

State: GUJARAT

Agriculture Contingency Plan for District: AMRELI

1.0 District Agriculture profile					
1.1	Agro-Climatic/Ecological Zone				
	Agro Ecological Sub Region (ICAR)	Cetral Highlands (Malwa), Gujarat Plan and Kathiawar Peninsula, Semi-Arid Eco-Region(5.3)			
	Agro-Climatic Zone (Planning Commission)	Gujarat Plains and Hills Region (XIII)			
	Agro Climatic Zone (NARP)	North Saurashtra (GJ-6) South Saurashtra (GJ-7)			
	List all the districts or part thereof falling under the NARP Zone	Amreli, Rajkot, Jamnagar, Suredranagar, Bhavnagar, Junagadh, Porbandar, Morbi, GirSomnath, Devbhumi Dwarka and Botad			
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude	
		21 ^o .3579" N	71 ^o .1282" E	130 m	
	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, Keria Road, Amreli-365 601			
1.2	Rainfall (Av. of 2005-06 to 2014-15)	Normal RF(mm)	Normal Rainy days (number)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	824	34	2 nd Week of June	4 th Week of September
	NE Monsoon (Oct-Dec):	-	-	-	-
	Winter (Jan- March)	-	-		
	Summer (Apr-May)	-	-		
	Annual	824	34		

Source: Agricultural Research Station, JAU, Amreli

1.3	Land use pattern of the district (latest statistics)	Geographical area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area ('000 ha)	736.46	549.95	40.60	46.10	54.32	12.06	0.0	14.29	14.65	14.29

Source: Report, District Panchayat, Agricultural Department (2010-11)

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 soils	491.51	66.73
	2. Saline soil (heavy texture) Amreli, Liliya&Lathi)	190.40	25.85
	3. Coastal alluvial (Rajula and Jafrabad)	54.62	7.42
	4. Others (specify):	-	-

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	522.99	125.33
	Area sown more than once	132.40	
	Gross cropped area	655.39	

Source: District Irrigation Plan, PMKSY (2016)

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	92.91		
	Gross irrigated area	189.17		
	Rainfed area	439.90		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals	-	2.17	2.33
	Tanks	-	-	-
	Open wells	103764	66.75	71.84
	Bore wells	110594	20.64	22.21
	Lift irrigation schemes	-	-	-
	Minor-irrigation	-	2.10	1.28
	Other sources, Ponds & Check dams	-	3.35	3.62
	Total Irrigated Area	-	92.91	100
	Pump sets	78921		
	No. of Tractors	13279		

	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	0	0	
	Critical	0	0	
	Semi- critical	1	8.08	Moderate saline, fluoride
	Safe	10	91.92	Safe
	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%				

1.7 Area under major field crops & horticulture (Average of five years: 2010-11 to 2014-15)

1.7	Sr. No.	Major field crops cultivated	Area ('000 ha)							
			<i>Kharif</i>			<i>Rabi</i>			Summer	Grand total
			Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
1	Groundnut	0.55	129.28	129.83	-	-	-	4.00	133.89	
2	Cotton	-	336.70	336.70	-	-	-	-	336.70	
3	Wheat	-	-	-	27.88	-	27.88	-	27.88	
4	Pearlmillet	-	5.63	5.63	-	-	-	1.24	6.87	
5	Pulses	0.88	4.55	5.42	2.68	-	2.68	1.37	9.47	
	Others (specify)	0.10	-	0.10	-	-	-	-	0.10	
	1.Sugarcane	-	-	-	-	-	-	-	-	
	2. Other Oilseeds Sesame	-	9.00	9.00	-	-	-	3.20	12.20	
	Castor	1.98	-	1.98	-	-	-	-	1.98	

1.7	Sr. No.	Horticulture crops (2015-16)	Total
	1	Mango	6.89
	2	Sapota	0.55
	3	Acid lime	0.62
	4	Banana	0.28
	Others (specify)	Ber and Guava	0.44
	Sr. No.	Vegetables	Total Area ('000 ha)
	1	Onion	4.20
	2	Garlic	1.40
	3	Cucurbits	1.10
	4	Tomato	1.01
	Others (specify)	Brinjal, Cow pea, Cabbage, Cauliflower, Okra and Cluster bean	3.50
	Sr. No.	Medicinal and Aromatic crops	Total Area ('000 ha)
	1	Isabgul	-
	2	Cumin	1.20
	3	Coriander	0.50
	4	Fenugreek	0.11
	Others	Chilli and Ajawain	0.34
	Sr. No.	Plantation crops	Total Area ('000 ha)
	1	Coconut	0.15
	Others (Specify)	eg., industrial pulpwood crops etc.	-
	Sr. No.	Fodder crops	Total Area ('000 ha)
	1	Sorghum	29.89
	2 Other (specify)	Maize	11.96
		Gross fodder crop area	41.85
	3	Grazing land	54.31
	4	Sericulture etc	-

Source: Statistical reports, District Panchayat, 2010-11 to 2014-15 & Director of Horticulture, Govt. of Gujarat-2015-16)

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)			311.9
	Crossbred cattle	-	-	-
	Non descriptive Buffaloes (local low yielding)	21.15	219.59	240.75
	Graded Buffaloes	-	-	-
	Goat		131.24	131.24
	Sheep		104.04	104.04
	Others (Camel, Pig, Yak, horse etc.)		8.60	8.60
	Commercial dairy farms (Number)			3.0

1.9	Poultry	No. of farms	Total No. of birds ('000)
	Commercial	1	1.90
	Backyard	-	10.68

1.10	Fisheries						
	A. Capture						
	i) Marine	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)	
		13800	930	220	4134	-	24 cold storage & Ice units
	ii) Inland	No. Farmer owned ponds		No. of Reservoirs		No. of village tanks	
			424		8		13
	B. Culture						
				Water Spread Area (ha)	Yield (t/ha)	Production ('000 tons)	
	i) Brackish water			-	-	200.77	
	ii) Fresh water			5732	-	0.30	

Source: Reports C-DAP(2012),Marine Products Exports Development Authority (MPEDA) and Fisheries Department, 2012

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

1.11	Name of crop	<i>Kharif</i>		<i>Rabi</i>		Summer		Total		Crop residue as fodder ('000 tons)
		Production ('000 t)	Productivity (kg/ha)							
Major Field crops (Crops to be identified based on total acreage)										
	Cotton (Lint)	759.71	1026	-	-	-	-	759.71	1026	1984.31
	Groundnut	146.32	907	-	-	7.90	2021	154.22	950	204.20
	Wheat	-	-	105.19	3694	-	-	105.19	3694	221.95
	Pulses	6.12	532	3.49	1302	0.91	676	10.52	1095	17.95
	Pearlmillet	8.54	1481	-	-	2.91	2388	11.45	1595	29.93
	(Others)									
	1 Sesame	3.07	341	-	-	3.08	964	6.15	504	10.61
	2 Castor	4.24	2084	-	-	-	-	4.24	2084	8.90
	3 Sugarcane	0.70	7110	-	-	-	-	0.70	7110	0.21
Major Horticultural crops (Crops to be identified based on total acreage)										
	Mango	-	-	-	-	45.35	6750	45.35	6750	-
	Sapota	-	-	-	-	4.29	7650	4.29	7650	-
	Acid lime	4.09	8280	-	-	-	-	4.09	8280	-
	Coconut	1.16	8200 (nuts/ha)	-	-	-	-	1.16	8200 (nuts/ha)	-
	Banana	4.50	32730	-	-	-	-	4.50	32730	-
Others	1 Ber	-	-	1.46	8550	-	-	1.46	8550	-
	2 Guava	-	-	-	-	2.46	9690	2.46	9690	-
Major Vegetable crops (Crops to be identified based on total acreage)										
	Onion	-	-	94.56	27312	-	-	94.56	27312	-
	Brinjal	-	-	25.47	14392	-	-	25.47	14392	-
	Tomato	-	-	24.10	18468	-	-	24.10	18468	-
	Cowpea	7.91	9024	-	-	-	-	7.91	9024	-
	Okra	6.59	5940	-	-	-	-	6.59	5940	-
Others	Cluster bean	5.72	5420	-	-	-	-	5.72	5420	-

Source: Statistical reports, District Panchayat, 2010-11 to 2014-15 & Director of Horticulture, Govt. of Gujarat-2015-16)

1.12	Sowing window for major field crops (start and end of normal sowing period)	Groundnut	Cotton	Wheat	Sesame	Pearlmillet	Green gram
	<i>Khariif</i> - Rainfed	June 2 nd week to July 1 st week	2 th week of June to 2 nd week of July	-	June 2 nd week to July 2 nd week	2 nd week of June to 2 nd week of July	June 2 nd week to July 2 nd week
	<i>Khariif</i> -Irrigated	-	4 th week of May to 1 st of June	-	-	-	-
	Rabi/Summer-Irrigated	-	-	Nov. 2 nd week to Nov.4 th week	Feb.3 rd week to Feb.4 th week	Feb.1 st week to Feb.3 rd week	Feb.2 nd week to Feb.3 rd week

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 (Rajula&Jafrabad)	√	-	-
	Pests and disease outbreak (specify) Pests-Aphid, Jassid, Thrips, white fly, Mealy bug, scale insect, early shoot borer, heliothis, leaf roller, white grub, pink boll worm Diseases-Wilt, Red rot, Rust, Tikka & Downy Mildew, collar rot	√	-	-
Others (specify)	-	-	-	

1.14	Include Digital maps of the district for	Location map of district within State as Annexure-1	Enclosed: Yes
		Mean annual rainfall of district as Annexure- 2a	Enclosed: Yes
		Mean annual rainfall of Amreli district Annexure 2b :	Enclosed: Yes
		Soil map of district as Annexure- 3a	Enclosed: Yes
		Micro nutrient status soil map of district as Annexure- 3b	Enclosed: Yes
		Nutrient status soil map of district as Annexure- 3c	Enclosed: Yes

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition		Suggested Contingency measures			
Early season drought (delayed onset)	Major Farming situation	Normal Crop/ Cropping system	Change in crop/cropping system including variety	Agronomic measures	Remarks on Implementation
Delay by 2 weeks (June 4 th week)*	Medium to shallow black soils	Groundnut (Spreading GG10, 11, GJG 17, 31 and Semi spreading GG 20,GJG-22)	No change	• Follow Package of practices	Seed source: National Seed Corporation (NSC). Gujarat State Seed Corporation (GSSC), Gujarat state Cooperative Marketing Federation (GUJCOMASOL), State Agril. Universities
		Cotton (Cotton hybrid 4,6,8,10, GJC 101 & Govt. approved Bt. hybrids)	No change		
		Sesame (GT-2,3,4)	No change		
		Pearlmillet (GHB-558, 577, 538, 719, 744, 732 and Govt. approved hybrids)	No change		
		Green gram (GM-4)	No change		
	Coastal alluvial & saline soils	Groundnut (Spreading & Semi spreading) (GG10, 11, GJG 17, 31 GG 20,GJG-22)	No change		
		Pearlmillet	No change		

Condition		Suggested Contingency measures			
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 4 weeks (July 2 nd week)	Medium to shallow 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	• Keep 45cm and 60cm row spacing for bunch and semi-spreading varieties respectively. • Other practices will be as such.	Seed source: National Seed Corporation (NSC). Gujarat State Seed Corporation (GSSC), Gujarat state Cooperative Marketing Federation (GUJCOMASOL), State Agril. Universities
		Cotton	No change	-	
		Sesame	No change	-	
		Pearlmillet	No change	-	
		Green gram	No change	-	

	Coastal alluvial & saline 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. 	
		Pearlmillet	No change	-	

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 to shallow 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)	<ul style="list-style-type: none"> • As per crop change follow the package of practices 	Seed source: National Seed Corporation (NSC). Gujarat State Seed Corporation (GSSC), Gujarat state Cooperative Marketing Federation (GUJCOMASOL), State Agril. Universities
		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 	
		Sesame	No change	<ul style="list-style-type: none"> • As per crop follow the package of practices. 	
		Pearlmillet	No change	<ul style="list-style-type: none"> • As per crop follow the package of practices. 	
		Green gram	No change	<ul style="list-style-type: none"> • As per crop follow the package of practices 	
	Coastal alluvial & saline 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)	<ul style="list-style-type: none"> • As per crop follow the package of practices 	
		Pearlmillet	No change	As per crop follow the package of practices.	

Condition		Suggested Contingency measures				
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation	
Delay by 8 weeks (Aug 2nd week)	Medium to shallow black 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)	• 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 equipment, Sprayers & dusters to farmer 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)	• As per crop change, follow the package of practices.		
		Sesame	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)	• As per crop change, follow the package of practices.		
		Pearlmillet	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)	• As per crop change, follow the package of practices.		
		Green gram	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)	• As per crop change, follow the package of practices.		
		Coastal alluvial & saline 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)		• As per crop change, follow the package of practices.
			Pearlmillet	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)		• As per crop change, follow the 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 to shallow 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 	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 	
		Sesame	<ul style="list-style-type: none"> • Thinning to maintain plant to plant distance (15 cm) 	<ul style="list-style-type: none"> • Interculturing to fill soil cracks, • Mulching with wheat straw or shredded cotton stalk 	
		Pearlmillet	<ul style="list-style-type: none"> • Thinning 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 	
		Green gram	<ul style="list-style-type: none"> • Thinning 	<ul style="list-style-type: none"> • Interculturing to fill soil cracks, • Mulching with wheat straw or shredded cotton stalk 	
	Coastal alluvial & saline 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 	
		Pearlmillet	<ul style="list-style-type: none"> • Thinning 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 	

Condition			Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measure	Remarks on Implementation
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation	Normal Crop/cropping system			
At vegetative stage	Medium to shallow 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 electric supply 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) 	
		Green gram	<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. 	
		Sesame	<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. Top dressing of N through urea after relief of drought 	
		Pearlmillet	<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. Top dressing of N through urea after relief of drought 	
	Coastal alluvial &	Groundnut	<ul style="list-style-type: none"> Weeding Protection against sucking pests (control of 	<ul style="list-style-type: none"> Mulching with wheat straw or crushed cotton stalk. 	<ul style="list-style-type: none"> Ensure electric supply for life saving

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measure	Remarks on Implementation
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	saline soils		jassid and aphid, spray imidachlopride 17.8 SL (4 ml/10 lit. water). • Lifesaving irrigation	• Inter tilling. • Spray kaolin @ 4% (400g/10 lit. water)	irrigation.
		Pearlmillet	• Weeding • Protection against sucking pests (control of jassid and aphid, spray imidachlopride 17.8 SL (4 ml/10 lit. water). • Lifesaving irrigation	• Mulching with wheat straw or crushed cotton stalk. • Inter tilling. • Top dressing of N through urea after relief of drought	

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)	Medium to shallow 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) 	<ul style="list-style-type: none"> Spray kaolin @ 4% (400g/10 lit. water). 	Ensure supply of electricity 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 	<ul style="list-style-type: none"> Spray kaolin @ 4% (400g/10 lit. water). 	
		Sesame	<ul style="list-style-type: none"> Supplemental irrigation if possible followed by weeding, 	<ul style="list-style-type: none"> Interculturing if possible, 	
		Pearlmillet	<ul style="list-style-type: none"> Supplemental irrigation if possible Harvest non flowering plants for fodder purpose if water is not available 	-	
		Green gram	<ul style="list-style-type: none"> Supplemental irrigation followed by weeding 	-	
	Coastal alluvial & saline 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) 	-	Ensure supply of electricity for life saving irrigation by PGVCL.
		Pearlmillet	<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"> Interculturing, Top dressing N through urea after relief of drought 	

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 to shallow black soils	Groundnut	<ul style="list-style-type: none"> Life saving irrigations if possible followed by weeding 	-	Ensure supply of electricity for life saving irrigation by PGVCL.
		Cotton	<ul style="list-style-type: none"> Harvest mature bolls. Supplemental irrigation. 	-	
		Sesame	<ul style="list-style-type: none"> Supplemental irrigation, if possible followed by weeding 	-	
		Pearlmillet	<ul style="list-style-type: none"> Supplemental Irrigation if possible. Harvest non flowering plants for fodder purpose if water is not available 	-	
		Green gram	<ul style="list-style-type: none"> Supplemental irrigation. Thin out plant population 	-	
	Coastal alluvial & saline soils	Groundnut	<ul style="list-style-type: none"> Life saving irrigations if possible followed weeding 	-	
		Pearlmillet	<ul style="list-style-type: none"> Harvest mature plants Supplemental irrigation through MIS 		

2.1.2 Drought - Irrigated situation

Condition	Major Farming situation	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 to shallow black soils		NA		
	Coastal alluvial & saline soils				

Condition	Major Farming situation	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 to shallow black soils		Irrigate the sown crop in alternate furrow		
	Coastal alluvial & saline soils				

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

Condition			Suggested Contingency measures		
	Major Farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Medium to shallow black soils		NA		
	Coastal alluvial & saline soils				

Condition			Suggested Contingency measures		
	Major Farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient ground water recharge due to low rainfall	Medium to shallow 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 irrigation system. Reduce area of irrigation. 	<ul style="list-style-type: none"> Ensure electric supply for life saving irrigation by Paschim Gujarat VijCompany (PGVCL). Supply MIS and quality seeds through Govt. agencies
		Cotton	No change	<ul style="list-style-type: none"> Give irrigation during night times to reduce transpiration. Adoption of MIS irrigation system. Alternate furrow irrigation 	<ul style="list-style-type: none"> Ensure supply of electricity for life saving irrigation by PGVCL. Supply MIS through Govt. schemes.

Condition	Suggested Contingency measures				
	Major Farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
	Coastal alluvial & saline soils	Wheat	Semi rabi Pearl millet (GHB 538), 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 sprinkler irrigation. Reduce area of irrigation Alternate furrow irrigation 	<ul style="list-style-type: none"> Ensure supply of electricity for life saving irrigation by PGVCL. Supply MIS through Govt. schemes.
Sea water intrusions	Coastal alluvial & saline soils	Wheat	Semi rabi Pearl millet (GHB-538) Leafy vegetables, carrot (GDC 1), beet, Lucerne	<ul style="list-style-type: none"> Adoption of MIS irrigation system. Limited area under irrigation, Light frequent irrigation to reduce over exploitation to some extent and limit depth of pumping Alternate furrow irrigation 	-

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.
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"> Preparation of quick drying techniques and techniques to separate good lot and bad lot.

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. 	
Pearlmillet	<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"> • For quick Surface drainage open channel around field. • Harvest mature ear heads. 	
Sesame	<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. 	
Pulses	<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"> • Arrange drainage, Harvest mature pods 	
HORTICULTURE				
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.
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 methyleugenol 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
Heavy rainfall with high speed winds in a short span				
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.
Groundnut	-	-	<ul style="list-style-type: none"> • Delay harvesting of spreading groundnut if possible. • Immediately harvest bunch groundnut. Quick surface drainage, Open channel around field. 	-do-
Pearlmillet	-	-	<ul style="list-style-type: none"> • Harvest mature earheads, • Quick surface drainage 	-do-
Pulses	-	-	<ul style="list-style-type: none"> • Arrange drainage, Harvest mature pods 	-do-

Horticulture				
Condition				
Heavy rainfall with high speed winds in a short span	Vegetative stage	Flowering stage	Crop maturity stage	Post -harvest
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.
Mango	-	Spray mancozeb 0.2 % (27g/10 lit. water) & 0.2 % (30g/10 lit water) wettable sulphur to control powdery mildew.	<ul style="list-style-type: none"> • Collect fallen fruits 	Unripe fruit may be used for pickles.
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 	-
Outbreak of pests and diseases due to unseasonal rains				
Wheat	<ul style="list-style-type: none"> • Spray mancozeb 0.2 % (27g/10 lit water) to control blight and rust 	<ul style="list-style-type: none"> • Spray mancozeb 0.2 % (27g/10 lit water) to control blight and rust 	<ul style="list-style-type: none"> • Spray mancozeb 0.2 % (27g/10 lit. water) to control blight and rust 	-
Cotton	-	-	-	-
Groundnut	<ul style="list-style-type: none"> • Spray 0.005% 	<ul style="list-style-type: none"> • Spray 0.005% 	<ul style="list-style-type: none"> • Spray 0.005% 	-

Horticulture				
Condition				
Heavy rainfall with high speed winds in a short span	Vegetative stage	Flowering stage	Crop maturity stage	Post -harvest
	hexaconazole(10 ml/10 lit. water) to control rust and tikka	hexaconazole(10 ml/10 lit. water) to control rust and tikka	hexaconazole(10 ml/10 lit. water) to control rust and tikka	
Pulses	-	-	-	-
Horticulture				
Cumin	• Spray mencozeb 0.2 % (27g/10 lit. water) to control cumin blight	• Spray mencozeb 0.2 % (27g/10 lit. water) to control cumin blight	• Spray mencozeb 0.2 % (27g/10 lit. water) to control cumin blight & 0.2 % (30g/10 lit water) wettable sulphur to control powdery mildew.	-
Mango	• Provision of drainage • Spray 0.005% hexaconazole (10ml /10 lit water) for control leaf blight under unusual rains with cloudy weather	• Spray 0.2%(30g/lit. water)wettablesulphur or hexaconazole 0.005%(10 ml/10 lit. water) to control powdery mildew after cessation of heavy rain	• Hang methyl euginol trap one/ acre to control fruit fly	-

2.3 Floods

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation¹				
Groundnut	NA	• As a preventive step open drainage channel	• As a preventive step open drainage channel	-
Cotton	NA	• As a preventive step open drainage channel	• As a preventive step open drainage channel	-
Sesame	NA	• As a preventive step open drainage channel	• As a preventive step open drainage channel	-
Pearlmillet	NA	• As a preventive step open drainage channel	• As a preventive step open drainage channel	-
Pulses	NA	• As a preventive step open drainage channel	• As a preventive step open drainage channel	-
Horticulture		• As a preventive step open drainage channel	• As a preventive step open drainage channel	
Cumin	NA	• As a preventive step open drainage channel	• As a preventive step open drainage channel	
Mango	• Provide surface drainage	• Provide surface drainage	• 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 	-
Sesame	<ul style="list-style-type: none"> As a preventive step open drainage channel. Spray mancozeb 0.2%(27g/10 lit water) to control phytophthora blight 	<ul style="list-style-type: none"> As a preventive step open Drainage channel. Spray mancozeb 0.2% (27g/10 lit water) control phytophthora blight. 	<ul style="list-style-type: none"> As a preventive step open drainage channel. Spray mancozeb 0.2% (27g/10 lit water) control phytophthora blight. 	Harvest mature plants
Pearlmillet	<ul style="list-style-type: none"> As a preventive step open drainage channel. Spray mancozeb 0.2% (27g/10 lit water) control downy mildew. 	<ul style="list-style-type: none"> As a preventive step open drainage channel. Spray mancozeb 0.2% (27g/10 lit water) control downy mildew. 	<ul style="list-style-type: none"> As a preventive step open drainage channel. Spray mancozeb 0.2% (27g/10 lit water) control downy mildew. 	Harvest mature earheads
Pulses	As a preventive step open drainage channel followed by spray 0.05% carbendazim (10g/10lit water) or 0.0025% hexaconazole(5 ml/10 lit. water) for control of powdery mildew	As a preventive step open drainage channel followed by spray 0.05% carbendazim (10g/10lit water) or 0.0025% hexaconazole(5 ml/10 lit. water) for control of powdery mildew	As a preventive step open drainage channel followed by spray 0.05% carbendazim (10g/10lit water) or 0.0025% hexaconazole(5 ml/10 lit. water) for control of powdery mildew	Picking of mature pods

Horticulture				
Continuous submergence for more than 2 days				
Condition	Suggested contingency measure			
Transient water logging/ partial inundation¹	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Cumin	<ul style="list-style-type: none"> Spray mencozeb 0.2 % (27g/10 lit. water) to control cumin blight & 0.2 % (30g/10 lit water) wettable sulphur to control powdery mildew. 	<ul style="list-style-type: none"> Spray mencozeb 0.2 % (27g/10 lit. water) to control cumin blight & 0.2 % (30g/10 lit water) wettable sulphur to control powdery mildew. 	<ul style="list-style-type: none"> Spray mencozeb 0.2 % (27g/10 lit. water) to control cumin blight & 0.2 % (30g/10 lit water) wettable sulphur to control powdery mildew. 	-
Mango	<ul style="list-style-type: none"> Shift graft to safe place & 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			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave	<ul style="list-style-type: none"> Light and frequent irrigation to all crops 	<ul style="list-style-type: none"> Light and frequent irrigation to all crops 	<ul style="list-style-type: none"> 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				
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 Spray mancozeb 0.2% (27g/10 lit water) to control black point in grain 	<ul style="list-style-type: none"> Shift produce at safer place
Cotton	Earthing up & Quick drainage	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 	
Pearlmillet	<ul style="list-style-type: none"> Quick drainage 	<ul style="list-style-type: none"> Quick drainage 	<ul style="list-style-type: none"> Quick drainage 	
Sesame	<ul style="list-style-type: none"> Quick drainage 	<ul style="list-style-type: none"> Quick drainage 	<ul style="list-style-type: none"> Quick drainage 	
Pulse	<ul style="list-style-type: none"> Quick drainage 	<ul style="list-style-type: none"> Quick drainage 	<ul style="list-style-type: none"> Quick drainage 	

Horticulture				
Cumin	<ul style="list-style-type: none"> Spray mencozeb 0.2 % (27g/10 lit. water) to control cumin blight & 0.2 % (30g/10 lit water) wettablesulphur to control powdery mildew. 	<ul style="list-style-type: none"> Spray mencozeb 0.2 % (27g/10 lit. water) to control cumin blight & 0.2 % (30g/10 lit water) wettablesulphur to control powdery mildew. 	<ul style="list-style-type: none"> Spray mencozeb 0.2 % (27g/10 lit. water) to control cumin blight & 0.2 % (30g/10 lit water) wettablesulphur to control powdery mildew. 	-
Mango	<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 	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 should be 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 in drinking water (1%) 	<ul style="list-style-type: none"> Give sufficient water as per the requirement of animal
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). 	<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. 	<ul style="list-style-type: none"> Add vitamin mineral mixtures 25 g/animal/day along with feed. Quarantine diseased animals

	<ul style="list-style-type: none"> • Add mineral mixtures 25 g/animal/day along with feed. • Animals to be covered cover under insurance schemes. 	<ul style="list-style-type: none"> • 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"> • 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%).
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 heath 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 carcas 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 grassroots level.
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 to be followed 	<ul style="list-style-type: none"> Linkage Govt. schemes with public/NGOs at grassroots level.
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 to be followed. 	<ul style="list-style-type: none"> Use stored feed ingredients.

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	-

2.5.3 Fisheries/ Aquaculture

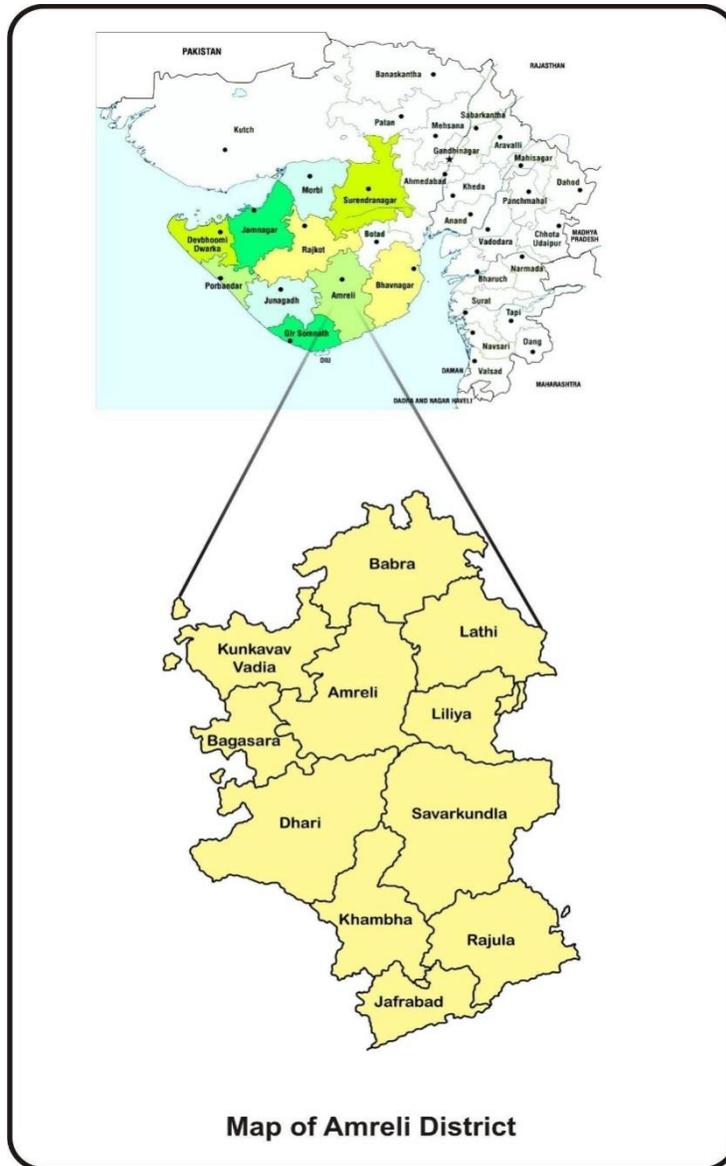
	Suggested contingency measures		
	Before the event ^a	During the event	After the event
1)Drought			
A. Capture			
Marine	NA	NA	NA
Inland	NA	NA	NA
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	• Desilting/deepening of pond so that more water can be stored	• Provision of 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.
(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 	-	-
	Suggested contingency measures		
	Before the event^a	During the event	After the event
(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.
Inland	NA	NA	NA
B. Aquaculture			

(i) Overflow / flooding of ponds	• Strengthening of dykes.	• Enhancement of dykes height by sand bags.	-
(ii) Changes in water quality (fresh water / brackish water ratio)	• Maintain salinity by addition of fresh water up to 20-25 ppt.	• Use euryhaline species.	• Use Euryhaline species for culture.
(iii) Health and diseases	• Liming and formalin treatment.	• Disinfectants treatments.	-
(iv) Loss of stock and inputs (feed, chemicals etc).	• Stock cover under insurance.	-	• Seed and feed to be supplied through Deptt of fisheries,
	Suggested contingency measures		
	Before the event^a	During the event	After the event
(v) Infrastructure damage (pumps, aerators, shelters/hutsetc)	-	-	• 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)	• Plantation of leafy trees on dyke, increase depth.	• Maintain water level in pond. • Use of fountain and peddle wheel aerator.	-
(ii) Health and disease management	-	• Bleaching powder 1 to 2 %, formalin treatment to prevent diseases.	• KMnO4 2 % to maintain oxygen level
(iii) Any other	-	-	-

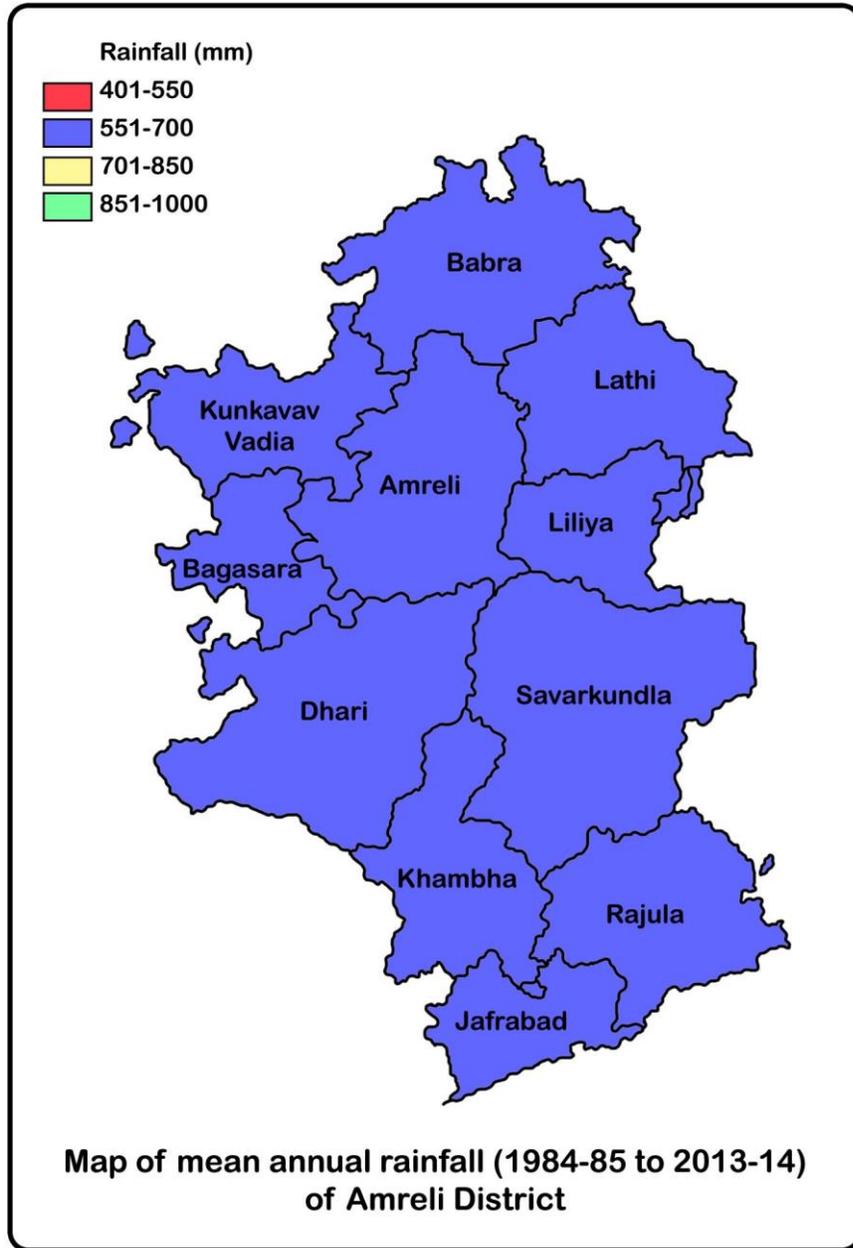
ANNEXURE-I

Location map of Amreli district



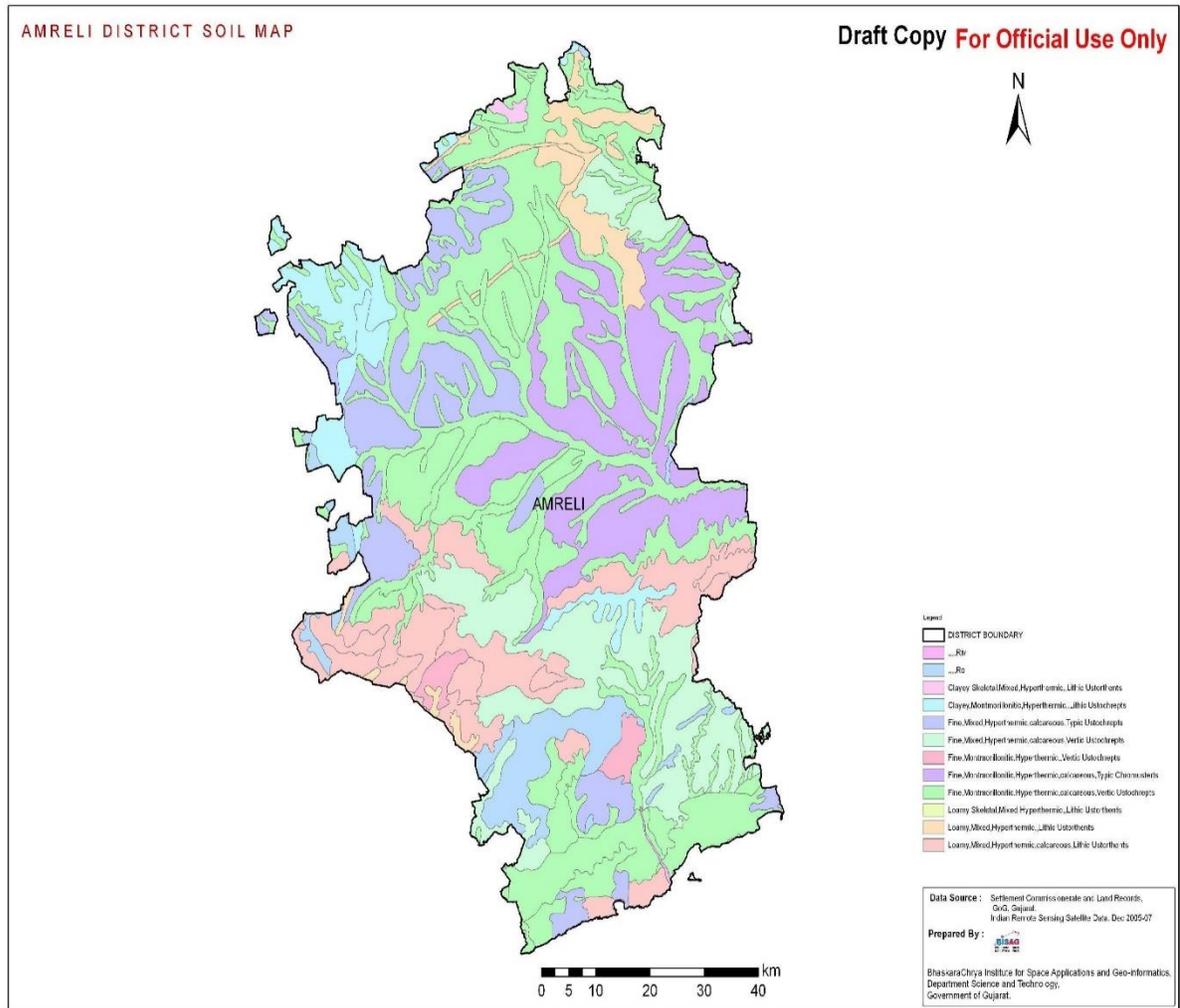
Annexure II

Mean annual Rainfall map

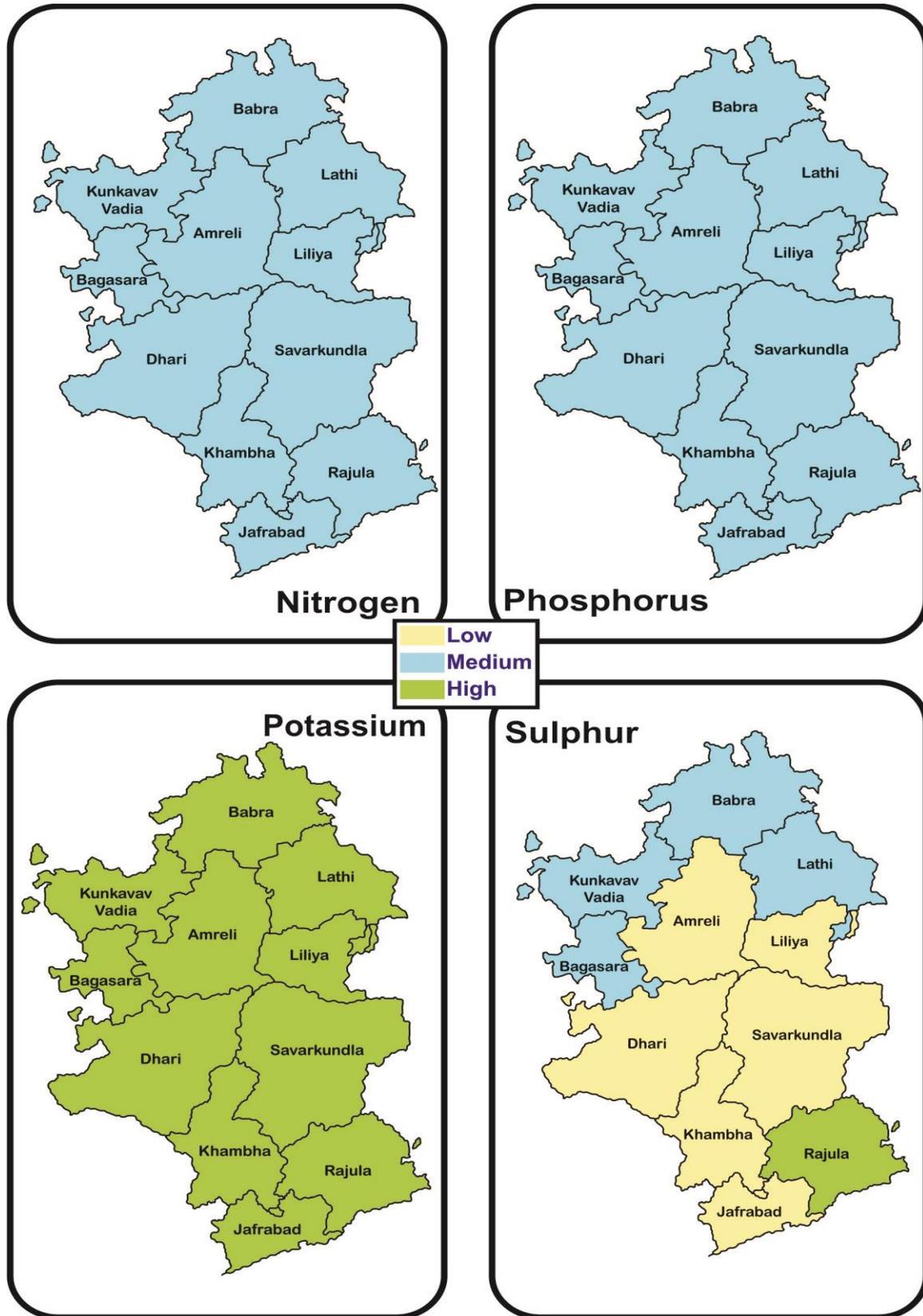


ANNEXURE III

Annexure III a Soil map

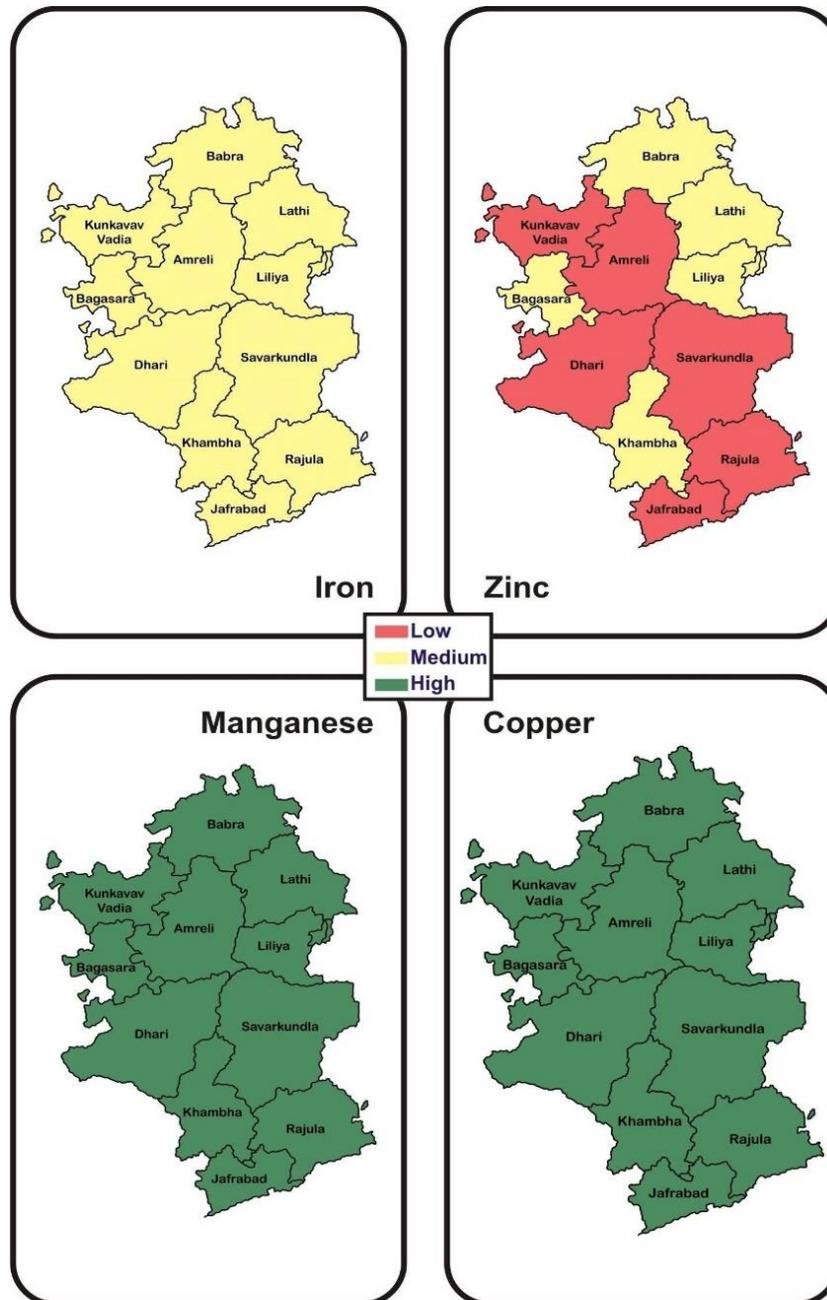


Annexure III b: Soil map of major nutrient status



Status of nutrients in soils of Amreli District

Annexure III c: Soil map of Micro nutrient status



Status of micronutrients in soils of Amreli District