State: GUJARAT

Agriculture Contingency Plan for District: GIR SOMNATH

1.0 District Agriculture profile					
1.1	**Agro-Climatic/Ecological Zone**				
	Agro Ecological Sub Region (ICAR)	Arid western Plains(5.1)			
	Agro-Climatic Zone (Planning Commission)	West coast plains & Hills Region(XIII)			
	Agro Climatic Zone (NARP)	South Saurashtra Zone (GJ-7)			
	List all the districts or part thereof falling under the NARP Zone	Junagadh,GirSomnath, Porbandar and part of Amreli , Bhavnagar, and Rajkot			
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude	
		20° 54' 28N	70° 22' 4E	23 m	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Directorate of Research, Junagadh Agricultural University, Junagadh (ZRS) Main Sugarcane Research Station, JAU, Kodinar 362725			
	Mention the KVK located in the district	KrishiVigyan Kendra, Ambujanagar,Kodinar Pin 362715 District: GirSomnath			
1.2	**Rainfall** (Avg. 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):*	1126	34.8	2nd Week of June	2nd Week of September
	NE Monsoon(Oct-Dec):	-	-	-	-
	Winter (Jan- March)	-	-	-	-
	Summer (Apr-May)	-	-	-	-
	Annual	1126	34.8	-	-

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)	375.452	182.584	42.509*	6.141	24.442	18.975	3.391	81.758	5.270	10.382

(Source :Gir Somnath District Panchayat report-2016 and PMKSY, State Irrigation Plan 2016-2020) * Forest area and Gir Forest area both.

1. 4	**Major Soils (common names like red sandy loam deep soils(etc.,)***	**Area ('000 ha)**	**Percent (%) of total**
	Medium to shallow black soils	103.259	56.6
	Mixed Red and Black soils	21.211	11.6
	Coastal alluvial soils	58.114	31.8

1.5	**Agricultural land use**	Area ('000 ha)	Cropping intensity %
	Net sown area	182.584	140.00
	Area sown more than once	73.200	
	Gross cropped area	255.80	

1.6	**Irrigation**	Area ('000 ha)		
	Net irrigated area	97.042		
	Gross irrigated area	183.28		
	Rain fed area	73.651		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals	162 km	5.048	2.75
	Tanks		0.00	-
	Open wells/Bore wells	36651	86.322	47.10
	Lift irrigation schemes		-	-
	Micro-irrigation		-	-
	Other sources, Ponds & Check dams	36657	91.91	50.15
	Total Irrigated Area		183.28	

	Pump sets	20881		
	No. of Tractors	321		
	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	-	-	Moderate saline
	Critical	-	-	
	Semi- critical	-	-	
	Safe	5	100	
	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 (Irrigation): PMKSY, state irrigation plan 2016-2020*),*Sources of Irrigation: *PMKSY, District irrigation plan (2016-2020)Gir Somnath,Gujarat, pp 27*
*Source :*PMKSY, District irrigation plan (2016-2020) Gir Somnath, GGRC, Gujarat)*

1.7 Area under major field crops & horticulture (as per latest figures of year2010-11 to2014-15)

1.7	**Major field crops cultivated**	**Area ('000 ha)**							
		Kharif			***Rabi***				
		Irrigated	**Rainfed**	**Total**	**Irrigated**	**Rainfed**	**Total**	**Summer**	**Grand total**
	Groundnut		143.797	143.797				7.803	151.773
	Wheat				74.955		74.955		74.955
	Cotton	32.413		32.413					32.413
	Pulses		3.895	3.895	1.435		1.435	2.155	7.485
	Sugarcane				12.836				12.836
	Pearl millet(Pearl millet)		6.173	6.173	5.473		5.473	4.998	16.644
	Others								
	2.Other Oil seed crops (Sesame, castor, mustard)		0.728	0.728				6.668	7.396

	Horticulture crops - Fruits	Area ('000 ha)
		Total
	Mango	13.890
	Sapota	1.255
	Banana	0.700
	Citrus	0.196
	Other (Ber, guava, pomegranate, papaya, custard apple, aonlaetc)	0.427
	Horticulture crops - Vegetables	**Total**
	Onion	3.600
	Brinjal	2.090
	Others (Tomato, cabbage, cauliflower, okra, cluster bean, cowpea, cucurbits etc.)	7.015
	Medicinal and Aromatic crops	**Total**
	Fenugreek	0.015
	Coriander	13.800
	Others	0.510
	Plantation crops	**Total**
	Coconut	7.450
	eg., industrial pulpwood crops etc.	
	Fodder crops	**Total**
	Sorghum	16.204
		-
	Total fodder crop area	33.014
	Grazing land	24.442
	Sericulture etc	-

Source: Reports of Department of Agriculture, Govt. of Gujarat. 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)	121.029	138.552	259.581
	Crossbred cattle	2.961	6.481	9.442
	Non descriptive Buffaloes (local low yielding)	19.484	138.192	157.676
	Graded Buffaloes	-	-	
	Goat			44.115

	Sheep			23.011
	Others (Camel, Pig, Yak, horse etc.)			3.388
	Commercial dairy farms (Number)			
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**	
	Commercial		30.180	
	Backyard	-	-	

1.10	**Fisheries** (Data source: Chief Planning Officer)						
	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)	
		78746	4577	113	330672		
	ii) Inland	**No. Farmer owned ponds**			**No. of Reservoirs**	**No. of village tanks**	
		-			**-**	**-**	
	B. Culture						
			Water Spread Area (ha)		**Yield (t/ha)**	**Production ('000 tons)**	
	i) **Brackish water**						
	ii) **Fresh water**		-		-	-	

(Source:Gir Somnath District Panchayat report-2016)

1.11 Production and Productivity of major crops (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										
	Groundnut	244.868	1687			14.129	1889	258.997	1788	348.6
	Cotton (Lint)	15.746	564					15.746	564	47.40
	Wheat			309.052	4111			309.052	4111	341.5
	Pearl millet	9.976	1440	11.467	2022	14.680	2686	36.123	2049	78.4
	Pulses	2.909	668	2.558	1737	1.462	546	6.929	984	5.5
	Sugarcane			995.722	74638			995.722	74638	163.2

Major Horticultural crops										
	Mango	-	-	-	-	-	-	84.352	7990	
	Sapota (Chiku)	-	-	-	-	-	-	6.640	8876	
	Banana	-	-	-	-	-	-	41.100	23108	
	Citrus	-	-	-	-	-	-	0.968	4168	
	Coconut ('000 nuts)	-	-	-	-	-	-	45.462	11100	
	Other (Beretc)	-	-	-	-	-	-	10.948	3650	

(Source: Reports of Department of Agriculture, Govt. of Gujarat, (2010-11 to 2014-15)) and Report of Department of Horticulture, Govt. of Gujarat, (2015-16)

1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	Groundnut	Cotton	Wheat	Sugarcane	Pearl millet
	Kharif- Rainfed	June 2nd week to July 1st week	June 2nd week to July 1st week	-	-	June 2nd week to July 2nd week
	Kharif-Irrigated	-	May 4th week to June 2nd week	-	-	-
	Rabi- Rainfed	-		-	-	-
	Rabi/ summer-Irrigated	-	-	Nov.2nd week to Nov.4th week '	Oct.4th week to Feb.4th week	Sept.3rd week to Oct.2nd 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 (Una, Kodinar,Sutrapada&Veravaltalukas)	√	-	-
	Pests and disease outbreak (specify) Pests-Aphid, Jassid, Thrips, White fly, Mealy bug, scale insect, early shoot borer, heliothis, leaf roller,white grub Diseases-Wilt, Red rot, ,Rust, ,Tikka & Downy Mildew, collor rot	√	-	-
	Others (specify)	-	-	-

1.14	**Include Digital maps of the district for**	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure II	Enclosed: Yes
		Soil map as Annexure III a b& c	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 4th week)	Medium & shallow black soils	Groundnut Spreading variety (GG 10, GG11, GG 13, GJGHPS 1 / semi spreading variety(GG-20, GJG 22)	No change	-	-
		Cotton (Cotton hybrid-4,6,8,10, & Govt. approved Bt. hybrids)	No change		
		Pearl millet (GHB-558, 577, 538,719,744,732 and Govt. approved hybrids)	No change		
	Coastal alluvial soils	Pearl millet (GHB-558, 577, 538,719,744,732 and Govt. approved hybrids)	No change		
		Groundnut Spreading variety (GG 10, GG11, GG 13, GJGHPS 1 / semi spreading variety(GG-20, GJG 22)	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 2nd week)	Medium & shallow black soils	Groundnut (spreading & semi spreading)	Prefer bunch variety (GG-2/GG-5/ GG-7,GJG-9, TG 37 A) / semi spreading variety(GG-20, GJG 22) of groundnut	• Keep 45 cm and 60 cm row spacing for bunch and semi spreading groundnut, respectively. • Other practices will be as such.	• Agencies for quality seed supply are National Seed Corporation (NSC), Gujarat State Seed Corporation (GSSC), University, Gujcomasol.
		Cotton	No change	-	
		Pearl millet	Castor (GC-3, GCH-4, GCH-6, GCH-7) Pigeon pea (BDN-2, Vaishali, GJT-1) Sorghum (Gundhari, GFS-3, GAFS-11,CSV-21F, S-1049)	• As per crop change, follow the package of practices.	
	Coastal alluvial soils	Pearl millet	Castor (GC-3, GCH-4, GCH-6, GCH-7), / Pigeon pea(BDN-2, Vaishali, GJT-1),/Sorghum(Gundhari, GFS-3, GAFS-11,CSV-21F, S-1049)	• As per crop change, follow the package of practices.	
		Groundnut (spreading & semi spreading)	Prefer bunch variety GG-2/GG-5/ GG-7,GJG-9, TG 37 A/ semi spreading variety GG-20, GJG 22 of groundnut	• Keep 45 cm and 60 cm row spacing for bunch and semi spreading groundnut, respectively. • Other practices will be as such.	

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 6 weeks (July 4th week)	Medium & shallow black soils	Groundnut (spreading & semi spreading	Green Gram (GM-4, K-851)/ Sesame (GT-2,GT-3,GT-4)/Sorghum (Gundhari, GFS-3, GAFS-11,CSV-21F, S-1049)/Castor (GC-3, GCH-4, GCH-6,GCH-7)/ Pigeon pea (BDN-2, Vaishali,GJP-1)Soybean (GS-1, GS-3,)	• As per crop change, follow the package of practices.	• Agencies for quality seed supply are National Seed Corporation (NSC), Gujarat State Seed Corporation (GSSC), University, Gujcomasol. • Supply of quality seed from NSC, GSSC, SAU and zero till seed drill, seed dressing equipments, sprayers& dusters from government schemes.
		Cotton	Green Gram (GM-4, K-851)/ Sesame (GT-2,GT-3,GT-4)/Sorghum (Gundhari, GFS-3, GAFS-11,CSV-21F, S-1049)/Castor (GC-3, GCH-4, GCH-6,GCH-7)/ Pigeon pea (BDN-2, Vaishali,GJP-1) Soybean (GS-1, GS-3,)	• As per crop follow the package of practices	
		Pearl millet	Green Gram (GM-4, K-851)/ Sesame (GT-2,GT-3,GT-4)/Sorghum (Gundhari, GFS-3, GAFS-11,CSV-21F, S-1049)/Castor (GC-3, GCH-4, GCH-6,GCH-7)/ Pigeon pea (BDN-2, Vaishali,GJP-1) Soybean (GS-1, GS-3)	• As per crop follow the package of practices	
	Coastal alluvial soils	Pearl millet	Green Gram (GM-4,K-851)/ Black Gram (Guj. Urd-1, T-9)/Sorghum (Gundhari, GFS-3, GAFS-11,CSV-21F, S-1049)/Castor (GAU-CH-1, GCH-6)/ Pigeon pea (GT-100, BDN-2, GJT-1)	• As per crop follow the package of practices	
		Groundnut (spreading & semi spreading	Green Gram (GM-4, K-851)/ Sesame (GT-2,GT-3,GT-4)/Sorghum (Gundhari, GFS-3, GAFS-11,CSV-21F, S-1049)/Castor (GC-3, GCH-4, GCH-6,GCH-7)/ Pigeon pea (BDN-2, Vaishali, GJT-1)	• As per crop change, 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 & shallow black soils	Groundnut (spreading & semi spreading	Sesame (GT-4, Purva-1)/Sorghum (Gundhari, GFS-3, GAFS-11,CSV-21F, S-1049)/ Castor (GC-3, GCH-4, GCH-5 GCH-6,GCH-7), Green Gram (GM-4,K-851)/ Black gram (Guj. Urd-1, T-9)	• As per crop change, follow the package of practices. • Irrigate the castor as per need.	• Agencies for quality seed supply are National Seed Corporation (NSC), Gujarat State Seed Corporation (GSSC), University, Gujcomasol. • Supply of quality seed from NSC,GSSC, SAU and zerotill seed drill, seed dressing equipments, sprayers& dusters from Government schemes.
		Cotton	Sesame (GT-4, Purva-1)/Sorghum (Gundhari, GFS-3, GAFS-11,CSV-21F, S-1049)/ Castor (GC-3, GCH-4, GCH-5 GCH-6,GCH-7), Green Gram (GM-4,K-851)/ Black gram (Guj. Urd-1, T-9)	• As per crop change, follow the package of practices. • Irrigate the castor as per need.	
		Pearl millet	Sesame (GT-4, Purva-1)/Sorghum (Gundhari, GFS-3, GAFS-11,CSV-21F, S-1049)/ Castor (GC-3, GCH-4, GCH-5 GCH-6,GCH-7), Green Gram (GM-4,K-851)/ Black gram (Guj. Urd-1, T-9)	• As per crop change, follow the package of practices. • Irrigate the castor as per need..	
	Coastal alluvial soils	Pearl millet	Sorghum (Gundhari, GFS-3, GAFS-11,CSV-21F, S-1049)/ Castor (GC-3, GCH-4, GCH-5 GCH-6,GCH-7)	• As per crop change, follow the package of practices. • Irrigate the castor as per need.	
		Groundnut (spreading & semi spreading	Sesame (GT-4,Purva-1)/Sorghum (Gundhari, GFS-3, GAFS-11,CSV-21F, S-1049)/ Castor (GC-3, GCH-4, GCH-5, GCH-6,GCH-7)	• As per crop change, follow the package of practices. • Irrigate the castor as per need.	

Condition			Suggested Contingency measures		
Early season drought (Normal onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient &moisture conservation measures**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Medium & shallow black soils	Groundnut	• Gap filling with maize, green gram, black gram	• Interculturing to fill soil cracks. • Mulching with wheat straw or shredded cotton stalk, mulching.	• Cotton stalk shredding machine is available in Jasdantown of Rajkot district to be supplied by Govt.
		Cotton	• Gap filling	• Interculturing to fill soil cracks. • Mulching with wheat straw or shredded cotton stalk, mulching.	
		Pearl millet	• Thinning to maintain 10 cm plant to plant spacing	• Interculturing to fill soil cracks. • Mulching with wheat straw or shredded cotton stalk.	
	Coastal alluvial soils	Pearl millet	• Thinning to maintain 10 cm plant to plant spacing	• Mulching with wheat straw or shredded cotton stalk.	
		Groundnut	• Gap filling with maize, green gram, black gram	• Interculturing to fill soil cracks. Mulching with wheat straw or shredded cotton stalk, mulching.	

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 & shallow black soils	Groundnut	• Weeding. • Protection against sucking pests (control of jassid and aphid, spray imidachlopride 17.8 SL 4 ml/10 lit. water) • lifesaving irrigation if possible. • Spray kaolin @ 4% (400g/10 lit. water).	• Mulching with wheat straw or shredded cotton stalk, mulching • Inter tilling.	• Supply of plastic film and pesticides through govt. schemes. • Ensure electric supply for life saving irrigation.

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**
		Cotton	• Weeding. • Protection against sucking pests (control of jassid and aphid, spray imidachlopride 17.8 SL 4 ml/10 lit. water) • lifesaving irrigation if possible. • Spray kaolin @ 4% (400g/10 lit. water)	• Mulching with wheat straw or shredded cotton stalk, mulching • Inter tilling.	
		Pearl millet	• Weeding/thinning to maintain 10 cm plant to plant spacing. • lifesaving Irrigation if possible	• Inter tilling. • Spray of 1 % N through urea after relief of drought.	
	Coastal alluvial soils	Pearl millet	• Weeding/thinning to maintain 10 cm plant to plant spacing. • lifesaving Irrigation if possible	• Interculturing. • Urea spray	
		Groundnut	• Weeding. • Protection against sucking pests (control of jassid and aphid, spray imidacloprid 17.8 SL 4 ml/10 lit. water) • Lifesaving irrigation if possible	• Mulching with wheat straw or shredded cotton stalk, mulching • Inter tilling/culturing.	

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 & shallow black soils	Groundnut	• Supplemental Irrigation followed by weeding. • Spray kaolin @ 4% (400g/10 lit. water)	-	• Ensure electric supply for life saving irrigation by Electricity Supply Board of State.

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**
		Cotton	• Supplemental Irrigation followed by weeding	-	
		Pearl millet	• Weeding. • Supplemental irrigation if possible. • Harvest non flowering plants for fodder purpose if water is not available	• Interculturing. • Top dressing of N through urea after relief of drought	• Ensure electric supply for life saving irrigation by Electricity Supply Board of State
	Coastal alluvial soils	Pearl millet	• Supplemental irrigation if possible. • Harvest non flowering plants for fodder purpose.	• Interculturing. • Top dressing of N through urea after relief of drought	• Ensure electric supply for life saving irrigation by Electricity Supply Board of State
		Groundnut	• Supplemental Irrigation followed by weeding. • Spray kaolin @ 4% (400g/10 lit. water)	-	• Ensure electric supply for life saving irrigation by Electricity Supply Board of State

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
	Medium & shallow black soils	Groundnut	• Lifesaving irrigation fromharvested water by MIS	-	• Ensure electric supply for life saving irrigation by Electricity Supply Board of State
		Cotton	• Harvest mature bolls. • Supplemental irrigation by MIS/ alternate furrow.	-	
		Pearl millet	• Supplemental irrigation. • Harvest non flowering plants for fodder	-	

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
	Coastal alluvial soils	Pearl millet	• Supplemental irrigation. • Harvest non flowering plants for fodder	-	• Ensure electric supply for life saving irrigation by Electricity Supply Board of State
		Groundnut	• Lifesaving irrigation from harvested water by MIS	-	

2.1.2 Drought - Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delayed/ limited release of water in canals due to low rainfall	Medium & shallow black soils	Wheat	• Sowing of short duration crops like coriander, chickpea	-	-
	Coastal alluvial soils	Sugarcane	No change	• Irrigation should be given during night, if possible	-

Note: Very limited canal irrigation facility exists in GirSomnath

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	**NA**				

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 & shallow black soils	NA			
	Coastal alluvial soils	NA			

Condition	Suggested Contingency measures				
	Major Farming situation	**Crop/ cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Insufficient groundwater recharge due to low rainfall	Medium & shallow black soils	Wheat	Gram (GG- 1, GJG-3, GJG-5)/ Coriander (Guj 2&3)/,Fenugreek (GM-2)/ Leafy vegetables / carrot(GDC 1)	• Supply irrigation during night time to reduce transpiration.	• Ensure electric supply for life saving irrigation by PGVCL.
				• Adoption of MIS system. • Reduce area of irrigation.	• Construction of well recharge structures. • Timely supply of MIS and seeds through Govt. schemes.
		Cotton	Gram (GG- 1, GJG-3, GJG-5)/ Coriander (GC 2, 3)/Fenugreek (GM-2)/ Leafy vegetables / carrot(GDC-1)	• Give irrigation during night time to reduce transpiration by MIS/ alternate furrow. • Adoption of drip irrigation system. • Mulching of 50 T, ~370 kg/ha. • Reduce area of irrigation.	• Ensure electric supply for life saving irrigation by PGVCL. • Provision of MIS and plastic film through Govt. schemes.
	Coastal alluvial soils	Wheat	Gram (GG- 1, GJG-3, GJG-5)/ Coriander (GC 2, 2)/Fenugreek (GM-2)/ Leafy vegetables / carrot(GDC 1)	• Give irrigation during night time to reduce transpiration losses. • Adoption of MIS, deficit irrigation, Reduce area of irrigation.	• Ensure electric supply for life saving irrigation • Construction of Well recharge structures, Timely supply of MIS and seeds through Govt. schemes.

Condition	Suggested Contingency measures				
	Major Farming situation	**Crop/ cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Sea water intrusion	Coastal alluvial, Medium land soils	Wheat	Leafy vegetables, Carrot(GDC-1), Beet, Lucerne(Anand-2,3) Semi Rabi pearl millet (GHB-538 & other Govt. approved hybrids)	• Adoption of MIS, limited area under irrigation to reduce over exploitation some extent & limit depth of pumping	-

2.2 Unusualrains (untimely, unseasonal etc.)(for both rainfed and irrigated situations)

Condition	Suggested Contingency measures			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post - harvest**
Wheat	-	-	• Surface drainage for management of water logging, lodging crop and black point in grain, spray mancozeb 0.2 % (mancozeb 75 WP(27 g/10 lit. water).	• Protect produce with plastic sheet (100 micron,UV stabilized colour plastic) or shift producesto farm shedand protection against pest/disease damage instorage etc. • Preparation of quick dryingtechniques. • Separate good lot and bad lot.
Cotton	• Surface drainage (for management of water logging)	• Surface drainage for management of water logging	• Surface drainage (for management of water logging) harvesting of mature bolls.	• Protect produce with plastic sheet (100 micron, UV stabilized colour plastic) or shift produces to farm shed and protection against pest/disease damage in storage etc.

Condition	Suggested Contingency measures			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post - harvest**
Groundnut	-	-	• Delay harvestingof spreading groundnut if possible. • Immediately harvest bunch groundnut. • Quick surface drainage • Open channel around field.	• Protect produce with plastic sheet (100 micron, UV stabilized colour plastic) or shift produces to farm shed and protection against pest/disease damage in storage etc. • Preparation of quick drying techniques. • Separate good lot and bad lot.
Pearl millet	-	-	• Harvest mature ear heads.	• Protect produce with plastic sheet (100 micron, UV stabilized colour plastic) or shift produces to farm shed and protection against pest/disease damage in storage etc. • Preparation of quick drying techniques. • Separate good lot and bad lot.
Sugarcane	• Surface drainage	• Surface drainage • Provide physical support through tying the bunch of plants	• Surface drainage • Provide physical support through tying the bunch of plants	-

Condition	Suggested Contingency measures			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post - harvest**
Horticulture				
Mango	• Provision of drainage. • Fertilizer application. • Control leaf blight under unusual rains with cloudy weather.	• Spray 0.2%(30g/10 lit water) wettablesulphur or 0.005 % hexaconazole (hexaconazole 5 EC (10 ml/ 10 litre water) for protection against powdery mildew after cessation of heavy rain.	• Hang methyl eugenol trap, 10 trap/ha for control of fruit fly.	• Utilize unripe fruits for pickles.
Banana	• Provision of drainage • Earthing up	• Earthing up	• Propping	• Shift produces to farm shed and protection against pest/disease damage in storage etc.
Coriander	• Surface drainage	• Control ofpowdery mildew	-	• Protect produce with plastic sheet (100 micron, 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 measures			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post - harvest**
Heavy rainfall with high speed winds in a short span				
Wheat	• Surface drainage (to control water logging condition)	• Surface drainage (to control water logging condition)	• Surface drainage (for management of water logging, lodging crop and black point in grain. spray mancozeb 0.2% (mancozeb 75 WP @ 27 g/10 litre water).	• Protect produce with plastic sheet (100 micron, UV stabilized colourplastic) or shift produces to farm shed • Protection against pest/disease damage in storage etc. • Preparation of quick drying techniques. • Separate good lot and bad lot.
Cotton	• Surface drainage(for management of water logging after drainage)	• Surface drainage (for management of water logging). • After drainage apply 199 kg/ha ammonium sulphate. • Upright the lodged plant and press the soil around the plant.	• Surface drainage (for management of water logging) harvesting of mature bolls.	• Protect produce with plastic sheet (100 micron, UV stabilized colour plastic) or shift produces to farm shed and protection against pest/disease damage in storage etc.
Groundnut	-	-	• Harvesting delay forspreading groundnut ifpossible. • Immediatelyharvest bunch groundnut. • Quick surface drainage. • Open channel around field.	• Protect produce with plastic sheet (100 micron, UV stabilized colour plastic) or shift produces to farm shed. • Protection against pest/disease damage in storage etc.

Condition	**Suggested Contingency measures**			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post - harvest**
Pearl millet	-	-	• Harvest mature ear heads. • Quick surface drainage.	• Protect produce with plastic sheet (100 micron, UV stabilized colour plastic) or shift produces to farm shed and protection against pest/disease damage in storage etc.
Mango	-	• Spray 0.2%(30g/10 lit water) wettable sulphur or hexaconazone 0.005%(hexaconazole 5 EC (10 ml/ 10 litre water) for protection against powdery mildew	• Collect fallen fruits	• Unripe fruit may be used for pickles.
Banana	-	• Earthing up	• Propping	• Shift produces to farm shed and protection against pest/disease damage in storage etc.
Coriander	• Surface drainage	• Surface drainage	• Surface drainage	• Protect produce with plastic sheet (100 micron, UV stabilized colour plastic) or shift produces to farm shed and protection against pest/disease damage in storage etc.

Condition	Suggested Contingency measures			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post - harvest**
Outbreak of pests and diseases due to unseasonal rains				
Wheat	• Spray mancozeb 0.2%(mancozeb 75 WP (27 g/10 litre water) to control leaf blight & rust	• Spray mancozeb 0.2%(mancozeb 75 WP (27 g/10 litre water) to control leaf blight & rust	• Spray mancozeb 0.2%(mancozeb 75 WP (27 g/10 litre water) to control black point in grain	-
Cotton	-	• 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. ?	• 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.	-
Groundnut	• Spray hexaconazole 0.005%(hexaconazole 5 EC (10 ml/10 litre water) for rust & tikka disease control. • Adopt integrated pest management techniques for white grub control like installation of light trap, seed treatment with chloropyriphosh 20 EC or quanalphosh 25 EC @ 25 ml/kg seed, drenching of chloropyriphosh 20 EC @ 4litre/ha in standing crop .	• Spray hexaconazole 0.005%(hexaconazole 5 EC (10 ml/ 10 litre water) for rust & tikka disease control.	• Spray hexaconazole 0.005%(hexaconazole 5 EC @ 10 ml/ 10 litre water) for rust & tikka disease control.	-
Pearl millet	-	-	• Spray mancozeb 0.2%%(mancozeb 75 WP @ 27 g/10 litre water)	-

Continuous high rainfall in a short span leading to water logging	Vegetative stage	Flowering stage	Crop maturity stage	Post - harvest
Horticulture				
Mango	• Provision of drainage • Fertilizer application • Control leaf blight.	• Spray 0.2%(30g/10 lit water) wettable sulphur or hexaconazole 0.005%(hexaconazole 5 EC @ 10 ml/ 10 litre water) for protection against powdery mildew after cessation of heavy rain.	• Hang methyl euginol trap, ten trap/hafor control of fruit fly.	-
Banana	-	• Spray mancozeb 0.2%(mancozeb 75 WP @ 27 g/10 litre water) to control leaf spot.	-	-
Coriander	-	• Control of powdery mildew • Control of aphid	-	-

Note: Crop insurance should be covered under PMFBY scheme.

2.3 Floods

Condition	Suggested contingency measure			
Transient water logging/ partial inundation[1]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Groundnut	NA	• For drainage, open drainage channel	• As a preventive step open drainage channel	-
Cotton	NA	• For drainage, open drainage channel	• As a preventive step open drainage channel	-
Pearl millet	NA	• For drainage, open drainage channel	• As a preventive step open drainage channel	-
Green gram	NA	• For drainage, open drainage channel	• As a preventive step open drainage channel	-
Horticulture	-	-	-	-
Mango	• Provide surface drainage	• Provide surface drainage	• Provide surface drainage	-
Banana	• Provide surface drainage	• Provide surface drainage	• Provide surface drainage	-
Coriander	• Provide surface drainage	• Provide surface drainage	• Provide surface drainage	Provide surface drainage

Condition	Suggested contingency measure			
Transient water logging/ partial inundation[1]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Continuous submergence for more than 2 days[2]				
Groundnut	• As a preventive step open drainage channel followed by spray of 0.05 % carbendazim (carbendazim 50 WP @ 10g/10 litre water) for control of leaf spot.	• As a preventive step open drainage channel followed by spray of 1 % $FeSO_4$ +citric acid for control of yellowing ,0.0025 % hexaconazole%(hexaconazole 5 EC @ 5 ml/ 10 litre water) for rust & leaf spot management	• As a preventive step open drainage channel followed by spray of 1 % FeSO4(100g/10 lit. water) + 0.1 % citric acid(10 g/10 lit. water) for control yellowing	-
Cotton	• As a preventive step open drainage channel. • Apply ammonium sulphate @ 199 kg/ha.	• As a preventive step open drainage channel. • Apply ammonium sulphate @ 199 kg/ha.	• As a preventive step open drainage channel. • Harvesting of mature bolls.	-
Pearl millet	• As a preventive step open drainage channel. • Spray mancozeb 0.2%(mancozeb 75 WP @ 27 g/10 litre water) to control downy mildew	• As a preventive step open drainage channel • Spray mancozeb 0.2%%(mancozeb 75 WP @ 27 g/10 litre water) to control downy mildew.	• As a preventive step open drainage channel • Spray mancozeb 0.2%(mancozeb 75 WP @ 27 g/10 litre water) to control rusts.	• Harvest mature ear heads.
Green gram	• As a preventive step open drainage channel. • Spray 0.025 % carbendazim (carbendazim 50 WP @ 5 g/10 litre water) for control of powdery mildew.	• As a preventive step open drainage channel. • Spray 0.025 % carbendazim (carbendazim 50 WP @ 5 g/10 litre water) for leaf spot & powdery mildew.	• As a preventive step open drainage channel • Spray 0.025 % carbendazim (carbendazim 50 WP @ 5 g/10 litre water) for control of powdery mildew.	• Picking of mature pods.
Horticulture				
Mango	• Shift grafts to safe place • Proper surface drainage	• Surface drainage	• Surface drainage	• Surface drainage
Banana	• Surface drainage	-	--	-
Coriander	• Surface drainage	• Surface drainage	• Surface drainage	Surface drainage
Sea water intrusion	NA	NA	NA	NA

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

Extreme event type	Suggested contingency measure[r]			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave	• Light & frequent irrigation to allcrops	• Light & frequent irrigation to allcrops	• Light & frequent irrigation to allcrops	-
Hailstorm	NA	NA	NA	NA
Cyclone				
Wheat	• Quick drainage	• Quick drainage	• Quick drainage. • Spraymancozeb 0.2% (mancozeb 75 WP @ 27 g/10 litre water) to controlblack point in grain.	• Shift produce at safer place
Cotton	• Earthing up , quick drainage	• Earthing up, quick drainage	• Earthing up, quick drainage	
Groundnut	• Quick drainage	-	-	
Horticulture				
Mango	• Shift grafts to safe place if possible& build Cyclone proof nursery. • Grow wind barrier trees around nursery.	• Reduce canopy & tying plantsdiagonally if possible. • Growing barrier trees around field.	• Reduce canopy & tying plantsdiagonally 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	• Store fodder (silage and hay), Conventional feeds are used for feeding (Roughages & concentrates) of maize, sorghum, groundnut fodder and wheat straw	• 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	• 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	• Rain water harvesting and create water bodies/watering points. • When water is scarce use only for drinking water for animals.	• 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%).	• Give sufficient water as per the animal requirement.
Health and disease management	• 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.	• 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.	• Add vitamin mineral mixtures 25 g/animal/day along with feed. • Quarantine diseased animals and deworming of the animals.
Floods			
Feed and fodder availability	• Harvest available fodder and store it at safe place if floods forecast. • Shift animals to safe place. • Identify rescue places for safety of animals.	• Give stored fodder with mineral mixture. • Fodder should be stored at safe place. • In severe rain and flood unteather animals.	• 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.

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Drinking water	• Add bleaching powder (1%) to drinking water when heavy rains occur and flood expected.	• Add bleaching powder to drinking water (1%).	• Add bleaching powder to drinking water (1%).
Health and disease management	• Provide insurance cover to the animals.	• 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.	• Disposal of dead animals by burning the carcas and sanitation measures to control spread of diseases. • Health checking to diseases outbreak.
Cyclone			
Feed and fodder availability	• Early harvesting & storage of fodder.	• Shift animals to safe place. • Give stored fodder with mineral mixture along with concentrated feed. • In severe rain and flood unteather animals.	• 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	• Add bleaching powder to drinking water (1%).	• Add bleaching powder to drinking water (1%).	• Add bleaching powder to drinking water (1%).

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Health and disease management	• Provide insurance cover to the animals.	• 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.	• 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			
Heat wave			
Nutritional management	**Sheltermanagement**	**Health management**	**Miscellaneous, if any**
• Feed 25 kg green fodder along with unconventional feed per animal. • Give jaggerywater with fenugreek powder. • High energy density and low protein diet are beneficial. • Increasing the grain/ forage ratio.	• Covered the shelter roof with dry grasses. (Provide protection in western side of shed) • Provide Fans & sufficient ventilation. • Use fogger/ sprinklers system • Forestry blocks can provide temporary shelter from extreme heat. • Providing good-quality drinking water and shade (natural or artificial).	• Spray them with cool water, especially on the legs and feet, or stand them in water • Lay wet towels over them. • Provide Vitamin C through Syrup for heat stress management. • Vaccinate the animals against infectious diseases.	• Cattle that are heat stressed will show increased respiration rates as they try to cool themselves down. • Don't allowed cattle to walk in extreme heat. • Use sprinklers and shade in holding yards. • Air flow is also important. • Sprinklers have been found to improve milk production, reduce fly irritation and make for more contented cows in the shed with better milk let down. • Cover animal under insurance.

Nutritional management	Sheltermanagement	Health management	Miscellaneous, if any
Cold wave			
• Feed silage & Hay (Urea treated with wheat straw) along with concentrate feed. • An increased energy requirement for maintenance as a result of increased resting metabolic rate.	• Operate heaters protect shed by tying gunny bags around shed. (Provide special protection in northern side of shed) •	• Add antibiotics in drinking water to young calves from Pneumonia. • Cold environment increases the whole body glucose turnover and glucose oxidation thus resulting in less production of ketones.	• Operate heaters protect shed by tying gunny bags around shed. • Protect animals from direct cold waves. • Cover animal under insurance.

[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	• Use stored feed, conventional feed, antibiotics and probiotics	• Use stored feed, conventional feed, antibiotics and probiotics	• Use conventional feed. • Vaccination for viral diseases –Marek's and Ranikhet diseases (MD & RD).	• Linkage Govt. schemes with public/NGOs at grass root levels.
Drinking water	• Rain water harvesting	• Give water for drinking only	• Give sufficient water as per the bird's requirement	• Linkage Govt. schemes with public/NGOs at grass root levels.
Health and disease management	• Vaccination for viral diseases –against MD & RD, cover birds under insurance	• Provide ventilation. • Add more calcium with feed. • Assure supply of electric power.	• Routine practices are followed, culling affected birds disposal by burning.	• Vaccination for viral diseases –against MD & RD.
Floods				
Shortage of feed ingredients	• Use conventional feed, ingredients	• Use stored feed, antibiotics, pro biotic. • Assure supply of electric power.	• Routine practices are followed	• Linkage Govt. schemes with public/NGOs at grass root levels.

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	**During the event**	**After the event**	
Drinking water	-	• Add bleaching powder to drinking water (1%).	• Add bleaching powder to drinking water (1%).	• Linkage Govt. schemes with public/NGOs at grass root levels.
Health and disease management	• Cover birds under insurance	• For suspected cases, give antibiotic in the feed. • Prevent water logging surrounding sheds. • Assure supply of electric power.	• Dispose dead birds by burning.	• Vaccination for viral diseases –against MD & RD.
Cyclone				
Shortage of feed ingredients	• Use stored feed ingredients.	• Use stored feed & use conventional feed, antibiotics, pro biotic.	• Routine practices are followed.	• 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	-

[a] based on forewarning wherever available

2.5.3 Fisheries/ Aquaculture

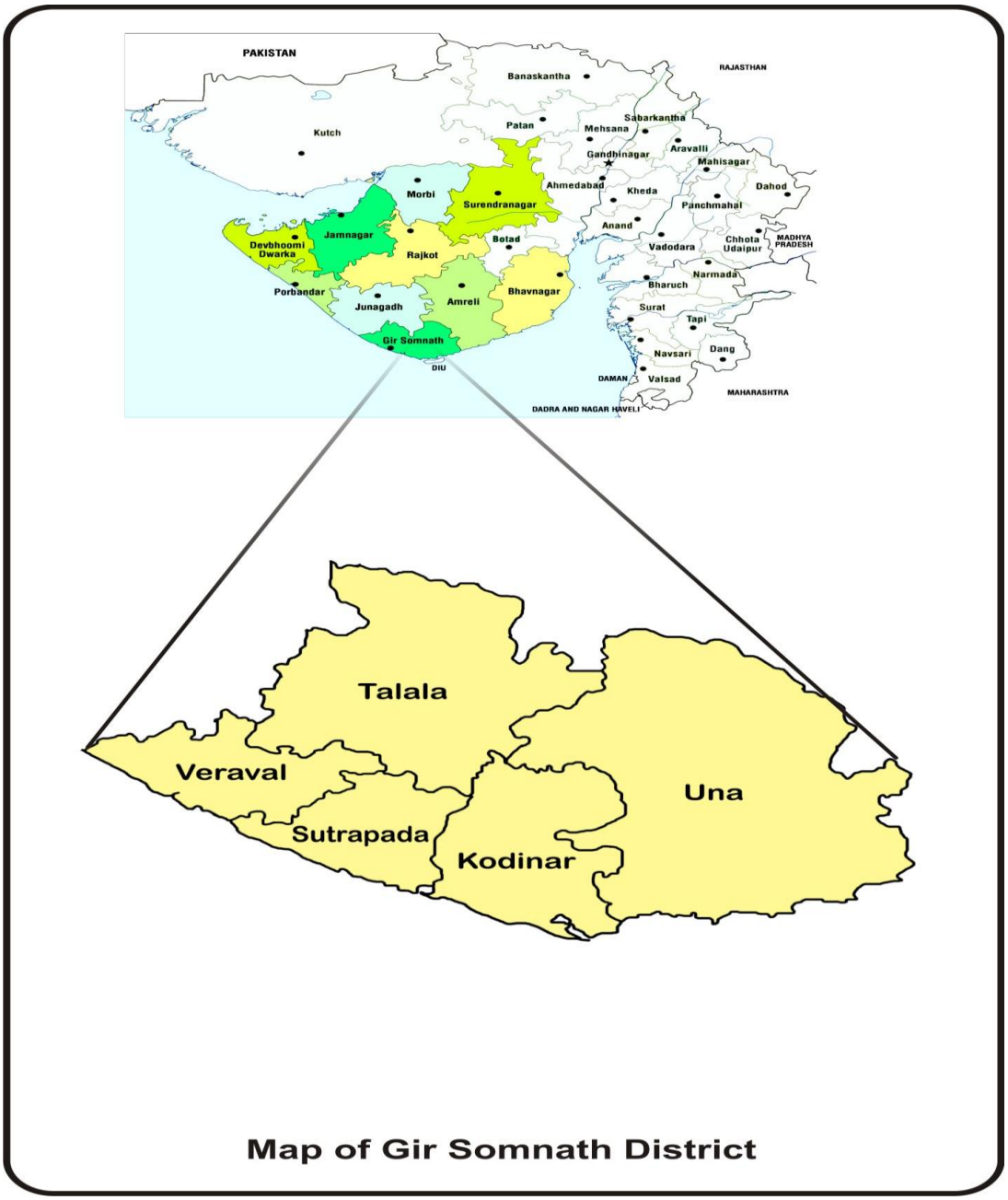
	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
1)Drought			
A. Capture			
Marine	NA	NA	NA
Inland	NA	NA	NA
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	• Desilting/deepening of pond so that more water can be stored	• Provision 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.
(iii) Any other	-	-	-
2) Floods			
A. Capture			
Marine	NA	NA	NA
Inland	NA	NA	NA
B. Aquaculture			
(i) Inundation with flood water.	• Deepening of ponds, repair, strengthening of dykes	• Enhancement of dykesheight by sand bags.	-
(ii) Water contamination and changes in water quality.	• Use of calcium hydroxide @ 150 kg/ha.	• Use of $KMnO_4$ for bath of fish as prophylactics.	• Lime treatment for oxidation.
(iii) Health and diseases.	• Antibiotics fortified feeding as prophylactics.	• Disinfectants formalin treatments as prophylactics.	-do-
(iv) Loss of stock and inputs (feed, chemicals etc).	• Stock cover under insurance	-	-
(v) Infrastructure damage (pumps, aerators, huts etc.)	-	-	• Repaire & maintenance of aqua structures to begiven.
(vi) Any other	-	-	-

	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
3. Cyclone / Tsunami			
A.Capture	-	-	-
Marine	-	-	-
(i) Average compensation to be paid due to loss of fishermen lives	• Forwarning systems to be installed. • Insurance & communication instruments supplied to fisher man. • Warning systems to be installed.	• Warning systems to be installed.	• Compensations to be paid for repair & maintenance of boats & gears on actual survey basis.
(ii) Avg. no. of boats / nets/damaged			• Compensation on assessment of actual losses & damage of boats &nets to be given.
(iii) Avg. no. of houses damaged	-	-	• 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,
(v) Infrastructure damage (pumps, aerators, shelters/hutsetc)	-	-	• Compensation on assessment of actual losses & damage of pumps, aerators, shelters/huts to begiven.
(vi) Any other	-	-	-

	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
4. Heat wave and cold wave			
A. Capture			
Marine	NA	NA	NA
Inland	NA	NA	NA
B. Aquaculture			
(i) Changes in pond environment (water quality)	• Plantation of leafy trees on dyke, increase depth.	• To maintain water level in pond. • Use of fountain and peddle wheel aerator.	-
	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
(ii) Health and disease management	-	• Bleaching powder 1 to 2 %, formalin treatment to prevent diseases.	• $KMnO_4$ 2 % to maintain oxygen level.
(iii) Any other	-	-	-

[a] based on forewarning wherever available

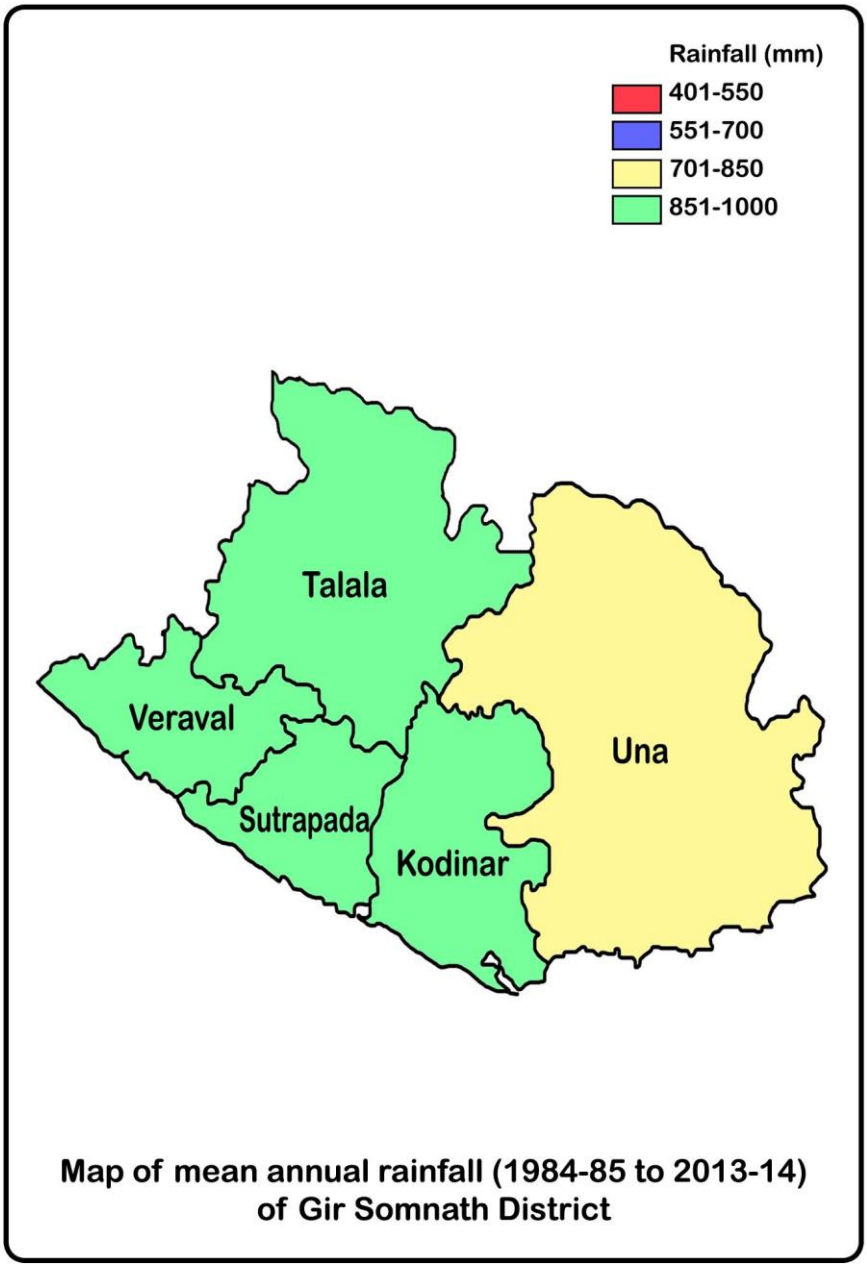
ANNEXURE I
Location map of district



Map of Gir Somnath District

ANNEXUREII

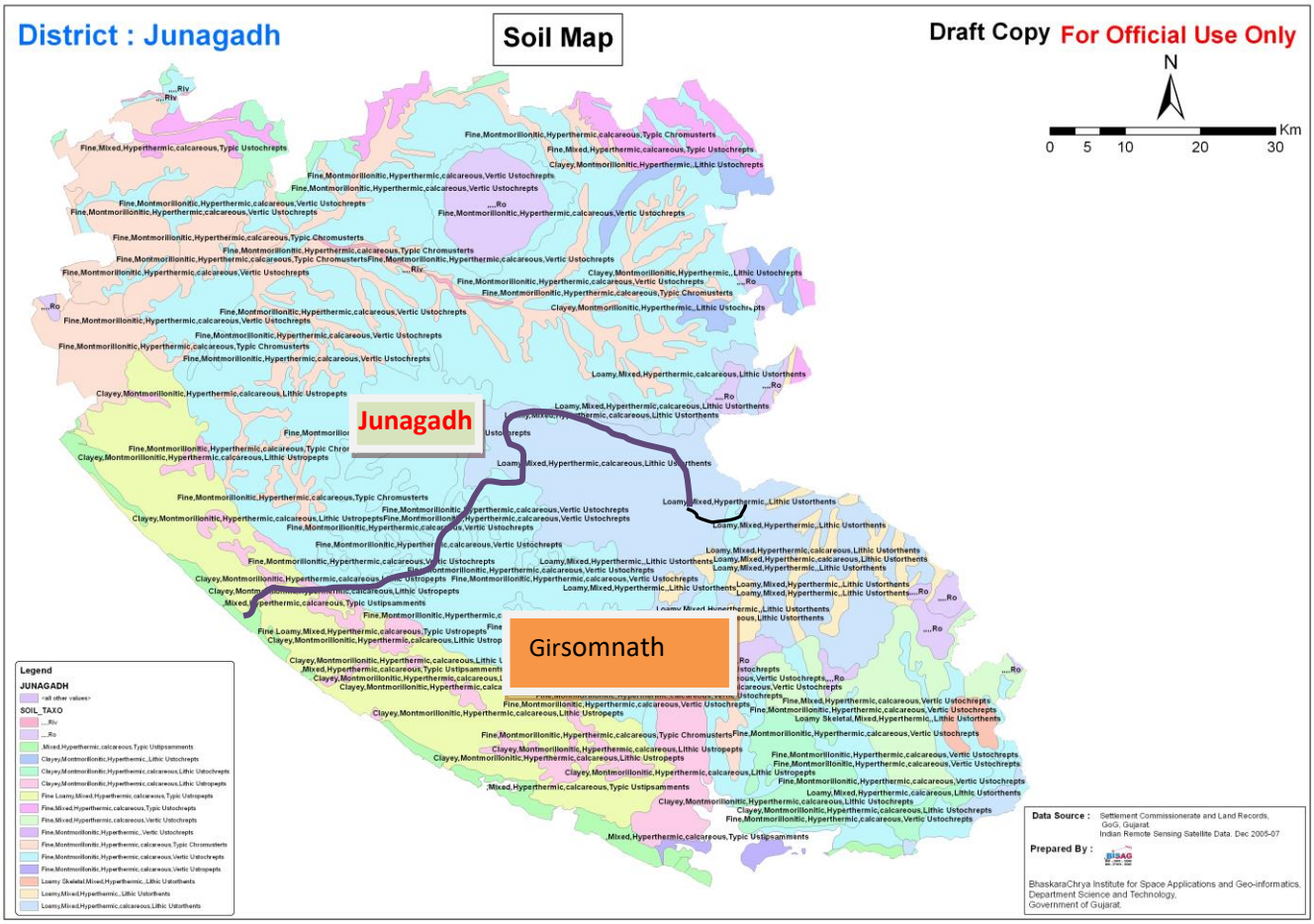
Mean annual rainfall of the district



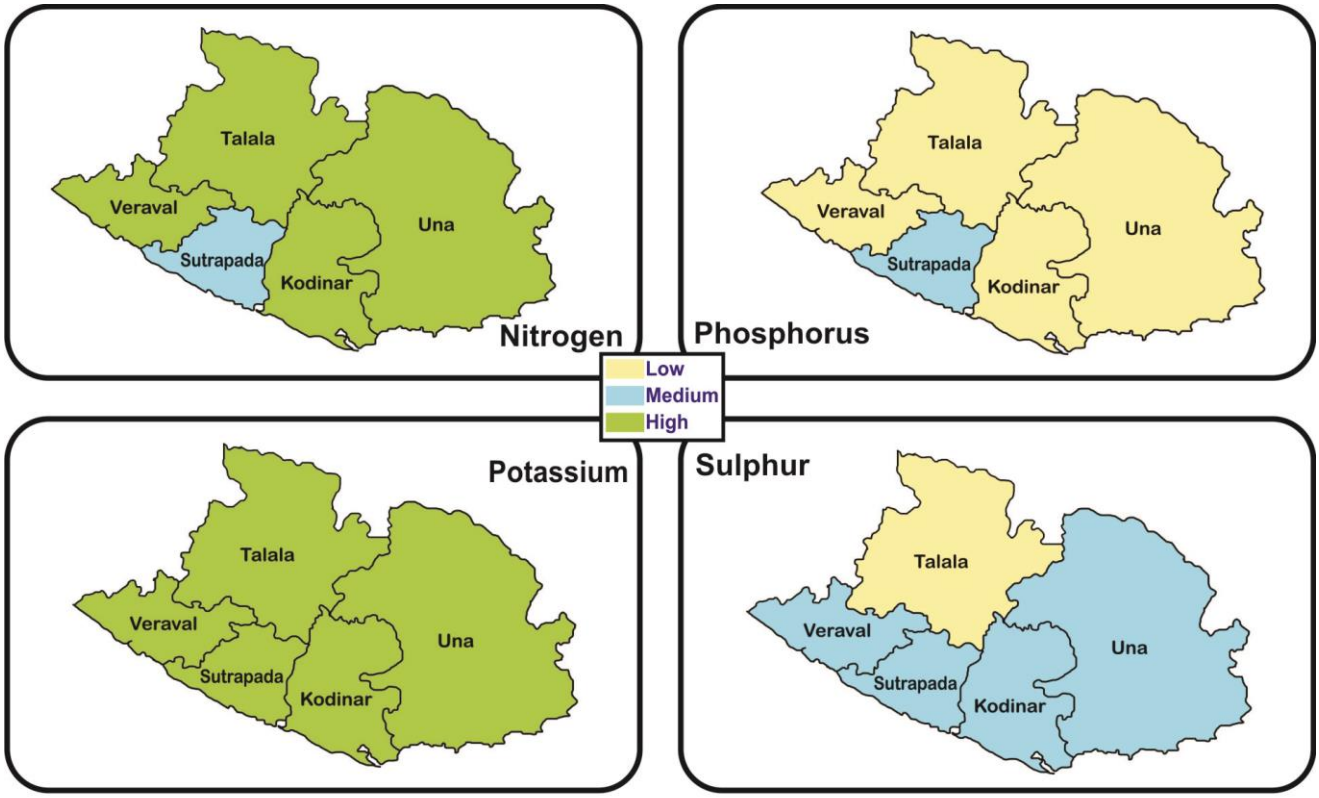
Map of mean annual rainfall (1984-85 to 2013-14)
of Gir Somnath District

ANNEXURE III

Annexure III a: Soil map of Gir-Somnath district

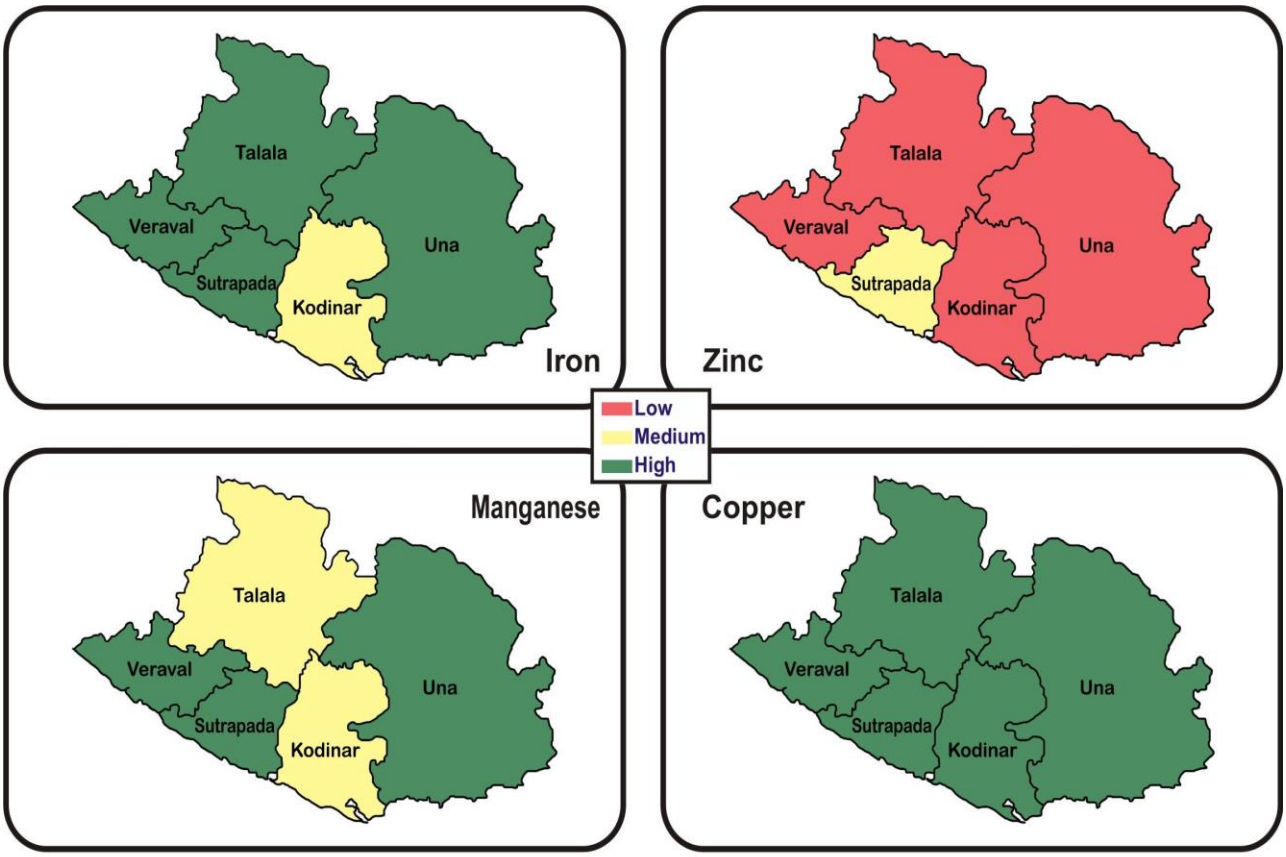


Annexure III b: Soil map of major nutrient status



Status of major nutrients in soils of Somnath District

Annexure III c: Soil map of micro nutrient status



Status of micronutrients in soils of Gir Somnath District