

State: GUJARAT

Agriculture Contingency Plan for District: DevbhumiDwarka

1.0 District Agriculture profile			
1.1	Agro-Climatic/Ecological Zone		
	Agro Ecological Sub Region (ICAR)	Arid Western Plains, Kachchh and Part of Kathia (2.4)	
	Agro-Climatic Zone (Planning Commission)	Gujarat Plain & Hill Region (XIII)	
	Agro Climatic Zone (NARP)	North Saurashtra Zone (GJ-6)	
	List all the districts or part thereof falling under the NARP Zone	DevbhumiDwarka, Jamnagar, Rajkot, Morbi, Surendranagar, Bhavnagar, Botad & Amreli	
	Geographic coordinates of district headquarters	Latitude	Longitude
		22°12'18.94 N	69°39'31.6" E
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Main Dry Farming Research Station, Junagadh Agricultural University, Targhadia (Dist. Rajkot) - 360003	
	Mention the KVK located in the district	At present there is no KVK in DevbhumiDwarka district.	

1.2	Rainfall(Average of 2005-06 to 2014-15)	Normal RF(mm)	Normal Rainy days (number)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	921	30	2 nd week of June	2 nd week of September
	NE Monsoon(Oct-Dec):	-	-		
	Winter (Jan- March)	-	-		
	Summer (Apr-May)	-	-		
	Annual	921	30		

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)	407.509	238.37	17.36	65.6	28.452	32.198	0	12.094	12.505	0.93

(Source: Comprehensive District Agricultural plan, Jamnagar District, 2012)

1.4	Major Soils (common names like red sandy loam deep soils(etc.,))*	Area ('000 ha)	Percent (%) of total
	1 Medium & shallow black (Jam Khambhaliya, Dwarka, Bhanvad, Jam Kalyanpur)	139.044	58.33
	2. Coastal alluvial (Jam Khambhaliya, Dwarka, Jam Kalyanpur)	65.128	27.32
	3. Red soil (Jam Khambhaliya)	32.438	13.61
	4. Hills soils (Jam Kalyanpur, Bhanvad)	1.76	0.74
	5. Others (specify):	-	-
		238.37	

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	238.37	106.0 %
	Area sown more than once	14.31	
	Gross cropped area	252.68	

Source: Comprehensive District Agricultural plan, Jamnagar District (2012)

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	30.05		
	Gross irrigated area	35.65		
	Rain fed area	208.32		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals		6.15	17.25
	Tanks	-		
	Open wells	32073	5.80	16.27
	Bore wells	2825	20.39	57.19
	Lift irrigation schemes			
	Minor-irrigation			
	Other sources, Ponds & Check dams	7	3.31	9.28
	Total Irrigated Area		35.65	
	Pump sets	25475		
	No. of Tractors	3081		
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc),

	Over exploited	-	-	-
	Critical	-	-	-
	Semi- critical	1	17.59	Moderate saline
	Safe	3	82.41	-
	Wastewater availability and use			
	Ground water quality	Saline groundwater with higher TDS, Sea water intrusion problem in coastal aquifers		
*Over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

Source :Reports of District Panchayat, Jamnagar(2016) and Comprehensive District Agricultural plan, Jamnagar District(2012)

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

1.7	Sr.No.	Major field crops cultivated	Area ('000 ha)							Grand total
			Kharif			Rabi			Summer	
			Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
1	Groundnut	36.00	108.11	144.11	-	-	-	2.63	146.74	
2	Cotton	35.11	-	35.11	-	-	-	-	35.11	
3	Castor	3.25	-	3.25	-	-	-	-	3.25	
4	Wheat	-	-	-	6.67	-	6.67	-	6.67	
5	Chickpea	-	-	-	31.3	-	31.3	-	31.3	
	Others (specify)	Others	-	-	-	-	-	-	-	
		1.Sesame	-	5.72	5.72	-	-	-	2.91	8.63
		2.Other Oil seed crops	-	-	-	-	-	-	-	

Sr.No.	Horticulture crops – Fruits (2015-16)	Area ('000 ha)
		Total
1	Ber	0.181
2	Pomegranate	0.141
3	Sapota(Chiku)	0.102
	Others (specify)	
Sr.No.	Horticulture crops – Vegetables	Total
1	Brinjal	0.240
2	Tomato	0.245

	3	Chilli	0.450
	4	Cluster bean	0.086
	5	Okra	0.460
	Others (specify)	Others	
		Medicinal and Aromatic crops	Total
	1	Cumin	0.450
	2	Coriander	0.715
	Others (specify)	Others	
		Plantation crops	Total
	1	Coconut	0.358
	2	Date palm	0.420
	Others (Specify)	e.g., industrial pulpwood crops etc.	
		Fodder crops	Total
	1	1.Sorghum	8.99
	Others (Specify)	Lucerne, maize, grasses, carrot, etc.	15.45
		Total fodder crop area	24.441
		Grazing land	28.452
		Sericulture etc	0
		Others (specify) :	-

(Source: Department of Horticulture, Govt. of Gujarat (2015-16))

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)	68.55	97.61	166.16
	Crossbred cattle		0.618	0.618
	Non descriptive Buffaloes (local low yielding)	1.77	138.07	139.84
	Graded Buffaloes			
	Goat	6.66	51.35	58.01
	Sheep	22.72	52.62	75.33
	Others (Camel, Pig, Yak, horse etc.)	4.79	6.388	11.178
	Commercial dairy farms (Number)	1		

1.9	Poultry	No. of farms	Total No. of birds ('000)
	Commercial	10	16
	Backyard	1384	25.323

1.10	Fisheries (Data source: Chief Planning Officer)						
	A. Capture						
	i) Marine (Data Source: Fisheries Department)	No. of fishermen	Boats		Nets		Storage facilities (Ice plants etc.)
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
		25752	1636	299	58995	263802	20
	ii) Inland (Data Source: Fisheries Department)	No. Farmer owned ponds		No. of Reservoirs		No. of village tanks	
		-	-	-	-	-	-
	B. Culture						
		Water Spread Area (ha)		Yield (t/ha)		Production ('000 tons)	
	i) Brackish water (Data Source: MPEDA/ Fisheries Department)	-		-		67146	
	ii) Fresh water (Data Source: Fisheries Department)	12218.35		36.66		448	
	Others						

(Source: Reports of Jamnagar District Panchayat, Department of Agriculture, Fisheries and Animal husbandry, Govt. of Gujarat, 2016-17)

1.11 Production and Productivity of major crops (Average of last 5 years: 2010-11 to 2014-15)

1.11	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder ('000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
Major Field crops (Crops to be identified based on total acreage)										
	Groundnut	216.16	1500	-	-	5.32	2025	231.48	1577	268
	Cotton	80.75	2300	-	-	-	-	80.75	2300	137.3
	Castor	8.48	2610	-	-	-	-	8.48	2610	8.48
	Wheat	-	-	21.41	3210	-	-	21.41	3210	43
	Sesame	2.06	360	-	-	2.03	700	4.09	474	8

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)	
	Chickpea	-	-	35.05	1120	-	-	35.05	1120	35.05
Major Horticultural crops (Crops to be identified based on total acreage)										
	Ber	-	-	1714	9480	-	-	1714	9480	-
	Pomegranate	1252	8900	-	-	-	-	1252	8900	-
	Sapota (Chiku)	-	-	-	-	1182	11570	2.822	11333	-
	Coconut	3580000(Nuts)	10000 (Nuts)	-	-	-	-	3580000 (Nuts)	10000 (Nuts)	-
	Coriander	-	-	1037	1450	-	-	1037	1450	-
	Cumin	-	-	383	850	-	-	383	850	-
	Okra	-	-	3312	7200	-	-	3312	7200	-
	Brinjal	-	-	4440	18500	-	-	4440	18500	-
	Tomato	-	-	7301	29800	-	-	7301	29800	-
	Chilli	-	-	855	1900	-	-	855	1900	-
	Cluster bean	-	-	-	-	830	9650	830	9650	-

Source :Reports of Jamnagar District Panchayat, Department of Agriculture and Horticulture, Government of Gujarat.(Horticulture, spices and vegetables data are for the year 2015-16)

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

1.13	What is the major contingency the district is prone to? (Tick mark)	Regular	Occasional	None	
	Drought		√		
	Flood		√		
	Cyclone		√		
	Hail storm			√	
	Heat wave		√		
	Cold wave			√	
	Frost			√	
	Sea wáterintrusión(Okha)		√		
	<u>Pests and disease outbreak (specify)</u>	√			
	<u>Pests:-</u>				
	Cotton:- Aphid, Jassid, Thrips, whitefly, Pink bollworm				
	Groundnut :- whitegrub, aphid, jassid, thrips				
	Sesame :- leaf binder, gall fly, mite				
	Castor :- Semilooper, prodenia, whitefly, leaf miner, capsule borer,				
	Acid lime: White fly,& Fruit fly				
	<u>Diseases :-</u>				
	Mango: Powdery Mildew,				
	Cotton :- angular leaf spot, wilt,				
	Groundnut: Collar rot, Rust, Tikka& Downy Mildew ,				
	Sesame :- blight, phyllody, root rot				
	Castor:- wilt, stemrot, root rot,				
	Others (specify)	-	-	-	

1.14	Include Digital maps of the district for	Location map of the district asAnnexure – I	Enclosed : Yes
		Mean annual rainfall of mapas Annexure - II	Enclosed : Yes
		Soil map of major nutrient status as Annexure - III a	Enclosed : Yes
		Soil map of micro nutrient status as Annexure - III b	Enclosed : Yes

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition	Major Farming situation	Normal Crop/ Cropping system	Suggested Contingency measures		
			Change in crop/cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)	1 Medium & shallow black to black (Jam Khambhaliya, Jam Kalyanpur, Bhanvad, Dwarka)	Groundnut (Spreading Semi- spreading) (Spreading GG10, 11, GJG 17, 31 and Semi spreading GG 20,GJG-22)	No change	• As per crop follow the package of practices	-
		Cotton (Cotton hybrid4,6,8,10, GJC 101& Govt. approved Bt. hybrids)	No change	• As per crop follow the package of practices	-
		Castor(GC-3, GCH-4, 6, 7)	No change	• As per crop follow the package of practices	-
	3.Coastal alluvial (Jam Khambhaliya, Dwarka, Jam Kalyanpur)	Groundnut (Spreading Semi- spreading) (Spreading GG10, 11, GJG 17, 31 and Semi spreading GG 20,GJG-22)	No change	• As per crop follow the package of practices	--
		Cotton (Cotton hybrid4,6,8,10, GJC 101& Govt. approved Bt. hybrids)	No change	• As per crop follow the package of practices	-
		Castor(GC-3, GCH-4, 6, 7)	No change	• As per crop follow the package of practices	-

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 4 weeks (July 2nd week)	1 Medium & shallow black to black (Jam Khambhaliya, Jam KalyanpurBhanvad, Dwarka)	Groundnut (Spreading Semi- spreading)	Prefer bunch varieties like GG-2, GG-5, GG-7, GJG-9, TG37A Semi- spreadingof groundnut GG-20,GJG-22, Soybean GJS-3 G.S.1, Sesame GT 2,3,4	<ul style="list-style-type: none"> • Keep 45cm and 60cm row spacing for bunch and semi- spreading varieties respectively. • Other practices will be as such. 	<ul style="list-style-type: none"> • Seed sources: National Seed Corporation (NSC), Gujarat State Seed Corporation (GSSC), University, Gujarat State Cooperative Marketing Federation Ltd. (Gujcomasol)
		Cotton	No change	<ul style="list-style-type: none"> • As per crop follow the package of practices 	
		Castor	No change	<ul style="list-style-type: none"> • As per crop follow the package of practices 	
	2..Coastal alluvial (Jam Khambhaliya, Dwarka, Jam Kalyanpur)	Groundnut	Prefer bunch varieties like GG-2, GG-5, GG-7, GJG-9, TG37A Semi- spreadingof groundnut GG-20,GJG-22, Soybean GJS-3 G.S.1, Sesame GT 2,3,4	<ul style="list-style-type: none"> • Keep 45cm and 60cm row spacing for bunch and semi- spreading varieties respectively. • Other practices will be as such. 	
		Cotton	No change	<ul style="list-style-type: none"> • As per crop follow the package of practices 	
		Castor	No change	<ul style="list-style-type: none"> • As per crop follow the package of practices 	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 6 weeks (July 4th week)	Medium & shallow black to black (Jam Khambhaliya, Jam Kalyanpur, Bhanvad, Dwarka)	Groundnut	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)	• As per crop change follow the package of practices(other than groundnut)	<ul style="list-style-type: none"> • Agencies for quality seed supply National (NSC), Gujarat State Seed Corporation (GSSC), University, and Gujcomasol. • Zero till seed drill, seed dressing equipment, Sprayers & dusters to farmer through Government schemes(Implement s like seed drill and seed dressing are available at Rajkot)
		Cotton	Green gram (GM-4)Castor (GC-3, GCH-4, 6, 7) Sorghum (Gundhari, GFS-3, GAFS-11,CSV-21F, S-1049), Sesame (GT-2,3,4) Pigeon pea (BDN-2,Vaishali,GJP-1), Soybean (GS-1,3)	• As per crop change follow the package of practices	
		Castor	No change	• As per crop follow the package of practices	
	Coastal alluvial (Jam Khambhaliya, Dwarka, Jam Kalyanpur)	Groundnut	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)	• As per crop change follow the package of practices(other than groundnut)	
		Cotton	Green gram (GM-4)Castor (GC-3, GCH-4, 6, 7) Sorghum (Gundhari, GFS-3, GAFS-11,CSV-21F, S-1049), Sesame (GT-2,3,4) Pigeon pea (BDN-2,Vaishali,GJP-1), Soybean (GS-1,3)	• As per crop change follow the package of practices	
		Castor	No change	• As per crop follow the package of practices	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 8 weeks (Aug 2nd week)	Medium & shallow black to black (Jam Khambhaliya, Jam Kalyanpur, Bhanvad, Dwarka)	Groundnut	Sesame (Purva-1), Castor (GC-3, GCH-4, 6, 7) Sorghum (Gundhari, GFS-3, GAFS-11, CSV-21F, S-1049), Pigeon pea (BDN-2, Vaishali, GJP-1), Soybean (GS-1,3)/Green gram (Variety GM-4)/ Black gram (GU 1, T-9)/ Pearl millet (GHB-538 and Govt. approved hybrids)	• As per crop change follow the package of practices	<ul style="list-style-type: none"> • Agencies for quality seed supply National (NSC), Gujarat State Seed Corporation (GSSC), University, and Gujcomasol. • Zero till seed drill, seed dressing equipment, Sprayers & dusters to farmer through Government schemes (Implements like seed drill and seed dressing are available at Rajkot)
		Cotton	Sesame (Purva-1), Castor (GC-3, GCH-4, 6, 7) Sorghum (Gundhari, GFS-3, GAFS-11, CSV-21F, S-1049), Pigeon pea (BDN-2, Vaishali, GJP-1), Soybean (GS-1,3)/Green gram (Variety GM-4)/ Black gram (GU 1, T-9)/ Pearl millet (GHB-538 and Govt. approved hybrids)	• As per crop change follow the package of practices	
		Castor	No change	• As per crop follow the package of practices	
	Coastal alluvial (Jam Khambhaliya, Dwarka, Jam Kalyanpur)	Groundnut	Sesame (Purva-1), Castor (GC-3, GCH-4, 6, 7) Sorghum (Gundhari, GFS-3, GAFS-11, CSV-21F, S-1049), Pigeon pea (BDN-2, Vaishali, GJP-1), Soybean (GS-1,3)/Green gram (Variety GM-4)/ Black gram (GU 1, T-9)/ Pearl millet (GHB-538 and Govt. approved hybrids)	• As per crop change follow the package of practices	
		Cotton	Sesame (Purva-1), Castor (GC-3, GCH-4, 6, 7) Sorghum (Gundhari, GFS-3, GAFS-11, CSV-21F, S-1049), Pigeon pea (BDN-2, Vaishali, GJP-1), Soybean (GS-1,3)/Green gram (Variety GM-4)/ Black gram (GU 1, T-9)/ Pearl millet (GHB-538 and Govt. approved hybrids)	• As per crop change follow the package of practices	
		Castor	No change	• As per crop follow the package of practices	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Medium & shallow black to black (Jam Khambhaliya, Jam Kalyanpur, Bhanvad, Dwarka)	Groundnut	<ul style="list-style-type: none"> • Gap filling with maize or sesame 	<ul style="list-style-type: none"> • Interculturing to fill soil cracks • Mulching with wheat straw or shredded cotton stalk • Spray kaolin @ 4% (400g/10 lit. water) 	<ul style="list-style-type: none"> • Cotton stalk shredding machine which is available in Jasdan town of Rajkot district to be supplied by Govt.
		Cotton	<ul style="list-style-type: none"> • Gap filling 	<ul style="list-style-type: none"> • Interculturing to fill soil cracks • Mulching with wheat straw or shredded cotton stalk • Spray kaolin @ 4% (400g/10 lit. water) 	<ul style="list-style-type: none"> • Cotton stalk shredding machine which is available in Jasdan town of Rajkot district to be supplied by Govt.
		Castor	<ul style="list-style-type: none"> • Gap filling 	<ul style="list-style-type: none"> • Interculturing to fill soil cracks, • Mulching with wheat straw or shredded cotton stalk 	<ul style="list-style-type: none"> • Cotton stalk shredding machine which is available in Jasdan town of Rajkot district to be supplied by Govt.
	Coastal alluvial (Jam Khambhaliya, Dwarka, Jam Kalyanpur)	Groundnut	<ul style="list-style-type: none"> • Gap filling with maize or sesame 	<ul style="list-style-type: none"> • Interculturing to fill soil cracks • Mulching with wheat straw or shredded cotton stalk • Spray kaolin @ 4% (400g/10 lit. water) 	<ul style="list-style-type: none"> • Cotton stalk shredding machine which is available in Jasdan town of Rajkot district to be supplied by Govt.
		Cotton	<ul style="list-style-type: none"> • Gap filling 	<ul style="list-style-type: none"> • Interculturing to fill soil cracks • Mulching with wheat straw or shredded cotton stalk • Spray kaolin @ 4% (400g/10 lit. water) 	<ul style="list-style-type: none"> • Cotton stalk shredding machine which is available in Jasdan town of Rajkot district to be supplied by Govt.
		Castor	<ul style="list-style-type: none"> • Gap filling 	<ul style="list-style-type: none"> • Interculturing to fill soil cracks, • Mulching with wheat straw or shredded cotton stalk 	<ul style="list-style-type: none"> • Cotton stalk shredding machine which is available in Jasdan town of Rajkot district to be supplied by Govt.

Condition	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, consecutive 2 weeks rainless (>2.5 mm) period)	Medium & shallow black to black (Jam Khambhaliya, Jam KalyanpurBhanvad, Dwarka)	Groundnut	<ul style="list-style-type: none"> Weeding Protection against sucking pests (control of jassid and aphid, spray imidacloprid 17.8 SL (4 ml/10 lit. water). Lifesaving irrigation 	<ul style="list-style-type: none"> Mulching with wheat straw or crushed cotton stalk. Inter tilling. Spray kaolin @ 4% (400g/10 lit. water) 	<ul style="list-style-type: none"> Supply of urea through Govt. schemes Ensure electric supply for life saving irrigation by PGVCL
		Cotton	<ul style="list-style-type: none"> Weeding Protection against sucking pests (control of jassid and aphid, spray imidacloprid 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) 	
		Castor	<ul style="list-style-type: none"> Weeding/ Protection against sucking pest (To control Jassid spray dimethoate @ 10ml/10l water) or imidacloprid @ 4 ml / 10litre water Spray cypermethrin 25% EC @ 10 ml/10litre for management of semilooper 	<ul style="list-style-type: none"> Inter culturing, Avoid top dressing of urea 	
	Coastal alluvial (Jam Khambhaliya, Dwarka, Jam Kalyanpur)	Groundnut	<ul style="list-style-type: none"> Weeding Protection against sucking pests (control of jassid and aphid, spray imidacloprid 17.8 SL (4 ml/10 lit. water). Lifesaving irrigation 	<ul style="list-style-type: none"> Mulching with wheat straw or crushed cotton stalk. Inter tilling. Spray kaolin @ 4% (400g/10 lit. water) 	<ul style="list-style-type: none"> Supply of urea through Govt. schemes Ensure electric supply for life saving irrigation by PGVCL
		Cotton	<ul style="list-style-type: none"> Weeding Protection against sucking pests (control of jassid and aphid, spray Imidacloprid 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) 	
		Castor	<ul style="list-style-type: none"> Weeding Protection against sucking pest (To control Jassid spray dimethoate @ 10ml/10l water) or imidacloprid @ 4 ml / 10litre water Spray cypermethrin 25% EC @ 10 ml/10litre for management of semilooper 	<ul style="list-style-type: none"> Inter culturing, Avoid top dressing of urea 	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At flowering/ fruiting stage	1. Medium & shallow black to black (Jam Khambhaliya, Jam KalyanpurBhanvad, Dwarka)	Groundnut	<ul style="list-style-type: none"> Supplemental irrigation if possible followed by weeding, Protection against White grub (control measures : Mix 4 lit. quinalphos or chlorpyriphos in 100 kg sand and broadcast) 	Spray kaolin @ 4% (400g/10 lit. water)	<ul style="list-style-type: none"> Ensure electric supply for life saving irrigation by PGVCL Supply of urea through Govt. schemes
		Cotton	<ul style="list-style-type: none"> Supplemental irrigation if possible followed by weeding. Install light trap Install pheromone trap@40/ha Spray recommended insecticide 	Spray kaolin @ 4% (400g/10 lit. water)	
		Castor	<ul style="list-style-type: none"> Weeding, Supplement irrigation if possible. Protection against sucking pest (To control Jassid spray dimethoate @ 10ml/10l water) or imidacloprid @ 4 ml / 10 litre water Spray cypermethrin 25% EC @ 10 ml/10 litre for management of Capsule borer Protection against sucking pest (To control Jassid spray dimethoate @ 10ml/10litre water) 	<ul style="list-style-type: none"> Avoid top dressing of urea 	
	2. Coastal alluvial (Jam Khambhaliya, Dwarka, Jam Kalyanpur)	Groundnut	<ul style="list-style-type: none"> Supplemental irrigation if possible followed by weeding, Protection against White grub (control measures : Mix 4 lit. quinalphos or chlorpyriphos in 100 kg sand and broadcast) 	Spray kaolin @ 4% (400g/10 lit. water)	
		Cotton	<ul style="list-style-type: none"> Supplemental irrigation if possible followed by weeding. Install light trap Install pheromone trap@40/ha Spray recommended insecticide 	Spray kaolin @ 4% (400g/10 lit. water)	

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)		Castor	<ul style="list-style-type: none"> Weeding, Supplement irrigation if possible. Protection against sucking pest (To control Jassid spray dimethoate @ 10ml/10l water) or imidacloprid @ 4 ml / 10 litre water Spray cypermethrin 25% EC @ 10 ml/10 litre for management of Capsule borer Protection against sucking pest (To control Jassid spray dimethoate @ 10ml/10litre water) 	<ul style="list-style-type: none"> Avoid top dressing of urea 	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Rabi Crop planning	Remarks on Implementation
Terminal drought (Early withdrawal of monsoon)	Medium & shallow black to black (Jam Khambhaliya, Jam KalyanpurBhanvad, Dwarka)	Groundnut	<ul style="list-style-type: none"> Lifesaving irrigations from harvested/ground water Spray kaolin @ 4% (400 g/10 lit. water) 	-	<ul style="list-style-type: none"> Ensure electric supply for life saving irrigation by PGVCL
		Cotton	<ul style="list-style-type: none"> Harvest mature bolls. Supplemental irrigation. Spray kaolin @ 4% (400 g/10 lit. water) 	-	
		Castor	<ul style="list-style-type: none"> Harvest mature spike, lifesaving irrigation if possible Use MIS for irrigation 	-	
	Coastal alluvial (Jam Khambhaliya, Dwarka, Jam Kalyanpur)	Groundnut	<ul style="list-style-type: none"> Lifesaving irrigations from harvested/ground water Spray kaolin @ 4% (400 g/10 lit. water) 	-	<ul style="list-style-type: none"> Ensure electric supply for life saving irrigation by PGVCL
		Cotton	<ul style="list-style-type: none"> Harvest mature bolls. Supplemental irrigation. Spray kaolin @ 4% (400 g/10 lit. water) 	-	
		Castor	<ul style="list-style-type: none"> Harvest mature spike, lifesaving irrigation if possible Use MIS for irrigation 	-	

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	1. Medium & shallow black to black (Jam Khambhaliya, Jam Kalyanpur, Bhanvad, Dwarka)	Wheat	<ul style="list-style-type: none"> Delay sowing upto 4th week of November for prevailing cropping patterns There after adopt late sowing varieties like GW-173 of wheat. 	<ul style="list-style-type: none"> Conjunctive use of groundwater/harvested water and canal water Use MIS on community base according to crops. 	-
		Cumin	<ul style="list-style-type: none"> Delay sowing upto 4th week of November for prevailing cropping patterns 	<ul style="list-style-type: none"> Conjunctive use of groundwater/harvested water and canal water Use MIS on community base according to crops. 	
		Chickpea	<ul style="list-style-type: none"> Delay sowing upto 4th week of November for prevailing cropping patterns 	<ul style="list-style-type: none"> Irrigate during critical stages only. Conjunctive use of canal and ground water If the groundwater is available, it should be utilized during later stages 	
		Coriander	<ul style="list-style-type: none"> Delay sowing upto 4th week of November for prevailing cropping patterns 	<ul style="list-style-type: none"> Conjunctive use of groundwater/harvested water and canal water Use MIS on community base according to crops. 	
	2. Coastal alluvial (Jam Khambhaliya, Dwarka, Jam Kalyanpur)	Wheat	<ul style="list-style-type: none"> Delay sowing upto 4th week of November for prevailing cropping patterns There after adopt late sowing varieties like GW-173 of wheat. 	<ul style="list-style-type: none"> Conjunctive use of groundwater/harvested water and canal water Use MIS on community base according to crops. 	
		Cumin	<ul style="list-style-type: none"> Delay sowing upto 4th week of November for prevailing cropping patterns 	<ul style="list-style-type: none"> Conjunctive use of groundwater/harvested water and canal water Use MIS on community base according to crops. 	

Condition	Major Farming situation	Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
		Chickpea	<ul style="list-style-type: none"> Delay sowing upto 4th week of November for prevailing cropping patterns 	<ul style="list-style-type: none"> Irrigate during critical stages only. Conjunctive use of canal and ground water If the groundwater is available, it should be utilized during later stages 	
		Coriander	<ul style="list-style-type: none"> Delay sowing upto 4th week of November for prevailing cropping patterns 	<ul style="list-style-type: none"> Conjunctive use of groundwater/harvested water and canal water Use MIS on community base according to crops. 	

Note: Very limited canal irrigation facility exists in DevbhumiDwarka

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 & shallow black to black (Jam Khambhaliya, Jam Kalyanpur, Bhanvad, Dwarka) 2. Coastal alluvial (Jam Khambhaliya, Dwarka, Jam Kalyanpur)				NA

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 & shallow black to black (Jam Khambhaliya, Jam KalyanpurBhanvad, Dwarka)				NA

Condition	Suggested Contingency measures				
	Major Farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
	2.Coastal alluvial, Medium land (Jam Khambhaliya, Dwarka, Jam Kalyanpur)				

Condition	Suggested Contingency measures				
	Major Farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	1. Medium & shallow black to black (Jam Khambhaliya, Jam KalyanpurBhanvad, Dwarka)	Wheat	Chickpea (GG 1, GJG 3, GG 5), Cumin (GC 3, 4)/ Coriander (Guj1, 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.
	2.Coastal alluvial, Medium land (Jam Khambhaliya, Dwarka, Jam Kalyanpur)	Wheat	Chickpea (GG 1, GJG 3, GG 5), Cumin (GC 3, 4)/ Coriander (Guj1, 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.

Condition	Major Farming situation	Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Sea water intrusion	2.Coastal alluvial, Medium land (Jam Khambhaliya, Dwarka, Jam Kalyanpur)	Wheat	Chickpea (GG 1, GJG 3, GG 5), Cumin (GC 3, 4)/ Coriander (Guj1, 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.

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

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post-harvest
Continuous high rainfall in a short span leading to water logging				
Wheat	<ul style="list-style-type: none"> • Surface drainage (to control water logging condition) 	<ul style="list-style-type: none"> • Surface drainage (to control water logging condition) 	<ul style="list-style-type: none"> • Surface drainage (for management of water logging, lodging of crop), • To control black point in grain spray mancozeb 0.2% (27g/10 lit water) 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. • Protection against pest/disease damage in storage etc. • Preparation of quick drying techniques • Separate good lot and bad lot.
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				
Castor	<ul style="list-style-type: none"> • Surface drainage (For management of water logging) 	<ul style="list-style-type: none"> • Surface drainage for management of water logging 	<ul style="list-style-type: none"> • Provide drainage • Harvest mature spikes. 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. • Preparation of quick drying techniques
Groundnut	<ul style="list-style-type: none"> • Surface drainage (For management of water logging) 	<ul style="list-style-type: none"> • Surface drainage for management of water logging 	<ul style="list-style-type: none"> • Delay harvesting of spreading groundnut if possible. • Immediately harvest bunch groundnut. • Harvesting is done immediately for bunch groundnut. • Quick surface drainage by open channel around field. 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. • Protection against pest/disease damage in storage etc. • Preparation of quick drying techniques • Separate good lot and bad lot.
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.

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post-harvest
Continuous high rainfall in a short span leading to water logging				
Coconut	Provision of drainage. Fertilizer application. Control black headed cater piller/ rhinoceros beetle with root feeding techniue under unusual rains with cloudy weather	Provision of drainage. Fertilizer application. Control black headed cater piller/ rhinoceros beetle with root feeding techniue under unusual rains with cloudy weather	• Hang light trap,one /acre for control of rhinoceros beetle	-do-
Pomegranate	<ul style="list-style-type: none"> • Provision of drainage. • Fertilizer application. Control thrips with spray of profenophos 50%EC (30 ml/15 litre water) under unusual rains with cloudy weather 	<ul style="list-style-type: none"> • Provision of drainage. • Fertilizer application. Control thrips with spray of profenophos 50%EC (30 ml/15 litre water) under unusual rains with cloudy weather 	<ul style="list-style-type: none"> • Provision of drainage. • Rape of fruit with protection fruit from anar cater pillar • Spray carbendazim prevent rotting • Spray boron for reduction of fruit cracking 	-do--
Heavy rainfall with high speed winds in a short span	Vegetative stage	Flowering stage	Crop maturity stage	Post-harvest
Wheat	<ul style="list-style-type: none"> • Surface drainage (to control water logging condition). 	<ul style="list-style-type: none"> • Surface drainage (to control water logging condition). 	<ul style="list-style-type: none"> • Surface drainage for management of water logging and lodging crop. • Spray mancozeb 0.2%.(27g/10 lit water) to control black point in grain. 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. • Protection against pest/disease damage in storage etc. • Preparation of quick drying techniques and techniques to separate good lot and bad lot.

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

Heavy rainfall with high speed winds in a short span	Vegetative stage	Flowering stage	Crop maturity stage	Post-harvest
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.
Castor	<ul style="list-style-type: none"> • Surface drainage(For management of water logging 	<ul style="list-style-type: none"> • Surface drainage for management of water logging 	<ul style="list-style-type: none"> • Provide drainage • Harvest mature spikes. 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. •Preparation of quick drying techniques
Ground nut	<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.
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.

Heavy rainfall with high speed winds in a short span	Vegetative stage	Flowering stage	Crop maturity stage	Post-harvest
Cumin	<ul style="list-style-type: none"> • Surface drainage (for management of water logging & diseases. • Spray mancozeb 0.2% (27g/10 lit water) to control cumin blight) 	<ul style="list-style-type: none"> • Surface drainage (for management of water logging & diseases. • Spray mancozeb 0.2% (27g/10 lit water) to control cumin blight) 	<ul style="list-style-type: none"> • Surface drainage (for management of water logging). • Spray 0.2% (30g/10 lit water) wettable sulphur to prevent powdery mildew infestation. • Harvesting at physiological maturity immediately 	<ul style="list-style-type: none"> • Protect produce with plastic sheet (100µ UV stabilized colour plastic) or shift produces to farm shed. • Protection against pest/disease damage in storage etc. • Preparation of quick drying techniques and techniques to separate good lot and bad lot.
Coconut	Provision of drainage. Fertilizer application. Control black headed cater piller/ rhinoceros beetle with root feeding technique under unusual rains with cloudy weather	Provision of drainage. Fertilizer application. Control black headed cater piller/ rhinoceros beetle with root feeding technique under unusual rains with cloudy weather	<ul style="list-style-type: none"> • Hang light trap, one /acre for control of rhinoceros beetle 	-do-
Pomegranate	<ul style="list-style-type: none"> • Provision of drainage. • Fertilizer application. Control thrips with spray of profenophos 50%EC (30 ml/15 litre water) under unusual rains with cloudy weather 	<ul style="list-style-type: none"> • Provision of drainage. • Fertilizer application. Control thrips with spray of profenophos 50%EC (30 ml/15 litre) water under unusual rains with cloudy weather 	<ul style="list-style-type: none"> • Provision of drainage. • Rape of fruit with protection fruit from anar cater pillar • Spray carbendazim prevent rotting • Spray boron for reduction of fruit cracking 	-do--

Outbreak of pests and diseases due to unseasonal rains	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Wheat	<ul style="list-style-type: none"> • Spray mencozeb 0.2 % (27g/10 lit water) to control blight and rust 	<ul style="list-style-type: none"> • Spray mencozeb 0.2 % (27g/10 lit water) to control blight and rust 	<ul style="list-style-type: none"> • Spray mencozeb 0.2 % (27g/10 lit. water) to control blight and rust 	-
Cotton	<ul style="list-style-type: none"> • Control pest with systemic pesticides 	<ul style="list-style-type: none"> • Adopt integrated pest management techniques for pink boll worm control. Like Pheromone trap (20/ha), Azadirachtin (1.2 lit/ha), Beauveriabassiana (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), Beauveriabassiana (2 kg/ha), Quanalphosh 25 EC (600 ml/ha). 	-

Outbreak of pests and diseases due to unseasonal rains	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Castor	-	<ul style="list-style-type: none"> • Protection against sucking pest (To control Jassid spray dimethoate(10ml/10l water) or imidacloprid (4 ml/10litre water) • Spray cypermethrin 25% EC (10 ml/10litre) for management of Capsule borer • Protection against sucking pest (To control Jassid spray dimethoate(10ml/10litre water) 	<ul style="list-style-type: none"> • Harvest the crop at Physiological maturity stage, • No measure for seed shattering 	-
Groundnut	<ul style="list-style-type: none"> • Spray hexaconazole0.005%(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 hexaconazole0.005%%(10ml /10 lit. water) for rust & tikka disease control. 	<ul style="list-style-type: none"> • Spray hexaconazole0.005%%(10ml /10 lit. water) for rust & tikka disease control. 	-
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. 	-
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. 	
Coconut	<ul style="list-style-type: none"> • black headed cater piller/ rhinoceros beetle with root feeding techniuqe under unusual rains with cloudy weather 	<ul style="list-style-type: none"> • Control black headed cater piller/ rhinoceros beetle with root feeding techniuqe under unusual rains with cloudy weather 	<ul style="list-style-type: none"> • Hang light trap, one /acre for control of rhinoceros beetle 	-

Outbreak of pests and diseases due to unseasonal rains	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Pomogranate	<ul style="list-style-type: none"> Control thrips with spray of profenophos 50%EC (30 ml/15 litre water) under unusual rains with cloudy weather 	<ul style="list-style-type: none"> Control thrips with spray of profenophos 50%EC (30 ml/15 litre water) under unusual rains with cloudy weather 	<ul style="list-style-type: none"> Rape of fruit with protection fruit from anar cater pillar Spray carbendazim prevent rotting Spray boron for reduction of fruit cracking 	

2.3 Floods

Condition	Suggested contingency measure			
Transient water logging/ partial inundation	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
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 	-
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 	-
Pearl millet	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 	-
Green gram	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 	-
Horticulture				
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 	
Cumin	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"> Shift to safe place & Surface drainage 	<ul style="list-style-type: none"> Surface drainage 	<ul style="list-style-type: none"> Surface drainage 	-
Pomogranate	<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 	-

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation				
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 	-
Pearl millet	<ul style="list-style-type: none"> As preventive step open drainage channel. 	<ul style="list-style-type: none"> As preventive step open drainage channel. 	<ul style="list-style-type: none"> As preventive step open drainage channel. 	<ul style="list-style-type: none"> Harvest Mature ear heads
Pulses	<ul style="list-style-type: none"> As a preventive step open drainage channel followed by spray 0.05% carbendazim (10g/10lit water) or 0.0025% hexaconazole(5 ml/10 lit. water) for control of powdery mildew 	<ul style="list-style-type: none"> As a preventive step open drainage channel followed by spray 0.05% carbendazim (10g/10lit water) or 0.0025% hexaconazole(5 ml/10 lit. water) for control of powdery mildew 	<ul style="list-style-type: none"> As a preventive step open drainage channel followed by spray 0.05% carbendazim (10g/10lit water) or 0.0025% hexaconazole(5 ml/10 lit. water) for control of powdery mildew 	<ul style="list-style-type: none"> Picking of mature pods
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 inundation				
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. 	-
Coconut	<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
Pomogranate	<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 intrusion	NA	NA	NA	NA

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

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

Extreme event type	Suggested contingency measure ^r			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Garlic	-	-	-	
Onion	-	-	-	
Castor	-	-	-	
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. 	
Coconut/pomegranate	<ul style="list-style-type: none"> Shift graft to safe place if possible, build cyclone proof nursery houses, grow wind barrier trees around nursery 	<ul style="list-style-type: none"> Reduce canopy & tying plants diagonally if possible Grow wind barrier trees around nursery 	<ul style="list-style-type: none"> Reduce canopy & tying plants diagonally if possible 	<ul style="list-style-type: none"> 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 unteather animals. 	<ul style="list-style-type: none"> • Feed silage & hay material along with concentrate feed. • Use chaff cutter for fodder. • Use press for making compact bundles of fodder for easy

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

	Suggested contingency measures		
	Before the event	During the event	After the event
		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.	spread of diseases. • Health checking to diseases outbreak.
Heat wave and cold wave	NA	NA	NA
Heat wave	NA	NA	NA

^a based on forewarning wherever available

2.5.2 Poultry

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

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	During the event	After the event	
Drinking water	-	<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%). 	-
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	-

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	During the event	After the event	
Health and disease management	NA	NA	NA	-

^a based on forewarning wherever available

2.5.3 Fisheries/ Aquaculture

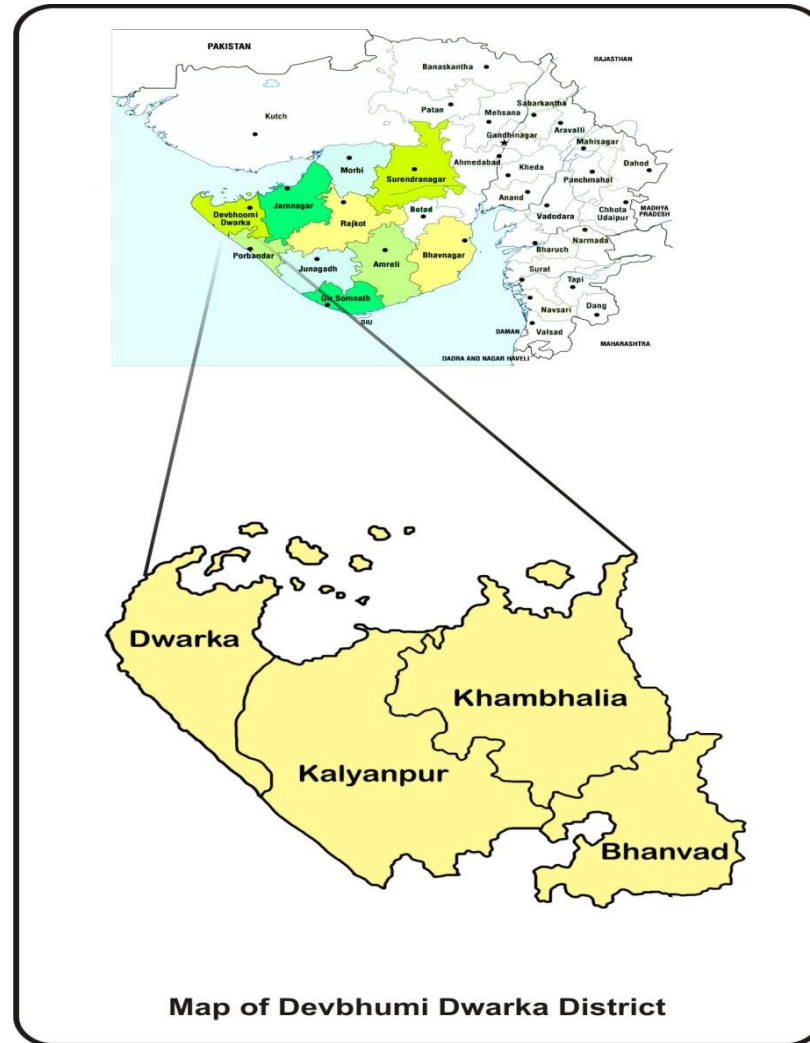
	Suggested contingency measures		
	Before the event ^a	During the event	After the event
1) Drought			
A. Capture			
Marine	NA	NA	NA
Inland	NA	NA	NA
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	<ul style="list-style-type: none"> Desilting/deepening of pond so that more 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	-	-	-
2) Floods			
A. Capture			
Marine	NA	NA	NA
Inland	NA	NA	NA
B. Aquaculture			
(i) Inundation with flood water.	<ul style="list-style-type: none"> Deepening of ponds, repair, strengthening of dykes 	<ul style="list-style-type: none"> Enhancement of dykes height by sand bags. 	-
(ii) Water contamination and changes in water quality.	<ul style="list-style-type: none"> Use of calcium hydroxide @ 150 kg/ha. 	<ul style="list-style-type: none"> Use of KMnO₄ for bath of fish as prophylactics. 	<ul style="list-style-type: none"> Lime treatment for oxidation.
(iii) Health and diseases.	<ul style="list-style-type: none"> Antibiotics fortified feeding as prophylactics. 	<ul style="list-style-type: none"> Disinfectants formalin treatments as prophylactics. 	-do-
(iv) Loss of stock and inputs (feed, chemicals etc).	<ul style="list-style-type: none"> Stock cover under insurance 	-	-

	Suggested contingency measures		
	Before the event ^a	During the event	After the event
(v) Infrastructure damage (pumps, aerators, huts etc.)	-	-	• Repaire & maintenance of aqua structures to begiven.
(vi) Any other	-	-	-
3. Cyclone / Tsunami			
A.Capture	-	-	-
Marine	-	-	-
(i) Average compensation to be paid due to loss of fishermen lives	<ul style="list-style-type: none"> • Forwarning systems to be installed. • Insurance & communication instruments supplied to fisher man. • Warning systems to be installed. 	<ul style="list-style-type: none"> • Warning systems to be installed. 	<ul style="list-style-type: none"> • Compensations to be paid for repair & maintenance of boats & gears on actual survey basis.
(ii) Avg. no. of boats / nets/damaged			<ul style="list-style-type: none"> • Compensation on assessment of actual losses & damage of boats & nets to be given.
(iii) Avg. no. of houses damaged	-	-	<ul style="list-style-type: none"> • Compensation on assessment of actual losses & damage of houses to be given.
Inland	NA	NA	NA
B. Aquaculture			
(i) Overflow / flooding of ponds	<ul style="list-style-type: none"> • Strengthening of dykes. 	<ul style="list-style-type: none"> • Enhancement of dykes height by sand bags. 	-
(ii) Changes in water quality (fresh water / brackish water ratio)	<ul style="list-style-type: none"> • Maintain salinity by addition of fresh water up to 20-25 ppt. 	<ul style="list-style-type: none"> • Use euryhaline species. 	<ul style="list-style-type: none"> • Use Euryhaline species for culture.
(iii) Health and diseases	<ul style="list-style-type: none"> • Liming and formalin treatment. 	<ul style="list-style-type: none"> • Disinfectants treatments. 	-
(iv) Loss of stock and inputs (feed, chemicals etc).	<ul style="list-style-type: none"> • Stock cover under insurance. 	-	<ul style="list-style-type: none"> • Seed and feed to be supplied through Deptt of fisheries,
(v) Infrastructure damage (pumps, aerators, shelters/hutsetc)	-	-	<ul style="list-style-type: none"> • Compensation on assessment of actual losses & damage of pumps, aerators, shelters/huts to begiven.

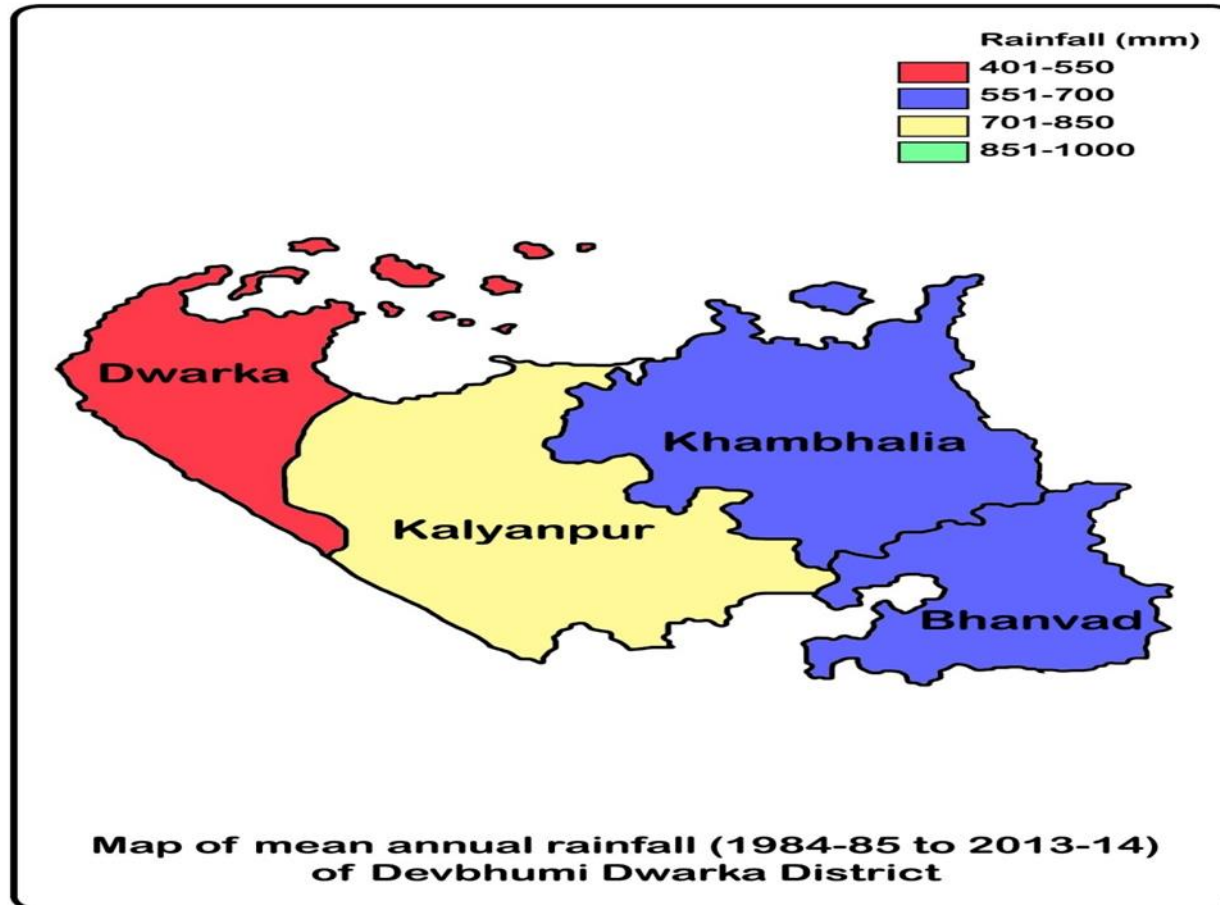
	Suggested contingency measures		
	Before the event^a	During the event	After the event
(vi) Any other	-	-	-
4. Heat wave and cold wave			
A. Capture			
Marine	NA	NA	NA
Inland	NA	NA	NA
B. Aquaculture			
(i) Changes in pond environment (water quality)	<ul style="list-style-type: none"> Plantation of leafy trees on dyke, increase depth. 	<ul style="list-style-type: none"> To maintain water level in pond. Use of fountain and peddle wheel aerator. 	-
(ii) Health and disease management	-	<ul style="list-style-type: none"> Bleaching powder 1 to 2 %, formalin treatment to prevent diseases. 	<ul style="list-style-type: none"> KMnO4 2 % to maintain oxygen level
(iii) Any other	-	-	-

^a based on forewarning wherever available

ANNEXURE -I
Location map of the district

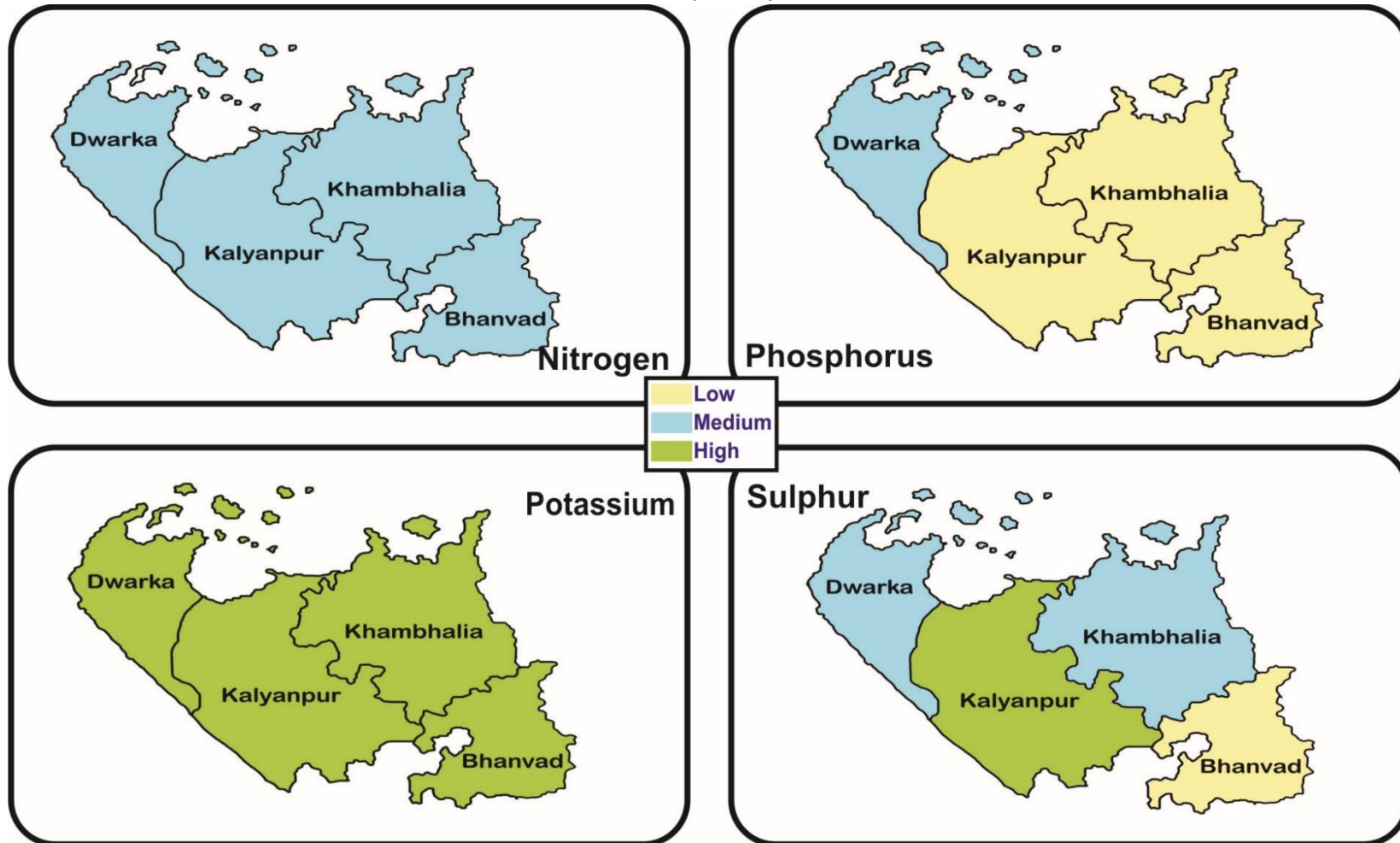


ANNEXURE-II
Mean annual rainfall of map:



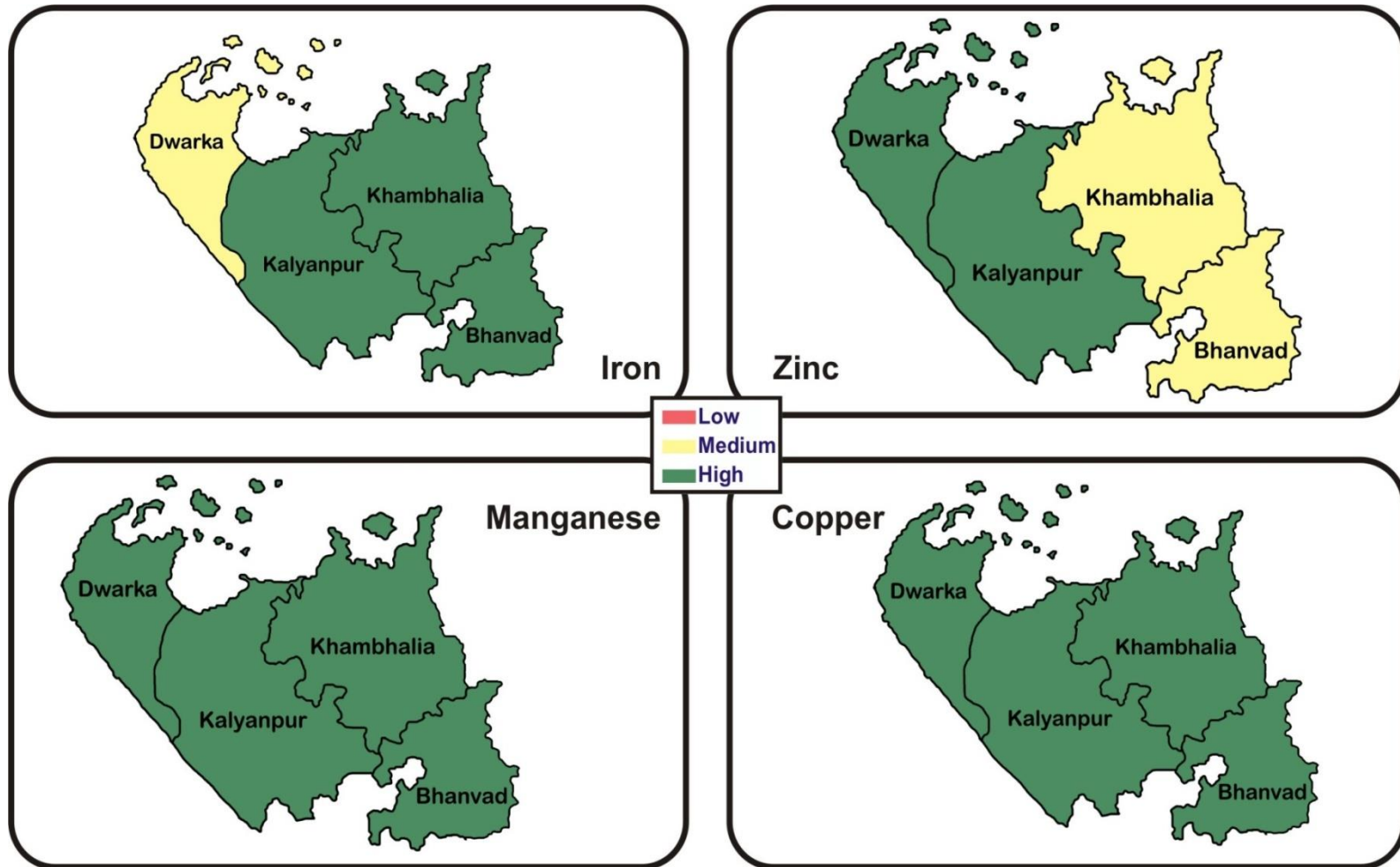
Annexure-III

Annexure III a: Soil map of major nutrient status



Status of major nutrients in soils of Devbhumi Dwarka District

Annexure III b: Soil map of micro nutrient status



Status of micronutrients in soils of Devbhumi Dwarka District