

State: GUJARAT

Agriculture Contingency Plan for District: JAMNAGAR

1.0 District Agriculture profile					
1.1	Agro-Climatic/Ecological Zone				
	Agro Ecological Sub Region (ICAR)	Western Plains, Katchch and Part of Kathiavar peninsula (2.4)			
	Agro-Climatic Zone (Planning Commission)	Gujarat Plains & Hills Region (XIII)			
	Agro Climatic Zone (NARP)	North Saurashtra Zone (GJ-6)			
	List all the districts or part thereof falling under the NARP Zone	Jamnagar, DevbhumiDwarka, Rajkot, Morbi, Surendranagar, part of Amreli&Bhavanagar			
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude	
		22° 28' 14.5236" N	70° 3' 27.8352" E	22.0m	
	Name and address of the concerned ZRS	Main Dry Farming Research Station, Junagadh Agricultural University, Targhadia (Dist. Rajkot) - 360003			
	Mention the KVK located in the district	KrishiVigyan Kendra, Air Force Road, Junagadh Agricultural University, Jamnagar-361 006			
1.2	Rainfall (Average of 2005-2014)	Normal RF (mm)	Normal Rainy days (number)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	789.7	30	2 nd Week of June	2 nd Week of September
	NE Monsoon(Oct-Dec):	-	-	-	-
	Winter (Jan- March)	-	-	-	-
	Summer (Apr-May)	-	-	-	-
	Annual	789.7	30	-	-

1.3	Land use pattern of the district (latest statistics) ('000 ha)	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)	602.55	386.384	28.03	89.87	44.92	32.07	10.2	3.12	7.09	0.35

Source: Statistical Report of District Panchayat of Jamnagar District

1.4	Major Soils(common names like red sandy loam deep soils (etc.,))*	Area ('000 ha)	Percent (%) of total
	1. Medium black to Shallow black soil (All six Talukas)	272	70.47
	2. Coastal alluvial (Jodia, Jamnagar)	74	19.17
	3.Hills soils (Kalavad, Jamjodhapur)	09	2.33
	4. Sandy Loam (Jodia, Jamnagar, Dhrol)	23	5.96
	Others (specify)	08	2.07
	Total	386	

Source: Comprehensive District Agriculture Plan, Jamnagar District (2012)

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	386.384	124.3
	Area sown more than once	93.700	
	Gross cropped area	480.1	

Source: (PMKSY) State Irrigation Plan (2016-20) by GGRC pp.15

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	177		
	Gross irrigated area	278.2		
	Rainfed area	201.9		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals	13	5.89	3.33
	Tanks	-	-	-
	Open wells	45169	57	32.20
	Bore wells	5758	110	62.15
	Lift irrigation schemes	-	-	-
	Minor irrigation		1.08	0.61
	Other sources, Ponds & Check dams		3.39	1.91
	Total Irrigated Area		177	
	Pump sets	43408		
	No. of Tractors	5315		

	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	-	-	-
	Semi- critical	3	53.20	Moderate saline
	Safe	3	46.80	-
	Wastewater availability and use	-	-	-
	Ground water quality	Saline groundwater with higher TDS, Sea water intrusion problem in coastal aquifers		
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

Source: Report of Jamnagar District Panchayat, Jamnagar, DAP of Jamnagar and SREP Report of Jamnagar(2012)

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

1.7	Sr.No.	Major field crops cultivated	Area ('000 ha)							Summer	Grand total
			Kharif			Rabi					
			Irrigated	Rainfed	Total	Irrigated	Rainfed	Total			
	1	Groundnut	-	208.9	208.9	-	-	-	4.5	213.4	
	2	Cotton	-	159.6	159.6	-	-	-	-	159.6	
	3	Castor	-	9.4	9.4	-	-	-	-	9.4	
	4	Wheat	-	-	-	7.979	-	7.979	-	7.979	
	5.	Chick pea				5.124		5.124		5.124	
	6	Pearl Millet	-	0.34	0.34	-	-	-	1.0	1.34	
	7.	Others (other oilseed crop & pluses)	-	45.2	45.2	37.5	-	37.5	1.0	83.7	
	Sr. No.	Horticulture crops - Fruits	Area ('000 ha)								
			Total								
	1	Mango	0.409								
	2	Pomegranate	0.484								
	3	Sapota	0.148								
	4	Lemon	0.209								
	5	Ber	0.173								
		Others (Coconut, Date palm, custard apple and Amla)	0.309								

Sr.No.	Horticulture crops - Vegetables	Total
1	Onion	0.268
2	Brinjal	0.595
3	Tomato	0.832
4	Lady Finger	1.058
5	Cluster bean	0.560
	Others vegetable (Guar, Choli etc)	1.017
Sr.No.	Spices, Medicinal and Aromatic crops	Total
1	Cumin	0.811
2	Coriander	0.862
3	Garlic	0.261
4	Pama Rosa	0.015
5	Chicory	0.235
	Others (specify)	
	Plantation crops	Total
1	Coconut	0.133
2	Rayan	0.021
3	Mosambi	0.031
4	Santra	0.005
5	Others	0.001
Sr.No.	Fodder crops	Total
1	Sorghum	12.2
2	Maize	3.4
3	Lucerne	1.3
	Others (Specify)	-
	Total fodder crop area	16.1
	Grazing land	44.92
	Sericulture etc	-
	Others (specify)	-

Source: Director of Agriculture, Dept. of Agriculture, Govt. of Gujarat, Gandhinagar and Deputy Director of Horticulture, Jamnagar (2010-11 to 2014-15) (For Horticulture crops, spices and vegetables data are for the year 2015-16)

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)	94.853	106.77	201.623
	Crossbred cattle	-	0.841	-
	Non descriptive Buffaloes (local low yielding)	2	156.839	158.839
	Graded Buffaloes	-	-	-
	Goat	09	111	120.0
	Sheep	49	85	134.0
	Others (Camel, Pig, Yak, dogs etc.)	-	-	4.50
	Commercial dairy farms (Number)	1		
1.9	Poultry	No. of farms	Total No. of birds ('000)	
	Commercial (Broiler)	13	74.420	
	Backyard	1450	17.722	

1.10	Fisheries (Data source: Chief Planning Officer)						
	A. Capture						
	i) Marine (Data Source: Fisheries Department)	No. of fishermen	Boats		Nets		Storage facilities (Ice plants etc.)
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
		15589	545	108	67624	13851	12
	ii) Inland (Data Source: Fisheries Department)	No. Farmer owned ponds		No. of Reservoirs		No. of village tanks	
		Nil		21		1	
	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)		5158.85	25.01	129			
Others		-	-	-			

Source: Report of Jamnagar District Panchayat, Jamnagar, DAP of Jamnagar and SREP Report of Jamnagar 2012

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

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)										
	Groundnut	283	1353	-	-	08.739	1942	291.739	1342	325
	Cotton	115	725 (Lint)	-	-	-	-	115	725(Lint)	200
	Castor	23.7	2932	-	-	-	-	23.7	2932	30
	Wheat	-	-	28.07	3518	-	-	90.9	3518	95
	Chick pea	-	-	6.148	1.199	-	-	6.148	1.199	07
	Pearl Millet	46.8	1375	-	-	22.5	2350	69.3	1861	86
	Others Pulses	23.26	517	17.5	1165	43.1	431	83.86	704	-
Major Horticultural crops (Crops to be identified based on total acreage)										
	Papaya	14.628	62090	-	-	-	-	14.628	62090	-
	Mango	-	-	-	-	3.227	8030	3.227	8030	-
	Ber	-	-	0.923	6280	-	-	0.923	6280	-
	Sapota	-	-	-	-	1.674	11252	1.674	11252	-
	Lemon	1.121	6754	-	-	-	-	1.121	6754	-
	Coconut	1.136	8543 nuts	-	-	-	-	1.136	8543 nuts	-
	Pomegranate	1.831	8985	-	-	-	-	1.831	8985	-

Source: Director of Agriculture, Dept. of Agriculture, Govt. of Gujarat, Gandhinagar and Deputy Director of Horticulture, Jamnagar (2010-11 to 2014-15) (For Horticulture crops, spices and vegetables data are for the year 2015-16)

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Groundnut	Cotton	Wheat	Pearl Millet	Castor
	Kharif- Rainfed	June 2 nd week to July 1 st week	June 2 nd week to July 1 st week	-	June 4 th week to July 3 rd week	July 2 nd week to Aug 2 nd week
	Kharif-Irrigated	-	June 1 st week to June 2 nd week	-	-	July 2 nd week to Aug 2 nd week
	Rabi- Rainfed	-	-	-	-	-
	Rabi-Irrigated	-	-	Nov. 2 nd week to Nov. 4 th week	Octo. 1 st week to Octo. 2 nd week (Semi-rabi)	-

1.13	What is the major contingency the district is prone to? (Tick mark)	Regular	Occasional	None
	Drought	-	√	-
	Flood	-	√	-
	Cyclone	-	√	-
	Hail storm	-	-	√
	Heat wave	-	-	√
	Cold wave	-	-	√
	Frost	-	-	√
	Sea water intrusion	√	-	-
	Pests and disease outbreak (specify)	√	-	-
	Pests- Cotton:Aphid, Jassid, Thrips,Pink ball worm, White fly Ground nut : White grub,Aphid, Jassid, Thrips Sesame: Leaf binder, Gall fly, Mite Castor: Semi looper, Prodenia, White fly, Leaf minor, Capsule borer Acid lime: White fly,& Fruit fly			
	Diseases- Mango: Powdery Mildew Cotton: Angular leaf spot, Wilt Groundnut: Collar rot ,Rust, Tikka, Downy Mildew Sesame: Wilt, Phylody, Root rot Castor: Wilt, Stem rot, Root rot			
	Others (specify)	-	-	-

1.14	Include Digital maps of the district		
		Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure II	Enclosed: Yes
		Map of mean annual rainfall (1984-85 to 2013-14) of Jamnagar District	Enclosed: Yes
		Soil map as Annexure IIIa, IIIb & IIIc	Enclosed: Yes

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

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 2 weeks (June 4 th week)	Medium Black & Shallow Black Soil (All six Talukas)	Groundnut (Spreading Semi-spreading) (Spreading GG10, 11, GJG 17, 31 and Semi spreading GG 20,GJG-22)	No change	• As per crop follow the package of practices	-
		Cotton (Cotton hybrid 4,6,8,10, GJC 101 & Govt. approved Bt. hybrids)	No change	• As per crop follow the package of practices	-
		Pearl Millet GHB 558,GHB 538, GHB744, GHB 732, GHB 905	No change	• As per crop follow the package of practices	
		Castor GC 3, GCH 4,6,7	No change	• As per crop follow the package of practices	-
	Coastal Alluvial (Jodia, Jamnagar)	Cotton (Cotton hybrid 4,6,8,10, GJC 101 & Govt. approved Bt. hybrids)	No change	• As per crop follow the package of practices	-
		Pearl Millet GHB 558,GHB 538, GHB744, GHB 732, GHB 905	No change	• As per crop follow the package of practices	-
		Castor GC 3, GCH 4,6,7	No change	• As per crop follow the package of practices	-

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 4 weeks (July 2nd week)	Medium Black & Shallow Black Soil (All six Talukas)	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 45 cm and 60 cm row spacing for bunch and semi spreading groundnut 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), Agricultural University, and Gujcomasol.
		Cotton	<ul style="list-style-type: none"> No change 	<ul style="list-style-type: none"> As per crop follow the package of practices. 	
		Pearl Millet	<ul style="list-style-type: none"> Prefer variety GHB 538 	<ul style="list-style-type: none"> As per crop follow the package of practices. 	
		Castor	<ul style="list-style-type: none"> No change 	<ul style="list-style-type: none"> As per crop follow the package of practices. 	
	Coastal Alluvial (Jodia, Jamnagar)	Cotton	<ul style="list-style-type: none"> No change 	<ul style="list-style-type: none"> As per crop follow the package of practices. 	
		Pearl Millet	<ul style="list-style-type: none"> Prefer variety GHB 538 	<ul style="list-style-type: none"> As per crop follow the package of practices. 	
		Castor	<ul style="list-style-type: none"> No change 	<ul style="list-style-type: none"> As per crop follow the package of practices. 	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 6 weeks (July 4th week)	Medium Black & Shallow Soil (All six Talukas)	Groundnut (Spreading & Semi spreading)	<ul style="list-style-type: none"> 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) Pearl Millet (GHB 538) 	<ul style="list-style-type: none"> As per crop change follow the package of practices (other than groundnut) 	<ul style="list-style-type: none"> Agencies for quality seed supply National (NSC), Gujarat State Seed Corporation (GSSC), University, and Gujcomasol. zero till seed drill, seed dressing equipment, 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)	<ul style="list-style-type: none"> As per crop change follow the package of practices 	
		Pearl Millet	No change	<ul style="list-style-type: none"> Follow the package of practices 	
		Castor	No change	<ul style="list-style-type: none"> As per crop follow package of practices 	
	Coastal Alluvial soils (Jodia, Jamnagar)	Cotton	<ul style="list-style-type: none"> 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) Pearl Millet (GHB 538) 	<ul style="list-style-type: none"> As per crop follow package of practices 	
		Pearl Millet	Prefer variety GHB 538	<ul style="list-style-type: none"> As per crop follow package of practices 	
		Castor	No change	<ul style="list-style-type: none"> As per crop follow package of practices 	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 8 weeks (August 4th week)	Medium Black & Shallow Black Soils (All six Talukas)	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	<ul style="list-style-type: none"> • Agencies for quality seed supply National (NSC), Gujarat State Seed Corporation (GSSC), University, and Gujcomsol. • zero till seed drill, seed dressing equipment, Sprayers & dusters to farmers through government schemes (Implements like seed drill and seed dressing are available in 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	
		Pearl Millet	Prefer variety GHB 538	• As per crop follow package of practices	
		Castor	No change	• As per crop follow package of practices	
	Costal Alluvial (Jodia, Jamnagar)	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	
		Pearl Millet	Prefer variety GHB 538	• As per crop follow package of practices	
		Castor	No change	• As per crop follow package of practices	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			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 & Shallow black Soils (All six Talukas)	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.
		Pearl Millet	<ul style="list-style-type: none"> Gap filling to maintain 10 cm plant to plant spacing 	<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.
		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.
	Costal Alluvial (Jodia, Jamnagar)	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
		Pearl Millet	<ul style="list-style-type: none"> Gap filling to maintain 10 cm plant to plant spacing 	<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.
		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			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation	Normal Crop/ cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At vegetative stage	Medium Black & Shallow soils (All six Talukas)	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 and pesticide through Govt. scheme. • Ensure electric supply for life saving irrigation by PGVCL • Supply of urea through Govt. schemes
		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) 	
		Pearl Millet	<ul style="list-style-type: none"> • Weeding/Thinning to maintain 10 cm plant to plant spacing 	<ul style="list-style-type: none"> • Interculturing • Spray 1% N through urea after relief of drought 	
		Castor	<ul style="list-style-type: none"> • Weeding/ • Protection against sucking pest (To control Jassid spray dimetheote @ 10ml/10l water) or imidacloprid @ 4 ml / 10 litre water • Spray cypermethrin 25% EC @ 10 ml/10 litre for management of semilooper 	<ul style="list-style-type: none"> • Inter culturing, • Avoid top dressing of urea 	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
	Costal Alluvial (Jodia, Jamnagar)	Pearl Millet	<ul style="list-style-type: none"> Weeding/Thinning to maintain 10 cm plant to plant spacing 	<ul style="list-style-type: none"> Inter culturing, Avoid top dressing of urea 	<ul style="list-style-type: none"> Supply of urea through Govt. schemes. Ensure electric supply for life saving irrigation by PGVCL -
		Castor	<ul style="list-style-type: none"> Weeding/ Protection against sucking pest (To control Jassid spray dimethoate @ 10ml/10l water) or imidacloprid @ 4 ml / 10 litre water Spray cypermethrin 25% EC @ 10 ml/10 litre for management of semilooper 	<ul style="list-style-type: none"> Inter culturing, Avoid top dressing of urea 	
Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At flowering/ fruiting stage	Medium Black & Shallow soils (All six Talukas)	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 chlorpyrifos in 100 kg sand and broadcast) 	Spray kaolin @ 4% (400g/10 lit. water)	<ul style="list-style-type: none"> Ensure electric supply for life saving irrigation by PGVCL
		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)	
		Pearl Millet	<ul style="list-style-type: none"> Supplemental irrigation if possible Harvest non flowering plants for fodder purpose if water is not available 	<ul style="list-style-type: none"> Avoid top dressing of urea 	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
		Castor	<ul style="list-style-type: none"> Weeding, Supplement irrigation if possible. Protection against sucking pest (To control Jassid spray dimetheote @ 10ml/10l water) or imidacloprid @ 4 ml / 10 litre water Spray cypermethrin 25% EC @ 10 ml/10 litre for management of Capsule borer and semi looper Protection against sucking pest (To control Jassid spray dimetheote @ 10ml/10litre water) 	<ul style="list-style-type: none"> Avoid top dressing of urea 	<ul style="list-style-type: none">
	Costal Alluvial (Jodia, Jamnagar)	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)	<ul style="list-style-type: none"> Supply of urea through Govt. schemes
		Pearl Millet	<ul style="list-style-type: none"> Supplemental irrigation if possible Harvest non flowering plants for fodder purpose if water is not available 	<ul style="list-style-type: none"> Avoid top dressing of urea 	
		Castor	<ul style="list-style-type: none"> Weeding, Supplement irrigation if possible. Protection against sucking pest (To control Jassid spray dimetheote @ 10ml/10l water) or imidacloprid @ 4 ml / 10 litre water Spray cypermethrin 25% EC @ 10 ml/10 litre for management of Capsule borer and semi looper Protection against sucking pest (To control Jassid spray dimetheote @ 10ml/10litre water) 	<ul style="list-style-type: none"> Avoid top dressing of urea 	

Condition	Major Farming situation	Normal Crop/ cropping system	Suggested Contingency measures		
			Crop management	Rabi Crop planning	Remarks on Implementation
Terminal drought (Early withdrawal of monsoon)	Medium Black & Shallow Black soils (All six Talukas)	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 electric supply 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) 	-	
		Pearl Millet	<ul style="list-style-type: none"> • Supplemental irrigation if possible • Harvest non flowering plants for fodder purpose if water is not available 	-	
		Castor	<ul style="list-style-type: none"> • Harvest mature spike • Remove dry plants • Lifesaving irrigation if possible 	-	
	Costal Alluvial (Jodia, Jamnagar)	Cotton	<ul style="list-style-type: none"> • Harvest mature bolls. Supplemental irrigation. • Spray kaolin @ 4% (400 g/10 lit. water) 	-	<ul style="list-style-type: none"> • Ensure electric supply for life saving irrigation by PGVCL
		Pearl Millet	<ul style="list-style-type: none"> • Supplemental irrigation if possible • Harvest non flowering plants for fodder purpose if water is not available 	-	
		Castor	<ul style="list-style-type: none"> • Harvest mature spike • Remove dry plants • Life saving irrigation if possible 	-	

2.1.2 Drought - Irrigated situation

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall	Medium Black & Shallow black soils (All six Talukas)	Wheat	No Change	<ul style="list-style-type: none"> Avoid wheat sowing 	
		Wheat	<ul style="list-style-type: none"> Delay sowing upto 4th week of November for prevailing cropping patterns There after adopt late sowing varieties like GW-173 of wheat. 	<ul style="list-style-type: none"> Conjunctive use of groundwater/harvested water and canal water Use MIS on community base 	
		Coriander	<ul style="list-style-type: none"> Delay sowing upto 4th week of November for prevailing cropping patterns 	<ul style="list-style-type: none"> Conjunctive use of groundwater/harvested water and canal water Use MIS on community base 	
		Cumin	<ul style="list-style-type: none"> Delay sowing upto 4th week of November for prevailing cropping patterns 	<ul style="list-style-type: none"> Conjunctive use of groundwater/harvested water and canal water Use MIS on community base 	
	Costal Alluvial (Jodia, Jamnagar)	NA			

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in canals due to low rainfall	Medium Black & shallow black Soils	NA			
	Costal Alluvial				

Condition	Major Farming situation	Normal 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 & shallow black Soils	NA			
	Costal Alluvial				

Condition	Major Farming situation	Normal 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 & shallow black Soils	NA			
	Costal Alluvial				

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	Medium Black & Shallow Black soils (All six Talukas)	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 	<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.

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
		Coriander/Cumin	No change	<ul style="list-style-type: none"> Adoption of MIS. Reduce area of irrigation Give irrigation during night times to reduce transpiration. 	<ul style="list-style-type: none"> Construction of well recharge structure. Timely use of MIS and seed through Govt. scheme
	Costal Alluvial (Jodia, Jamnagar)	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.
		Coriander/Cumin	No change	<ul style="list-style-type: none"> Adoption of MIS. Reduce area of irrigation Give irrigation during night times to reduce transpiration. 	<ul style="list-style-type: none"> Construction of well recharge structure. Timely use of MIS and seed through Govt. scheme

2.2 Unusual rains (untimely, unseasonal etc) (for both rainfed 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				
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				
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"> • Provide drainage • Harvest mature 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
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.
Pearl Millet	<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"> • Provide drainage • Harvest mature ear heads 	<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.

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.
Horticulture				
Mango	<ul style="list-style-type: none"> • Provision of drainage. • Spray 0.005% hexaconazole (10ml /10 lit water) for control leaf blight under unusual rains with cloudy weather 	<ul style="list-style-type: none"> • Spray 0.2% (27g/10 lit water) wettable sulphur or 0.005% hexaconazole (10ml /10 lit water) for protection against powdery mildew after cessation of heavy rain. 	<ul style="list-style-type: none"> • Harvest at pre maturity stage • Hang methyle euginol trap, one/acre for control of fruit fly. 	<ul style="list-style-type: none"> • Unripe fruit may be used for pickles.

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"> • Provision of drainage. • Fertilizer application. • Control thrips with profenophos 50% EC @ 20ml/10 lit under unusual rains with cloudy weather 	<ul style="list-style-type: none"> • Provision of drainage. • Fertilizer application. • Control thrips with profenophos 50% EC @ 20ml/10 lit under unusual rains with cloudy weather 	<ul style="list-style-type: none"> • Provision of drainage. • Rape fruit with protection bag • Spray carbendazim to prevent rotting • Spray boron to reduce fruit cracking 	-

Heavy rainfall with high speed winds in a short span	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
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.
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.

Heavy rainfall with high speed winds in a short span	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
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. • 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.
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"> • Provide drainage • Harvest mature 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
Pearl Millet	<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.
Horticulture				
Mango	-	<ul style="list-style-type: none"> • Spray 0.2% wettable sulphur or 0.005% hexaconazole for protection against powdery mildew. 	<ul style="list-style-type: none"> • Collect fallen fruits 	<ul style="list-style-type: none"> • Unripe fruit may be used for pickles
Pomegranate	<ul style="list-style-type: none"> • Provision of drainage. • Fertilizer application. • Control thrips with profenophos 50% EC @ 20ml/10 lit under unusual rains with cloudy weather 	<ul style="list-style-type: none"> • Provision of drainage. • Fertilizer application. • Control thrips with profenophos 50% EC @ 20ml/10lit under unusual rains with cloudy weather 	<ul style="list-style-type: none"> • Provision of drainage. • Rape fruit with protection bag • Spray carbendazim to prevent rotting • Spray boron to reduce fruit cracking 	-

Outbreak of pests and diseases due to unseasonal rains	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
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 	-
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, Quanalphosh 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, Quanalphosh 25 EC @ 600 ml/ha. 	-
Castor	-	<ul style="list-style-type: none"> • Protection against sucking pest (To control Jassid spray dimetheoate @ 10ml/10l water or Imidacloprid @ 3 m/10 lit) • Spray Cypermethrin to control Semi looper @ 10 ml / 10 lit 	<ul style="list-style-type: none"> • Harvest the crop at Physiological maturity stage, • No measure for seed shattering 	-
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 chlorpyriphos 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. 	-
Pearl Millet	-	-	-	-
Horticulture				
Mango	<ul style="list-style-type: none"> • Control of Leaf blight under unusual rains with cloudy weather 	<ul style="list-style-type: none"> • Spray 0.2% wettable sulphar • For protection against powdery mildew after cessation of heavy rain 	<ul style="list-style-type: none"> • Hang methyl eugenol poison trap. one/acre for control of fruit fly 	-
Pomegranate	<ul style="list-style-type: none"> • Control thrips with profenophos 50% EC @ 20ml/10 lit under unusual rains with cloudy weather 	<ul style="list-style-type: none"> • Control thrips with profenophos 50% EC @ 20ml/10 lit under unusual rains with cloudy weather 	<ul style="list-style-type: none"> • Rape fruit with protection bag • Spray carbendazim to prevent rotting • Spray boron to reduce fruit cracking 	-

2.3 Floods

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation				
Groundnut	NA	As preventive step, open drainage channel		-
Pearl Millet	NA	As preventive step, open drainage channel		
Cotton	NA	As preventive step, open drainage channel		
Pulses	NA	As preventive step, open drainage channel		
Continuous submergence for more than 2 days				
Groundnut	<ul style="list-style-type: none"> As a preventive step open drainage channel followed by spray 0.05% carbendazim for control of leaf spot 	<ul style="list-style-type: none"> As a preventive step open drainage channel followed by spray 1% FeSO₄ + 0.1% citric acid or control of yellowing 0.0025% hexaconazole for rust & leaf spot management 	<ul style="list-style-type: none"> As a preventive step open drainage channel followed by spray 1% FeSO₄ + 0.1% citric acid for control of yellowing 0.0025% hexaconazole for rust & leaf spot management 	-
Cotton	<ul style="list-style-type: none"> As a preventive step open drainage channel and supply 199 kg/ha ammonium sulphate 	<ul style="list-style-type: none"> As a preventive step open drainage channel and supply 199 kg/ha ammonium sulphate 	<ul style="list-style-type: none"> As a preventive step open drainage channel and supply 199 kg/ha ammonium sulphate 	-
Pearl Millet	<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. 	<ul style="list-style-type: none"> Harvest mature ear head
Pulses	<ul style="list-style-type: none"> As a preventive step open drainage channel followed by spray 0.05% carbendazim or 0.0025% hexaconazole for control of powdery mildew 	<ul style="list-style-type: none"> As a preventive step open drainage channel followed by spray 0.05% carbendazim or 0.0025% hexaconazole for control of powdery mildew 	<ul style="list-style-type: none"> As a preventive step open drainage channel followed by spray 0.05% carbendazim or 0.0025% hexaconazole for control of powdery mildew 	<ul style="list-style-type: none"> Harvest mature ear head
Horticulture				
Mango	<ul style="list-style-type: none"> Shift to safe place and 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 and 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

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

Extreme event type	Suggested contingency measurer			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave	Light & frequent irrigation to all crops	Light & frequent irrigation to all crops	Light & frequent irrigation to all crops	-
Cold wave	NA			
Frost	NA			
Hailstorm	NA			
Cyclone				
Wheat	<ul style="list-style-type: none"> Quick drainage 	<ul style="list-style-type: none"> Quick drainage 	<ul style="list-style-type: none"> Quick drainage and spray mancozeb 0.2% to control black point in grain 	<ul style="list-style-type: none"> Shift produce to a safer place
Cumin/coriander	<ul style="list-style-type: none"> Quick drainage 	<ul style="list-style-type: none"> Quick drainage 	<ul style="list-style-type: none"> Quick drainage 	
Cotton	<ul style="list-style-type: none"> Earthing up & Quick drainage 	<ul style="list-style-type: none"> Earthing up & Quick drainage 	<ul style="list-style-type: none"> Earthing up & Quick drainage 	
Castor	<ul style="list-style-type: none"> Earthing up & Quick drainage 	<ul style="list-style-type: none"> Earthing up & Quick drainage 	<ul style="list-style-type: none"> Earthing up & Quick drainage 	
Groundnut	<ul style="list-style-type: none"> Quick drainage 	<ul style="list-style-type: none"> Quick drainage 	<ul style="list-style-type: none"> Quick drainage 	
Sea water intrusion	<ul style="list-style-type: none"> Quick drainage & apply additional irrigation with good quality water 	<ul style="list-style-type: none"> Quick drainage & apply additional irrigation with good quality water 	<ul style="list-style-type: none"> Quick drainage & apply additional irrigation with good quality water 	-

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

	Suggested contingency measures		
	Before the event	During the event	After the event
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
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 unteather 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 unteather 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%).
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.
Heat wave and cold wave	NA	NA	NA
Heat wave	NA	NA	NA

^a based on forewarning wherever available

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.
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"> - 	<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.
Suggested contingency measures				Convergence/linkages with

	Before the event	During the event	After the event	ongoing programs, if any
Drinking water	-	• Add bleaching powder to drinking water (1%).	• Add bleaching powder to drinking water (1%).	-
Health and disease management	• Cover birds under insurance	• For suspected cases give antibiotics.	• Dispose dead birds by burning.	-
• Heat wave and cold wave				
• Heat wave				
Shelter/environment management.	Arrangement of good ventilation by fan, foggers.	• Operate fans, foggers; keep open ventilators in night and cool period.	• Routine practices are to be followed.	-
Health and disease management	Cover birds under insurance	• Viral vaccination add calcium in the poultry feed.	• Routine practices are to be followed.	-
Cold wave				
Shelter/environment management	NA	NA	NA	-
Health and disease management	NA	NA	NA	-

^a based on forewarning wherever available

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event ^a	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	• Desilting/deepening of pond so that more water can be stored	• Provision of additional bore wells. Use Euryhaline species.	• Maintaining pond water level at least 1 m depth.
(ii) Impact of salt load build up in ponds / change in water quality	• Replenishment of water in pond with fresh water.	• 30 % exchange of water.	• 10 % exchange of water.

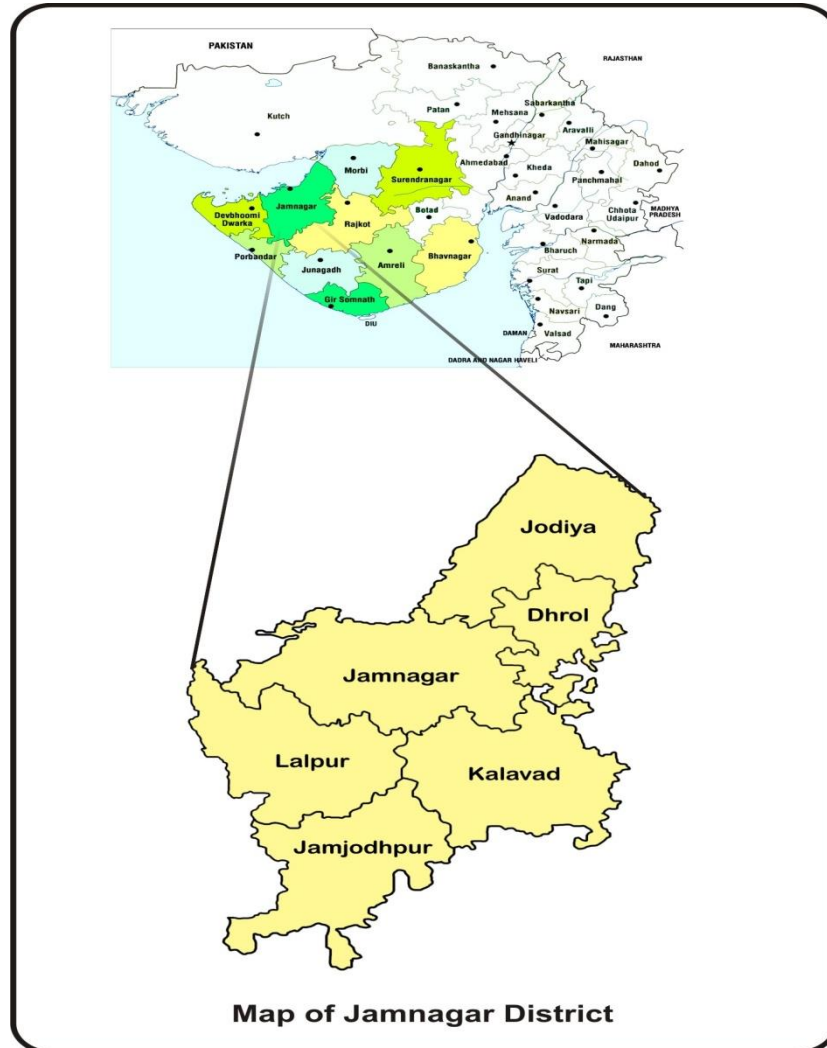
	Suggested contingency measures		
	Before the event ^a	During the event	After the event
(iii) Any other	-	-	-
2) Floods			
A. Capture			
Marine	NA	NA	NA
Inland	NA	NA	NA
B. Aquaculture			
(i) Inundation with flood water.	<ul style="list-style-type: none"> • Deepening of ponds, repair, strengthening of 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.
(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. 	-do-
(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"> • Repaire & maintenance of aqua structures to begiven.
(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"> • Forwarning systems to be installed. • Insurance & communication instruments supplied to fisher man. • 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.

	Suggested contingency measures		
	Before the event^a	During the event	After the event
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 to be given.
(vi) Any other	-	-	-
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	-	-	-

^a based on forewarning wherever available

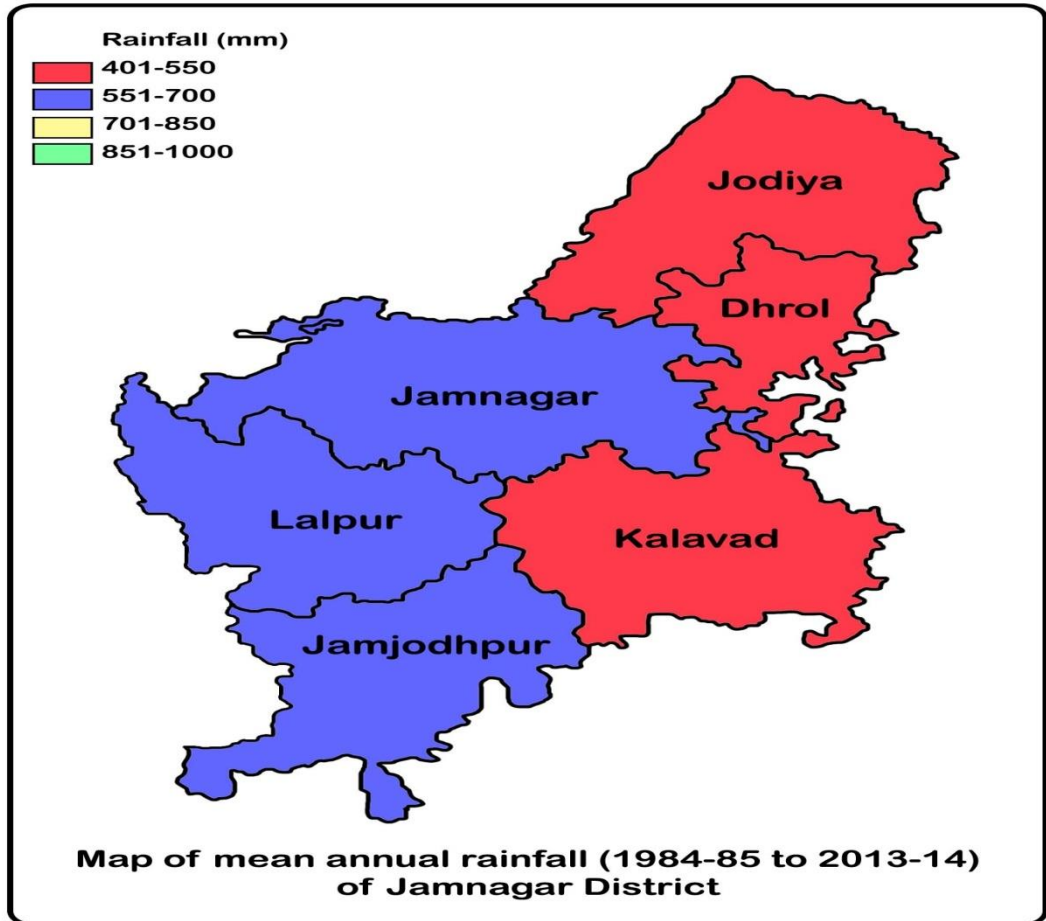
ANNEXURE I

Location map of Jamnagar district



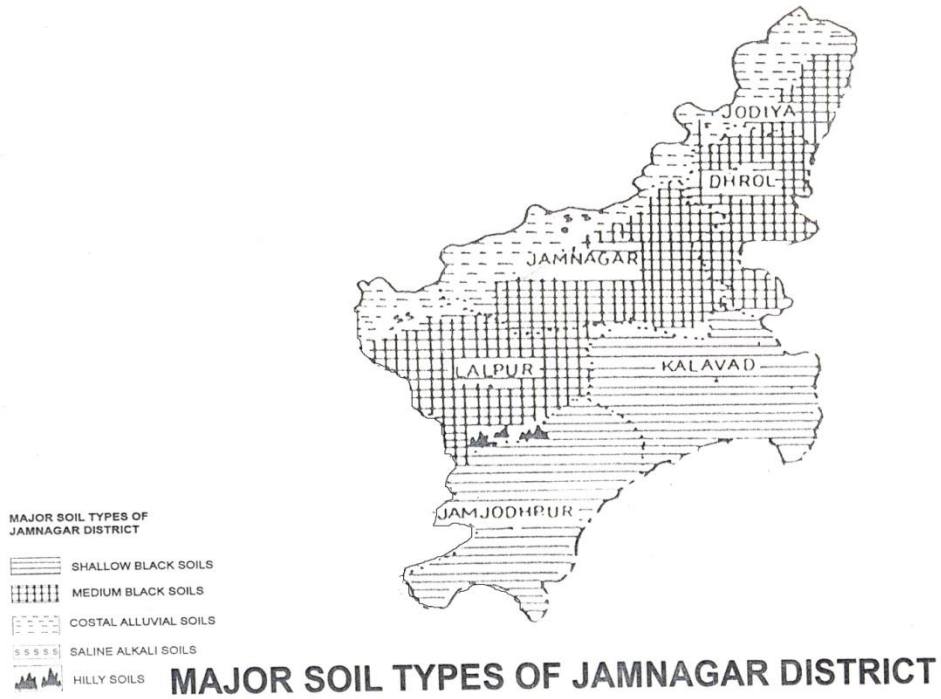
ANNEXURE II

Mean annual rainfall of map



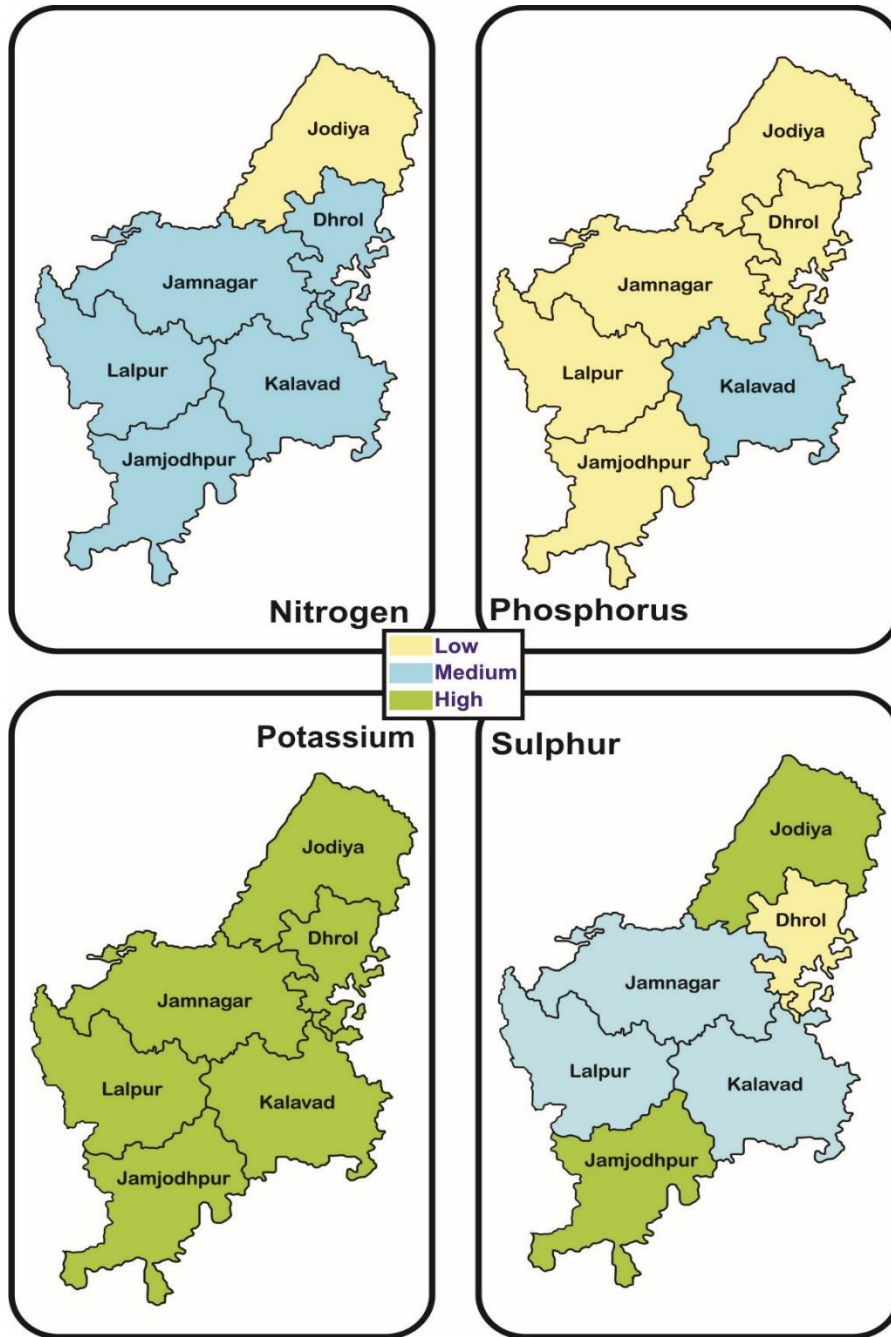
ANNEXURE III

Annexure III a Soil map of the district



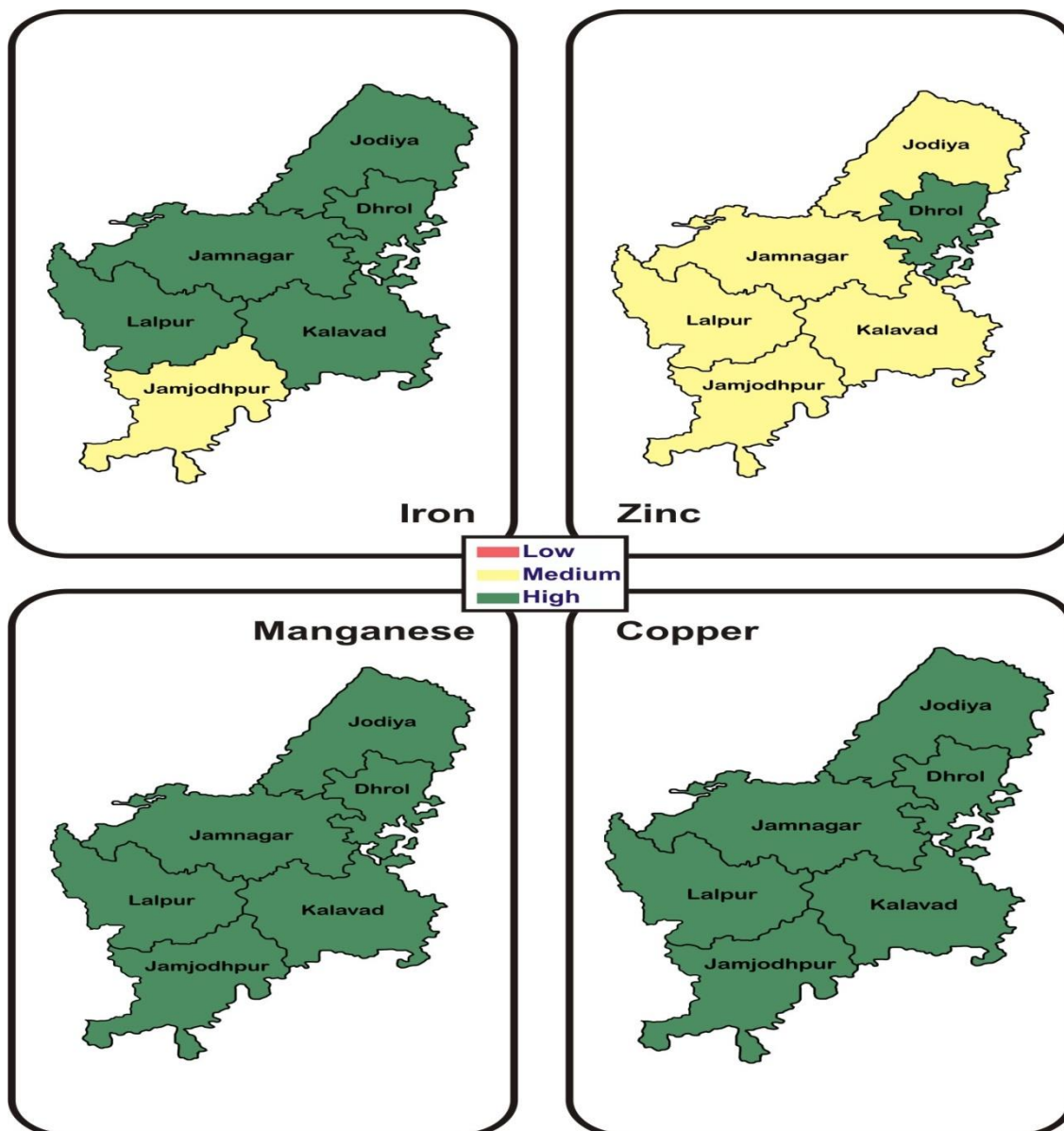
ANNEXURE III

Annexure III b: Soil map of major nutrient status



Status of nutrients in soils of Jamnagar District

Annexure III c: Soil map of micro nutrient status



Status of micronutrients in soils of Jamnagar District