

State: GUJARAT

Agriculture Contingency Plan for District:Rajkot

1.0 District Agriculture profile					
1.1	Agro-Climatic/Ecological Zone				
	Agro Ecological Sub Region (ICAR)	Arid Western Plains (4.2)			
	Agro-Climatic Zone (Planning Commission)	Gujarat Plains & Hills Region(XIII)			
	Agro Climatic Zone (NARP)	North Saurashtra Agro-Climatic Zone (GJ-6), South Saurashtra Agro-Climatic Zone (GJ-7)			
	List all the districts or part thereof falling under the NARP Zone	Amreli,Bhavnagar,Jamnagar,Rajkot,Surendranagar, Devbhoomi Dwarka, Morbi, Botad, Porbandar, Junagadh, Gir somnath			
	Geographic coordinates of district headquarters	Latitude		Longitude	
		20°3039' N		70°8022' E	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Main Dry Farming Research Station, Junagadh Agricultural University, Targhadia (RAJKOT)-360003			
	Mention the KVK located in the district	Krishi Vigyan Kendra, Junagadh Agricultural University, Targhadia (RAJKOT) PIN 360003			
1.2	Rainfall (Average of 2005 to 2014)	Average (mm)	Normal Rainy days (number)	Normal Onset (week and month)	Normal Cessation (week and month)
	SW monsoon (June-Sep):	807.26	35.3	3 rd week of June	3 rd week of September
	NE Monsoon(Oct-Dec):	-	-	NA	NA
	Winter (Jan- March)	-	-	NA	NA
	Summer (Apr-May)	-	-	NA	NA
	Annual	807.26	35.3	NA	NA

1.3	Land use pattern of the district (latest statistics) 2004-05	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 ('000ha)	768.989	532.538	16.900	48.422	63.545	9.56	0	66.921	31.100	-

Source: District Statistical Report of Rajkot District Year 2015-16

1.4	Major Soil types	Area ('000 ha)	% Area
	Medium black soil	364.94	68.53
	Alluvial soil	154.12	28.94
	Hilly soil	9.528	1.79
	Silty soil	3.95	0.74
	Total	532.538	

1.5	Agricultural land use	Area (000 ha)	Cropping intensity %
	Net sown area	532.538	106.64%
	Area sown more than one	35.171	
	Gross sown area	567.709	

Source: District Statistical Report of Rajkot District Year 2015-16

1.6	Irrigation	Area ('000ha)		
	Net irrigated area	193.724		
	Gross irrigated area	219.700		
	Rainfed area	338.814		
	Sources of Irrigation(2015-16)	Number	Area ('000ha)	Percentage of total irrigated area
	Canals	278.44 km	14.980	7.73
	Tanks	1210	24.200	12.49
	Open wells/bore well	84307	128.770	66.47
	Other Sources		17.304	8.93
	Lift irrigation schemes			
	Minor/Micro-irrigation	53	8.470	4.37
	Other sources (please specify)			
	Total Irrigated Area		193.724	
	Pump sets	93242		
	No. of Tractors	3389		

	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc.)
	Over exploited	-	-	-
	Critical	-	-	Saline
	Semi- critical	-	-	Moderate saline
	Safe	10	100	-
	Waste water availability and use	-	-	-
	Ground water quality	Good quality water is Available upto500-650 feet ,but more than poor water quality observed		
*Over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

1.7 Area under major field crops & horticulture (2010-11to 2014-15)

1.7	Sr. No.	Major field crops cultivated	Area ('000 ha)							
			<i>Kharif</i>			<i>Rabi</i>			Summer	Grand total
			Irrigated	Rain fed	Total	Irrigated	Rain fed	Total		
1	Groundnut		246.275	246.275				5.649	251.924	
2	Cotton(irrigated)	236.135		236.135					236.135	
3	Sesame		2.204	2.204				4.603	6.807	
4	Castor		9.346	9.346					9.346	
5	Green gram		2.506	2.506				1.005	3.511	
6.	Black gram		1.914	1.914					1.914	
7	Wheat				72.203		72.203		72.203	
8	Chickpea				6.072		6.072		6.072	
9	Pearl millet		1.858	1.858				1.200	3.058	

	Sr.No.	Horticulture crops - Fruits (2015-16)	Area ('000ha)
	1	Mango	0.427
	2	Sapota	0.250
	3	Acid lime	0.761
	4	Ber	0.281
	5	Custard apple	0.126
	6	Pomegranate	0.635

	7	Aonla		0.090	
	8	Datepalm		0.068	
	9	Papaya		0.027	
	10	Guava		0.038	
	Sr.No.	Horticulture crops -Vegetables		Area ('000ha)	
	1	Onion		1.700	
	2	Brinjal		0.650	
	3	Cabbage		1.525	
	4	Okra		1.185	
	5	Tomato		0.415	
	6	Cauliflower		0.130	
	7	Cluster bean		0.196	
	8	Cowpea		0.365	
	9	Cucurbits		1.289	
	Sr.No.	Horticulture crops - Spices crop		Area ('000ha)	
	1	Cumin		5.900	
	2	Chilies		1.225	
	3	Garlic		1.400	
	4	Coriander		2.900	
	5	Fenugreek		0.250	
	Sr.No.	Horticulture crops - Flowercrop		Area ('000ha)	
	1	Rose		0.090	
	2	Marigold		0.165	
	3	Lily		0.005	
	Fodder crops		Total	Irrigated	Rain fed
	1	Sorghum	21.375		21.375
	2	Maize	7.547		7.547
	3	Lucerne	0.234	0.234	
	4	Others	0.041		0.041
	Total fodder crop area		29.197	0.234	28.963
		Grazing land	93.616		93.616

1.8	Livestock	Male	Female	Total ('000)			
	Cattle (Cow)	178.926	282.018	460.944			
	Buffaloes	17.786	270.374	288.160			
	Goat	-	-	118.722			
	Sheep	-	-	126.959			
	Others (Camel, Pig, Yak etc.)	-	-	2.002			
	Commercial dairy farms (Number)						
1.9	Poultry	No. of farms	Total No. of birds				
	Commercial	3	38.154				
	Backyard	0	4073				
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.) Nil
	-	-	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	-		-		-	

(Source: Reports of Rajkot District Panchayat, Department of Agriculture, Horticulture, Fisheries and Animal husbandry, Government of Gujarat, 2015-16)

1.11 Production and Productivity of major crops (2010-11 to 2014-15)

1.11	Name of crop	<i>Kharif</i>		<i>Rabi</i>		<i>Summer</i>		<i>Total</i>		Crop residue as fodder (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)										
	Groundnut	372.775	1514	-	-	13.506	2391	386.281	1533	494.92
	Cotton	516.433	2187	-	-	-	-	516.433	2187	618.88
	Castor	18.797	1875	-	-	-	-	18.797	1875	33.90
	Sesame	0.776	352	-	-	6.633	1633	7.409	1088	6.050
	Green gram	1.245	497			1.580	1573	2.825	805	4.500
	Black gram	0.847	442					0.847	442	1.250
	Wheat	-	-	291.506	4037	--	--	291.506	4037	610.12
	Chickpea	-	-	8.972	1478	-	-	8.972	1478	14.26
	Pearl millet	3.080	1658			2.950	2460	6.030	1972	12.30
Major Horticultural crops (Crops to be identified based on total acreage)										
	Mango	-	-	-	-	2.501	8199	2.501	8199	-
	Sapota	-	-	3.068	12268	-	-	3.068	12268	-
	Acid lime	-	-	9.512	12499	-	-	9.512	12499	-
	Ber	2.506	8918	-	-	-	-	2.506	8918	-
	Custard apple	-	-	1.285	10198	-	-	1.285	10198	-
	Pomegranate	-	-	9.112	14349	-	-	9.112	14349	-
	Aonla	-	-	0.540	6000	-	-	0.540	6000	
	Datepalm	-	-	0.382	5617	-	-	0.382	5617	
	Papaya	-	-	1.824	76000	-	-	1.824	76000	
	Guava	-	-	0.373	9815	-	-	0.373	9815	
Horticulture crops - Vegetables										
	Onion	-	-	44.200	26000	-	-	44.200	26000	-
	Brinjal	-	-	11.667	17949	-	-	11.667	17949	-
	Cabbage	-	-	33.550	22000	-	-	33.550	22000	-
	Okra	-	-	-	-	8.800	7426	8.800	7426	-
	Tomato	-	-	8.750	21084	-	-	8.750	21084	-

	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder (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)	
	Cauliflower	-	-	2.640	20307			2.640	20307	
	Cluster bean	1.560	7959					1.560	7959	
	Cowpea	4.000	10958					4.000	10958	
	Cucurbits	-	-	16.469	12776			16.469	12776	
Spices crops										
	Cumin	-	-	4.130	700	-	-	4.130	700	-
	Chillies			2.364	1929			2.364	1929	
	Garlic	-	-	13.650	9750	-	-	13.650	9750	-
	Coriander	-	-	5.655	1950	-	-	5.655	1950	-
	Fenugreek	-	-	0.816	1600	-	-	0.816	1600	-
Flower crops										
	Rose	0.787	8744	-	-	-	-	0.787	8744	-
	Marigold	1.635	9909	-	-	-	-	1.635	9909	-
	Lily	0.041	8250	-	-	-	-	0.041	8250	-
Eg., industrial pulpwood crops etc.										

(Source: Statistical reports, District Panchayat, 2012-13 to 2015-16 & Director of Horticulture, Govt. of Gujarat-2015-16)

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Groundnut	Cotton	Castor	Wheat	Cumin
	Kharif- Rain fed	3 rd week of June to 1 st week of July	3 rd week of June to 1 st week of July	3 rd week of June to 1 st week of July	-	-
	Kharif-Irrigated	3 rd week of May	3 rd week of May	2 nd to 3 rd week of August	-	-
	Rabi/Summer-Irrigated	-	-	--	2 nd week of Nov. to 4 th week of Nov.	2 nd week of Nov. to 4 th week of Nov.

1.13	What is the major contingency the district is prone to? (Tick mark)	Regular	Sporadic	None
	Drought		√	
	Flood		√	
	Cyclone		√	
	Hail storm			√
	Heat wave		√	
	Cold wave			√
	Frost			√
	Sea water intrusion			
	Pests and diseases Pests-Aphid, Jassids, Thrips, white grub, White fly & Fruit fly, Pink boll worm Diseases-Powdery Mildew, Rust, Leaf spot, Tikka & Downy Mildew, Collar rot	√		
What is the major contingency the district is prone to? (Tick mark)	Regular	Sporadic	None	

1.14	Include Digital maps of the district for	Location map of district within state as Annexure I	Enclosed: Yes / No Yes
		Annual rainfall map as Annexure II	Enclosed: Yes / No Yes
		Soil map as Annexure IIIa, b & c	Enclosed: Yes / No Yes

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Suggested Contingency measures	
				Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)	Medium Black Soils	Groundnut (Spreading GG10, 11, GJG 17 and Semi spreading GG 20, GJG-22)	No change	<ul style="list-style-type: none"> Follow standard recommended package of practices 	-
		Cotton (Cotton hybrid-4,6,8,10, & Govt. approved Bt. hybrids)	No change	<ul style="list-style-type: none"> Follow standard recommended package of practices 	-
		Castor(GC-3, GCH-4, GCH-6, GCH-7)	No change	<ul style="list-style-type: none"> Follow standard recommended package of practices 	-
Delay by 2 weeks (Specify month)*					

July 1st wk 27th Std week	Alluvial soils	Groundnut (Spreading GG10, 11, GJG 17 and Semi spreading GG 20,GJG-22)	No change	<ul style="list-style-type: none"> Follow standard recommended package of practices 	-
		Cotton (Cotton hybrid-4,6,8,10, & Govt. approved Bt. hybrids)	No change	<ul style="list-style-type: none"> Follow standard recommended package of practices 	-
		Castor(GC-3, GCH-4, GCH-6, GCH-7)	No change	<ul style="list-style-type: none"> Follow standard recommended package of practices 	-

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
Delay by 4 weeks (Specify month)* July 3rd wk 29th Std Week	Medium Black Soils	Groundnut (Spreading & Semi spreading)	Prefer bunch varieties like GG-2, GG-5, GG-7, GJG-9, TG37A Semi- spreading of groundnut GG-20,GJG-22, Soybean GJS-3 G.S.1, Sesame GT 2,3,4	<ul style="list-style-type: none"> Keep 45cm and 60cm row spacing for bunch and semi-spreading varieties respectively. Other practices will be as such. 	<ul style="list-style-type: none"> Agencies for quality seed supply National (NSC), Gujarat State Seed Corporation (GSSC), University, and Gujcomasol.
		Cotton	No change	-	
		Castor	No change	-	
	Alluvial soils	Groundnut (Spreading & Semi spreading)	Prefer bunch varieties like GG-2, GG-5, GG-7, GJG-9, TG37A Semi- spreading of groundnut GG-20,GJG-22, Soybean GJS-3 G.S.1, Sesame GT 2,3,4	<ul style="list-style-type: none"> Keep 45cm and 60cm row spacing for bunch and semi-spreading varieties respectively. Other practices will be as such. 	
		Cotton	No change	-	
		Castor	No change	-	

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
Delay by 6 weeks (Specify month)* August 1st wk	Medium Black Soils	Groundnut (Spreading & Semi spreading)	Green gram (GM-4) Castor (GC-3, GCH-4, 6, 7) Sorghum (Gundhari, GFS-3, GAFS-11, CSV-21F, S-1049), Sesame (GT-2,3,4) Pigeon pea (BDN-2, Vaishali, GJP-1), Soybean (GS-1,3)	• As per crop change follow the package of practices (other than groundnut)	Agencies for quality seed supply National (NSC), Gujarat State Seed Corporation (GSSC), University, and Gujcomsol. zero till seed drill, seed dressing equipments, sprayers & dusters to farmers through government schemes (Implements like seed drill and seed dressing are available in Rajkot)
		Cotton	Green gram (GM-4) Castor (GC-3, GCH-4, 6, 7) Sorghum (Gundhari, GFS-3, GAFS-11, CSV-21F, S-1049), Sesame (GT-2,3,4) Pigeon pea (BDN-2, Vaishali, GJP-1), Soybean (GS-1,3)	• As per crop change follow the package of practices	
		Castor	No change	do	
	Alluvial soils	Groundnut (Spreading & Semi spreading)	Green gram (GM-4) Castor (GC-3, GCH-4, 6, 7) Sorghum (Gundhari, GFS-3, GAFS-11, CSV-21F, S-1049), Sesame (GT-2,3,4) Pigeon pea (BDN-2, Vaishali, GJP-1), Soybean (GS-1,3)	• As per crop change follow the package of practices (other than groundnut)	
		Cotton	Green gram (GM-4) Castor (GC-3, GCH-4, 6, 7) Sorghum (Gundhari, GFS-3, GAFS-11, CSV-21F, S-1049), Sesame (GT-2,3,4) Pigeon pea (BDN-2, Vaishali, GJP-1), Soybean (GS-1,3)	• As per crop change follow the package of practices	
		Castor	No change	--	

Condition	Major Farming Situation	Normal Crop / Cropping System	Suggested Contingency measures		
			Change in crop / cropping System including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 8 weeks (Specify month)* August 3rd wk	Medium Black Soils	Groundnut (Spreading & Semi spreading)	Sesame (Purva-1) (Castor (GC-3, GCH-4, 6, 7) Sorghum (Gundhari, GFS-3, GAFS-11, CSV-21F, S-1049), Pigeon pea (BDN-2, Vaishali, GJP-1), Soybean (GS-1,3) /Green gram (Variety GM-4)/ Black gram (GU 1, T-9)/ Pearl millet(GHB-538 and Govt. approved hybrids)	• As per crop change follow the package of practices	Agencies for quality seed supply National (NSC), Gujarat State Seed Corporation (GSSC), University, and Gujcomasol, zero till seed drill, seed dressing equipments, sprayers & dusters to farmers through Government schemes (Implements like seed drill and seed dressing are available at Rajkot)
		Cotton	Sesame (Purva-1) (Castor (GC-3, GCH-4, 6, 7) Sorghum (Gundhari, GFS-3, GAFS-11, CSV-21F, S-1049), Pigeon pea (BDN-2, Vaishali, GJP-1), Soybean (GS-1,3) /Green gram (Variety GM-4)/ Black gram (GU 1, T-9)/ Pearl millet(GHB-538 and Govt. approved hybrids)	• As per crop change follow the package of practices	
		Castor	No change	• Follow standard recommended package of practices	
	Alluvial soils	Groundnut	Sesame (Purva-1) (Castor (GC-3, GCH-4, 6, 7) Sorghum (Gundhari, GFS-3, GAFS-11, CSV-21F, S-1049), Pigeon pea (BDN-2, Vaishali, GJP-1), Soybean (GS-1,3) /Green gram (Variety GM-4)/ Black gram (GU 1, T-9)/ Pearl millet(GHB-538 and Govt. approved hybrids)	• As per crop change follow the package of practices	
		Cotton	Sesame (Purva-1) (Castor (GC-3, GCH-4, 6, 7) Sorghum (Gundhari, GFS-3, GAFS-11, CSV-21F, S-1049), Pigeon pea (BDN-2, Vaishali, GJP-1), Soybean (GS-1,3) /Green gram (Variety GM-4)/ Black gram (GU 1, T-9)/ Pearl millet(GHB-538 and Govt. approved hybrids)	• As per crop change follow the package of practices	
		Castor	No change	• Follow standard recommended package of practices	

Condition			Suggested Contingency measures		
Normal onset	Major Farming situation	Normal Crop/ cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Medium Black Soils	Groundnut	<ul style="list-style-type: none"> • Gap filling with maize or sesame 	<ul style="list-style-type: none"> • Interculturing to fill soil cracks • Mulching with wheat straw or shredded cotton stalk • Spray kaolin @ 4% (400g/10 lit. water) 	<ul style="list-style-type: none"> • Cotton stalk shredding machine which is available in Jasdan town of Rajkot district to be supplied by Govt.
		Cotton	<ul style="list-style-type: none"> • Gap filling 	<ul style="list-style-type: none"> • Interculturing to fill soil cracks • Mulching with wheat straw or shredded cotton stalk • Spray kaolin @ 4% (400g/10 lit. water) 	<ul style="list-style-type: none"> • Cotton stalk shredding machine which is available in Jasdan town of Rajkot district to be supplied by Govt.
		Castor	<ul style="list-style-type: none"> • Gap filling 	<ul style="list-style-type: none"> • Interculturing to fill soil cracks • Mulching with wheat straw or shredded cotton stalk 	<ul style="list-style-type: none"> • Cotton stalk shredding machine which is available in Jasdan town of Rajkot district to be supplied by Govt.
	Alluvial soils	Groundnut	<ul style="list-style-type: none"> • Gap filling with maize or sesame 	<ul style="list-style-type: none"> • Interculturing to fill soil cracks • Mulching with wheat straw or shredded cotton stalk • Spray kaolin @ 4% (400g/10 lit. water) 	<ul style="list-style-type: none"> • Cotton stalk shredding machine which is available in Jasdan town of Rajkot district to be supplied by Govt.
		Cotton	<ul style="list-style-type: none"> • Gap filling 	<ul style="list-style-type: none"> • Interculturing to fill soil cracks • Mulching with wheat straw or shredded cotton stalk • Spray kaolin @ 4% (400g/10 lit. water) 	<ul style="list-style-type: none"> • Cotton stalk shredding machine which is available in Jasdan town of Rajkot district to be supplied by Govt.
		Castor	<ul style="list-style-type: none"> • Gap filling 	<ul style="list-style-type: none"> • Interculturing to fill soil cracks • Mulching with wheat straw or shredded cotton stalk 	<ul style="list-style-type: none"> • Cotton stalk shredding machine which is available in Jasdan town of Rajkot district to be supplied by Govt.

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Mid-season drought (long dry spell,consecutive 2 weeks rainless (>2.5mm period))	Medium Black Soils	Groundnut	<ul style="list-style-type: none"> Weeding Protection against sucking pests (control of jassid and aphid, spray imidachlopride 17.8 SL (4 ml/10 lit. water). Lifesaving irrigation 	<ul style="list-style-type: none"> Mulching with wheat straw or crushed cotton stalk. Inter tilling. Spray kaolin @ 4% (400g/10 lit. water) 	<ul style="list-style-type: none"> Ensure supply of electricity for life saving irrigation.
		Cotton	<ul style="list-style-type: none"> Weeding Protection against sucking pests (control of jassid and aphid, spray imidachlopride 17.8 SL (4 ml/10 lit. water). Lifesaving irrigation 	<ul style="list-style-type: none"> Mulching with wheat straw or crushed cotton stalk. Inter tilling. Spray kaolin @ 4% (400g/10 lit. water) 	<ul style="list-style-type: none"> Ensure supply of electricity for life saving irrigation.
		Castor	<ul style="list-style-type: none"> Weeding. Protection against sucking pests (control of jassid and aphid, spray imidachlopride 17.8 SL (4 ml/10 lit. water). Life saving irrigation 	<ul style="list-style-type: none"> Mulching with wheat straw or crushed cotton stalk. Inter tilling. 	<ul style="list-style-type: none"> Ensure supply of electricity for life saving irrigation.
	Alluvial soils	Groundnut	<ul style="list-style-type: none"> Weeding Protection against sucking pests (control of jassid and aphid, spray imidachlopride 17.8 SL (4 ml/10 lit. water). Lifesaving irrigation 	<ul style="list-style-type: none"> Mulching with wheat straw or crushed cotton stalk. Inter tilling. Spray kaolin @ 4% (400g/10 lit. water) 	<ul style="list-style-type: none"> Supply of plastic film through Govt. schemes. Ensure supply of electricity for life saving irrigation.
		Cotton	<ul style="list-style-type: none"> Weeding Protection against sucking pests (control of jassid and aphid, spray imidachlopride 17.8 SL (4 ml/10 lit. water). Lifesaving irrigation 	<ul style="list-style-type: none"> Mulching with wheat straw or crushed cotton stalk. Inter tilling. Spray kaolin @ 4% (400g/10 lit. water) 	<ul style="list-style-type: none"> Supply of plastic film through Govt. schemes. Ensure supply of electricity for life saving irrigation.
		Castor	<ul style="list-style-type: none"> Weeding. Protection against sucking pests (control of jassid and aphid, spray imidachlopride 17.8 SL (4 ml/10 lit. water). Life saving irrigation 	<ul style="list-style-type: none"> Mulching with wheat straw or crushed cotton stalk. Inter tilling. 	<ul style="list-style-type: none"> Supply of plastic film through Govt. schemes. Ensure supply of electricity for life saving irrigation.

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At flowering/ fruiting stage	Medium black Soils	Groundnut	<ul style="list-style-type: none"> • Supplemental irrigation if possible followed by weeding, • Protection against White grub (control measures : Mix 4 lit. quinalphos or chlorpyriphos in 100 kg sand and broadcast) 	• Spray kaolin @ 4% (400g/10 lit. water)	<ul style="list-style-type: none"> • Ensure timely supply of electric power for life saving irrigation by PGVCL, • Interculturing implements by Govt. agencies.
		Cotton	<ul style="list-style-type: none"> • Supplemental irrigation if possible followed by weeding. • Install light trap • Install pheromone trap@40/ha • Spray recommended insecticide 	• Spray kaolin @ 4% (400g/10 lit. water)	
		Castor	• Supplemental irrigation if possible followed by weeding.	• Interculturing if possible	
	Alluvial soils	Groundnut	<ul style="list-style-type: none"> • Supplemental irrigation if possible followed by weeding, • Protection against White grub (control measures : Mix 4 lit. quinalphos or chlorpyriphos in 100 kg sand and broadcast) 	• Spray kaolin @ 4% (400g/10 lit. water)	
		Cotton	<ul style="list-style-type: none"> • Supplemental irrigation if possible followed by weeding. • Install light trap • Install pheromone trap@40/ha • Spray recommended insecticide 	• Spray kaolin @ 4% (400g/10 lit. water)	
		Castor	• Supplemental irrigation if possible followed by weeding.	• Interculturing if possible,	

Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/ cropping system	Crop management	Rabi Crop planning	Remarks on Implementation
	Medium black Soils	Groundnut	<ul style="list-style-type: none"> Lifesaving irrigations from harvested/ground water Spray kaolin @ 4% (400 g/10 lit. water) 	-	<ul style="list-style-type: none"> Ensure supply of electricity for life saving irrigation by PGVCL.
		Cotton	<ul style="list-style-type: none"> Harvest mature bolls. Supplemental irrigation. Spray kaolin @ 4% (400 g/10 lit. water) 	-	
		Castor	<ul style="list-style-type: none"> Harvest spikes. Supplemental irrigation if possible. 	-	
	Alluvial soils	Groundnut	<ul style="list-style-type: none"> Lifesaving irrigations from harvested/ground water Spray kaolin @ 4% (400 g/10 lit. water) 	-	<ul style="list-style-type: none"> Ensure supply of electricity for life saving irrigation by PGVCL.
		Cotton	<ul style="list-style-type: none"> Harvest mature bolls. Supplemental irrigation. Spray kaolin @ 4% (400 g/10 lit. water) 		
		Castor	<ul style="list-style-type: none"> Harvest spikes. Supplemental irrigation if possible. 		

2.1.2 Drought - Irrigated situate

Condition	Major Farming situation	Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed/ limited release of water in canals due to low rainfall	Medium black Soils		NA		
	Alluvial soils		NA		

Condition	Major Farming situation	Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	Medium black Soils		NA		
	Alluvial soils				

Condition	Major Farming situation	Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Medium Black Soils		NA		
	Alluvial Soils				

Condition	Major Farming situation	Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
	Medium Black Soils	Wheat	Chickpea (GG 1, GJG 3, GJG 5), Cumin (GC 3, 4)/ Coriander (Guj.1, 2) Fenugreek(GM-2)/ Leafy vegetables/ carrot(GDC 1)	<ul style="list-style-type: none"> • Adoption of MIS. • Reduce area of irrigation • Supply irrigation during night times to reduce transpiration. • Alternate furrow irrigation • Give irrigation during night times to reduce transpiration. 	<ul style="list-style-type: none"> • Construct well recharge structures • Timely supply of MIS and seeds through Govt. Agencies.
		Cotton	No change	<ul style="list-style-type: none"> • Adoption of MIS. • Reduce area of irrigation • Alternate furrow irrigation • Give irrigation during night times to reduce transpiration. 	<ul style="list-style-type: none"> • Provision of MIS through Govt. schemes.
	Alluvial soils Hilly soils Silty soils	Wheat	Chickpea (GG 1, GJG 3, GJG 5), Cumin (GC 3, 4)/ Coriander (Guj1, 2) Fenugreek(GM-2)/ Leafy vegetables/ carrot(GDC 1)	<ul style="list-style-type: none"> • Adoption of MIS. • Reduce area of irrigation • Supply irrigation during night times to reduce transpiration. • Alternate furrow irrigation • Give irrigation during night times to reduce transpiration. 	<ul style="list-style-type: none"> • Construct well recharge structures • Timely supply of MIS and seeds through Govt. Agencies.
		Cotton	No change	<ul style="list-style-type: none"> • Adoption of MIS. • Reduce area of irrigation • Alternate furrow irrigation • Give irrigation during night times to reduce transpiration. 	<ul style="list-style-type: none"> • Provision of MIS through Govt. schemes.

2.2 Unusual rains (untimely, unseasonal etc.) (for both rain fed and irrigated situations)

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post-harvest
Continuous high rainfall in a short span leading to water logging				
Groundnut	<ul style="list-style-type: none"> • Surface drainage(For management of water logging 	<ul style="list-style-type: none"> • Surface drainage for management of water logging 	<ul style="list-style-type: none"> • Delay harvesting of spreading groundnut if possible. • Immediately harvest bunch groundnut. • Harvesting is done immediately for bunch groundnut. • Quick surface drainage by open channel around field. 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. • Protection against pest/disease damage in storage etc. • Preparation of quick drying techniques • Separate good lot and bad lot.
Cotton	<ul style="list-style-type: none"> • Surface drainage (for management of water logging. • After drainage apply 199 kg/ha ammonium sulphate. 	<ul style="list-style-type: none"> • Surface drainage (for management of water logging. • After drainage apply 199 kg/ha ammonium sulphate. 	<ul style="list-style-type: none"> • Surface drainage (for management of water logging. • Harvesting of mature bolls. 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. • Preparation of quick drying techniques • Separate good lot and bad lot.
Castor	<ul style="list-style-type: none"> • Surface drainage(For management of water logging 	<ul style="list-style-type: none"> • Surface drainage for management of water logging 	<ul style="list-style-type: none"> • Surface drainage (For management of water logging). • Harvesting at Physiological maturity stage. 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. • Preparation of quick drying techniques • Separate good lot and bad lot.
Wheat	<ul style="list-style-type: none"> • Surface drainage (to control water logging condition) 	<ul style="list-style-type: none"> • Surface drainage (to control water logging condition) 	<ul style="list-style-type: none"> • Surface drainage (for management of water logging, lodging of crop), • To control black point in grain spray mancozeb 0.2% (27g/10 lit water) 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. • Protection against pest/disease damage in storage etc. • Preparation of quick drying techniques • Separate good lot and bad lot.

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post-harvest
Continuous high rainfall in a short span leading to water logging				
Horticulture				
Coriander	<ul style="list-style-type: none"> • Surface drainage(For management of water logging 	<ul style="list-style-type: none"> • Surface drainage for management of water logging 	<ul style="list-style-type: none"> • Surface drainage for management of water logging. • Spray 0.2% (30g/10 lit water) wettable sulphur for protection against powdery mildew disease. 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. • Protection against pest/disease damage in storage etc. • Preparation of quick drying techniques and techniques to separate good lot and bad lot.
Cumin	<ul style="list-style-type: none"> • Surface drainage(For management of water logging 	<ul style="list-style-type: none"> • Surface drainage for management of water logging 	<ul style="list-style-type: none"> • Surface drainage for management of water logging. • To prevent/control cumin blight spray mancozeb 0.2 % (27g/10 lit water) and 0.2% (30g/10 lit water) wettable sulphur for protection against powdery mildew disease. 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. • Protection against pest/disease damage in storage etc. • Preparation of quick drying techniques and techniques to separate good lot and bad lot.
Acid lime	<ul style="list-style-type: none"> • Control citrus canker by spray of copper oxychloride 0.2 % (40g/ 10lit water)+ streptocycline 100 ppm (1 g/10 lit water). 	<ul style="list-style-type: none"> • Control citrus canker by spray of copper oxychloride 0.2 % (40g/ 10lit water)+ streptocycline 100 ppm (1 g/10 lit water). 	<ul style="list-style-type: none"> • Control citrus canker by spray of copper oxychloride 0.2 % (40g/ 10lit water)+ streptocycline 100 ppm (1 g/10 lit water). 	-
Pomegranate	-	<ul style="list-style-type: none"> • Spray 0.2 % (30g/10 lit water) wettable sulphur for protection against powdery mildew 	<ul style="list-style-type: none"> • Spray 0.2 % (30g/10 lit water) wettable sulphur for protection against powdery mildew. • Harvest mature fruits. 	-

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post-harvest
Continuous high rainfall in a short span leading to water logging				
Heavy rainfall with high speed winds in a short span				
Groundnut	<ul style="list-style-type: none"> • Surface drainage (for management of waterlogging). 	<ul style="list-style-type: none"> • Surface drainage (for management of waterlogging). 	<ul style="list-style-type: none"> • Delay harvesting of spreading groundnut if possible. • Immediately harvest bunch groundnut. • Quick surface drainage, Open channel around field. 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. • Protection against pest/disease damage in storage etc. • Preparation of quick drying techniques and techniques to separate good lot and bad lot.
Cotton	<ul style="list-style-type: none"> • Surface drainage for management of water logging. • After drainage apply 199 kg/ha ammonium sulphate 	<ul style="list-style-type: none"> • Surface drainage for management of water logging. • After drainage apply 199 kg/ha ammonium sulphate 	<ul style="list-style-type: none"> • Surface drainage (for management of water logging), • Harvesting mature bolls. 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. • Preparation of quick drying techniques and techniques to separate good lot and bad lot.
Castor	<ul style="list-style-type: none"> • Surface drainage (for management of waterlogging). 	<ul style="list-style-type: none"> • Surface drainage (for management of waterlogging). 	<ul style="list-style-type: none"> • Surface drainage (for management of water logging) • Harvest spikes 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. • Preparation of quick drying techniques and techniques to separate good lot & bad lot.
Wheat	<ul style="list-style-type: none"> • Surface drainage (to control water logging condition). 	<ul style="list-style-type: none"> • Surface drainage (to control water logging condition). 	<ul style="list-style-type: none"> • Surface drainage for management of water logging and lodging crop. • Spray mancozeb 0.2%. (27g/10 lit water) to control black point in grain. 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. • Protection against pest/disease damage in storage etc. • Preparation of quick drying techniques and techniques to separate good lot and bad lot.

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post-harvest
Continuous high rainfall in a short span leading to water logging				
Coriander	<ul style="list-style-type: none"> • Surface drainage (for management of water logging & diseases). 	<ul style="list-style-type: none"> • Surface drainage (for management of water logging & diseases). 	<ul style="list-style-type: none"> • Surface drainage (for management of water logging). • Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation. • Harvesting at physiological maturity immediately 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. • Protection against pest/disease damage in storage etc. • Preparation of quick drying techniques and techniques to separate good lot and bad lot.
Cumin	<ul style="list-style-type: none"> • Surface drainage (for management of water logging & diseases). • Spray mancozeb 0.2% (27g/10 lit water) to control cumin blight) 	<ul style="list-style-type: none"> • Surface drainage (for management of water logging & diseases). • Spray mancozeb 0.2% (27g/10 lit water) to control cumin blight) 	<ul style="list-style-type: none"> • Surface drainage (for management of water logging). • Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation. • Harvesting at physiological maturity immediately 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. • Protection against pest/disease damage in storage etc. • Preparation of quick drying techniques and techniques to separate good lot and bad lot.
Horticulture				
Acid lime	<ul style="list-style-type: none"> • Control citrus canker by spray of copper oxychloride 0.2 % (40g/10lit water)+ streptomycin 100 ppm (1 g/10 lit water). 	<ul style="list-style-type: none"> • Control citrus canker by spray of copper oxychloride 0.2 % (40g/ 10lit water)+ streptomycin 100 ppm (1 g/10 lit water). 	<ul style="list-style-type: none"> • Control citrus canker by spray of copper oxychloride 0.2 % (40g/10lit water)+ streptomycin 100 ppm (1 g/10 lit water). • collect mature fruits 	-

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post-harvest
Continuous high rainfall in a short span leading to water logging				
Pomegranate	-	<ul style="list-style-type: none"> Spray 0.2 % (30g/10 lit water) wettable sulphur for protection against powdery mildew 	<ul style="list-style-type: none"> Spray 0.2 % (30g/10 lit water) wettable sulphur for protection against powdery mildew. Harvest mature fruits. 	-
Outbreak of pests and diseases due to unseasonal rains				
Groundnut	<ul style="list-style-type: none"> Spray hexaconazole 0.005% (10ml /10 lit. water) for rust & tikka disease control. Protection against White grub (control measures : Mix 4 lit. quinalphos or chlorpyrifos in 100 kg sand and broadcast) 	<ul style="list-style-type: none"> Spray hexaconazole 0.005% (10ml /10 lit. water) for rust & tikka disease control. 	<ul style="list-style-type: none"> Spray hexaconazole 0.005% (10ml /10 lit. water) for rust & tikka disease control. 	-
Cotton	<ul style="list-style-type: none"> Control pest with systemic pesticides 	<ul style="list-style-type: none"> Adopt integrated pest management techniques for pink boll worm control. Like Pheromone trap @ 20/ha, Azadirachtin @ 1.2 lit/ha, Beauveria bassiana @ 2 kg/ha, Quinalphos 25 EC @ 600 ml/ha. 	<ul style="list-style-type: none"> Adopt integrated pest management techniques for pink boll worm control. Like Pheromone trap @ 20/ha, Azadirachtin @ 1.2 lit/ha, Beauveria bassiana @ 2 kg/ha, Quinalphos 25 EC @ 600 ml/ha. 	-
Wheat	<ul style="list-style-type: none"> Spray mencozeb 0.2 % (27g/10 lit water) to control blight and rust 	<ul style="list-style-type: none"> Spray mencozeb 0.2 % (27g/10 lit water) to control blight and rust 	<ul style="list-style-type: none"> Spray mencozeb 0.2 % (27g/10 lit. water) to control blight and rust 	-
Coriander	<ul style="list-style-type: none"> Surface drainage (for management of water logging & diseases. 	<ul style="list-style-type: none"> Surface drainage (for management of water logging & diseases. 	<ul style="list-style-type: none"> Surface drainage (for management of water logging). Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation. 	-

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post-harvest
Continuous high rainfall in a short span leading to water logging				
Cumin	<ul style="list-style-type: none"> • Surface drainage (for management of water logging & diseases). • Spray mancozeb 0.2% (27g/10 lit water) to control cumin blight) 	<ul style="list-style-type: none"> • Surface drainage (for management of water logging & diseases). • Spray mancozeb 0.2% (27g/10 lit water) to control cumin blight) 	<ul style="list-style-type: none"> • Surface drainage (for management of water logging). • Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation. 	-
Horticulture				
Acid lime	<ul style="list-style-type: none"> • Control citrus canker by spray of copper oxychloride 0.2 % (40g/ 10lit water)+ streptocycline 100 ppm (1 g/10 lit water). 	<ul style="list-style-type: none"> • Control citrus canker by spray of copper oxychloride 0.2 % (40g/ 10lit water)+ streptocycline 100 ppm (1 g/10 lit water). 	<ul style="list-style-type: none"> • Control citrus canker by spray of copper oxychloride 0.2 % (40g/ 10lit water)+ streptocycline 100 ppm (1 g/10 lit water). • collect mature fruits 	-
Pomegranate	-	<ul style="list-style-type: none"> • Spray 0.2 % (27g/10 lit water) wettable sulphur for protection against powdery mildew 	<ul style="list-style-type: none"> • Spray 0.2 % (27g/10 lit water) wettable sulphur for protection against powdery mildew. • Harvest mature fruits. 	-

2.3 Floods

Condition	Suggested contingency measures			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation				
Groundnut	NA	<ul style="list-style-type: none"> • As a preventive step open drainage channel 	<ul style="list-style-type: none"> • As a preventive step open drainage channel 	-
Cotton	NA	<ul style="list-style-type: none"> • As a preventive step open drainage channel 	<ul style="list-style-type: none"> • As a preventive step open drainage channel 	-
Castor	NA	<ul style="list-style-type: none"> • As a preventive step open drainage channel 	<ul style="list-style-type: none"> • As a preventive step open drainage channel 	-

Condition	Suggested contingency measures			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation				
Horticulture				
Acid lime	<ul style="list-style-type: none"> Shift to safe place & Surface drainage 	<ul style="list-style-type: none"> Provide surface drainage 	<ul style="list-style-type: none"> Provide surface drainage 	<ul style="list-style-type: none"> Provide surface drainage
Pomegranate	<ul style="list-style-type: none"> Shift to safe place & Surface drainage 	<ul style="list-style-type: none"> Provide surface drainage 	<ul style="list-style-type: none"> Provide surface drainage 	<ul style="list-style-type: none"> Provide surface drainage
Continuous submergence for more than 2 days				
Groundnut	<ul style="list-style-type: none"> As a preventive step open drainage channel followed by spray of 0.05 % carbendazim (10g/10 lit. water) for control of leaf spot. 	<ul style="list-style-type: none"> As a preventive step open drainage channel followed by spray of 1 % FeSO₄ (100 g/10 lit. water)+citric acid (10g/10 lit. water) for control of yellowing, 0.0025 % hexaconazole (5 ml/10 lit. of water) for rust and leaf spot management 	<ul style="list-style-type: none"> As a preventive step open drainage channel followed by spray of 1 % FeSO₄ (100 g/10 lit. water)+citric acid (10g/10 lit. water) for control of yellowing, 0.0025 % hexaconazole(5 ml/10 lit. of water) for rust and leaf spot management 	-
Cotton	<ul style="list-style-type: none"> As a preventive step open drainage channel Apply 199 kg/ha ammonium sulphate 	<ul style="list-style-type: none"> As a preventive step open drainage channel Apply 199 kg/ha ammonium sulphate 	<ul style="list-style-type: none"> As a preventive step open drainage channel Apply 199 kg/ha ammonium sulphate Harvest mature bolls 	-
Castor	<ul style="list-style-type: none"> As a preventive step open drainage channel. 	<ul style="list-style-type: none"> As a preventive step open drainage channel. 	<ul style="list-style-type: none"> As a preventive step open drainage channel Give well water irrigation if possible. 	<ul style="list-style-type: none"> Harvest mature spikes
Horticulture				
Acid lime	<ul style="list-style-type: none"> Shift to safe place & with Proper surface drainage 	<ul style="list-style-type: none"> Surface drainage 	<ul style="list-style-type: none"> Surface drainage 	<ul style="list-style-type: none"> Surface drainage
Pomegranate	<ul style="list-style-type: none"> Shift to safe place & Provide proper surface drainage 	<ul style="list-style-type: none"> Surface drainage 	<ul style="list-style-type: none"> Surface drainage 	<ul style="list-style-type: none"> Surface drainage
Sea water inundation	NA	NA	NA	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	• Light and frequent irrigation to all crops	• Light and frequent irrigation to all crops	• Light and frequent irrigation to all crops	NA
Cold wave	NA	NA	NA	NA
Frost	NA	NA	NA	NA
Hailstorm	NA	NA	NA	NA
Cyclone				
Groundnut	Quick drainage	Quick drainage	Quick drainage	Shift produce at safer place
cotton	• Earthing up, • Quick drainage	• Earthing up, • Quick drainage	• Earthing up, • Quick drainage	
Castor	• Earthing up, • Quick drainage	• Earthing up, • Quick drainage	• Earthing up, • Quick drainage	
Wheat	• Quick drainage	• Quick drainage	• Quick drainage • Spray mancozeb 0.2 % (27g/10 lit. water) to control black point in grain	
Coriander	• As a preventive step open drainage channel, • Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation.	• As a preventive step open drainage channel, • Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation.	• As a preventive step open drainage channel, • Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation.	
Cumin	• As a preventive step open drainage channel, • Spray mancozeb 0.2% (27g/10 lit water) to control cumin blight) • Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation.	• As a preventive step open drainage channel, • Spray mancozeb 0.2% (27g/10 lit water) to control cumin blight) • Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation.	• As a preventive step open drainage channel, • Spray mancozeb 0.2% (27g/10 lit water) to control cumin blight) • Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation.	

Extreme event type	Suggested contingency measure ^r			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Horticulture				
Acid lime	<ul style="list-style-type: none"> Shift graft to safe place if possible, build cyclone proof nursery houses, grow wind barrier trees around nursery 	<ul style="list-style-type: none"> Reduce canopy & tying plants diagonally if possible grow wind barrier trees around nursery 	<ul style="list-style-type: none"> Reduce canopy & tying plants diagonally if possible 	<ul style="list-style-type: none"> Early harvesting of crop
Pomegranate	<ul style="list-style-type: none"> Shift graft to safe place if possible, build cyclone proof nursery houses, grow wind barrier trees around nursery 	<ul style="list-style-type: none"> Reduce canopy & tying plants diagonally if possible grow wind barrier trees around nursery 	<ul style="list-style-type: none"> Reduce canopy & tying plants diagonally if possible 	<ul style="list-style-type: none"> Early harvesting of crop

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	<ul style="list-style-type: none"> Store fodder (silage and hay), Conventional feeds are used for feeding (Roughages & concentrates) of maize, sorghum, groundnut fodder and wheat straw 	<ul style="list-style-type: none"> Stored feed & fodder in silage & hay. Treated wheat straw with 4 % urea solution. Use chaff cutter for fodder. Use press for making compact bundles of fodder for easy transportation. Establish feed block preparation facilities for animals. Arrange bulk transportation of fodder 	<ul style="list-style-type: none"> Feed little green fodder along with unconventional feed, 5 kg green feed/mature animal
Drinking water	<ul style="list-style-type: none"> Rain water harvesting and create water bodies/watering points. When water is scarce use only for drinking water for animals. 	<ul style="list-style-type: none"> Avoid wallowing. Judicious use of drinking water. Establish and arrange the community based drinking water facilities. In coastal area community based R.O. plant to be established for drinking water. Add bleaching powder to drinking water (1%) 	<ul style="list-style-type: none"> Give sufficient water as per the animal requirement

	Suggested contingency measures		
	Before the event	During the event	After the event
Health and disease management	<ul style="list-style-type: none"> • Foot & Mouth disease vaccination in June • Vaccination for Bacterial diseases e.g. HS,BQ Deworming of the animals (cattle & buffaloes). • Add mineral mixtures 25 g/animal/day along with feed. • Animals to be covered cover under insurance schemes. 	<ul style="list-style-type: none"> • Add mineral mixtures 25 g/Animal/day along with feed, • Deworming of the animals. • Arrange mobile dispensary for animal health in the region. • Establish link with Agricultural/Veterinary University for animal health. Involve vet. Science students for health management of animal. • Carry out disease diagnosis camps. 	<ul style="list-style-type: none"> • Add vitamin mineral mixtures 25 g/animal/day along with feed, quarantine diseased animals and deworming of the animals.
Floods			
Feed and fodder availability	<ul style="list-style-type: none"> • Harvest available fodder and store it at safe place if floods forecast. Shift animals to safe place. Identify rescue places for safety of animals 	<ul style="list-style-type: none"> • Give stored fodder with mineral mixture. Fodder should be stored at safe place. In severe rain and flood untether animals. 	<ul style="list-style-type: none"> • Feed silage & hay material along with concentrate feed. • Use chaff cutter for fodder. • Use press for making compact bundles of fodder for easy transportation. • Establish community based shelter houses for animals. • Establish feed block preparation facilities for animals. • Arrange bulk transportation of fodder.
Drinking water	<ul style="list-style-type: none"> • Add bleaching powder (1%) to drinking water when heavy rains occur and flood expected. 	<ul style="list-style-type: none"> • Add bleaching powder to drinking water (1%). 	<ul style="list-style-type: none"> • Add bleaching powder to drinking water (1%).

	Suggested contingency measures		
	Before the event	During the event	After the event
Health and disease management	<ul style="list-style-type: none"> • Provide insurance cover to the animals. 	<ul style="list-style-type: none"> • Vaccination of animals against HS, BQ • Add mineral mixtures 25 g/Animal/day along with feed, • Deworming of the animals. • Arrange mobile dispensary for animal health in the region. • Establish link with Agricultural/Veterinary University for animal health. • Involve vet. Science students for health management of animal. • Carry out disease diagnosis camps. 	<ul style="list-style-type: none"> • Disposal of dead animals by burning the carcass and sanitation measures to control spread of diseases. • Health checking to diseases outbreak.
Cyclone			
• Feed and fodder availability	<ul style="list-style-type: none"> • Early harvesting & storage of fodder 	<ul style="list-style-type: none"> • Shift animals to safe place. Give stored fodder with mineral mixture along with concentrated feed. • In severe rain and flood untether animals. 	<ul style="list-style-type: none"> • Feed silage & hay material along with concentrated feed. • Use chaff cutter for fodder. • Use press for making compact bundles of fodder for easy transportation. • Establish community based shelter houses for animals. • Establish feed block preparation facilities for animals. • Arrange bulk transportation of fodder.
• Drinking water	<ul style="list-style-type: none"> • Add bleaching powder to drinking water (1%). 	<ul style="list-style-type: none"> • Add bleaching powder to drinking water (1%). 	<ul style="list-style-type: none"> • Add bleaching powder to drinking water (1%).

	Suggested contingency measures		
	Before the event	During the event	After the event
Health and disease management	<ul style="list-style-type: none"> • Provide insurance cover to the animals. 	<ul style="list-style-type: none"> • Vaccination of animals against HS& BQ. • Add mineral mixtures 25 g/animal/day along with feed, deworming of the animals. • Arrange mobile dispensary for animal health 	<ul style="list-style-type: none"> • Disposal of dead animals by burning the carcass and sanitation measures to control spread of diseases. • Health checking to diseases outbreak.

	Suggested contingency measures		
	Before the event	During the event	After the event
		in the region. • Establish link with Agricultural/Veterinary University for animal health. • Involve vet. Science students for health management of animal. • Carry out disease diagnosis camps.	
Heat wave and cold wave			
Heat wave			
Shelter/environment management	<ul style="list-style-type: none"> Arrangement to be made such as Cover roof with dry grass , Fans & ventilation 	<ul style="list-style-type: none"> Operate fans, sprinklers, keep open ventilators to control temperature. 	Routine practices are followed
Health and disease management	<ul style="list-style-type: none"> Cover animal under insurance 	<ul style="list-style-type: none"> Viral vaccination against FMD Provide ventilation 	-do-
Cold wave	•	•	•
Shelter/environment management	-	<ul style="list-style-type: none"> Operate heaters protect shed by tying gunny bags 	Routine practices are followed
Health and disease management	<ul style="list-style-type: none"> Cover animal under insurance 	<ul style="list-style-type: none"> Add antibiotics in drinking water to protect young animals from Pneumonia. 	-do-

2.5.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	During the event	After the event	
Drought				
Shortage of feed ingredients	<ul style="list-style-type: none"> Use stored feed, conventional feed, antibiotics and probiotics • 	<ul style="list-style-type: none"> Use stored feed, conventional feed, antibiotics and probiotics 	<ul style="list-style-type: none"> Use conventional feed, Vaccination for viral diseases –Marek's and Ranikhet diseases (MD & RD). 	<ul style="list-style-type: none"> Linkage Govt. schemes with public/NGOs at grass root levels.
Drinking water	<ul style="list-style-type: none"> Rain water harvesting 	<ul style="list-style-type: none"> Give water for drinking only 	<ul style="list-style-type: none"> Give sufficient water as per the bird's requirement 	<ul style="list-style-type: none"> Linkage Govt. schemes with public/NGOs at grass root levels.

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	During the event	After the event	
Health and disease management	<ul style="list-style-type: none"> • Vaccination for viral diseases –against MD & RD, cover birds under insurance 	<ul style="list-style-type: none"> • Provide ventilation. • Add more calcium with feed. • Assure supply of electric power. 	<ul style="list-style-type: none"> • Routine practices are followed, culling affected birds disposal by burning. 	<ul style="list-style-type: none"> • Vaccination for viral diseases –against MD & RD.
Floods				
Shortage of feed ingredients	<ul style="list-style-type: none"> • Use conventional feed, ingredients 	<ul style="list-style-type: none"> • Use stored feed, antibiotics, pro biotic, and assure supply of electric power. 	<ul style="list-style-type: none"> • Routine practices are followed 	<ul style="list-style-type: none"> • Linkage Govt. schemes with public/NGOs at grass root levels.
Drinking water	-	<ul style="list-style-type: none"> • Add bleaching powder to drinking water (1%). 	<ul style="list-style-type: none"> • Add bleaching powder to drinking water (1%). 	<ul style="list-style-type: none"> • Linkage Govt. schemes with public/NGOs at grass root levels.
Health and disease management	<ul style="list-style-type: none"> • Cover birds under insurance 	<ul style="list-style-type: none"> • For suspected cases, give antibiotic in the feed, prevent water logging surrounding sheds. Assure supply of electric power. 	<ul style="list-style-type: none"> • Dispose dead birds by burning. 	<ul style="list-style-type: none"> • Vaccination for viral diseases –against MD & RD.
Cyclone				
Shortage of feed ingredients	<ul style="list-style-type: none"> • Use stored feed ingredients. 	<ul style="list-style-type: none"> • Use stored feed & use conventional feed, antibiotics, pro biotic 	<ul style="list-style-type: none"> • Routine practices are followed. 	<ul style="list-style-type: none"> • Use stored feed ingredients.
Drinking water	-	<ul style="list-style-type: none"> • Add bleaching powder to drinking water (1%). 	<ul style="list-style-type: none"> • Add bleaching powder to drinking water (1%). 	-
Health and disease management	<ul style="list-style-type: none"> • Cover birds under insurance 	<ul style="list-style-type: none"> • For suspected cases give antibiotics. 	<ul style="list-style-type: none"> • Dispose dead birds by burning. 	-
Heat wave and cold wave				
Heat wave				
Shelter/environment management	<ul style="list-style-type: none"> • Arrangement of good ventilation by fan, foggers. 	<ul style="list-style-type: none"> • Operate fans, foggers; keep open ventilators in night and cool period. 	<ul style="list-style-type: none"> • Routine practices are to be followed. 	

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	During the event	After the event	
Health and disease management	<ul style="list-style-type: none"> Cover birds under insurance 	<ul style="list-style-type: none"> Viral vaccination add calcium in the poultry feed. 	<ul style="list-style-type: none"> Routine practices are to be followed. 	-
Cold wave				
Shelter/environment management	NA	NA	NA	-
Health and disease management	NA	NA	NA	-

2.5.3 Fisheries/ Aquaculture

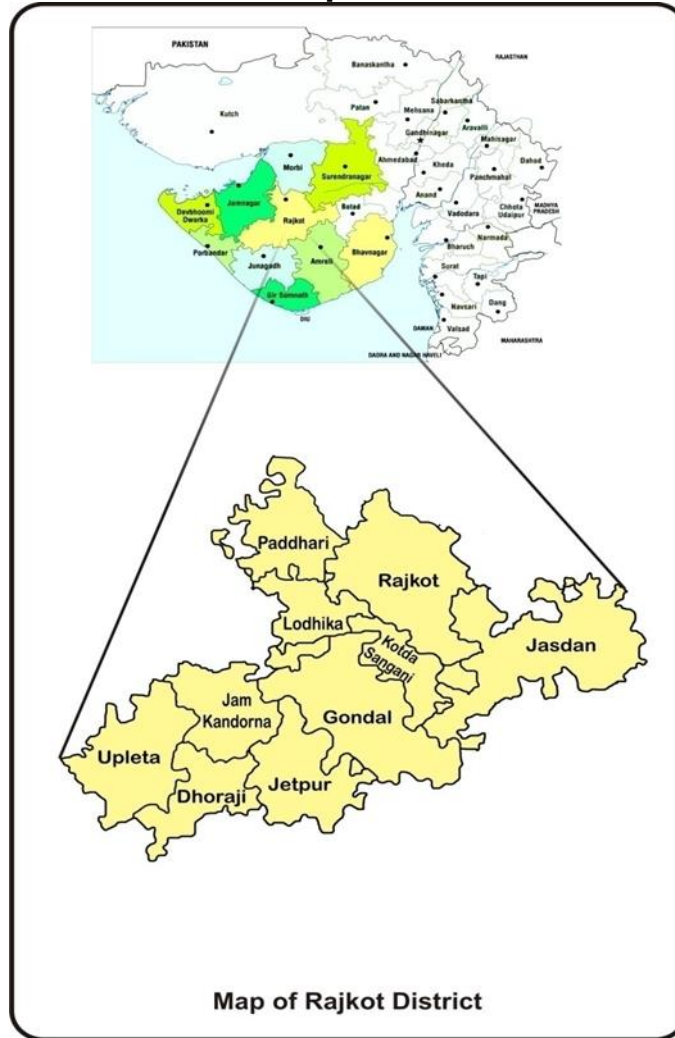
	Suggested contingency measures		
	Before the event	During the event	After the event
1) Drought : A. Capture			
Marine	NA	NA	NA
Inland	NA	NA	NA
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	<ul style="list-style-type: none"> Desilting/deepening of pond so that more water can be stored 	<ul style="list-style-type: none"> Provision of additional bore wells. Use Euryhaline species. 	<ul style="list-style-type: none"> Maintaining pond water level at least 1 m depth.
(ii) Impact of salt load build up in ponds / change in water quality	<ul style="list-style-type: none"> Replenishment of water in pond with fresh water. 	<ul style="list-style-type: none"> 30 % exchange of water. 	<ul style="list-style-type: none"> 10 % exchange of water.
(iii) Any other	-	-	-
2) Floods : A. Capture			
Marine	NA	NA	NA
Inland	NA	NA	NA
B. Aquaculture			
(i) Inundation with flood water.	<ul style="list-style-type: none"> Deepening of ponds, repair, strengthening of dykes 	<ul style="list-style-type: none"> Enhancement of dykes' height by sand bags. 	-
(ii) Water contamination and changes in water quality.	<ul style="list-style-type: none"> Use of calcium hydroxide @ 150 kg/ha 	<ul style="list-style-type: none"> Use of KMnO₄ for bath of fish as prophylactics. 	<ul style="list-style-type: none"> Lime treatment for oxidation.

	Suggested contingency measures		
	Before the event	During the event	After the event
(iii) Health and diseases.	<ul style="list-style-type: none"> Antibiotics fortified feeding as prophylactics. 	<ul style="list-style-type: none"> Disinfectants formalin treatments as prophylactics. 	<ul style="list-style-type: none"> Lime treatment for oxidation.
(iv) Loss of stock and inputs (feed, chemicals etc.).	<ul style="list-style-type: none"> Stock cover under insurance 	-	-
(v) Infrastructure damage (pumps, aerators, huts etc.)	-	-	<ul style="list-style-type: none"> Repair & maintenance of aqua structures
(vi) Any other	-	-	-
3. Cyclone / Tsunami : A.Capture			
Marine			
(i) Average compensation to be paid due to loss of fishermen lives	<ul style="list-style-type: none"> Forewarning systems to be installed. Insurance & communication instruments supplied to fisherman Warning systems to be installed. 	<ul style="list-style-type: none"> Warning systems to be installed. 	<ul style="list-style-type: none"> Compensations to be paid for repair & maintenance of boats & gears on actual survey basis.
(ii) Avg. no. of boats / nets/damaged			<ul style="list-style-type: none"> Compensation on assessment of actual losses & damage of boats & nets to be given.
(iii) Avg. no. of houses damaged	-	-	<ul style="list-style-type: none"> Compensation on assessment of actual losses & damage of houses to be given.
Inland	NA	NA	NA
B. Aquaculture			
(i) Overflow / flooding of ponds	<ul style="list-style-type: none"> Strengthening of dykes. 	<ul style="list-style-type: none"> Enhancement of dykes' height by sand bags. 	-
(ii) Changes in water quality (fresh water / brackish water ratio)	<ul style="list-style-type: none"> Maintain salinity by addition of fresh water up to 20-25 ppt. 	<ul style="list-style-type: none"> Use Euryhaline species. 	<ul style="list-style-type: none"> Use Euryhaline species for culture.
(iii) Health and diseases	<ul style="list-style-type: none"> Liming and formalin treatment. 	<ul style="list-style-type: none"> Disinfectants treatments. 	-
(iv) Loss of stock and inputs (feed, chemicals etc).	<ul style="list-style-type: none"> Stock cover under insurance. 	-	<ul style="list-style-type: none"> Seed and feed to be supplied through Dept. of fisheries,
(v) Infrastructure damage (pumps, aerators, shelters/hutsetc.)	-	-	<ul style="list-style-type: none"> Compensation on assessment of actual losses & damage of pumps, aerators, shelters/ huts.
(vi) Any other	-	-	-

	Suggested contingency measures		
	Before the event	During the event	After the event
4. Heat wave and cold wave			
A. Capture			
Marine	NA	NA	NA
Inland	NA	NA	NA
B. Aquaculture			
(i) Changes in pond environment (water quality)	<ul style="list-style-type: none"> Plantation of leafy trees on dyke, increase depth. 	<ul style="list-style-type: none"> To maintain water level in pond. Use of fountain and peddle wheel aerator. 	-
(ii) Health and disease management	-	<ul style="list-style-type: none"> Bleaching powder 1 to 2 %, formalin treatment to prevent diseases. 	<ul style="list-style-type: none"> KMnO₄ 2 % to maintain oxygen level
(iii) Any other	-	-	-

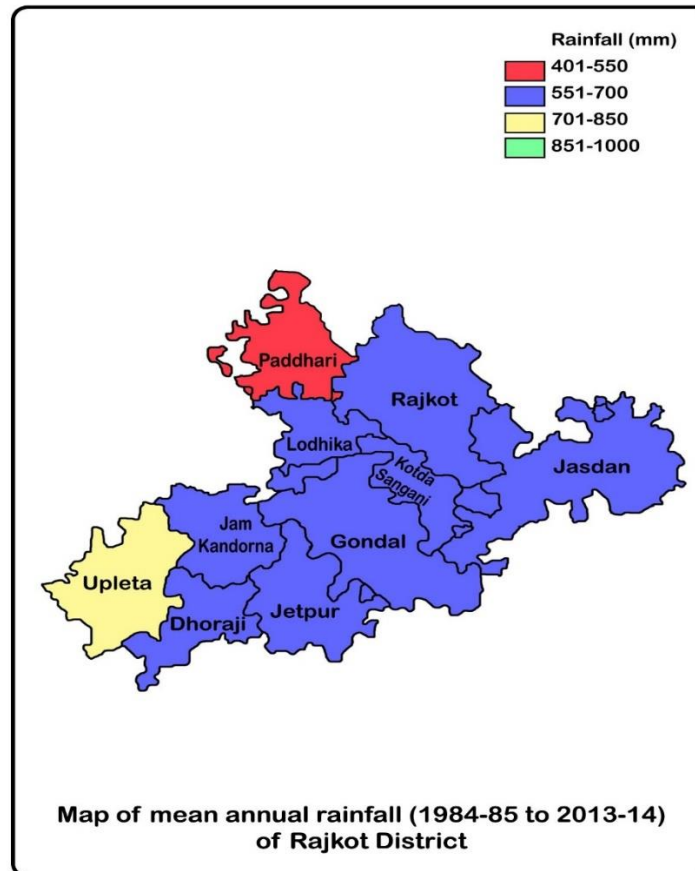
ANNEXURE I

Location map of the district



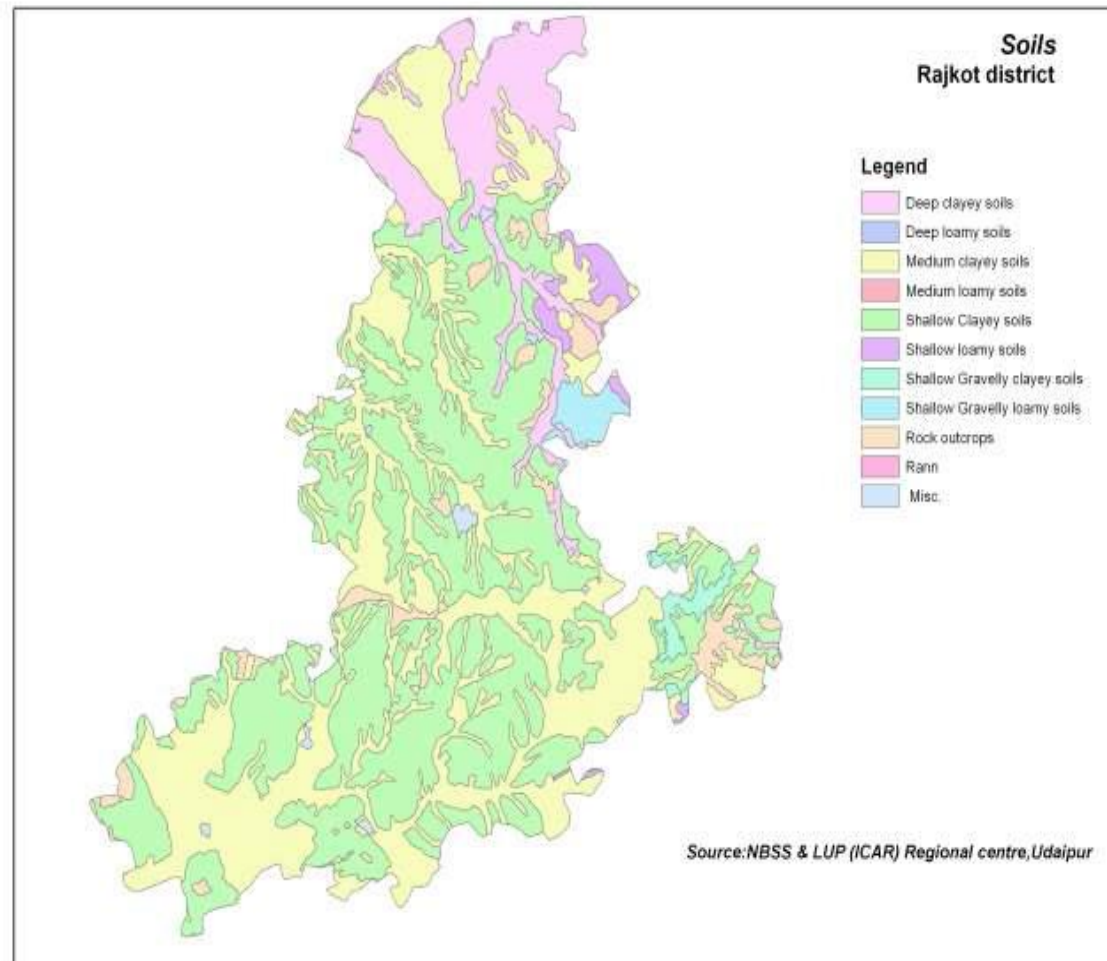
ANNEXURE II

Mean annual rainfall of the district



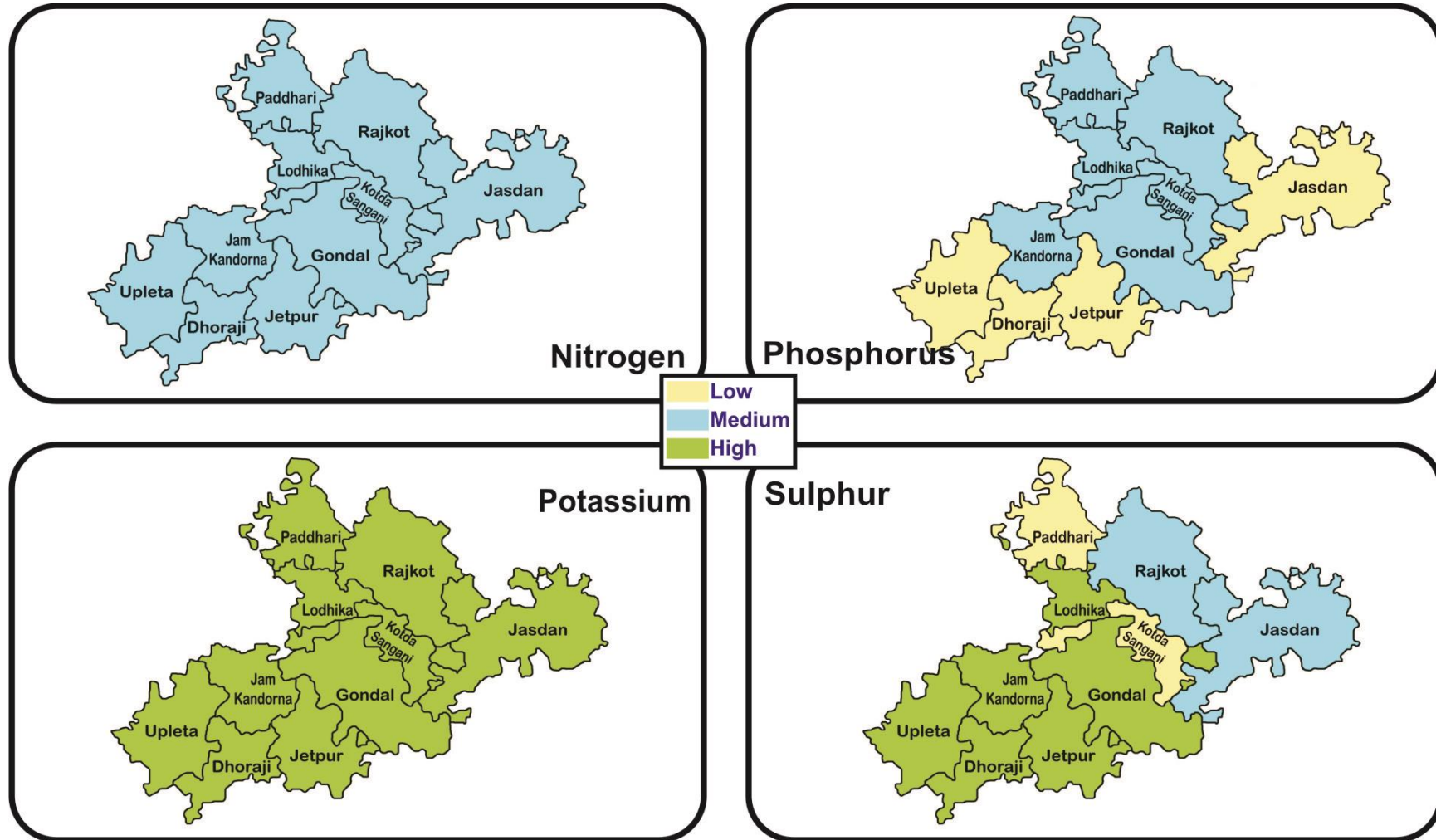
ANNEXURE III

Annexure IIIa: Soil map



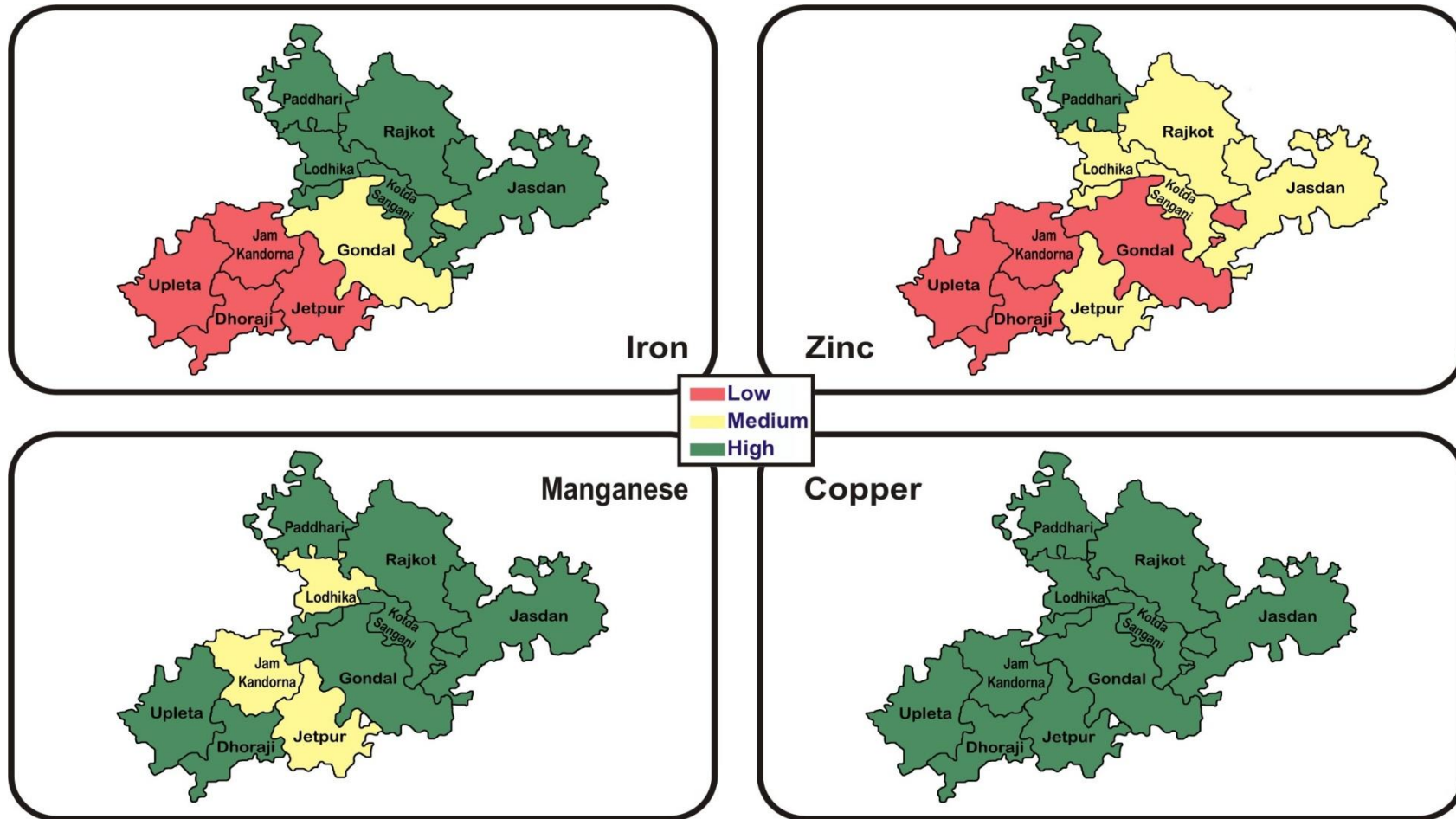
Annexure III b

Annexure III b: Soil map of major nutrient status



Status of major nutrients in soils of Rajkot District

Annexure III C: Soil map of micro nutrient status



Status of micronutrients in soils of Rajkot District