community grazing areas	Restrict wallowing of animals in water bodies/resources Provide clean drinking water	Bleach (0.1%) drinking water / water sources Provide clean drinking water

2.5.2 Poultry

	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
Drought			
Shortage of feed ingredients	Storing of house hold grain like maize, wheat, sorghum, bajra etc, Culling of weak birds	Supplementation only for productive birds with house hold grain Supplementation of shell grit (calcium) for laying birds	Supplementation to all the birds
Drinking water	Rain water harvesting	Sanitation of drinking water	Give sufficient water as per the bird's requirement
Health and disease management	Culling of sick birds. Deworming and vaccination against RD and IBD	Mixing of Vit. A,D,E, K and B-complex including vit C in drinking water	Hygienic and sanitation of poultry house Disposal of dead birds by burning / burying with line powder in pit
Floods			
Shortage of feed ingredients	In case of EFW, shift the birds to safer place Storing of house hold grain like wheat/rice, sorghum, bajra etc, Culling of weak birds	Use stored feed as supplement Don't allow for scavenging Protect from thunder storms	Supplementation to all the birds
Drinking water	Provide clean drinking water	Sanitation of drinking water	Give sufficient water as per the bird's requirement
Health and disease management	In case of EFW, add antibiotic powder in drinking water to prevent any disease outbreak	Sanitation of poultry house Treatment of affected birds Prevent water logging surrounding the sheds Assure supply of electricity Sprinkle lime powder to prevent ammonia accumulation due to dampness	Hygienic and sanitation of poultry house Disposal of dead birds by burning / burying with line powder in pit
Heat wave			
Shelter/environment management	Provision of proper shelter with good ventilation	In severe cases, foggers/water sprinklers/wetting of hanged gunny bags should be arranged Don't allow for scavenging during mid day	Routine practices are followed
Health and disease management	Deworming and vaccination against RD and IBD	Supplementation of house hold grain Provide cool and clean drinking water with	Routine practices are followed

		electrolytes and vit. C In hot summer, add anti-stress probiotics in drinking water or feed	
Cold wave			
Shelter/environment management	Provision of proper shelter Arrangement for brooding Assure supply of continuous electricity	Close all openings with polythene sheets In severe cases, arrange heaters Don't allow for scavenging during early morning and late evening	Routine practices are followed
Health and disease management	Arrangement for protection from chilled air	Supplementation of grains Antibiotics in drinking water to protect birds from pneumonia	Routine practices are followed

2.5.3: Fisheries/Aquaculture: Not Applicable