State: GUJARAT
Agriculture Contingency Plan for District: GANDHINAGAR

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	Northern Plain (And Central Highlands) Including Aravallis, Hot Semi-Arid Eco-		
	Agro-Climatic Zone (Planning Commission)	Gujarat Plains and Hills Region (XIII)		
	Agro Climatic Zone (NARP)	North Gujarat Zone (GJ-4)		
	List all the districts or part thereof falling under the NARP Zone	Sabarkantha, Gandhinagar, Mehsana, Banaskantha		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		$23^0$13'45.81" N	72°39'07.11" E	88 M
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Fruit Research Station, S.D.Agricultural University, Dehgam		
	Mention the KVK located in the district	Krushi Vigyan Kendra, Gujarat Vidyapeeth Randheja,Ta. Gandhinagar		

1.2	**Rainfall**	Normal RF (mm)	Normal Rainy days (number)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June -September)	779	32	4th week of June	2nd week of September
	NE Monsoon(October -December)	-	-	-	-
	Winter (January- February)				
	Summer (March - May)				
	Annual	779	32		

1.3	**Land use pattern of the district** (latest stat.)	Geographical area	Cultivable area	Forest area	Land under nonagril use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area ('000 ha)	215.0	164.0	2.0	22.6	11.8	5.9	-	1.5	6.9	-

1. 4	**Major soils (common names like red sandy loam deep soils (etc.,)***	**Area ('000 ha)**	**Percentage of total**
	Medium black to sandy loam soils	164.0	76.3
	Others (specify):		

1.5	**Agricultural land use**	Area ('000 ha)	Cropping intensity %
	Net sown area	164	159
	Area sown more than once	97	
	Gross cropped area	261	

1.6	**Irrigation**	Area ('000 ha)		
	Net irrigated area	102.6		
	Gross irrigated area	102.6		
	Rainfed area	61.4		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals		5.1	5.0
	Tanks	-	-	-
	Open wells	-	-	-
	Bore wells	1553	97.5	95.0
	Lift irrigation schemes	-	-	-
	Micro-irrigation		-	-
	Other sources (please specify)	-	-	-
	Total Irrigated Area	-	102.6	
	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	4 (Gandhinagar, Kalol, Mansa, Dehgam)	-	-

	Critical	-	-	-
	Semi- critical	-	-	-
	Safe			
	Wastewater availability and use			
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

Source:- Statistical information received from District Panchayat, Gandhinagar

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

1.7	S. No.	Major field crops cultivated	Area ('000 ha)							
			Kharif			*Rabi*			Summer	Grand total
			Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
	1	Wheat				31.2		31.2	-	31.2
	2	Cotton	28.2	-	28.2	-	-	-	-	28.2
	3	Castor	27.0	-	27.0	-	-	-	-	27.0
	4	Bajra	-	18.0	18.0	-	-	-	7.2	25.2
	5	Rice	12.0	-	12.0	-	-	-	-	12.0
	6	Pulses (Greengram)	-	5.7	5.7	-	-	-	-	5.7
	S. No.	**Horticulture crops - Fruits**	**Area ('000 ha)**							
			Total							
	1	Lemon	2.0							
	2	Mango	1.0							
	3	Sapota	1.0							
	4	Aonla	0.7							
	5	Guava	0.5							
		Horticulture crops - Vegetables	**Total**							
	1	Brinjal	3.0							
	2	Okra	2.5							
	3	Chilli	1.7							
	4	Vine Crops (Cucurbits, Bottle, Ridge, Smooth, Bitter and Little gourds)	1.6							

Source:- Statistical information received from District Panchayat, Gandhinagar

		Medicinal and Aromatic crops	**Total**
	1	Fennel	1.7
		Plantation crops	-
	Others (Specify)	Eg., industrial pulpwood crops etc.	-
		Fodder crops	**Total**
	1	*Jowar*	2.0
	2	Maize	0.4
	Others (Specify)	-	-
		Total fodder crop area	2.4
		Grazing land	11.8
		Sericulture etc	-
		Others (specify)	-

Source:- Statistical information received from District Panchayat, Gandhinagar

1.8	**Livestock** **Source: 26th survey Report (08-09), Dept. of A. H., Gujarat State**	**Male ('000)**	**Female (No's)**	**Total (No's)**
	Non descriptive Cattle (local low yielding)	-	80115	80115
	Crossbred cattle	-	68351	68351
	Non descriptive Buffaloes (local low yielding)	-		
	Graded Buffaloes	-	364040	364040
	Goat	-	47149	47149
	Sheep	-	16658	16658
	Others (Camel, Pig, Yak etc.)	-	1801 (camel) + 400 (pigs)	2201
	Commercial dairy farms (Number)			
1.9	**Poultry**	**No. of farms**	**Total No. of birds (No's)**	
	Commercial	-	31520 (layer) + 44500 (broilers) + 28 (ducks) = 76048	
	Backyard	-	9317	
1.10	**Fisheries** (Data source: Gujarat Fisheries Statistics 2006-07 and MArch-10, Commissioner of Fisheries, Govt. of Gujarat			
	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)	
		-	-	-	-	-	-
	ii) Inland (Data Source: Fisheries Department)	**No. Farmer owned ponds**		**No. of Reservoirs**		**No. of village tanks**	
		-		**2 (45 ha)**		-	

	B. Culture			
		Water Spread Area (ha)	**Yield (t/ha)**	**Production (MT)**
	i) **Brackish water** (Data Source: MPEDA/ Fisheries Department)	-	-	-
	ii) **Fresh water** (Data Source: Fisheries Department)	-	-	**8**
	Others	-	-	-

Data source: Gujarat Fisheries Statistics 2006-07 and MArch-10, Commissioner of Fisheries, Govt. of Gujarat

1.11 Production and Productivity of major crops (Average of last 5 years: 2003-04 to 2008-09 05, specify years)

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)										
1	Wheat	-	-	92.5	2956	-	-	92.5	2956	106.4
2	Cotton	10.5 (Lint)	634 (Lint)	-	-	-	-	10.5 (Lint)	634 (Lint)	31.5
3	Castor	55.6	2067	-	-	-	-	55.6	2067	83.4
4	Bajra	21.9	1231	-	-	19.1	2623	41.0	1628	80.5
5	Rice	28.2	2355	-	-	3.7	1783	32.0	2406	36.7
6	Total Pulses (Mung, Urd, Tur)	5.7	698	-	-	-	-	5.7	698	11.4

Major Horticultural crops (Crops to be identified based on total acreage)										
1	Lemon	-	-	-	-	-	-	24.2	12000	-
2	Mango	-	-	-	-	-	-	8.5	8500	-
3	Sapota	-	-	-	-	-	-	11.1	12500	-
4	Aonla	-	-	-	-	-	-	7.5	11000	-
5	Guava	-	-	-	-	-	-	6.2	12800	-
Others	-		-	-	-	-	-	-	-	-

Source:- Statistical information received from District Panchayat, Gandhinagar

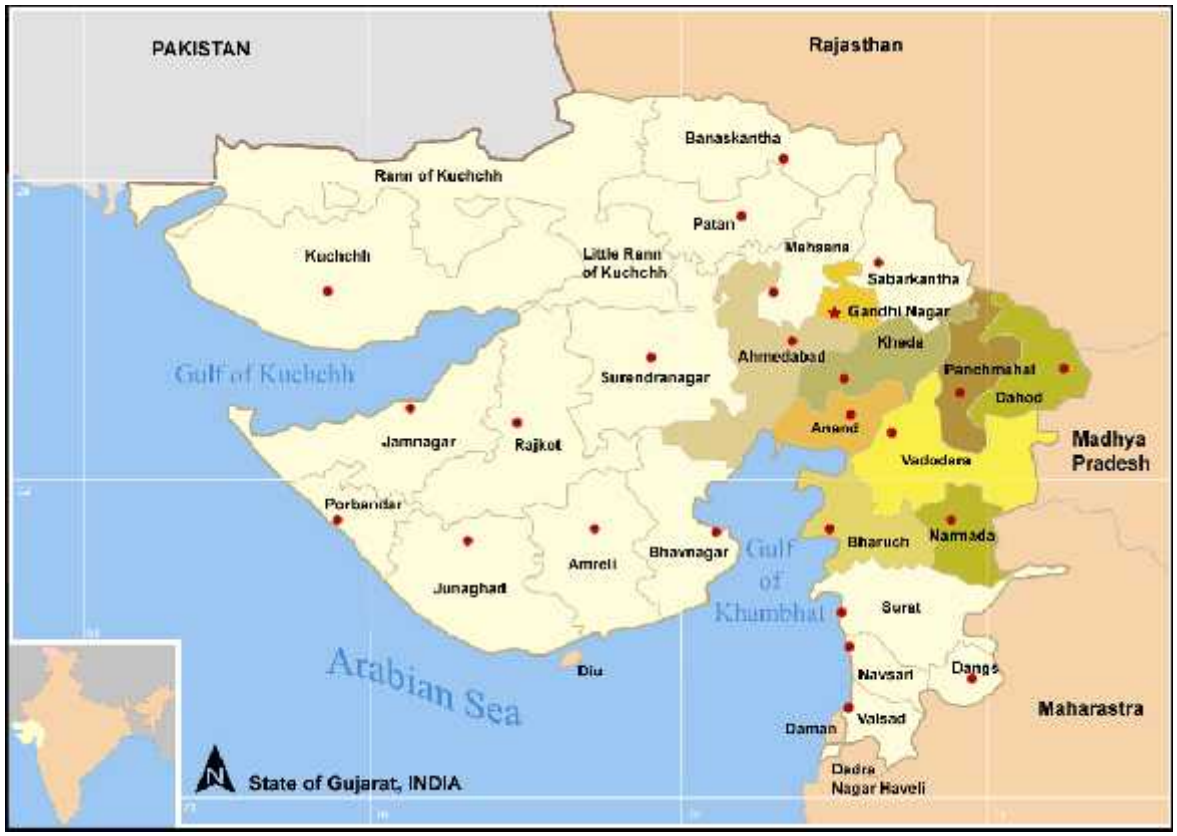
1.12	**Sowing window for 5 major field crops** (Start and end of normal sowing period)	**Wheat**	**Cotton**	**Castor**	**Bajra**	**Rice**	**Greengram**
	Kharif- Rainfed	-	-	-	3rd week of June - 1st week of July.	-	3rd week of June - 1st week of July
	Kharif-Irrigated	-	3rd week of June- 3rd week of July	3rd week of July - 3rd week of Aug.	-	3rd Week of June - 1st week of July	-
	Rabi- Rainfed	-	-	-	-	-	-
	Rabi-Irrigated	3rd week to 4th week of November	-	-	-	-	-

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 disease outbreak (specify)		✓	
	Others (specify)			

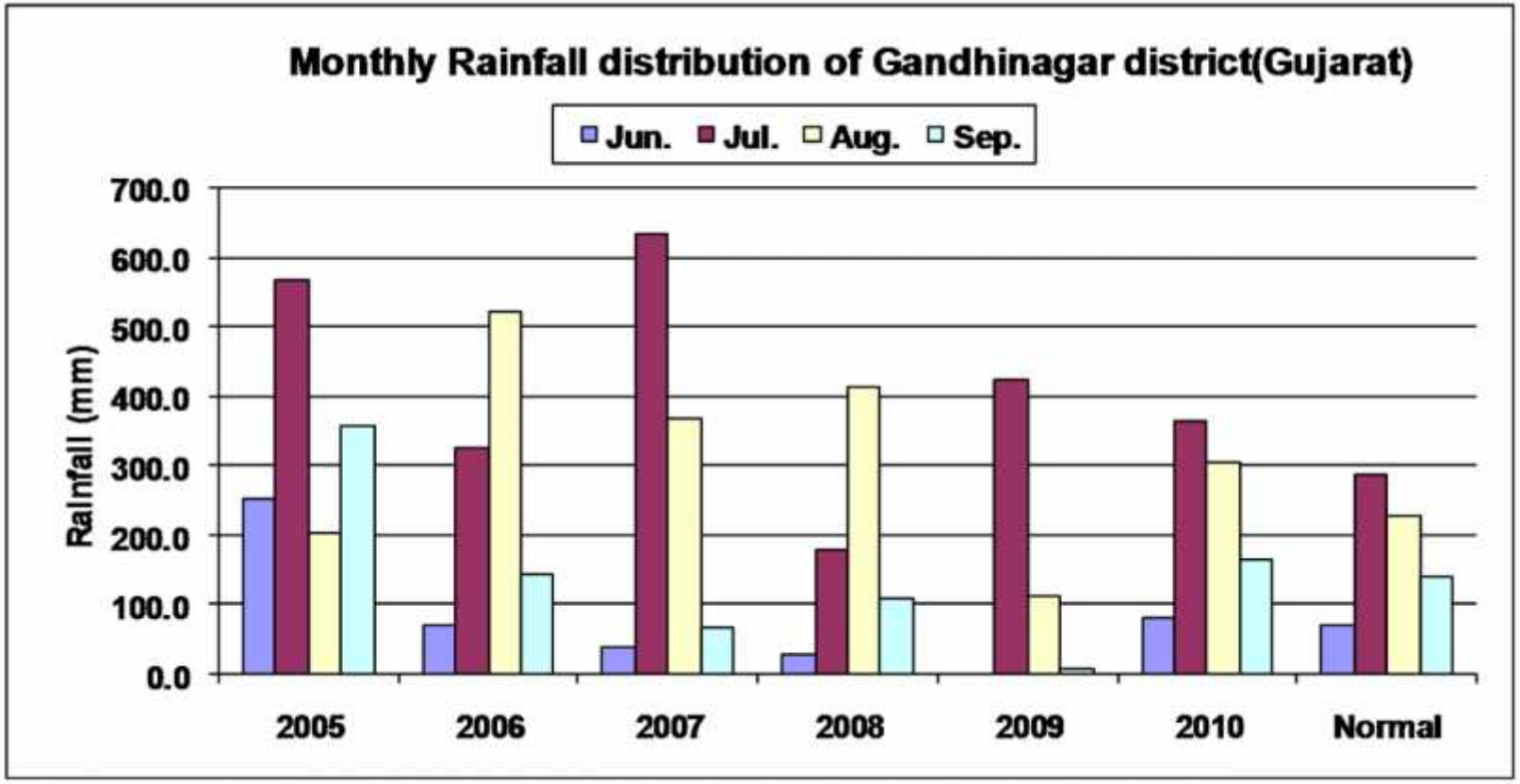
1.14	**Include Digital maps of the district for**	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: No

Annexure-I

LOCATION MAP OF GANDHINAGAR DISTRICT (GUJARAT)



Annexure-II


Monthly Rainfall distribution of Gandhinagar district(Gujarat)
Jun.
Jul.
Aug.
Sep.
Rainfall (mm)
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
2005
2006
2007
2008
2009
2010
Normal

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks (July 2nd week)	Medium black to loamy sand soils (Gandhinagar, Mansa, Kalol, Dehgam)	Bajra	No change. Prefer short duration early maturing varieties of Bajra viz.GHB-538, GHB-577	• 20% higher seed rate • Seed priming with thiourea (0.05%) for four hours • Sowing by adopting compartmental bunding (3.0m X 4.5 m)	• Breeder seed source SAU • Certified seed source NSC,GSSC, GUJCOMASOL • Seed drill under RKVY (costing Rs. 30000/-)
		Greengram	No change	-	-
		Fodder crop Jowar	Jowar**:** S-1049, SSG-59-3 (Multicut) Bajra: GF Bajra-1 (Multicut)	No change	• Seed source NSC, GUJCOMASOL, GSSC.
		Maize	African tall	-do-	-do-

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 4 weeks (July 4th week)	Medium black to loamy sand soils (Gandhinagar, Mansa, Kalol, Dehgam)	Bajra	• Short duration early maturing Var. GHB-538 and 577 • Karingdo as a inter crop after every third row of pearl millet • Replace 25% acreage of pearl millet with Guar and Mothbean	• Sowing at 60 cm • Seed priming with thiurea (0.05%) for four hours • Sowing by adopting compartmental bunding (3.0m X 4.5 m)	-do-
		Greengram	Gujarat Mung-4	• Sowing at 60 cm spacing • Fertilizer reduction by 30 %	-do-
		Fodder crop Jowar	Jowar: S-1049, SSG-59-3 (Multicut) Bajra**:** GF Bajra-1 (Multicut)	• Compartmental Bunding (3.6 m x 6.0 m) • S applicaton @ 20 kg/ha in form of Gypsum	• Seed source NSC, GUJCOMASOL, GSSC. • Gypsum may supplied by GSFC under subsidised rate
		Maize	African tall	-do-	Bund maker can be provided under RKVY

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 6 weeks (August 2nd week)	Medium black to loamy sand (Gandhinagar, Mansa, Kalol, Dehgam)	Bajra	Clusterbean HG-75, Gujarat Guar 1 or 2	• 25% higher seed rate with 60 cm spacing • Reduce the fertilizer by 40 % • Seed hardening (soaking the seed 3 to 4 hours in water followed by shade drying)	• Breeder seed source SAU • Certified seed source NSC,GSSC, GUJCOMASOL • Seed drill under RKVY (costing Rs. 30000/-) • Ridge & furrow maker can be provided under RKVY or other Govt. Agency.
			Fodder sorghum GJ-39 and Malvan	• Wider spacing at 60 cm with 25% higher seed rate • Reduce the fertilizer application by 40 % • In fodder sorghum, apply 20 kg S/ha through gypsum	-do- Gypsum provided under subsidized rate by Govt. Agency.
		Greengram	Fodder sorghum: GJ-39, Malvan	• Wider spacing at 60 cm with 25% higher seed rate • Reduce the fertilizer application by 40 % • In fodder sorghum, apply 20 kg S/ha through gypsum	• Breeder seed source SAU • Certified seed source NSC,GSSC, GUJCOMASOL • Seed drill under RKVY (costing Rs. 30000/-)
		Fodder crop Jowar	Jowar: S-1049, SSG-59-3 (Multicut) Bajra: GF Bajra-1 (Multicut)	• Compartmental Bunding (3.6 m x 6.0 m) • S applicaton @ 20 kg/ha in form of gypsum	• Seed source NSC, GUJCOMASOL, GSSC. • Gypsum may supplied by GSFC under subsidies rate
		Maize local	African tall	-do-	Bund maker can be provided under RKVY

Condition			Suggested Contingency measures		
Early season drought (delayed onset	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8 weeks (Specify month) **(August 4th week)**	Medium black to loamy sand (Gandhinagar, Mansa, Kalol, Dehgam)	Bajra	Fodder Jowar : GJ-39, Malvan	• Wider spacing at 60 cm with 25% higher seed rate • Reduce the fertilizer application by 40% • In fodder sorghum, apply 20 kg S/ha through gypsum	• Breeder seed source SAU • Certified seed source NSC,GSSC, GUJCOMASOL • Seed drill under RKVY (costing Rs. 30000/-) • Ridge & furrow maker can be provided under RKVY or other Govt. Agency. • Gypsum provided under subsidized rate by Govt. Agency.
		Greengram	Fodder Jowar: GJ-39, Malvan	• Wider spacing at 60 cm with 25% higher seed rate • Reduce the fertilizer application by 40% • For Fodder Sorghum, apply 20 kg S/ha through Gypsum	-do-
		Fodder crop Jowar	Jowar:S-1049, SSG-59-3 (Multicut) Bajra:GF Bajra-1 (Multicut)	• Compartmental bunding (3.6 m x 6.0 m) • S applicaton @ 20 kg/ha in form of gypsum • Reduce the seed rate by 25 %	• Seed source NSC, GUJCOMASOL, GSSC. • Gypsum may supplied by GSFC under subsidized rate • Bund maker can be provided under RKVY
		Maize	Jowar:S-1049, SSG-59-3 (Multicut) Bajra:GF Bajra-1 (Multicut)	• Compartmental bunding (3.6 m x 6.0 m) • S applicaton @ 20 kg/ha in form of gypsum • Reduce the seed rate by 25%	• Bund maker can be provided under RKVY • Gypsum may supplied by GSFC under subsidized rate

Condition			**Suggested Contingency measures**		
Early season drought **(Normal onset)**	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination / crop stand etc.	Medium black to loamy sand (Gandhinagar, Mansa, Kalol, Dehgam)	Bajra	Thinning to maintain 10 to 15 cm plant to plant distance	-do-	-do-
		Greengram	-	Conservation of soil moisture by hoeing and weeding. Use weeds as mulch	Implements for hoeing & weeding be procured under RKVY or Govt. at subsidized rate
		Fodder crop Jowar	-	-	-
		Maize local	-	-	-

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell, consecutive 2 weeks rainless period)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At vegetative stage	Medium black to loamy sand soils (Gandhinagar, Mansa, Kalol, Dehgam)	Bajra	• Thinning of 20 to 25% plants within row • Life saving irrigation • Postpone the top dressing of N fertilizers	• Conservation of soil moisture by hoeing and weeding • Spraying of 5% kaoline solution	• Implements for hoeing & weeding be procured under RKVY or Govt. subsides rate • Mulching material under RKVY or Govt. subsides rate • Water harvesting structure can be constructed under MGNREGA

		Greengram	• Removal of 20% plant from the row • Protection against sucking pest (Spraying of Methyl o demeton or Dimethoate 10 ml/10 lit of water) • If possible life saving irrigation through MIS	• Interculturing • Weeding	• Implements for hoeing & weeding be procured under RKVY or Govt. at subsidized rates
		Fodder crop Jowar	• Life saving irrigation • Restrict the fertilizer application if moisture is insufficient • Reduce 25% plant population	• Intercultivation • Soil mulch by selo interculturing	---
		Maize local	-do-	-do-	-

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At flowering/ fruiting stage	Medium black to loamy sand soils (Gandhinagar, Mansa, Kalol, Dehgam)	Bajra	• Remove the barren tillers and use as fodder • Remove every fourth row and use as dry fodder • Life saving irrigation if possible	Spraying of 5% kaolin solution	• Labour for harvesting can be provided under MANREGA • Kaolin provided under RKVY or NFSM

		Greengram	• Removal of 20 to 25% plants from the row and use as fodder • Life saving irrigation • Protection against sucking pest (Spraying of Methyl o demeton or Dimethoate @10 ml/10 lit of water) • Protection against podborer (spraying of monocrotophos @10 ml, endosulphan @ 20 ml or Acephate @ 20 g in 10 lit of water at 50% flowering followed by 15 days	-	• Sprayers and duster be procured under RKVY or pulse production mission
		Fodder crop Jowar	• Life saving irrigation if possible. • Reduce 30 % plant population	• Restrict the fertilizer application if moisture is insufficient	-
		Maize local	Reduce 25% plant population	-	-

Condition			**Suggested Contingency measures**		
Terminal drought (Early withdrawal of monsoon)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
At maturity stage	Medium black to loamy sand soils (Gandhinagar, Mansa, Kalol, Dehgam)	Bajra	• Harvest the crop at physiological maturity stage	-	-
		Greengram	• Life saving irrigation • Harvest mature pods	-	-
		Fodder crop Jowar	Harvest the crop and dry it	-	-
		Maize local	-do-	-	-

2.1.2 Drought - Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delayed released of water in canals due to low rainfall	**NA**				

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Non released of water in canals under delayed onset of monsoon in catchment	**NA**				

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	**NA**				

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Insufficient groundwater recharge due to low rainfall	Medium black to loamy sand soils (Gandhinagar, Mansa, Kalol, Dehgam)	Wheat	• Wheat GW 11 and GW 173 • Reduce area under wheat and replace by Gram: ICC 4,Gram Gujarat 1 & 2, Cumin: Guj 4 Fenugreek: Guj Fenugreek 1 Leafy vegetables:Palak, Methi Dill Seed: Guj. Dill seed 1 Barley: RD 2052 Isabgol: Guj.Isabgul 1 &2	• Pressurized irrigation at critical stage •	• Seed sources Breeder-SAUs Certified: GSSC, GUJCOMASOL, NSC • Pressurized irrigation system through Gujarat Green Revolution Co.Ltd, under subsidized rate.
		Cotton	-	• Adoption of drip irrigation and mulching with plastic mulch of 50 micron @ 370 kg/ha • Reduce the plant population by 15 to 20% and use as mulching material • Mulching with farm byproduct @ 10t/ha (castor shell or Bajra husk) • Band application of organic manures and 25% NPK as additional dose • Spraying of 0.5% $MgSO_4$ solution	• Pressurized irrigation system through Gujarat Green Revolution Co. Ltd, under subsidized rate.
		Castor	-	-do-	-do-
		Okra	Cluster bean Pusa Navabahar	Double row furrow basin planting Alternate furrow irrigation	-

		Brinjal	Gram ICCC-4, Guj-1 & 2 Cumin :Guj- 1,2,3 & 4/ Coriander :Guj-1 & 2, Fenugreek :Guj- 1, Leafy vegetable Radish :Japanese white, Pusa hemani, Pusa resham/ Carrot GDC 1/ cauliflower Snow ball-16, hissar-1, Cabbage :Pride of India, Early drum head, Pusa drum head,	Alternate furrow irrigation through drip system	
		Chilli	Cluster bean Pusa Navabahar	Drip irrigation with plastic mulch of 50 micron @ 370 kg/ha	• Drip system can be provided under GGRC • Plastic Mulch can be provided under RKVY
		Fennel	Reduce the area by 25%	-do-	• Furrow maker can be provided under RKVY • Drip system can be provided under GGRC
		Lucerne	GALL-1	-	Seed source from NSSC
		Oat	Bajra (multicut) GF Bajra-1	-	-do-

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

Condition	**Suggested contingency measure**			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**
Cotton	• Surface drainage • Intercultivation for aeration • Apply 25 kg N/ha as additional dose	• Surface drainage • Apply 25 kg N/ha as additional dose • Protect the crop against whitefly and sucking pest(Acephate 75 EC 15 g, Trizophos 40 EC 25 ml, Imidacloprid @ 2.5 ml in 10 lit of water)	• Surface drainage • Protect the crop against Boll Worm in non Bt Cotton • Apply 25 kg N/ha as additional dose	Cover the produce with plastic sheet(100 micron UV stabilized color plastic)
Wheat	-	-	Surface drainage to avoid lodging of crop and to control black point in grain Spray Mancozeb 0.2%	Cover produce with plastic sheet (100 µm, UV stabilized colour plastic) or shift produces to farm shed and protect against pest/disease damage in storage etc,
Pulses	-	-	Quick drainage , harvest mature pods	-do-
Horticulture				
Mango	-	Spray 0.2% wettable sulphur or 0.005% Hexaconazole for protection against PM	-	Unripe fruit may be used for pickles.
Citrus	Control citrus canker by spray of Copper Oxy chloride 0.2% & streptocycline 100 ppm	Control citrus canker by spray of Copper Oxy chloride 0.2 % & streptocycline 100 ppm	• Control citrus canker by spray of Copper Oxychloride 0.2% & streptocycline 100 ppm, • Collect mature fruits	-
Sapota	-	• Spray 0.2% wettable sulphur or 0.05% Hexaconazole for protection against powdery mildew • Provide drainage	• Harvest the matured fruits • Provide drainage • Protect the fruit against fruit spot (Difenconazole 0.05% spray)	Transfer the fruits to safer place
Aonla	-	-do-	• Harvest the fruits • Protect the crop against fruit spots disease(Carbendazim 0.025 %)	Transfer the fruits to safer place

Heavy rainfall with high speed winds in a short span				
Cotton	• Surface drainage • Interculturing for aeration • Apply 25 kg N/ha as additional dose	• Surface drainage • Apply 25 kg N/ha as additional dose • Protect the crop against whitefly and sucking pest(Acephate 75 EC @15 gm, Trizophos 40 EC @25 ml, Imidachloropid @ 2.5 ml in 10 lit of water)	• Surface drainage • Protect the crop against Boll Worm • Apply 25 kg N/ha as additional dose after cessation of rainfall	Cover the produce with plastic sheet(100 micron UV stabilized colour plastic)
Wheat	Surface drainage	Surface drainage	Surface drainage to avoid lodging of crop and to control black point in grain, Spray Mancozeb 0.2%	Cover produce with plastic sheet (100 µm , UV stabilized colour plastic) or shift produces to farm shed and protect against pest/disease damage in storage etc,
Pulses	-	-	Quick drainage , harvest mature pods	-do -
Horticulture				
Mango	-	Spray 0.2% wettable sulphur or 0.005% Hexaconazole for protection against PM	Collect fallen fruits	Unripe fruits may be used for pickles.
Guava	-	• Spray 0.2% wettable sulphur or 0.05% Hexaconazole for protection against powdery mildew • Provide drainage	• Harvest the matured fruits • Provide drainage • Protect the fruit against fruit spot (Difenconazole 0.05%spray)	Transfer the fruits to safer place
Citrus	Control citrus canker by spray of Copper Oxy chloride 0.2 % & streptocycline 100 ppm	Control citrus canker by spray of Copper Oxychloride 0.2 % & streptocycline 100 ppm	Control citrus canker by spray of Copper Oxychloride 0.2 % & streptocycline 100 ppm, collect mature fruits	-
Sapota	-	-do-	• Harvest the mature fruits • Provide drainage • Protect the fruit against fruit spot (Difenconazole 0.05% spray)	Transfer the fruits to safer place

Aonla	-	-do-	• Harvest the fruits • Protect the crop against fruit spots disease (Carbendazim 0.025 %)	-do-
Outbreak of pests and diseases due to unseasonal rains				
Wheat	Spray Mancozeb 0.2% (To control leaf blight & rust)	Spray Mancozeb 0.2% (To control leaf blight & rust)	To control black point in grain spray Mancozeb 0.2%	-
Horticulture				
Mango	-	Spray 0.2% wettable sulphur or 0.005% Hexaconazole for protection against PM	-	-
Citrus	Control citrus canker by spray of Copper Oxy chloride 0.2 % & streptocycline 100 ppm	Control citrus canker by spray of Copper Oxy chloride 0.2 % & streptocycline 100 ppm	Control citrus canker by spray of Copper Oxy chloride 0.2 % & streptocycline 100 ppm, collect mature fruits	-
Sapota	-	Spray 0.2% wettable sulphur or 0.05% Hexaconazole for protection against powdery mildew	Protect the fruit against fruit spot (Difenconazole 0.05% spray)	
Aonla	-	Spray 0.2% wettable sulphur or 0.05% Hexaconazole for protection against powdery mildew	Protect the crop against fruit spots disease (Carbendazin 0.025%)	

2.3 Floods

Condition	Suggested contingency measure			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Transient water logging/ partial inundation	NA			
Continuous submergence for more than 2 days	NA			
Sea water intrusion	NA			

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

Extreme event type	Suggested contingency measures			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave	NA	NA	NA	NA
Cold wave	NA	NA	NA	NA
Frost	NA	NA	NA	NA
Hailstorm	NA	NA	NA	NA
Cyclone	NA	NA	NA	NA

2.5.1 Livestock

	Suggested contingency measures		
	Before the event[s]	**During the event**	**After the event**
Drought	- Veterinary preparedness - Assessment of resources - Integration with the district system - Plan for rapid mobilization of resources specially Silage. - dry fodder (fodder bank), complete feed blocks (CFBs)	Assure and mobilize water supply	- Impact assessment

Feed and fodder availability	• Establishment of fodder banks at village/taluka/district level • Co-operative societies • Preparation of surplus silage by involving local administration • And district system • To have complete feed blocks ready in bulk • Computation of complete draught ration by identifying the various • Unconventional fodder, trees leaves & other industrial byproducts • To initiate good co-ordination with Panjrapole managing bodies • To Encourage perennial fodder on bunds and waste land on community basis	• Regular supply of dry fodder, complete feed blocks (CFBs) & silage to the draught affected areas • Nutritional supplementation in the form of urea-molasses-mineral blocks, mineral blocks, salt licks • To ensure minimum maintenance ration for each animals • Mobilization	• Availing Insurance - Restoration of the mass production of fodder, public grazing land • Restoration of balanced feeding practices for production animals
Drinking water	- Preserving water in the tank for drinking purpose - Excavation of Bore wells - Establishment of water grid on co-operative / community basis - Water management practices should be given wide publicity among the stakeholders	- Using preserved water in the tank for drinking purpose - Whenever ground water or other water resources are available, priority should be fixed for drinking purpose only	- Awareness & extension programme for judicious usage of water and water resources - Restoration of water management (Harvesting practices at higher scale
Health and disease management	-Veterinary preparedness with medicine and vaccine -Organizing / getting ready the rapid response team in place (Comprising veterinary staff, Para-veterinarian staff and team representative of local bodies -Temporary shelter for animals with in shed / tarpaulin thatch etc -Predisaster planning at community level	-Organizing animals health camps for treating the animals -Immunization- vaccination against FMD, Enterotoxaemia, PPR, Sheep pox etc -Segregation / Isolation of least, moderate and most affected animals and to put efforts in the direction of minimum loss of productivity -Hygienic & safe disposal of dead animals -P.M. and reporting	-culling sick animals -Impact assessment of the condition

Floods	-District lies under arid / semi-arid agro climatic zone and less or least prone to flood condition. Based on data of last 10 years, flood situation aroused in the past but for the shorter duration. Planning and preparedness for the safe evacuation of the livestock and pet animals -Construction of permanent shelter at higher and safer place which otherwise can be used as fodder storage godown in draught season & or even as the livestock shelter -Warning to the people for preparedness and to shift to higher places		
Feed and fodder availability	Fodder banks at taluka places	Supply of fodder to affected animals	
Drinking water		-Sterilization / sanitization of water for drinking purpose -Treatment of water to minimize water borne diseases	
Health and disease management	-Veterinary preparedness with medicines -Vaccination programme for contagious diseases like HS, BQ, etc -Insurance	-Organizing animal health camps -Deworming programmes -Safe & hygienic disposal of carcasses	-P.M. and reporting - Impact assessment of the condition and managemental operations -Future planning
Cyclone	-Warning and notification of the forthcoming situation to the population -Shifting of livestock to safer places -Construction of permanent structures for livestock shelter and for the storage of fodder (Fodder godown) at village/taluka/district level -Requirement of Manpower for the disposal of carcasses		
Feed and fodder availability	Storage of fodder at safer places (Fodder godown)	-Maintain supply of feed & fodder to the shifted animals	-Nutritional supplementation to animals(Vitamins, minerals, balanced feed)

Drinking water		-Provision of clean and fresh water	
Health and disease management	-Insurance -Immunization -Shifting of livestock -Veterinary preparedness (Establishment of Veterinary Rapid Response Team & stock pilling of medicines)	-Rescue & search of affected animals -Treatment of affected animals by organizing animal health camps -Treatment & Isolation of animals affected with diseases of zoonotic importance leading to zoonotic public health issues	-Search & Rescue of dead & affected animals -P.M. & Reporting -Handling of zoonotic diseases -Availing insurance
Heat wave and cold wave			
Shelter/environment management	Construction of low cost housing / shelter for animals -Mass tree plantation -Safe, hygienic & economical solid and liquid waste management (Bio-gas plants, FYM, Vermin-compost)	-Regular supply of drinking water -Measured to be adopted for maintaining lowest possible under shed / in-house temperature (Sprinkler, wet gunny bags, foggers) during **heat waves** -During **cold wave,** proper insulation of the shelter & houses -Minimize heat loss from the houses as well as from animal body - Nutritional manipulation according to condition	-Impact Assessment
Health and disease management			

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	Buffer stock of readymade feed	Ensure sufficient water supply	Resumption of routine management	
Drinking water				
Health and disease management	Routine vaccination and medication should be followed	Attention should be paid towards general management	-----do----------	
Floods	Poultry requires excellence in general management in respect of litter management and bio- security			
Shortage of feed ingredients				
Drinking water				
Health and disease management				Culling of affected birds
Cyclone	In case of uncontrollable condition it is advisable to sell of the flock at the earliest			Resumption of routine management
Shortage of feed ingredients				
Drinking water				
Health and disease management				
Heat wave and cold wave		Adopting measures for maintaining the in house temperature at or near to physiological optimum temperature		
Shelter/environment management		Measures to maintain at or near physiological optimum temperature		
Health and disease management		Nutritional manipulation like use of fats/edible oil in the ration, extra supplementation of methionine, biotin, choline chloride and vitamin C etc.		Culling of affected birds

[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	Nil	Nil	
Inland	-Insure water storage & supply well in advance -Harvesting & marketing	-Watering of the ponds --Harvesting & marketing	_Restoking of the ponds -Fertilization & manuring of ponds
(i) Shallow water depth due to insufficient rains/inflow	-First to ensure the water supply to maintain minimum level of water for fishes in that particular period. If not possible then harvesting & marketing	-To maintain water level is the only option otherwise harvesting & marketing	-Regular operations for the remaining stock and also restoring of newone
(ii) Changes in water quality	-Oxygen depletion may lead to death of fishes -Ensure water supply or harvest the stock	- Harvesting & marketing -Emptying of pond	-Manuring, fertilization & rewatering - Establishment of new stock
(iii) Any other			
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	-Water is only the major component or necessity for such operations -Ensure water supply or otherwise stoppage of the operation / culling temporary -Water managemental practices		
(ii) Impact of salt load build up in ponds / change in water quality	-Attempts to be made to minimize oxygen depletion from water and also for oxygenation of water	-Oxygenation of water -Stirring of water with pumps	-Re-establishment of normal managemental conditions
(iii) Any other	-Training and Awareness		

2) Floods			
A. Capture			
Marine	**NA**		
Inland	-		
(i) Average compensation paid due to loss of human life	Fishing should be prohibited because of breeding season		
(ii) No. of boats / nets/damaged	-Insurance -arrangement of boats, nets etc in surplus		
(iii) No. of houses damaged	-Co-ordination with the district administration & assurance to fisherman	-Rescue & Help -Programme in collaboration with district system	-Rehabilitation of fisherman for all their necessities
(iv) Loss of stock	-Training & Awareness	-Compensation	-Compensation
(v) Changes in water quality	-Preparation for checking the inflow of outside runoff water in to the pond runoff water into the ponds	- Arrangement of checking overflow of ponds --Overflow of ponds -Net installations to capture the fishes going out due to overflow	-Proper oxygenation -Maintenance of water pH
(vi) Health and diseases		-water treatment to minimize ectoparasite infestation	
B. Aquaculture			
(i) Inundation with flood water			
(ii) Water contamination and changes in water quality			
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, huts etc)			
(vi) Any other			
3. Cyclone / Tsunami			
A. Capture	NA		

Marine	NA		
(i) Average compensation paid due to loss of fishermen lives			
(ii) Avg. no. of boats / nets/damaged			
(iii) Avg. no. of houses damaged			
Inland			
B. Aquaculture			
(i) Overflow / flooding of ponds			
(ii) Changes in water quality (fresh water / brackish water ratio)			
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)			
(vi) Any other			
4. Heat wave and cold wave			
A. Capture			
Marine			
Inland			
B. Aquaculture			
(i) Changes in pond environment (water quality)			
(ii) Health and Disease management			
(iii) Any other			

[a] based on forewarning wherever available