

State: GUJARAT

Agriculture Contingency Plan for District: PORBANDAR

1.0 District Agriculture profile					
1.1	Agro-Climatic/Ecological Zone				
	Agro Ecological Sub Region (ICAR)		Arid Western Plain(5.1)		
	Agro-Climatic Zone (Planning Commission)		Gujarat Plains & Hills Region (XIII)		
	Agro Climatic Zone (NARP)		South Saurashtra Agro Climatic Zone (GJ.7)		
	List all the districts or part thereof falling under the NARP Zone		Porbandar, Gir Somnath Junagadh, and part of Bhavnagar, Amreli and Rajkot		
	Geographic coordinates of district headquarters		Latitude	Longitude	Altitude
			21°38'31" N	69°36'33" E	27.44m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS		Directorate of Research, Junagadh Agricultural University, Junagadh, Gujarat		
	Mention the KVK located in the district		Krishi Vigyan Kendra, JAU, Khapat Farm, Khapat-Porbandar-360575		
	1.2	Rainfall (2006-2015)	Normal RF(mm)	Normal Rainy days (number)	Normal Onset (specify week and month)
SW monsoon (June-Sep):		850	31	2 nd Week of June	2 nd Week of September
NE Monsoon(Oct-Dec):		-	-	NA	NA
Winter (Jan- March)				-	-
Summer (Apr-May)				-	-
Annual		850	31	-	-

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)	229.5	119.4	24.4	15.4	25.5	4.7	-	18.6	21.5	-

(Source: Statistical reports by District Panchayat, Porbandar 2016 and C-DAP, Porbandar, 2012)

1.4	Major Soils (common names like red sandy loam deep soils(etc.,)*)	Area ('000 ha)	Percent (%) of total
	1. Medium Black	86.6	38
	2. Deep Black (Ghed area)	56.9	25
	3. Hilly soil	46.1	20
	4. Shallow Black	39.8	17
	Others (specify):	-	-

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	119.37	112.26
	Area sown more than once	14.64	
	Gross cropped area	134.01	

(Source: Statistical reports by District Panchayat, Porbandar)

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	19.5		
	Gross irrigated area	19.5		
	Rainfed area	99.9		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals		0.08	
	Tanks	-		
	Open wells	20058	19.5	100
	Bore wells	-		
	Lift irrigation schemes	-		
	Micro-irrigation		-	
	Other sources (please specify)			
	Total Irrigated Area		19.5	
	Pump sets			
	No. of Tractors			

	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	-	-	saline water
	Critical	-		
	Semi- critical	1	50.8	Fluoride, Nitrate content , saline water
	Safe	2	49.2	
	Wastewater availability and use	0		
	Ground water quality	Saline water with high TDS, Sea water intrusion		

*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%

(Source: Reports of District Panchayat, Porbandar (2016)&PMKSY, District irrigation plan, PMKSY, (2016) Porbandar, Gujarat)

1.7 Area under major field crops & horticulture (as per latest figures) (Specify year 2010-11 to 2014-15)

1.7	Major field crops cultivated	Area ('000 ha)							
		Kharif			Rabi			Summer	Grand total
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
	Groundnut	-	82.1	82.1	-	-	-	0.1	82.2
	Cotton	9.2	0.9	10.1	-	-	-	-	10.1
	Wheat	-	-	-	20.7	-	20.7	-	20.7
	Pulses	-	0.9	0.9	-	10.6	11.5	2.0	14.4
	Sesame	-	0.2	0.2	-	-	-	2.4	2.6
	Horticulture crops (2015-16) - Fruits	Total Area ('000 ha)							
	Papaya	0.01							
	Mango	0.298							
	Sapota(Chiku)	0.210							
	Acid lime	0.04							
	Horticulture crops - Vegetables	Total							
	Brinjal	0.245							
	Onion	0.20							
	Chilli	0.50							

	Spices, Medicinal and Aromatic crops	Total
	Cumin	17.5
	Coriander	15.5
	Plantation crops	Total
	Coconut	0.690
	Eg., industrial pulpwood crops etc.	-
	Fodder crops	Total
	Sorghum, Maize, Lucerne	29.5
	Total fodder crop area	29.5
	Grazing land	25.5
	Sericulture etc	
	Others (specify)	

Source: Statistical reports by District Panchayat, 2015, Reports of District Panchayat, Department of Agriculture (2010-11-2014-15), Reports of Department of Horticulture (2015-16), Government of Gujarat,

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)	35.9	48.8	84.7
	Crossbred cattle	-	-	-
	Non descriptive Buffaloes (local low yielding)	4.3	140.2	144.5
	Graded Buffaloes	-	-	-
	Goat	2.4	15.4	17.8
	Sheep	5.2	16.5	21.7
	Others (Camel, Pig, Yak etc.)	3.6	1.4	5.0
	Commercial dairy farms (Number)			0.191
1.9	Poultry	No. of farms	Total No. of birds ('000)	
	Commercial	15	14.6	
	Backyard	0	1.0	

1.10	Fisheries						
	A. Capture						
	i) Marine	No. of fishermen	Boats		Nets		Storage facilities (Ice plants etc.)
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
		32925	4638	133	95970	-	112
ii) Inland	No. Farmer owned ponds		No. of Reservoirs		No. of village tanks		
	-		7		27		
	B. Culture						
		Water Spread Area (ha)		Yield (t/ha)		Production ('000 tons)	
	i) Brackish water	0.7		1.5		0.001	
	ii) Fresh water						
	Others						

Source: Department of Animal Husbandry and Fisheries, Government of Gujarat(2015)

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 (Crops to be identified based on total acreage)										
Crop 1	Groundnut	142.07	1817	-	-	-	-	142.07	1817	213.10
Crop 2	Cotton-irrigated	31.63	2025	-	-	-	-	31.63	2025	-
Crop 3	Wheat	-	-	64.7	3119	-	-	67.70	3119	4.80
Crop 4	Chickpea	-	-	13.7	1289	-	-	13.7	1289	26.80
Others		-	-	-	-	-	-	-	-	-
Major Horticultural crops (Crops to be identified based on total acreage)										
Crop 1	Cumin	-	-	12.1	693	-	-	12.1	693	-
Crop 2	Coriander	-	-	25.3	1630	-	-	25.3	1630	-
Crop 3	Onion	-	-	5.4	2700	-	-	5.4	2700	-

(Source: Reports of District Panchayat, Department of Agriculture (2010-11-2014-15), Reports of Department of Horticulture (2015-16), Government of Gujarat,

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	1: Groundnut	2: Cotton	3: Wheat	4: Cumin	5: Chickpea
	Kharif- Rainfed	2 nd week of June to 1 st week of July	2 nd week of June to 2 nd week of July	-		
	Kharif-Irrigated	4 th week of May to 2 nd week of June	4 th week of May to 2 nd week of June	-	-	
	Rabi- Rainfed	-		-	-	2 nd week of Nov. to 4 th week of Nov.
	Rabi-Irrigated	-		2 nd week of Nov. to 4 th week of Nov.	2 nd week of Nov. to 4 th week of Nov.	

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

1.14	Include Digital maps of the district for	Location map of district within State as Annexure I	Enclosed: Yes
		Rainfall map as Annexure II	Enclosed: Yes
		Soil map as Annexure III	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	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 2 weeks (Specify month) June 4 th week	1 Medium black to shallow black soils	Groundnut (Spreading Semi- spreading) (Spreading GG10, 11, GJG 17, 31 and Semi spreading GG 20,GJG-22)	No Change	• As per crop follow the package of practices	-
		Cotton - Irrigated (Cotton hybrid 4,6,8,10, GJC 101 & Govt. approved Bt. hybrids)	No Change	• As per crop follow the package of practices	
		Sorghum (Gundhri)	No Change	• As per crop follow the package of practices	
	2.Deep black soil (<i>Ghed</i> area)	Cotton- rainfed (G. Cot. 13,15,21,25)	No Change	• As per crop follow the package of practices	
		Sorghum Sorghum (Gundhri)	No Change	• As per crop follow the package of practices	
Delay by 4 weeks (Specify month) 2 nd week of July	1 Medium black to shallow black soils	Groundnut (Spreading Semi- spreading)	Prefer bunch varieties like GG-2, GG-5, GG-7, GJG-9, TG37A Semi-spreading of groundnut GG-20,GJG-22, Soybean GJS-3 G.S.1, Sesame GT 2,3,4	<ul style="list-style-type: none"> • Keep 45cm and 60cm row spacing for bunch and semi-spreading varieties respectively. • As per crop change follow the package of practices(other than groundnut) 	Agencies for quality seed supply National (NSC), Gujarat State Seed Corporation (GSSC), University, and Gujcomasol.
		Cotton - Irrigated	No change	• As per crop follow the package of practices	
		Sorghum	No change	No change	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
	2.Deep black soil (Ghed area)	Cotton -rainfed	No change	<ul style="list-style-type: none"> • Higher seed rate • Dry sowing 	Agencies for quality seed supply National (NSC), Gujarat State Seed Corporation (GSSC), University, and Gujcomasol.
		Sorghum	No change	<ul style="list-style-type: none"> • As per crop follow the package of practices 	
Delay by 6 weeks (Specify month) 4th Week of July	1 Medium black to shallow black soils	Groundnut (Spreading Semi- spreading)	Green gram (GM-4) Castor (GC-3, GCH-4, 6, 7) Sorghum (Gundhari, GFS-3, GAFS-11,CSV-21F, S-1049), Sesame (GT-2,3,4) Pigeon pea (BDN-2,Vaishali,GJP-1), Soybean (GS-1,3)	<ul style="list-style-type: none"> • As per crop change follow the package of practices 	Agencies for quality seed supply National (NSC), Gujarat State Seed Corporation (GSSC), University, and Gujcomasol. Zero till seed drill, seed dressing equipment, sprayers & dusters from government schemes.
		Cotton -irrigated	Green gram (GM-4) Castor (GC-3, GCH-4, 6, 7) Sorghum (Gundhari, GFS-3, GAFS-11,CSV-21F, S-1049), Sesame (GT-2,3,4) Pigeon pea (BDN-2,Vaishali,GJP-1), Soybean (GS-1,3)	<ul style="list-style-type: none"> • As per crop change follow the package of practices 	
		Sorghum (Gundari)	No Change	<ul style="list-style-type: none"> • As per crop follow the package of practices 	
	2.Deep black soil (Ghed area)	Cotton- rainfed	No Change	<ul style="list-style-type: none"> • As per crop follow the package of practices 	
		Sorghum	No Change	<ul style="list-style-type: none"> • As per crop follow the package of practices 	

Condition	Major Farming situation	Crop/cropping system	Suggested Contingency measures				
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation		
Early season drought (delayed onset) Delay by 8 weeks (Specify month) 2nd Week of August	1 Medium black to shallow black soils	Groundnut (Spreading Semi-spreading)	Sesame (Purva-1) (Castor (GC-3, GCH-4, 6, 7) Sorghum (Gundhari, GFS-3, GAFS-11,CSV-21F, S-1049),Pigeon pea (BDN-2,Vaishali, GJP-1), Soybean (GS-1,3) /Green gram (Variety GM-4)/ Black gram (GU 1, T-9)/Soybean (GS-1, GS-3)/ Pearl millet(GHB-538 and Govt. approved hybrids)	• As per crop change follow the package of practices	Agencies for quality seed supply National (NSC), Gujarat State Seed Corporation (GSSC), University, and Gujcomasol. Zero till seed drill, seed dressing equipment, sprayers & dusters from government schemes.		
		Cotton (irrigated)	Sesame (Purva-1) (Castor (GC-3, GCH-4, 6, 7) Sorghum (Gundhari, GFS-3, GAFS-11,CSV-21F, S-1049),Pigeon pea (BDN-2,Vaishali, GJP-1), Soybean (GS-1,3) /Green gram (Variety GM-4)/ Black gram (GU 1, T-9)/Soybean (GS-1, GS-3)/ Pearl millet(GHB-538 and Govt. approved hybrids)				
		Sorghum	Sorghum-Fodder (Gundari ,GFS-3, GAFS-11,CSV-21F, S-1049)				
	2.Deep black soil (<i>Ghed</i> area)	Cotton -rainfed	Sorghum-Fodder (Gundari ,GFS-3, GAFS-11,CSV-21F, S-1049)			• As per crop change follow the package of practices	Agencies for quality seed supply National (NSC), Gujarat State Seed Corporation (GSSC), University, and Gujcomasol. Zero till seed drill, seed dressing equipment, sprayers & dusters from government schemes.
		Sorghum	Sorghum-Fodder (Gundari ,GFS-3, GAFS-11,CSV-21F, S-1049)				

Condition			Suggested Contingency measures		
Early season drought	Major Farming situation	Crop/cropping system	Crop management	Soil management	Remarks on Implementation
(Normal onset, followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.)	1 Medium black to shallow black soils	Groundnut	<ul style="list-style-type: none"> Gap filling with maize or sesame 	<ul style="list-style-type: none"> Interculturing to fill soil cracks Mulching with wheat straw or shredded cotton stalk Spray kaolin @ 4% (400g/10 lit. water) 	<ul style="list-style-type: none"> Supply cotton stalk shredding machine which is available in Jasdan town of Rajkot district through Govt. Schemes
		Cotton	<ul style="list-style-type: none"> Gap filling 	<ul style="list-style-type: none"> Interculturing to fill soil cracks Mulching with wheat straw or shredded cotton stalk Spray kaolin @ 4% (400g/10 lit. water) 	<ul style="list-style-type: none"> Supply cotton stalk shredding machine which is available in Jasdan town of Rajkot district through Govt. Schemes
		Sorghum	Thinning	<ul style="list-style-type: none"> Interculturing to fill soil cracks Mulching with wheat straw or shredded cotton stalk 	<ul style="list-style-type: none"> Supply cotton stalk shredding machine which is available in Jasdan town of Rajkot district through Govt. Schemes
	2.Deep black soil (<i>Ghed</i> area)	Cotton	Gap filling	<ul style="list-style-type: none"> Interculturing to fill soil cracks, mulching with wheat straw or shredded cotton stalk Spray kaolin @ 4% (400g/10 lit. water) in cotton 	<ul style="list-style-type: none"> Supply cotton stalk shredding machine which is available in Jasdan town of Rajkot district through Govt. Schemes
		Sorghum	Thinning		
At vegetative stage	1 Medium black to shallow black soils	Groundnut	<ul style="list-style-type: none"> Weeding Protection against sucking pests (control of jassid and aphid, spray imidachlopride 17.8 SL (4 ml/10 lit. water). Lifesaving irrigation 	<ul style="list-style-type: none"> Mulching with wheat straw or crushed cotton stalk. Inter tilling. Spray kaolin @ 4% (400g/10 lit. water) 	<ul style="list-style-type: none"> Ensure supply of electricity for life saving irrigation

Condition	Major Farming situation	Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil management	Remarks on Implementation
Early season drought		Cotton	<ul style="list-style-type: none"> • Weeding • Protection against sucking pests (control of jassid and aphid, spray imidachlopride 17.8 SL (4 ml/10 lit. water). • Lifesaving irrigation 	<ul style="list-style-type: none"> • Mulching with wheat straw or crushed cotton stalk. • Inter tilling. • Spray kaolin @ 4% (400g/10 lit. water) 	<ul style="list-style-type: none"> • Ensure supply of electricity for life saving irrigation
		Sorghum	<ul style="list-style-type: none"> • Weeding • Protection against sucking pests (control of jassid and aphid, spray imidachlopride 17.8 SL (4 ml/10 lit. water). • Lifesaving irrigation 	<ul style="list-style-type: none"> • Inter tilling 	<ul style="list-style-type: none"> • Ensure supply of electricity for life saving irrigation
	2.Deep black soil (Ghed area)	Cotton	<ul style="list-style-type: none"> • Weeding • Protection against sucking pests (control of jassid and aphid, spray imidachlopride 17.8 SL (4 ml/10 lit. water). 	<ul style="list-style-type: none"> • Mulching with wheat straw or crushed cotton stalk. • Inter tilling. • Spray kaolin @ 4% (400g/10 lit. water) 	-
		Sorghum	<ul style="list-style-type: none"> • Weeding • Protection against sucking pests (control of jassid and aphid, spray imidachlopride 17.8 SL 4 ml/10 lit. water), 	<ul style="list-style-type: none"> • Inter tilling 	-

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)	1 Medium black to shallow black soils	Groundnut	<ul style="list-style-type: none"> Supplemental irrigation if possible followed by weeding, Protection against White grub (control measures : Mix 4 lit. quinalphos or chlorpyrifos in 100 kg sand and broadcast) 	<ul style="list-style-type: none"> Spray kaolin @ 4% (400g/10 lit. water) 	Ensure supply of electricity for life saving irrigation by PGVCL.
		Cotton	<ul style="list-style-type: none"> Supplemental irrigation if possible followed by weeding. Install light trap Install pheromone trap@40/ha Spray recommended insecticide 	<ul style="list-style-type: none"> Spray kaolin @ 4% (400g/10 lit. water) 	
		Sorghum	-	-	
	2.Deep black soil (Ghed area)	Cotton	Supplemental irrigation followed by weeding	<ul style="list-style-type: none"> Inter tilling Postponed top dressing Spray kaolin @ 4% (400g/10 lit. water) 	Ensure supply of electricity for life saving irrigation by PGVCL.
		Sorghum	Supplemental irrigation followed by weeding	<ul style="list-style-type: none"> Inter tilling Postponed top dressing 	-

Condition	Major Farming situation	Crop/cropping system	Suggested Contingency measures		
			Crop management	Rabi Crop planning	Remarks on Implementation
Terminal drought (Early withdrawal of monsoon)	1 Medium black to shallow black soils	Groundnut	<ul style="list-style-type: none"> Lifesaving irrigations from harvested water Spray kaolin @ 4% (400 g/10 lit. water) 	-	Ensure supply of electricity for life saving irrigation by PGVCL.
		Cotton	<ul style="list-style-type: none"> Harvest mature bolls. Supplemental irrigation. Spray kaolin @ 4% (400 g/10 lit. water) 		
		Sorghum	<ul style="list-style-type: none"> Thinning of no flowered plants and use as fodder 		
	2.Deep black soil (Ghed area)	Cotton	<ul style="list-style-type: none"> Harvest mature bolls. Supplemental irrigation. Spray kaolin @ 4% (400 g/10 lit. water) 	-	-
		Sorghum	<ul style="list-style-type: none"> Thinning of no flowered plants and use as fodder 	-	-

2.1.2 Drought - Irrigated situation:

Note: Reservoirs havenot adequate irrigation water to supply for Growth period of any crop.

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	1 Medium black to shallow black soils	Cotton	NA	NA	NA
		Cumin			
		Wheat			
		Onion			
		Coriander			
	2.Deep black soil (Ghed area)	Chickpea	NA	NA	NA
		Cotton			
		Sorghum			

Condition	Major Farming situation	Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	1 Medium black to shallow black soils	Cotton	NA	NA	NA
		Cumin			
		Wheat			
		Onion			
		Coriander			
	2.Deep black soil (<i>Ghed</i> area)	Chickpea	NA	NA	NA
Cotton					
Sorghum					

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	1 Medium black to shallow black soils	Cotton	NA	NA	NA
		Cumin			
		Wheat			
		Onion			
		Coriander			
	2.Deep black soil (<i>Ghed</i> area)	Chickpea	NA	NA	NA
Cotton					
Sorghum					

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

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

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

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post-harvest
Continuous high rainfall in a short span leading to water logging				
Mango	<ul style="list-style-type: none"> • Provision of drainage. • Spray 0.005% hexaconazole (10ml /10 lit water) for control leaf blight under unusual rains with cloudy weather 	<ul style="list-style-type: none"> • Spray 0.2% (27g/10 lit water) wettable sulphur or 0.005% hexaconazole (10ml /10 lit water) for protection against powdery mildew after cessation of heavy rain. 	<ul style="list-style-type: none"> • Harvest at pre maturity stage • Hang methyle euginol trap, one/acre for control of fruit fly. 	<ul style="list-style-type: none"> • Unripe fruit may be used for pickles.
Sapota (Chiku)	-	-	-	-
Acid lime	<ul style="list-style-type: none"> • Control citrus canker by spray of copper oxychloride 0.2 % (40g/ 10lit water)+ streptocycline 100 ppm (1 g/10 lit water). 	<ul style="list-style-type: none"> • Control citrus canker by spray of copper oxychloride 0.2 % (40g/ 10lit water)+ streptocycline 100 ppm (1 g/10 lit water). 	<ul style="list-style-type: none"> • Control citrus canker by spray of copper oxychloride 0.2 % (40g/ 10lit water)+ streptocycline 100 ppm (1 g/10 lit water). 	-
Heavy rainfall with high speed winds in a short span				
Groundnut	<ul style="list-style-type: none"> • Surface drainage (for management of waterlogging). 	<ul style="list-style-type: none"> • Surface drainage (for management of waterlogging). 	<ul style="list-style-type: none"> • Delay harvesting of spreading groundnut if possible. • Immediately harvest bunch groundnut. • Quick surface drainage, Open channel around field. 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. • Protection against pest/disease damage in storage etc. • Preparation of quick drying techniques and techniques to separate good lot and bad lot.

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post-harvest
Continuous high rainfall in a short span leading to water logging				
Wheat	<ul style="list-style-type: none"> • Surface drainage (to control water logging condition). 	<ul style="list-style-type: none"> • Surface drainage (to control water logging condition). 	<ul style="list-style-type: none"> • Surface drainage for management of water logging and lodging crop. • Spray mancozeb 0.2%. (27g/10 lit water) to control black point in grain. 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. • Protection against pest/disease damage in storage etc. • Preparation of quick drying techniques and techniques to separate good lot and bad lot.
Sorghum	<ul style="list-style-type: none"> • Surface drainage (to control water logging condition) 	<ul style="list-style-type: none"> • Surface drainage (to control water logging condition) 	<ul style="list-style-type: none"> • Surface drainage (for management of water logging, lodging crop 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. • Protection against pest/disease damage in storage etc. • Preparation of quick drying techniques and techniques to separate good lot and bad lot.
Cotton	<ul style="list-style-type: none"> • Surface drainage for management of water logging. • After drainage apply 199 kg/ha ammonium sulphate 	<ul style="list-style-type: none"> • Surface drainage for management of water logging. • After drainage apply 199 kg/ha ammonium sulphate. 	<ul style="list-style-type: none"> • Surface drainage (for management of water logging), Harvesting mature bolls. 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. • Preparation of quick drying techniques and techniques to separate good lot and bad lot.
Horticulture				
Coriander	<ul style="list-style-type: none"> • Surface drainage (for management of water logging & diseases. 	<ul style="list-style-type: none"> • Surface drainage (for management of water logging & diseases. 	<ul style="list-style-type: none"> • Surface drainage (for management of water logging). • Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation. • Harvesting at physiological maturity immediately 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. • Protection against pest/disease damage in storage etc. • Preparation of quick drying techniques and techniques to separate good lot and bad lot.

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

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

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post-harvest
Continuous high rainfall in a short span leading to water logging				
Mango	<ul style="list-style-type: none"> Provision of drainage, fertilizer application, control leaf blight 	<ul style="list-style-type: none"> Spray 0.2% wettable sulphur(30g/10 lit water) or hexaconazole 0.005%(10 ml/10 lit water) for protection against powdery mildew after cessation of heavy rain. 	<ul style="list-style-type: none"> Hang methyl euginol trap one/ acre for control of fruit fly 	-
Sapota (Chiku)	-	-	-	-
Acid lime	<ul style="list-style-type: none"> Control citrus canker by spray of copper oxychloride 0.2 % (40g/ 10lit water)+ streptocycline 100 ppm (1 g/10 lit water). 	<ul style="list-style-type: none"> Control citrus canker by spray of copper oxychloride 0.2 % (40g/ 10lit water)+ streptocycline 100 ppm (1 g/10 lit water). 	<ul style="list-style-type: none"> Control citrus canker by spray of copper oxychloride 0.2 % (40g/ 10lit water)+ streptocycline 100 ppm (1 g/10 lit water). Collect mature fruits 	-

2.3 Floods

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation¹				
Groundnut	NA	<ul style="list-style-type: none"> As a preventive step open drainage channel 	<ul style="list-style-type: none"> As a preventive step open drainage channel 	<ul style="list-style-type: none"> As a preventive step open drainage channel
Cotton	NA	<ul style="list-style-type: none"> As a preventive step open drainage channel 	<ul style="list-style-type: none"> As a preventive step open drainage channel 	<ul style="list-style-type: none"> As a preventive step open drainage channel
Sorghum	NA	<ul style="list-style-type: none"> As a preventive step open drainage channel 	<ul style="list-style-type: none"> As a preventive step open drainage channel 	<ul style="list-style-type: none"> As a preventive step open drainage channel
Horticulture	-	-	-	-
Cumin/ coriander	NA	<ul style="list-style-type: none"> As a preventive step open drainage channel 	<ul style="list-style-type: none"> As a preventive step open drainage channel 	
Coconut	<ul style="list-style-type: none"> Provide surface drainage 	<ul style="list-style-type: none"> Provide surface drainage 	<ul style="list-style-type: none"> Provide surface drainage 	-
Mango	<ul style="list-style-type: none"> Provide surface drainage 	<ul style="list-style-type: none"> Provide surface drainage 	<ul style="list-style-type: none"> Provide surface drainage 	-

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation¹				
Sapota (Chiku)	<ul style="list-style-type: none"> • Provide surface drainage 	<ul style="list-style-type: none"> • Provide surface drainage 	<ul style="list-style-type: none"> • Provide surface drainage 	-
Acid lime	<ul style="list-style-type: none"> • Provide surface drainage 	<ul style="list-style-type: none"> • Provide surface drainage 	<ul style="list-style-type: none"> • Provide surface drainage 	-
Continuous submergence for more than 2 days				
Groundnut	<ul style="list-style-type: none"> • As a preventive step open drainage channel followed by spray of 0.05 % carbendazim (10g/10 lit. water) for control of leaf spot. 	<ul style="list-style-type: none"> • As a preventive step open drainage channel followed by spray of 1 % FeSO₄ (100 g/10 lit. water)+citric acid (10g/10 lit. water) for control of yellowing, • 0.0025 % hexaconazole (5 ml/10 lit. of water) for rust and leaf spot management 	<ul style="list-style-type: none"> • As a preventive step open drainage channel followed by spray of 1 % FeSO₄ (100 g/10 lit. water)+citric acid (10g/10 lit. water) for control of yellowing, • 0.0025 % hexaconazole(5 ml/10 lit. of water) for rust and leaf spot management 	-
Cotton	<ul style="list-style-type: none"> • As a preventive step open drainage channel • Apply 199 kg/ha ammonium sulphate 	<ul style="list-style-type: none"> • As a preventive step open drainage channel • Apply 199 kg/ha ammonium sulphate 	<ul style="list-style-type: none"> • As a preventive step open drainage channel • Apply 199 kg/ha ammonium sulphate • Harvest mature bolls 	-
Sorghum	<ul style="list-style-type: none"> • Surface drainage 	<ul style="list-style-type: none"> • As a preventive step open drainage channel 	<ul style="list-style-type: none"> • Surface drainage 	<ul style="list-style-type: none"> • Surface drainage
Horticulture				
coriander	<ul style="list-style-type: none"> • As a preventive step open drainage channel, • Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation. 	<ul style="list-style-type: none"> • As a preventive step open drainage channel, • Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation. 	<ul style="list-style-type: none"> • As a preventive step open drainage channel, • Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation. 	-

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation¹				
Cumin	<ul style="list-style-type: none"> As a preventive step open drainage channel, Spray mancozeb 0.2% (27g/10 lit water) to control cumin blight) Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation. 	<ul style="list-style-type: none"> As a preventive step open drainage channel, Spray mancozeb 0.2% (27g/10 lit water) to control cumin blight) Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation. 	<ul style="list-style-type: none"> As a preventive step open drainage channel, Spray mancozeb 0.2% (27g/10 lit water) to control cumin blight) Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation. 	<ul style="list-style-type: none"> As a preventive step open drainage channel, Spray mancozeb 0.2% (27g/10 lit water) to control cumin blight) Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation.
Coconut	<ul style="list-style-type: none"> Shift graft to safe place & surface drainage 	<ul style="list-style-type: none"> Surface drainage 	<ul style="list-style-type: none"> Surface drainage 	<ul style="list-style-type: none"> Surface drainage
Mango	<ul style="list-style-type: none"> Shift graft to safe place & surface drainage 	<ul style="list-style-type: none"> Surface drainage 	<ul style="list-style-type: none"> Surface drainage 	<ul style="list-style-type: none"> Surface drainage
Sapota (Chiku)	<ul style="list-style-type: none"> Shift to safe place & surface drainage 	<ul style="list-style-type: none"> Surface drainage 	<ul style="list-style-type: none"> Surface drainage 	<ul style="list-style-type: none"> Surface drainage
Acid lime	<ul style="list-style-type: none"> Shift to safe place & Surface drainage 	<ul style="list-style-type: none"> Surface drainage 	<ul style="list-style-type: none"> Surface drainage 	<ul style="list-style-type: none"> Surface drainage
Sea water inundation	NA	NA	NA	NA

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

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave	<ul style="list-style-type: none"> Light & frequent irrigation to all crops 	<ul style="list-style-type: none"> Light & frequent irrigation to all crops 	<ul style="list-style-type: none"> Light & frequent irrigation to all crops 	-
Cold wave	NA	NA	NA	NA
Frost	NA	NA	NA	NA
Cyclone				
Cotton	<ul style="list-style-type: none"> Earthing up, quick drainage 	<ul style="list-style-type: none"> Earthing up, quick drainage 	<ul style="list-style-type: none"> Earthing up, quick drainage 	<ul style="list-style-type: none"> Shift produce at safer place
Wheat	<ul style="list-style-type: none"> Quick drainage 	<ul style="list-style-type: none"> Quick drainage 	<ul style="list-style-type: none"> Quick drainage Spray mancozeb 0.2 % (27g/10 lit. water) to control black point in grain 	

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Groundnut	•Quick drainage	•Quick drainage	•Quick drainage	
Horticulture				
Coriander	<ul style="list-style-type: none"> • As a preventive step open drainage channel, • Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation. 	<ul style="list-style-type: none"> • As a preventive step open drainage channel, • Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation. 	<ul style="list-style-type: none"> • As a preventive step open drainage channel, • Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation. 	-
Cumin	<ul style="list-style-type: none"> • As a preventive step open drainage channel, • Spray mancozeb 0.2% (27g/10 lit water) to control cumin blight) • Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation. 	<ul style="list-style-type: none"> • As a preventive step open drainage channel, • Spray mancozeb 0.2% (27g/10 lit water) to control cumin blight) • Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation. 	<ul style="list-style-type: none"> • As a preventive step open drainage channel, • Spray mancozeb 0.2% (27g/10 lit water) to control cumin blight) • Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation. 	-
Onion	-	-	-	-
Coconut	•Build Cyclone proof nursery houses	-	-	•Early harvesting of crop
Mango	•Shift seeding to safe place if possible & Build Cyclone proof nursery houses	•Reduce canopy & tying plants diagonally if possible	•Reduce canopy & tying plants diagonally if possible	•Early harvesting of crop
Sapota (Chiku)	•Shift seeding to safe place if possible & Build Cyclone proof nursery houses	•Reduce canopy & tying plants diagonally if possible	•Reduce canopy & tying plants diagonally if possible	•Early harvesting of crop
Acid lime	•Shift seeding to safe place if possible & Build Cyclone proof nursery houses	•Reduce canopy & tying plants diagonally if possible	•Reduce canopy & tying plants diagonally if possible	•Early harvesting of crop

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event	During the event	After the event
Drought			
Feed and fodder availability	<ul style="list-style-type: none"> Store fodder (silage and hay), Conventional feeds are used for feeding (Roughages & concentrates) of maize, sorghum, groundnut fodder and wheat straw 	<ul style="list-style-type: none"> Stored feed & fodder in silage & hay. Treated wheat straw with 4 % urea solution. Use chaff cutter for fodder. Use press for making compact bundles of fodder for easy transportation. Establish feed block preparation facilities for animals. Arrange bulk transportation of fodder 	<ul style="list-style-type: none"> Feed little green fodder along with unconventional feed, 5 kg green feed/mature animal
Drinking water	<ul style="list-style-type: none"> Rain water harvesting and create water bodies/watering points. When water is scarce use only for drinking water for animals. 	<ul style="list-style-type: none"> Avoid wallowing. Judicious use of drinking water. Establish and arrange the community based drinking water facilities. In coastal area community based R.O. plant to be established for drinking water. Add bleaching powder to drinking water (1%) 	<ul style="list-style-type: none"> Give sufficient water as per the animal requirement
Health and disease management	<ul style="list-style-type: none"> Foot & Mouth disease vaccination in June Vaccination for Bacterial diseases e.g. HS, BQ Deworming of the animals (cattle & buffaloes). Add mineral mixtures 25 g/animal/day along with feed. Animals to be covered cover under insurance schemes. 	<ul style="list-style-type: none"> Add mineral mixtures 25 g/Animal/day along with feed, Deworming of the animals. Arrange mobile dispensary for animal health in the region. Establish link with Agricultural/Veterinary University for animal health. Involve vet. Science students for health management of animal. Carry out disease diagnosis camps. 	<ul style="list-style-type: none"> Add vitamin mineral mixtures 25 g/animal/day along with feed, quarantine diseased animals and deworming of the animals.
Floods			
Feed and fodder availability	<ul style="list-style-type: none"> Harvest available fodder and store it at safe place if floods forecast. Shift animals to safe place. Identify rescue places for safety of animals 	<ul style="list-style-type: none"> Give stored fodder with mineral mixture. Fodder should be stored at safe place. In severe rain and flood untether animals. 	<ul style="list-style-type: none"> Feed silage & hay material along with concentrate feed. Use chaff cutter for fodder. Use press for making compact bundles of fodder for easy transportation. Establish community based shelter houses for animals.

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

	Suggested contingency measures		
	Before the event	During the event	After the event
management		feed, deworming of the animals. <ul style="list-style-type: none"> • 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. 	to control spread of diseases. <ul style="list-style-type: none"> • Health checking to diseases outbreak.
Heat wave and cold wave			
Heat wave			
Shelter/environment management	<ul style="list-style-type: none"> • Arrangement to be made such as Cover roof with dry grass , Fans & ventilation 	<ul style="list-style-type: none"> • Operate fans, sprinklers, keep open ventilators to control temperature. 	Routine practices are followed
Health and disease management	<ul style="list-style-type: none"> • Cover animal under insurance 	<ul style="list-style-type: none"> • Viral vaccination against FMD • Provide ventilation 	-do-
Cold wave			
Shelter/environment management	-	<ul style="list-style-type: none"> • Operate heaters protect shed by tying gunny bags 	Routine practices are followed
Health and disease management	<ul style="list-style-type: none"> • Cover animal under insurance 	<ul style="list-style-type: none"> • Add antibiotics in drinking water to protect young animals from Pneumonia. 	-do-

2.5.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	During the event	After the event	
Drought				
Shortage of feed ingredients	<ul style="list-style-type: none"> Use stored feed, conventional feed, antibiotics and probiotics 	<ul style="list-style-type: none"> Use stored feed, conventional feed, antibiotics and probiotics 	<ul style="list-style-type: none"> Use conventional feed, Vaccination for viral diseases –Marek's and Ranikhet diseases (MD & RD). 	<ul style="list-style-type: none"> Linkage Govt. schemes with public/NGOs at grass root levels.
Drinking water	<ul style="list-style-type: none"> Rain water harvesting 	<ul style="list-style-type: none"> Give water for drinking only 	<ul style="list-style-type: none"> Give sufficient water as per the bird's requirement 	<ul style="list-style-type: none"> Linkage Govt. schemes with public/NGOs at grass root levels.
Health and disease management	<ul style="list-style-type: none"> Vaccination for viral diseases – against MD & RD, cover birds under insurance 	<ul style="list-style-type: none"> Provide ventilation. Add more calcium with feed. Assure supply of electric power. 	<ul style="list-style-type: none"> Routine practices are followed, culling affected birds disposal by burning. 	<ul style="list-style-type: none"> Vaccination for viral diseases –against MD & RD.
Floods				
Shortage of feed ingredients	<ul style="list-style-type: none"> Use conventional feed, ingredients 	<ul style="list-style-type: none"> Use stored feed, antibiotics, pro biotic, and assure supply of electric power. 	<ul style="list-style-type: none"> Routine practices are followed 	<ul style="list-style-type: none"> Linkage Govt. schemes with public/NGOs at grass root levels.
Drinking water	-	<ul style="list-style-type: none"> Add bleaching powder to drinking water (1%). 	<ul style="list-style-type: none"> Add bleaching powder to drinking water (1%). 	<ul style="list-style-type: none"> Linkage Govt. schemes with public/NGOs at grass root levels.
Health and disease management	<ul style="list-style-type: none"> Cover birds under insurance 	<ul style="list-style-type: none"> For suspected cases, give antibiotic in the feed, prevent water logging surrounding sheds. Assure supply of electric power. 	<ul style="list-style-type: none"> Dispose dead birds by burning. 	<ul style="list-style-type: none"> Vaccination for viral diseases –against MD & RD.
Cyclone				
Shortage of feed ingredients	<ul style="list-style-type: none"> Use stored feed ingredients. 	<ul style="list-style-type: none"> Use stored feed & use conventional feed, antibiotics, pro biotic 	<ul style="list-style-type: none"> Routine practices are followed. 	<ul style="list-style-type: none"> Use stored feed ingredients.
Drinking water	-	<ul style="list-style-type: none"> Add bleaching powder to drinking water (1%). 	<ul style="list-style-type: none"> Add bleaching powder to drinking water (1%). 	-

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	During the event	After the event	
Health and disease management	<ul style="list-style-type: none"> Cover birds under insurance 	<ul style="list-style-type: none"> For suspected cases give antibiotics. 	<ul style="list-style-type: none"> Dispose dead birds by burning. 	-
Heat wave and cold wave				
Heat wave				
Shelter/environment management.	<ul style="list-style-type: none"> Arrangement of good ventilation by fan, foggers. 	<ul style="list-style-type: none"> Operate fans, foggers; keep open ventilators in night and cool period. 	<ul style="list-style-type: none"> Routine practices are to be followed. 	
Health and disease management	<ul style="list-style-type: none"> Cover birds under insurance 	<ul style="list-style-type: none"> Viral vaccination add calcium in the poultry feed. 	<ul style="list-style-type: none"> Routine practices are to be followed. 	-
Cold wave				
Shelter/environment management	NA	NA	NA	-
Health and disease management	NA	NA	NA	-

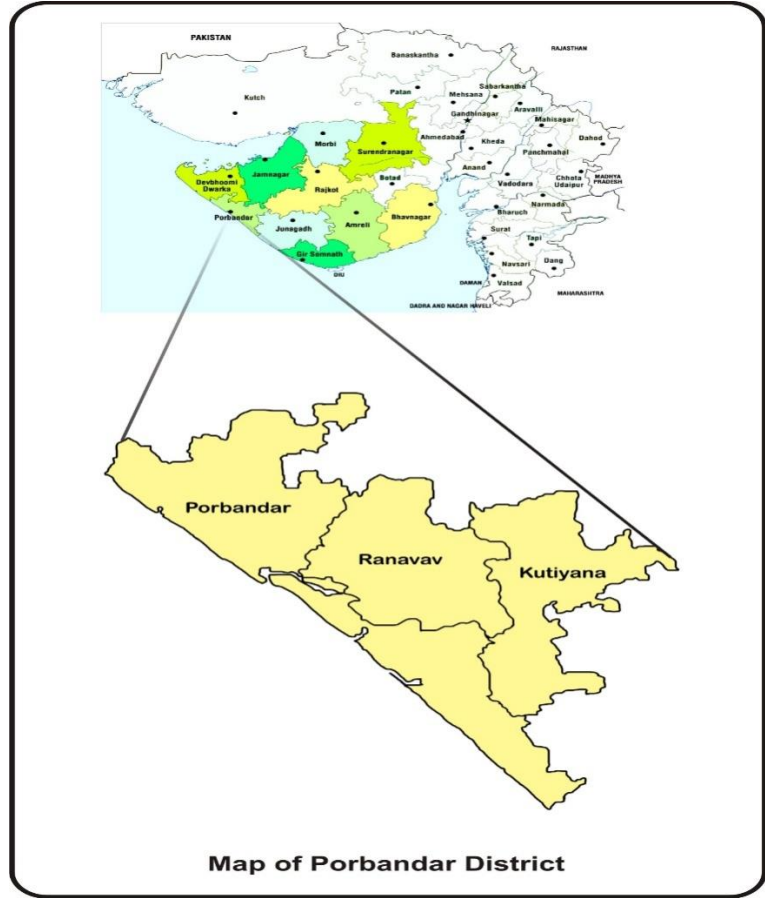
2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event	During the event	After the event
1) Drought : A. Capture			
Marine	NA	NA	NA
Inland	NA	NA	NA
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	<ul style="list-style-type: none"> Desilting/deepening of pond so that more water can be stored 	<ul style="list-style-type: none"> Provision of additional bore wells. Use Euryhaline species. 	<ul style="list-style-type: none"> Maintaining pond water level at least 1 m depth.
(ii) Impact of salt load build up in ponds / change in water quality	<ul style="list-style-type: none"> Replenishment of water in pond with fresh water. 	<ul style="list-style-type: none"> 30 % exchange of water. 	<ul style="list-style-type: none"> 10 % exchange of water.
(iii) Any other	-	-	-

	Suggested contingency measures		
	Before the event	During the event	After the event
2) Floods : A. Capture			
Marine	NA	NA	NA
Inland	NA	NA	NA
B. Aquaculture			
(i) Inundation with flood water.	<ul style="list-style-type: none"> Deepening of ponds, repair, strengthening of dykes 	<ul style="list-style-type: none"> Enhancement of dykes' height by sand bags. 	-
(ii) Water contamination and changes in water quality.	<ul style="list-style-type: none"> Use of calcium hydroxide @ 150 kg/ha. 	<ul style="list-style-type: none"> Use of KMnO₄ for bath of fish as prophylactics. 	<ul style="list-style-type: none"> Lime treatment for oxidation.
(iii) Health and diseases.	<ul style="list-style-type: none"> Antibiotics fortified feeding as prophylactics. 	<ul style="list-style-type: none"> Disinfectants formalin treatments as prophylactics. 	<ul style="list-style-type: none"> Lime treatment for oxidation.
(iv) Loss of stock and inputs (feed, chemicals etc.).	<ul style="list-style-type: none"> Stock cover under insurance 	-	-
(v) Infrastructure damage (pumps, aerators, huts etc.)	-	-	<ul style="list-style-type: none"> Repaire & maintenance of aqua structures
(vi) Any other	-	-	-
3. Cyclone / Tsunami : A. Capture			
Marine			
(i) Average compensation to be paid due to loss of fishermen lives	<ul style="list-style-type: none"> Forewarning systems to be installed. Insurance & communication instruments supplied to fisher man. Warning systems to be installed. 	<ul style="list-style-type: none"> Warning systems to be installed. 	<ul style="list-style-type: none"> Compensations to be paid for repair & maintenance of boats & gears on actual survey basis.
(ii) Avg. no. of boats / nets/damaged			<ul style="list-style-type: none"> Compensation on assessment of actual losses & damage of boats & nets to be given.
(iii) Avg. no. of houses damaged	-	-	<ul style="list-style-type: none"> Compensation on assessment of actual losses & damage of houses to be given.
Inland	NA	NA	NA

	Suggested contingency measures		
	Before the event	During the event	After the event
B. Aquaculture			
(i) Overflow / flooding of ponds	<ul style="list-style-type: none"> Strengthening of dykes. 	<ul style="list-style-type: none"> Enhancement of dykes' height by sand bags. 	-
(ii) Changes in water quality (fresh water / brackish water ratio)	<ul style="list-style-type: none"> Maintain salinity by addition of fresh water up to 20-25 ppt. 	<ul style="list-style-type: none"> Use Euryhaline species. 	<ul style="list-style-type: none"> Use Euryhaline species for culture.
(iii) Health and diseases	<ul style="list-style-type: none"> Liming and formalin treatment. 	<ul style="list-style-type: none"> Disinfectants treatments. 	<ul style="list-style-type: none"> -
(iv) Loss of stock and inputs (feed, chemicals etc).	<ul style="list-style-type: none"> Stock cover under insurance. 	<ul style="list-style-type: none"> - 	<ul style="list-style-type: none"> Seed and feed to be supplied through Dept. of fisheries,
(v) Infrastructure damage (pumps, aerators, shelters/huts etc.)	-	-	<ul style="list-style-type: none"> Compensation on assessment of actual losses & damage of pumps, aerators, shelters/ huts.
(vi) Any other	-	-	-
4. Heat wave and cold wave			
A. Capture			
Marine	NA	NA	NA
Inland	NA	NA	NA
B. Aquaculture			
(i) Changes in pond environment (water quality)	<ul style="list-style-type: none"> Plantation of leafy trees on dyke, increase depth. 	<ul style="list-style-type: none"> To maintain water level in pond. Use of fountain and peddle wheel aerator. 	-
(ii) Health and disease management	-	<ul style="list-style-type: none"> Bleaching powder 1 to 2 %, formalin treatment to prevent diseases. 	<ul style="list-style-type: none"> KMnO₄ 2 % to maintain oxygen level
(iii) Any other	-	-	-

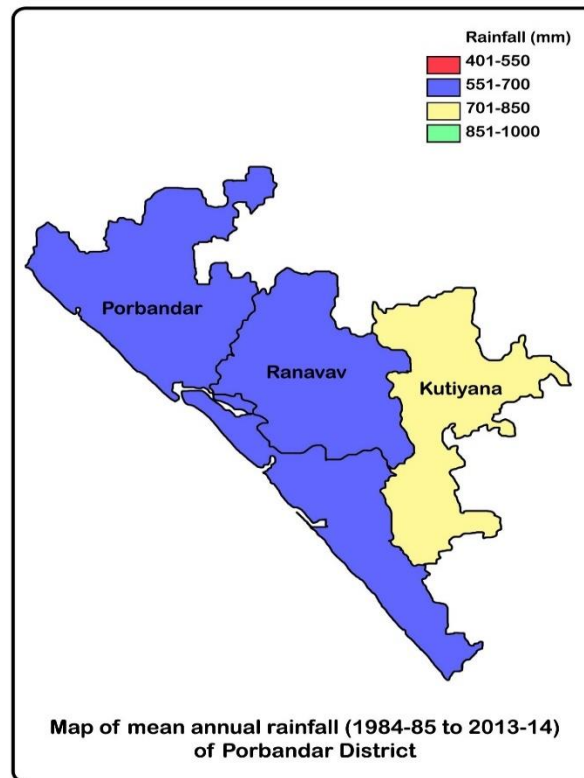
ANNEXURE I
Location map of district



Map of Porbandar District

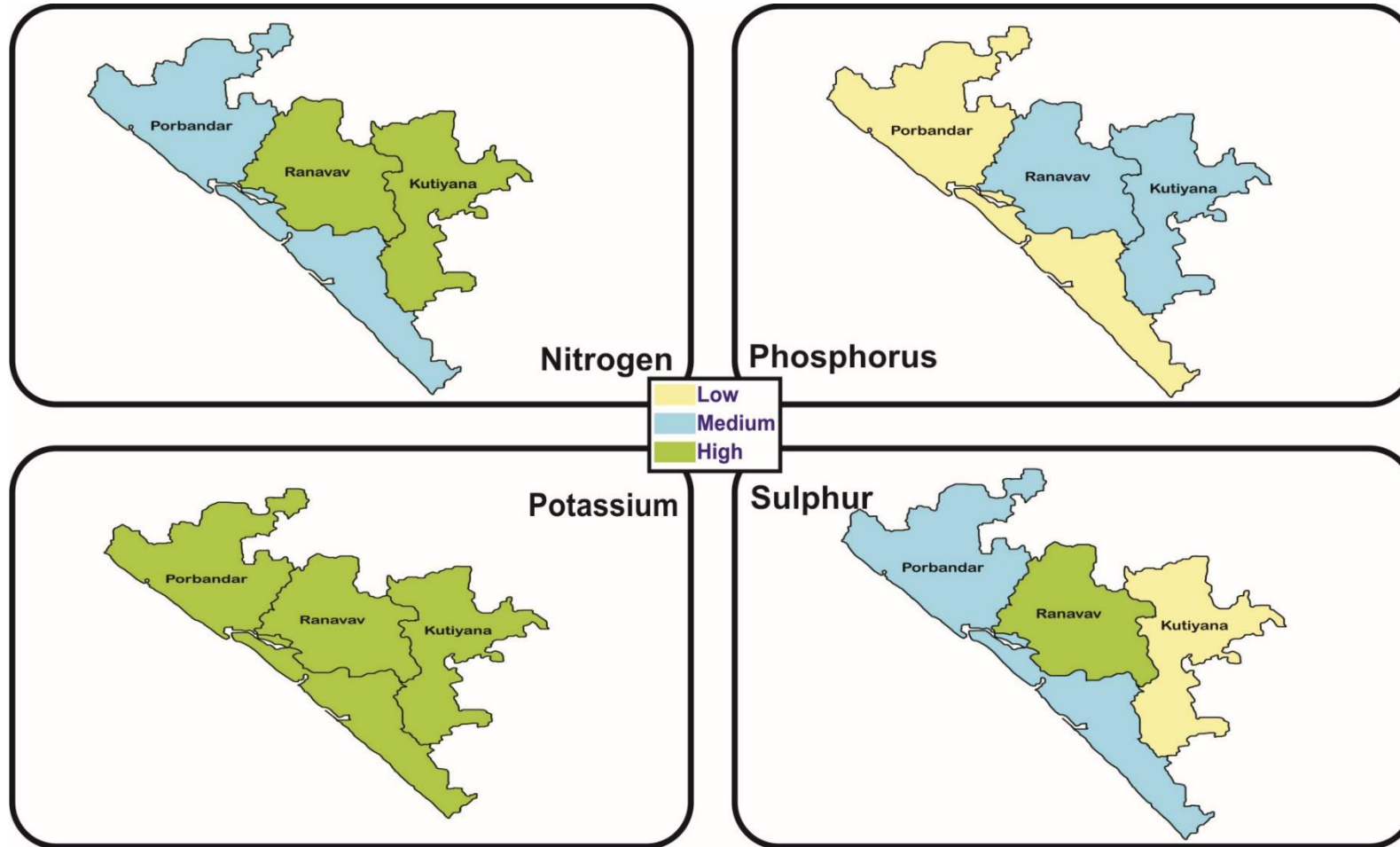
ANNEXURE II

Mean annual rainfall of Porbandar



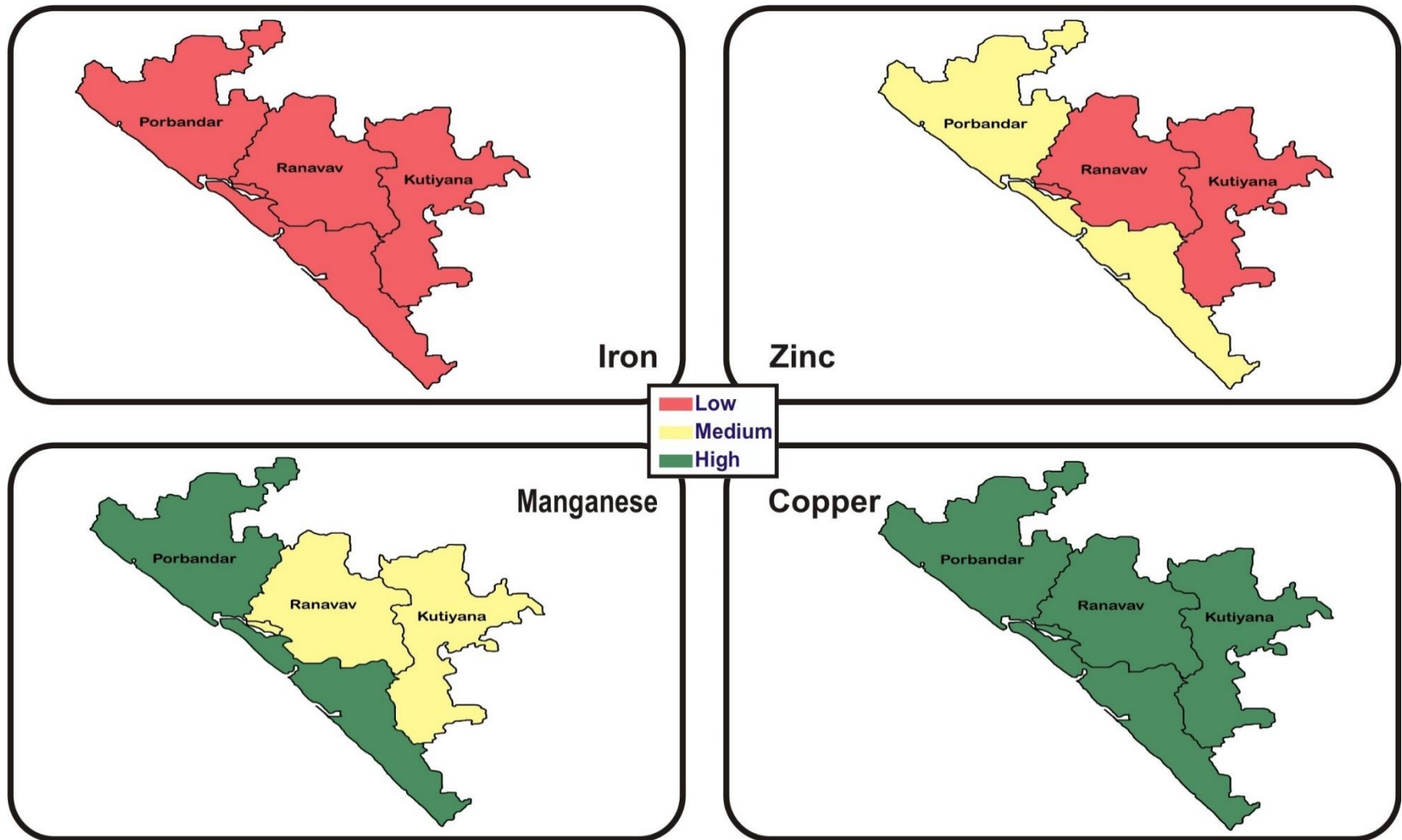
ANNEXURE III

Annexure III a: Soil map of major nutrient status



Status of major nutrients in soils of Porbandar District

Annexure III b: Soil map of micro nutrient status



Status of micronutrients in soils of Porbandar District