

State: GUJARAT

Agriculture Contingency Plan for District: RAJKOT

1.0 District Agriculture profile					
1.1	Agro-Climatic/Ecological Zone				
	Agro Ecological Sub Region (ICAR)	Western Plain, Kachchh And Part Of Kathiawar Peninsula, Hot Arid Eco-Region (2.4)			
	Agro-Climatic Zone (Planning Commission)	Gujarat Plains & Hills Region (XIII)			
	Agro Climatic Zone (NARP)	North Saurashtra (GJ-6)			
	List all the districts or part thereof falling under the NARP Zone	Amreli, Bhavnagar, Jamnagar, Rajkot, Surendranagar			
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude	
		20°18' N	70°56' E	138 m	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Main Dry Farming Research Station, Junagadh Agricultural University, Targhadia (RAJKOT)-360 003			
Mention the KVK located in the district	Krishi Vigyan Kendra, Junagadh Agricultural University, Dry Farming Research Station, Targhadia (RAJKOT)-360003				
1.2	Rainfall	Average (mm)	Normal Rainy days (number)	Normal Onset	Normal Cessation
	SW monsoon (June-Sep):	623.9	28	3 rd Std Week of June	3 rd Std Week of September
	NE Monsoon (Oct-Dec):	-	-	NA	NA
	Winter (Jan- March)	-	-	NA	NA
	Summer (Apr-May)	-	-	NA	NA
	Annual	623.9	28	NA	NA

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 ('000ha)	1111.4	758.5	38.4	34.9	88.5	16.2	63.7	95.1	5.1	-

Source: District Panchayat Rajkot

1.4	Major Soil types	Area ('000 ha)	% Area
	Medium & shallow Black(Silty clay to clay in texture, dark greyish brown to dark brown in colour, Ustocrepts-Inceptisol	520.5	68.6
	Alluvial soils (Sandy loam to clay loam intexture, Yellowgrayish brown to brown in colour, Ustocrepts & ustorthents-Inceptisol	222.2	29.3
	Others-hilly- clay loam to clay in texture, dark brown tovery dark brown in colour, Ustorthents -Entisol	15.7	2.1
	Total	758.5	

Source : District Panchayat Rajkot

1.5	Agricultural land use	Area (ha)	Cropping intensity %
	Net sown area	758.5	139.16%
	Area sown more than one	296.9	
	Gross sown area	1055.5	

1.6	Irrigation	Area ('000ha)		
	Net irrigated area	294.5 (38.28%)		
	Gross irrigated area	286.1 (38.60%)		
	Rainfed area	472.4 (61.40%)		
	Sources of Irrigation	Number	Area ('000ha)	Percentage of total irrigated area
	Canals		50.9	17.1
	Tanks	749	26.5	08.9
	Open wells	91028	161.0	54.2
	Bore wells	6151	58.3	19.6
	Lift irrigation schemes	-	-	-
	Micro-irrigation		-	-
	Other sources (please specify)	-	-	-
	Total Irrigated Area		296.9	
	Pump sets	71950		
	No. of Tractors	9130		
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited			
	Critical	Gondal		
	Semi- critical	7.Dhoraji, Jam Kandorana, Jasdan, Lodhika, Morbi, Paddhari & Rajkot	70-80%	Saline
Safe	5.Jetpur, Kotada Sangani, Tankara, Upleta, & Wankaner	70-80%	Safe	
Waste water availability and use	Malia Miyana	Sufficient	Salty water or Saline water	
Ground water quality	Good quality water is available upto 500-650 feet ,but more than that poor water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

Source:1.Report of estimation of GWR & irrigation potential –GWRE-2002,2.Narmada water resources water supply & Kalapsur Deptt. Gov.of Gujarat,Gandhinagar

1.7 Area under major field crops & horticulture (as per latest figures) (Specify year, 2008-09)

1.7	Major field crops cultivated	Area ('000 ha)							
		Kharif			Rabi			Summer	Grand total
		Irrigated	Rain fed	Total	Irrigated	Rain fed	Total		
Groundnut	-	325.6	325.6	-	-	-	6.1	331.8	
Cotton	280.3	31.1	311.5	-	-	-	-	311.5	
Sesamum	-	33.8	33.8	-	-	-	0.9	34.8	
Castor	-	17.9	17.9	-	-	-	-	17.9	
Wheat	-	-	-	100.1	-	100.1	-	100.1	
Cumin	-	-	-	6.2	-	6.2	-	6.2	
Pulses	-	8.7	8.7	-	-	-	0.540	9.2	
Pearl millet	-	2.2	2.2	-	-	-	0.520	2.7	
Horticulture crops -	Area ('000ha)								
Fruits	Total		Irrigated			Rain fed			
Mango	0.35		0.35			-			
Sapota (Chiku)	0.25		0.25			-			
Papaya	0.16		0.16			-			
Citrus	0.35		0.35			-			
Ber	0.27		-			0.27			
Custard apple	0.05		-			0.05			
Total	Irrigated		Rain fed						
Tomato	1.4		1.4			-			
Onion	8.5		8.5			-			
Brinjal	2.2		2.2			-			
Cabbage	1.8		1.8			-			
Okra	1.2		1.2			-			
Total	Irrigated		Rain fed						
Cumin	34.2		34.2			-			
Garlic	12.0		12.0			-			
Coriander	1.4		1.4			-			
Fenugreek	0.2		0.2			-			

Total		Irrigated	Rain fed	
	Rose	0.068	0.068	-
	Marigold	0.144	0.144	-
	Lily	0.035	0.035	-
	Anola	0.140	0.140	-
	Coconut	0.015	0.015	-
Total		Irrigated	Rain fed	
	Sorghum	21.375	-	21.375
	Maize	7.547	-	7.547
	Lucerne	0.234	0.234	-
	Others	0.041	-	0.041
29.197		0.234	28.963	
	Grazing land	93.616	-	93.616
	Sericulture etc	-	-	-
	Others (specify)	-	-	-

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)	203.2	226.6	429.9
	Crossbred cattle	4.7	17.0	21.7
	Non descriptive Buffaloes (local low yielding)	5.5	57.6	63.2
	Graded Buffaloes	27.9	270.8	298.8
	Goat	27.5	169.8	197.4
	Sheep	47.0	170.3	217.3
	Others (Camel, Pig, Yak etc.)	-	-	12.8
	Commercial dairy farms (Number)			1241.4

1.9	Poultry	No. of farms	Total No. of birds ('000)
	Commercial	7	178.2
	Backyard	0	4.1

1.10	Fisheries (Data source: Chief Planning Officer)								
A. Capture									
i) Marine (Data Source: Fisheries Department)		8246		Boats		Nets		Storage facilities (Ice plants etc.)	
85 Boat				Mechanized 88	Non-mechanized 949	Mechanized (Trawl nets, Gill nets) 85	Non-mechanized (Shore Seines, Stake & trap nets) -	Nil	
ii) Inland (Data Source: Fisheries Department)		No. Farmer owned ponds		No. of Reservoirs		No. of village tanks			
		37		122		13			
B. Culture									
		Water Spread Area (ha)			Yield (t/ha)		Production ('000 tons)		
i) Brackish water (Data Source: MPEDA/ Fisheries Department)		6270 ha							
ii) Fresh water (Data Source: Fisheries Department) Others		20813.8					3.2		

Source: DAO, Deptt. of Agril ,Horticulture ,Report of commissioner of fisheries, GOG. Gandhinagar,

1.11 Production and Productivity of major crops (year: 2006-07 to 2008-09)

1.1 1	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder (tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
Major Field crops										
	Groundnut	454.6	1180	-	-	6.7	1766	461.3	1473	692.0
	Hyb. Cotton	788.9	2057	-	-	-	-	788.9	2057	790.0

	Sesamum	12.8	317	-	-	0.6	620	13.4	469	40.0
	Castor	14.4	2855	-	-	0.2	2238	14.6	2547	21.9
	Pulses	5.8	1029	-	-	-	-	5.8	1029	16.5
	Wheat	-	-	441.9	4115	-	-	441.9	4115	882.5
	Gram	-	-	18.9	2178	-	-	18.9	2178	45.00
	Cumin	-	-	19.6	573	-	-	19.6	573	19.60
	Garlic	-	-	95.4	7953	-	-	95.4	7953	-
	Others	-	-	-	-	-	-	-	-	-
Horticulture Crops										
Major Horticultural crops (Crops to be identified based on total acreage)										
	Mango					1243	3500	1.2	3500	-
	Sapota (Chiku)			3.0	12000			3.0	12000	-
	Papaya	-	-	17.6	110000	-	-	17.6	110000	--
	Citrus	2.3	7000	-	-	-	-	2.3	7000	-
	Ber	-	-	1.6	6000	-	-	1.6	6000	-
	Custard apple	-	-	0.5	10000	-	-	0.5	10000	-
Vegetable Crops										
Horticulture crops – Vegetables										
	Tomato	-	-	29.7	20000	-	-	29.7	20000	-
	Onion	-	-	221.2	26000	-	-	221.2	26000	-
	Brinjal	-	-	40.6	18000	-	-	40.6	18000	-
	Cabbage	-	-	37.3	20000	-	-	37.3	20000	-
	Okra	9.9	8000	-	-	-	-	9.9	8000	-

	Cumin	-	-	22.2	650	-	-	22.2	650	-
	Garlic	-	-	96.0	8000	-	-	96.0	8000	-
	Coriander	-	-	2.2	1600	-	-	2.2	1600	-
	Fenugreek	-	-	0.5	2080	-	-	0.5	2080	-
	Turmeric	0.2	20000	-	-	-	-	0.2	20000	
Plantation crops										
	Rose	0.4	6000	-	-	-	-	0.4	6000	-
	Marigold	1.7	12000	-	-	-	-	1.7	12000	-
	Lily	0.2	7000	-	-	-	-	0.2	7000	-
	Anola	-	-	0.8	6000	-	-	0.8	6000	-
	Coconut	-	-	-	-	0.1	11000	0.1	11000	-
Eg., industrial pulpwood crops etc.										

Source: DAO, Deptt. of Agril., & Horticulture, Rajkot

1.12	Sowing window	Groundnut	Cotton	Wheat	Sesamum	Pulses (Green gram, Black gram, Cow pea etc.)
	Kharif- Rain fed	3 rd week of June to 1 st week of July	3 rd week of June to 1 st week of July	-	3 rd week of June to 1 st week of July	3 rd week of June to week of July -
	Kharif- Irrigated	3 rd week of May	3 rd week of May	-	-	-
	Rabi- Irrigated	-	-	2 nd week of Nov. to 4 th week of Nov.	-	3 rd week of October to 4 th week of November (Gram)

1.13	What is the major contingency the district is prone to? (Tick mark)	Regular	Sporadic	None
	Drought	-	√	-
	Flood	-	√	-
	Cyclone	-	√	-
	Hail storm	-	-	√
	Heat wave	-	√	-
	Cold wave	-	-	√
	Frost	-	-	√

	Sea water intrusion	√	-	-
	Pests and diseases Pests-Aphid, Jasad, Thrips, White fly&Fruit fly Diseases-Powdery Mildew,Rust,Leaf spot,Tikka & Downy Mildew	√	-	-

1.14	Include Digital maps of the district for	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: No
		Soil map as Annexure 3	Enclosed: No

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)					
Delay by 2 weeks July 1 st wk	Medium & shallow Black Soils	Groundnut	No change	Normal	N.A
		Cotton	No change	Normal	
		Sesamum	No change	Normal	
		Pulses	No change	Normal	
	Alluvial soils	Groundnut	No change	Normal	
		Cotton	No change	Normal	
		Sesamum	No change	Normal	
		Pulses	No change	Normal	

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 4 weeks July 3 rd wk	Medium & shallow Black Soils	Groundnut(Spreading & Semi spreading)	Bunch variety GG-2/GG-5/GG-7/Semi spreading variety G-20 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	-	
		Sesamum	Castor GAUCH-1, GCH-6 /Sorghum GFS-4&5, Gundhari, S-1049	(As per crop change, follow the package of practices.)	
		Pulses	Green Gram (Variety Guj. Mug-4) / Black Gram (Guj. Udad-1, T-9)	(As per crop change, follow the package of practices.)	
	Alluvial soils	Groundnut	Bunch variety GG-2/GG-5/GG-7/Semi spreading variety G-20 of groundnut	Keep 45 cm and 60 cm row spacing for bunch and semi spreading groundnut, respectively. Other practices will be as such.	
		Cotton	No change	-	
		Sesamum	Castor GAUCH-1, GCH-6 /Sorghum GFS-4&5, Gundhari, S-1049	(As per crop change, follow the package of practices.)	
		Pulses	Green Gram (Variety Guj. Mug-4) / Black Gram (Guj. Udad-1, T-9)	(As per crop change, follow the package of practices.)	

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 6 weeks (Specify month) August 1st wk	Medium Black Soils	Groundnut (Spreading & Semi spreading)	Greengram (Guj. Mag-4, K-851/ Sesame Purva-1 /Sorghum GFS-4&5, Gundhari, S-1049/ Castor GAUCH-1, GCH-6 / Pigeon pea, BDN-2, /Cotton G cot 13,15,21	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. Supply of quality seed from NSC, GSSC, SAU, and zero till seed drill, seed dressing equipments, Spayers & dusters from government schemes(Implements like seed drill,seed dressing are available in Rajkot).
		Cotton	- do -	(As per crop change, follow the package of practices.)	
		Sesame	Castor GAUCH-1, GCH-6 / Sorghum GFS-4&5, Gundhari, S-1049	(As per crop change, follow the package of practices.)	
		Pulses	Greengram (Variety Guj. Mug-4) / Black Gram (Guj. Udad-1, T-9)	(As per crop change, follow the package of practices.)	
	Alluvial soils	Groundnut (Spreading & Semi spreading)	Greengram (Guj. Mag-4, K-851/ Sesame Purva-1 /Sorghum GFS-4&5, Gundhari, S-1049/ Castor GAUCH-1, GCH-6 / Pigeon pea, BDN-2, /Cotton G cot 13,15,21	Keep 45 cm and 60 cm row spacing for bunch and semi spreading groundnut, respectively. Other practices will be as such.	
		Cotton	- do -	(As per crop change, follow the package of practices.)	
		Sesame	Castor GAUCH-1, GCH-6 / Sorghum GFS-4&5, Gundhari, S-1049	-do-	
		Pulses	Greengram (Variety Guj. Mug-4) / Black Gram (Guj. Udad-1, T-9)	- do -	

Condition			Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)	Major Farming situation	Normal Crop / Cropping system			
Delay by 8 weeks (Specify month) August 3rd wk	Medium Black Soils	Groundnut(Spreading & Semi spreading)	Sesame Purva-1/Sorghum GFS-4 & 5, Gundhari, S-1049/ Castor GAUCH-1, GCH-5	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. Supply of quality seed from NSC, GSSC, SAU, and zero till seed drill, seed dressing equipments, Sprayers & dusters from government schemes(Implements like seed drill, seed dressing are available in Rajkot).
		Cotton	- do -	(As per crop change, follow the package of practices.)	
		Sesame	-do-	-do-	
		Pulses	- do -	(As per crop change, follow the package of practices.)	
	Alluvial soils	Groundnut(Spreading & Semi spreading)	Sesame Purva-1/Sorghum GFS-4 & 5, Gundhari, S-1049/ Castor GAUCH-1, GCH-5	Keep 45 cm and 60 cm row spacing for bunch and semi spreading groundnut, respectively. Other practices will be as such.	
		Cotton	- do -	(As per crop change, follow the package of practices.)	
		Sesame	-do-	-do-	
		Pulses	- do -	-do-	

Condition			Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Normal onset	Major Farming situation	Normal Crop/cropping system			
Normal onset followed by 15-20	Medium & shallow Black Soils	Groundnut	Gap filling	Intercultivation to fill soil cracks, mulching with wheat straw or shredded cotton stalk Mulching	Supply of plastic film through govt. schemes. Cotton stock shredding machine which available

days dry spell after sowing leading to poor germination/crop stand etc.				(Plastic film 25 micron, ~200 kg/ha.)	in Jasdan Village of Rajkot district to be supplied by Govt.
		Cotton	Gap filling	- do -	-do-
		Sesame	Thinning to maintain plant to plant distance(5 cm)	Intercultivation to fill soil cracks, mulching with wheat straw or shredded cotton stalk	Supply of wheat straw or shredded cotton stalk
		Pulses Greengram &Blackgram	-	-do-	-do-
	Alluvial soils	Groundnut	Gap filling	Intercultivation to fill soil cracks, Mulching (Plastic film 25 micron, ~200 kg/ha.)	Same as black soil
		Cotton (I)	Gap filling to maintain plant stand	Intercultivation to fill soil cracks, mulching with wheat straw or shredded cotton stalk Mulching (Plastic film 25 micron, ~200 kg/ha.)	-do-
		Sesame	Thinning to maintain plant to plant distance(5 cm)	Intercultivation to fill soil cracks, mulching with wheat straw or shredded cotton stalk	Supply of wheat straw or shredded cotton stalk
		Pulses Greengram &Blackgram	-	Intercultivation to fill soil cracks	-do-
Condition			Suggested Contingency measures		
Mid season drought (long dry spell,consecutive 2 weeks rainless (>2.5 mm)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conserva tion measures	Remarks on Implementation
At vegetative stage	Medium & shallow Black Soils	Groundnut	Weeding. Protection against sucking pests (To control Jassid spraying methyle-o-demeton @ 10 ml / 10 lit. water or dimetheote @10 ml/ 10 lit water). Life saving irrigation if possible	Mulching with wheat straw or crushed cotton stalk Mulching (Plastic film 25 micron, ~200 kg/ha.) Inter tilling	Supply of plastic film and pesticides through govt. schemes. Ensure electric supply for life saving irrigation by Electricity Supply Board of State

		Cotton	-do-	-do-	-do-
		Sesame	Thinning to maintain plant to plant distance(5 cm)	Intercultivation to fill soil cracks, mulching with wheat straw or shredded cotton stalk	Supply of wheat straw or shredded cotton stalk
		Pulses	Weeding. Protection against <u>sucking pests</u> (To control Jassid spraying of methyle-o-demeton @ 10 ml / 10 lit. water or dimetheote @10 ml/ 10 lit water). Life saving irrigation if possible.	Intercultivation	Supply of pesticides through govt. schemes. Ensure electric supply for life saving irrigation by Electricity Supply Board of State
	Alluvial soils	Groundnut	-do-	Mulching with wheat straw or crushed cotton stalk Mulching (Plastic film 25 micron, ~200 kg/ha.) Inter tilling	Same as medium black soils
		Cotton	-do-	-do-	Same as medium black soils
		Sesame	Weeding/ thinning to maintain 5 cm plant to plant spacing. Life saving irrigation if possible.	Intercultivation Spray 1 % N through urea after relief of drought.	Same as medium black soils
		Pulses Greengram & Blackgram	Weeding. Protection against <u>sucking pests</u> (To control Jassid spraying methyle-o-demeton @ 10 ml / 10 lit. water or dimetheote @10 ml/ 10 lit water) life saving irrigation if possible	Intercultivation, Avoid top dressing of urea,	Same as medium black soils

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)					
At flowering/ fruiting stage	Medium & Shallow Black Soils	Groundnut	Supplemental irrigation if possible followed by weeding.	-	Ensure electric supply for life saving irrigation by Electricity Supply Board of State
		Cotton	- do -	-	
		Sesame	- do -	-	
		Pulses Green gram & Blackgram	- do -	Avoid top dressing of urea	
	Alluvial soils	Groundnut	Supplemental irrigation if possible followed by weeding.	-	
		Cotton	- do -	-	
		Sesame	- do -	-	
		Pulses Green gram & Blackgram	Weeding, Supplemental Irrigation if possible	Avoid top dressing of urea	

Condition	Suggested Contingency measures			
	Major Farming situation	Normal Crop/cropping system	Crop management	Remarks on Implementation
Terminal drought (Early withdrawal of Monsoon)				
	Medium & Shallow Black Soils	Groundnut	Life saving irrigation if possible.	Ensure electric supply for life saving irrigation by Electricity Supply Board of State
		Cotton	Harvest mature bolls. Supplemental irrigation if possible	2. -do-
		Sesamum	Harvest mature plants , thin out plant population , Remove old leaves , life saving irrigation if possible,	-do-

			Complete removal of weeds	
		Pulses Greengram &Blackgram	Supplemental irrigation if possible. Thin out plant population. Harvest mature plants.	-do-
	Alluvial soils	Groundnut	Life saving irrigation if possible.	Ensure electric supply for life saving irrigation by Electricity Supply Board of State
		Cotton	Harvest mature bolls. Supplemental irrigation if possible	-do-
		Sesamum	Harvest mature plants , thin out plant population , Remove old leaves , life saving irrigation if possible, Complete removal of weeds	-do-
		Pulses Greengram &Blackgram	Supplemental irrigation if possible. Thin out plant population. Harvest mature plants.	-do-

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/ limited release of water in canals due to low rainfall	Medium & shallow Black to Mixed Red & Black soils		NA		
	Coastal Alluvial soils				

Condition	Major Farming situation	Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed	Medium & shallow Black to Mixed Red & Black soils		NA -		

onset of monsoon in catchment	Coastal Alluvial soils		
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Condition	Major Farming situation	Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Medium & shallow Black to Mixed Red & Black soils		NA		
	Costal Alluvial soils, Medium land				

Condition	Major Farming situation	Crop/cropping system	Change in crop/cropping system	Suggested Contingency measures	
				Agronomic measures	Remarks on Implementation
Insufficient ground water recharge due to low rainfall	Medium & shallow Black	Wheat	Wheat	Supply irrigation during night time to reduce transpiration.	Ensure electric supply for life saving irrigation by Electricity Supply Board of State
			Gram ICCC 4, Guj 1 & 2 / Cumin Guj 1,2,3 & 4/ Coriander Guj 1 & 2/ Fenugreek Guj 1, Leafy Vegetables / Carrot.	Adoption of Sprinkler irrigation system. Reduce area of irrigation.	
		Cotton	Cotton	Supply irrigation during night time to reduce transpiration.	

			Gram ICC 4, Guj 1 & 2 / Cumin Guj 1,2,3 & 4/ Coriander Guj 1 & 2/ Fenugreek Guj 1, Leafy Vegetables / Carrot.	Adoption of drip irrigation system. Mulching of 50 μ , ~370 kg/ha. Reduce area of irrigation.		
		Cumin	As above	Adoption of drip, deficit irrigation, Reduce area of irrigation		
	Alluvial Soil	Wheat	Wheat	Wheat	Supply irrigation during night time to reduce transpiration.	Ensure electric supply for life saving irrigation by Electricity Supply Board of State.
			Gram ICC 4, Guj 1 & 2 / Cumin Guj 1,2,3 & 4/ Coriander Guj 1 & 2/ Fenugreek Guj 1, Leafy Vegetables / Carrot.	Adoption of Sprinkler irrigation system. Reduce area of irrigation.	Construction of Well recharge structures, Timely supply of MIS and seeds through govt. schemes	
	Cumin	As above	As above	Adoption of drip, deficit irrigation, limited area irrigation	Ensure electric supply for life saving irrigation by Electricity Supply Board of State.	

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	-	-	Surface drainage (for management of water logging, lodging crop and to control black point in grain.) spray mancozeb 0.2 %	Protect produce with plastic sheet (100 μ m, UV stabilized colour plastic) or shift produces to farm shed and protection against pest/disease damage in storage etc, Preparation of quick

				drying techniques to separate good lot and bad lot.
Cotton	Surface drainage (for management of water logging, Apply 199 Kg/ha Ammonium Sulphate	Surface drainage (for management of water logging, Apply 199 Kg/ha Ammonium Sulphate	Surface drainage (for management of water logging) harvesting mature bolls	-do-
Green gram	-	-	Harvest mature ear heads.	-do-
Groundnut	-	-	Arrange drainage, Harvest mature pods.	-do-
Mango	Provision of drainage. Fertilizer application. Control leaf blight under unusual rains with cloudy weather.	Spray 0.2% wettable sulphur or 0.005% hexaconazole for protection against powdery mildew after cessation of heavy rain.	Hang methyle euginol trap, one /acre for control of fruit fly.	Utilized unripe fruits for pickles.
Citrus	Control citrus canker by spray of Copper Oxy chloride 0.2 % & streptocycline 100 ppm	Control citrus canker by spray of Copper Oxy chloride 0.2 % & streptocycline 100 ppm	Control citrus canker by spray of Copper Oxy chloride 0.2 % & streptocycline 100 ppm, collect mature fruits	-
Ber	-	Spray 0.2 % wettable sulphur for protection against PM	-	-
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, and to control black point in grain, spray mancozeb 0.2%.	Protect produce with plastic sheet (100 µm, UV stabilized colour plastic) or shift produces to farm shed and protection against pest/disease damage in storage etc, Preparation of quick drying techniques to separate good lot and bad lot.
Cumin	Surface drainage (For management of water logging & diseases. Spray Mancozeb 0.2% to control Cumin blight, 0.2% wettable sulphur for	Surface drainage (for management of water logging & diseases, Spray Mancozeb 0.2% to control Cumin blight)), 0.2 % wettable sulphur for	Surface drainage (for management of water logging)	To cover produce with plastic sheet (100 µm, UV stabilized colour plastic) or shift produces to farm shed and protection against pest/disease damage in storage etc,

	protection against PM	protection against PM		
Cotton	Surface drainage (for management of water logging. After drainage apply 199 Kg/ha ammonium sulphate.	Surface drainage (for management of water logging. After drainage apply 199 Kg/ha ammonium sulphate.	Surface drainage (for management of water logging). Harvesting mature bolls.	Protect produce with plastic sheet (100 µm, UV stabilized colour plastic) or shift produces to farm shed and protection against pest/disease damage in storage
Groundnut	-	-	Harvesting delay for spreading groundnut if possible. Immediately harvested bunch groundnut. Quick surface drainage, Open channel around field.	Protect produce with plastic sheet (100 µm, UV stabilized colour plastic) or shift produces to farm shed and protection against pest/disease damage in storage etc, Preparation of quick drying techniques to separate good lot and bad lot.
Green gram	-	-	Arrange drainage, Harvest mature pods.	-do-
Horticulture				
Mango	-	Spray 0.2% wettable sulphur or 0.005% Hexaconazole for protection against powdery mildew.	Collect fallen fruits.	Utilized unripe fruits for pickles.
Citrus	Control citrus canker by spray of Copper Oxy chloride 0.2 % & streptomycin 100 ppm	Control citrus canker by spray of Copper Oxy chloride 0.2 % & streptomycin 100 ppm	Control citrus canker by spray of Copper Oxy chloride 0.2 % & streptomycin 100 ppm, collect mature fruits	-
Ber	-	Spray 0.2 % wettable sulphur for protection against PM	-	-
Outbreak of pests and diseases due to unseasonal rains				
Wheat	Spray Mancozeb 0.2% (To control leaf Blight & rust	Spray Mancozeb 0.2% (To control leaf Blight & rust)	For black point in grain, Spray Mancozeb 0.2%	-
Cumin	Spray Mancozeb 0.2% to control Cumin blight	Spray Mancozeb 0.2% (To control Cumin Blight)	Spray 0.2% wettable sulphur to control PM	-
Cotton	-	Control cotton angular leaf spot by spray of Copper Oxy	Control cotton angular leaf spot by spray of Copper Oxy chloride	-

		chloride 0.2 % & streptocycline 100 ppm.	0.2 % & streptocycline 100 ppm.	
Groundnut	Spray 0.005% hexaconazole for rust & tikka disease control.	Spray 0.005% hexaconazole for rust & tikka disease control.	Spray 0.005% hexaconazole for rust & tikka disease control.	-
Pulses	-	-	-	-

Horticulture				
Mango	Provision of drainage, fertilizer application, Control leaf blight under unusual rains with cloudy weather.	Spray 0.2% wettable sulphur or 0.005% hexaconazole for protection against powdery mildew after cessation of heavy rain.	Hang methyle euginol trap, one /acre for control of fruit fly.	-
Citrus	Control citrus canker by spray of Copper Oxy chloride 0.2 % & streptocycline 100 ppm	Control citrus canker by spray of Copper Oxy chloride 0.2 % & streptocycline 100 ppm	Control citrus canker by spray of Copper Oxy chloride 0.2 % & streptocycline 100 ppm, collect mature fruits	-
Ber	-	spray 0.2% wettable sulphur to control PM	spray 0.2% wettable sulphur to control PM	-

2.3 Floods

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation				
Groundnut	NA	As a preventive step open drainage channel.	As a preventive step open drainage channel.	-
Cotton	NA	-do-	-do-	-
Sesame	NA	-do-	-do-	-
Green gram	NA	-do-	-do-	-
Horticulture	-	-	-	-

Mango	Proper Surface drainage	Surface drainage	Surface drainage	-
Citrus	Shift to safe place with proper drainage	Surface drainage	Surface drainage	-
Ber	-do-	-do-	-do-	-
Continuous submergence for more than 2 days				
Groundnut	As a preventive steps open drainage channel followed by spray 0.05 % carbendazim for control of leaf spot.	As a preventivesteps open drainage channel followed by spray 1 % FeSO ₄ + 0.1 % citric acid for control yellowing, 0.0025% hexaconazole for rust & leaf spot management.	As a preventive steps open drainage channel followed by spray 1 % FeSO ₄ + 0.1 % citric acid for control yellowing.	
Cotton	As a preventive step open drainage channel and apply 199 Kg/ha amonium sulphate.	As a preventive step open drainage channel and apply 199 Kg/ha amonium sulphate.	As a preventive step open drainage channel. Harvesting mature bolls.	
Sesamum	As a preventive step open drainage channel	As a preventive step open drainage channel. Spray of copper oxychloride 0.2% to control phytophthora blight	As a preventive step open drainage channel and spray propiconazole 0.025% (To control leaf / stem spot)	harvest mature plants
Green gram	As a preventive step open drainage channel and spray 0.05 % carbendazim for powdery mildew.	As a preventive step open drainage channel and spray 0.005% hexaconazole or 0.025 % carbendazim for leaf spot & powdery mildew.	As a preventive step open drainage channel and spray 0.005% hexaconazole or 0.025 % carbendazim for powdery mildew.	Picking of Mature pods.
Horticulture				
Mango	Shift grafts to safe place & proper surface drainage.	Surface drainage.	Surface drainage.	Surface drainage.
Citrus	Shift to safe place & with proper surface drainage	-do-	-do-	-do-
Ber				
Sea water intrusion	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	Light & frequent irrigation to all crops	Light & frequent irrigation to all crops	Light & frequent irrigation to all crops	-
Cold wave	NA	NA	NA	NA
Frost	NA	NA	NA	NA
Hailstorm	NA	NA	NA	NA
Cyclone				
Wheat	Quick drainage	Quick drainage	Quick drainage and spray mancozeb 0.2% to control black point in grain.	Shift produce at safer place
Cotton	Earthing up , quick drainage	Earthing up, quick drainage	Earthing up, quick drainage	
Groundnut	Quick drainage	Quick drainage	Quick drainage	
Cumin/ Coriander	Quick drainage	Quick drainage	Quick drainage	
Horticulture				
Mango	Shift grafts to safe place if possible & build Cyclone proof nursery, Grow wind barrier trees around nursery.	Reduce canopy & tying plants diagonally if possible, Grow wind barrier trees around field.	Reduce canopy & tying plants diagonally if possible.	Early harvesting of crop.
Citrus	Shift to safe place if possible & Build Cyclone proof nursery, Grow wind barrier trees around nursery	Reduce canopy & tying plants diagonally if possible, Grow wind barrier trees around field.	Reduce canopy	-do-
Ber	-	-	Reduce canopy	-do-

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 & 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.
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. Vaccination for bacterial diseases e.g. , 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.	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.
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 health in the region. Establish link with Agricultural/Veterinary University for animal health. Involve vet. science students for health management of animal. Carry out decease diagnosis camps.	Disposal of dead animals by burning the carcas and sanitation measures to control spread of diseases. Health checking to diseases out break.
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%).
Health and disease management	Provide insurance cover to the animals.	Vaccination of animals to HS & BQ. Keep animal free. 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.	Disposal of dead animals by burning the carcass and sanitation measures to control spread of diseases. Health checking to diseases outbreak.
Heat wave and cold wave	NA	NA	NA
Heat wave	NA	NA	NA
	Suggested contingency measures		
	Before the event^s	During the event	After the event
Drought			
Feed and fodder availability	To store fodder (silage and hay), Conventional feeds are used for feeding (Roughages & concentrates) of Maize, Sorghum, Groundnut fodder & wheat straw)	Feed stored fodder-silage & Hay Urea treated wheat straw 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	Feed little green fodder along with unconventional feed, 5 kg green feed/mature animal

Drinking water	Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals)	Avoid wallowing Judicious use of drinking water, Establish and arrange the community based drinking water facilities. In costal area community based R.O. Plant to be established for drinking water.	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 for cattle & Buffaloes, Add mineral mixtures 25 g/Animal/day along with feed, animals cover under insurance , Vaccination for Bacterial diseases e.g. , HS,BQ	Add mineral mixtures 25 g/Animal/day along with feed, Deworming of the animals list out dead animals and submit for insurance claim, 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.	Add vitamin mineral mixtures 25 g/Animal/day along with feed, quarantine disease animals Deworming of the animals
Floods			
Feed and fodder availability	Harvest available fodder and store it if floods are warned 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 rains and floods unteather the animals	Feed silage & Hay 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	Add bleaching powder (1%) to drinking water when heavy rains occur and floods are 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 list out dead animals and submit for insurance claim Arrange mobile dispensary for animal	Disposal of dead animals by burning the carcass and sanitation measures to control spread of diseases

		<p>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.</p>	
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.	<p>Feed silage & Hay 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</p>
Drinking water	Add bleaching powder to drinking water (1%)	Add bleaching powder to drinking water (1%)	Add bleaching powder to drinking water (1%)
Health and disease management	Provide insurance cover to the animals	<p>Vaccination of animals to HS & BQ, keep animal free list out dead animals and submit for insurance claim 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.</p>	Disposal of dead animals by burning the carcass and sanitation measures to control spread of diseases
Heat wave and cold wave	NA	NA	NA
Heat wave	NA	NA	NA

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	Stored feed, conventional feed, Antibiotics and probiotics	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, covers birds under insurance.	Provide ventilation. Add more calcium with feed. Assure supply of electric power.	Routine practices are to be 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 biotics, and Assure supply of electric power.	Routine practices are to be followed.	Linkage Govt. schemes with public/NGOs at grass root levels.
Drinking water	-	Add bleaching powder to drinking water (1%).	Add bleaching powder to drinking water (1%).	-do-
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 to be 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 fitting fan and 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, calcium in the poultry feed.	Routine practices are to be followed.	-
Cold wave				
Shelter/environment management	N.A.	N.A.	N.A.	-
Health and disease management	N.A.	N.A.	N.A.	-

2.5.3 Fisheries/ Aquaculture

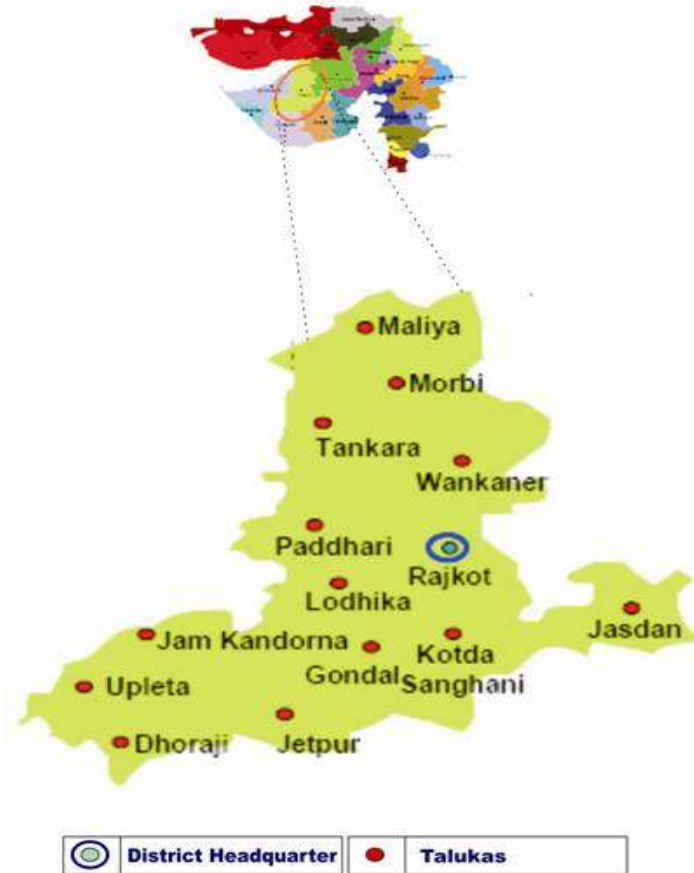
	Suggested contingency measures		
	Before the event	During the event	After the event
1) Drought			
A. Capture			
Marine	NA	NA	NA
Inland	NA	NA	NA
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	Desilting/deepening of pond so that more water can be stored	Provision of additional 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
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 dykes height by sand bags	-
(ii) Water contamination and changes in water quality	Use of calcium hydroxide @ 150 kg/ha	Infected fishes to be treated with KMnO ₄ 1 % 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)	-	-	Repair & maintenance of aqua structures to be given

3. Cyclone / Tsunami			
A. Capture			
Marine			
(i) Average compensation paid due to loss of fishermen lives	For warning 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	-	-
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)	-	-	Compensation on assessment of actual losses & damage of pumps, aerators, shelters/huts to be given
4. Heat wave and cold wave			
Heat 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	Prophylactic measures
(ii) Health and Disease management	-	Bleaching powder 1 to 2 % , formalin treatment to prevent disease	KMnO ₄ 2 % to maintain oxygen level
cold wave			
A. Capture			
Marine	NA	NA	NA
Inland	NA	NA	NA
B. Aquaculture			
(i) Changes in pond environment (water quality)	-	To maintain water level in pond ,	Prophylactic measures
(ii) Health and Disease management	-	Bleaching powder 1 to 2 % , formalin treatment to prevent disease	KMnO ₄ 2 % to maintain oxygen level

Rajkot District Map- Annexure I

Map of Rajkot District with talukas



Source : Rajkot District Collectorate, Rajkot

Annexure- II.

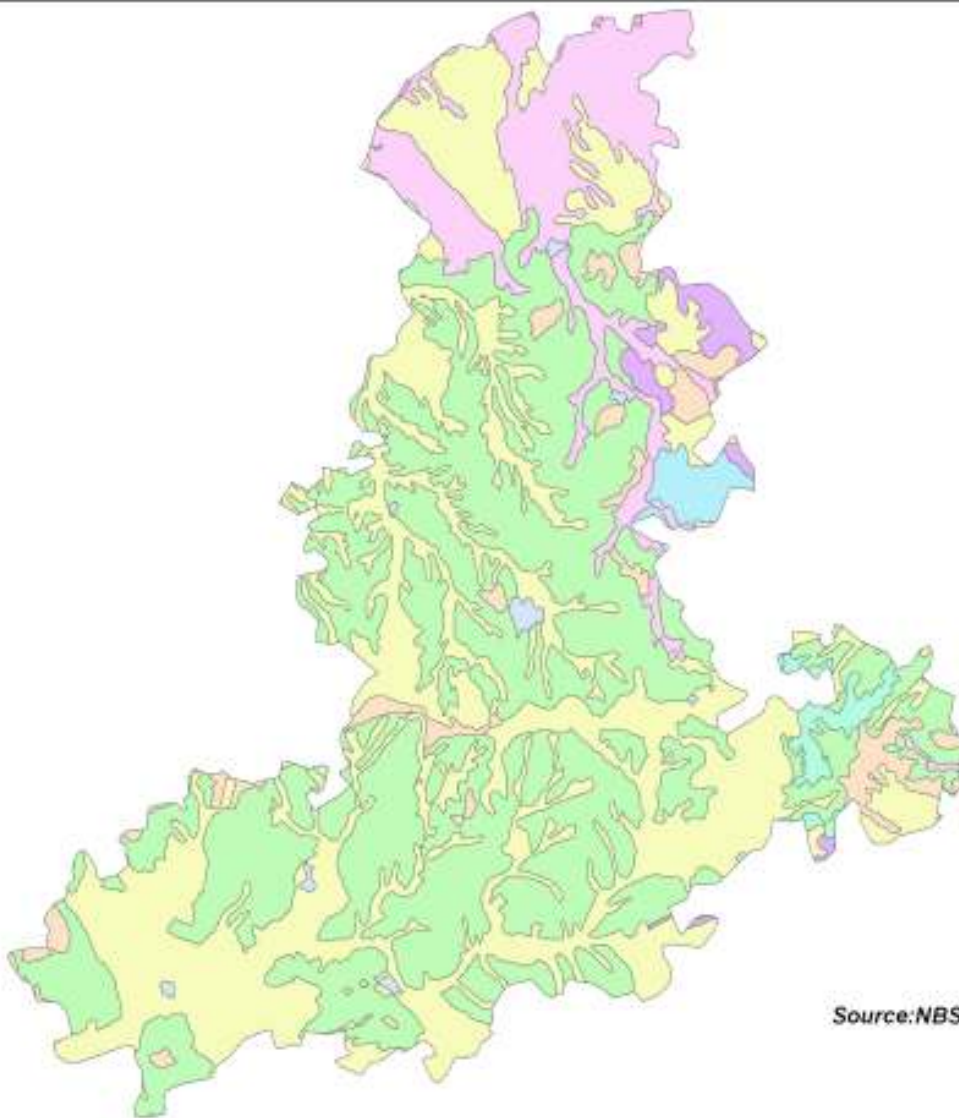
Rainfall of different talukas of Rajkot district.

Sr. No.	Name of Taluka	Rainfall(mm)		
		2006-07	2007-08	2008-09
1.	Rajkot	913	1408	862
2.	Jasdan	896	900	689
3.	Lodhika	894	1268	754
4.	Kotda-Sangani	721	1170	970
5.	Gondal	729	1418	816
6.	Jetpur	886	1037	1048
7.	Dhoraji	1084	995	960
8.	Upleta	1205	1081	850
9.	Jam-Kandorna	840	1122	887
10.	Morabi	989	886	730
11.	Maliya-Miana	848	686	491
12.	Paddhri	631	1149	713
13.	Wankaner	594	685	778
14.	Tankara	575	845	623

Soils Rajkot district

Legend

-  Deep clayey soils
-  Deep loamy soils
-  Medium clayey soils
-  Medium loamy soils
-  Shallow Clayey soils
-  Shallow loamy soils
-  Shallow Gravelly clayey soils
-  Shallow Gravelly loamy soils
-  Rock outcrops
-  Rann
-  Misc.



Source: NBSS & LUP (ICAR) Regional centre, Udaipur