

State: GUJARAT

Agriculture Contingency Plan for District: MEHASANA

1.0 District Agriculture profile											
1.1	Agro-Climatic/Ecological Zone										
	Agro Ecological Sub Region (ICAR)		Northern Plain (and Central Highlands) In (4.2)								
	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 (Chanasma, Kadi, Kalol, Kheralu, Mehsana, Patan, Sidhpur, Visnagar And Vijapur), Banaskantha (Dhanera, Deesa, Palanpur, Danta and Vadgam), Ahmedabad (Dahgam, Ahmedabad City, Daskroi and Sanad)								
	Geographic coordinates of district headquarters		Latitude			Longitude			Altitude		
			20 ^o . 02''			68 ^o .08''			93 m		
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS		Agricultural Research Station, Ladol Centre for Research on Seed Spices, Jagudan Main Wheat Research Station, Vijapur								
Mention the KVK located in the district		Ganpat University, Kherva Dist: Mehsana									
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-Sep):		680	27	4 th week of June			2 nd week of September			
	NE Monsoon (Oct-Dec):		-	-							
	Winter (Jan- Feb)		-	-	-			-			
	Summer (March-May)		-	-	-			-			
	Annual		680	-	-			-			
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)	439.4	365.3	7.2	31.5	30.4	52.4	7.1	10.6	-	-

1.4	Major Soils (common names like red sandy loam deep soils (etc.,))*	Area ('000 ha)	Per cent (%) of total
	1. Medium black	64.5	14.8
	2. Sandy to Sandy loam (Goradu)	288.6	61.0
	3. Saline salt affected	81.9	18.6

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	365.3	161
	Area sown more than once	222.0	
	Gross cropped area	587.2	

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	181.7		
	Gross irrigated area	218.7		
	Rainfed area	158.9		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals		38.0	17.6
	Tanks		0.7	0.03
	Open wells			
	Bore wells	6826	178.1	82.4
	Lift irrigation schemes			
	Micro-irrigation	1307	2.5	1.1
	Other sources (please specify)		0.07	0.03
	Total Irrigated Area		218.7	
	Pump sets	10873		
	No. of Tractors	6128		
	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	-	-	-
	Safe	-	-	-
Wastewater availability and use	-	-	-	
Ground water quality			Saline	

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

Source:- Statistical information received from District Panchayat, Mehsana

1.7 Area under major field crops & horticulture (as per latest figures) (Average of 2004-05 to 2008-09)

1.7	S.No.	Major field crops cultivated	Area ('000 ha)							
			<i>Kharif</i>			<i>Rabi</i>			Summer	Grand total
			Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
1	Bajra	-	51.6	51.6	-	-	-	-	51.6	
2	Cotton	45.1	-	45.1	-	-	-	-	45.1	
3	Castor	41.0	-	41.0	-	-	-	-	41.0	
4	Pulses	-	17.0	17.0	-	-	-	-	17.0	
5	Sesame	-	13.0	13.0	-	-	-	-	13.0	
	Horticulture crops - Fruits	Area ('000 ha)								
		Total			Irrigated			Rainfed		
1	Citrus	9.2			9.2					
2	Aonla	1.9						1.9		
3	Ber	1.8						1.9		
4	Chiku	1.0			1.1					
5	Mango	0.8						0.88		
	Horticulture crops - Vegetables	Total			Irrigated			Rainfed		
1	Tomato	2.5			2.5			-		
2	Clusterbean	2.2			2.2			-		
3	Brinjal	1.6			1.6			-		
4	Okra	1.6			1.6			-		
	Others (specify)									

		Medicinal and Aromatic crops	Total	Irrigated	Rainfed
	1	Isabgol	1.9	1.9	----
	Others (specify)				
		Plantation crops	Total	Irrigated	Rainfed
	Others (Specify)	Eg., industrial pulpwood crops etc.			
		Fodder crops	Total	Irrigated	Rainfed
	1	Sorghum	3.7	2.0	1.7
		Total fodder crop area	3.7	2.0	1.7
		Grazing land	30.4	-----	30.4
		Sericulture etc			
		Others (specify)			

1.8	Livestock Source: 26 th survey Report (08-09), Dept. of A. H., Gujarat State		Male (number)	Female (number)	Total (number)	
	Non descriptive Cattle (local low yielding)				155.7	
	Crossbred cattle					
	Non descriptive Buffaloes (local low yielding)				478.1	
	Graded Buffaloes					
	Goat				81.87	
	Sheep				15.28	
	Others (Camel, Pig, Yak etc.)				3.22	
Commercial dairy farms (Number)				-		
1.9	Poultry		No. of farms	Total No. of birds (number)		
	Commercial			49125 (layer) + 51035(broilers) + 10(ducks) =100170		
	Backyard			12531		
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	
			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	
			24 (12555 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)	-		94			
Others	-		-			

1.11 Production and Productivity of major crops (Average of last 5 years: 2004, 05, 06, 07, 08, 09; 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	Bajra	48.8	970	--	--	--	--	79.2	1259	174.3
2	Cotton	125.4	476	--	--	--	--	125.4	476	504.1
3	Castor	80.1	1940	--	--	--	--	80.1	1940	160.2
4	Pulses	14.2	517	--	--	--	--	1.8	565	160.2
5	Sesame	4.5	353	--	---	---	---	4.5	353	-
Major Horticultural crops (Crops to be identified based on total acreage)										
1	Citrus							83.5	9050	--
2	Aonla							13.6	7050	--
3	Ber							15.0	8040	--
4	Chiku							8.8	8100	--
5	Mango							5.3	6000	--

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Bajra	Cotton	Castor	Pulses	Sesame
	Kharif- Rainfed	21 st June to 10 th July	1 st June-1 st July	-	15 th June -15 th July	15 th June -15 th July
	Kharif-Irrigated	-	-	15 th July -15 th Aug	-	-
	Rabi- Rainfed	-	-	-	-	-
	Rabi-Irrigated	-	-	-	-	-

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)	-	-	✓

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

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Suggested Contingency measures	
				Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)					
Delay by 2 weeks. i.e. (July 1 st week)	Sandy loam soils	Castor	GCH 4,5,7	<ul style="list-style-type: none"> • Seed treatment with Rhizobium & PSB • Compartmental bunding, • Wider spacing • Line sowing • Chemical weed control, • Conservation furrow • Maintenance of plant stand • Water harvesting • Intercultivation 	<ul style="list-style-type: none"> • Breeder seed Source-SAU • Certified seed-Source – GSSC,NSC, GUJCOMASOL NFSM, ISOPAM • Seed drill under RKVY
		Cotton	GM-4		
		Pearlmillet	GHB 558, 557		
		Greengram			
		Blackgram	GU-2		
		Paddy	GR-11,12 &13		
	Sandy to sandy loam soils	Bajra	GHB 558, 577	<ul style="list-style-type: none"> • Seed treatment with Rhizobium & PSB • Compartmental bunding, • Wider spacing • Line sowing • Chemical weed control, • Conservation furrow • Maintenance of plant stand • Water harvesting • Intercultivation 	<ul style="list-style-type: none"> • Breeder seed Source-SAU • Certified seed-Source – GSSC,NSC, GUJCOMASOL NFSM, ISOPAM • Seed drill under RKVY
		Castor	GCH 4,5,7		
		Cotton	GM-4		
		Fennel	GF-1,2&3		
		Groundnut			
		Greengram			
		Blackgram	GU-2		
		Tur	GT-100, 10, Banas, GTH-1		
	Medium black saline soils	Cotton	GM-4	<ul style="list-style-type: none"> • Seed treatment with Rhizobium & PSB • Compartmental bunding, • Wider spacing 	<ul style="list-style-type: none"> • Breeder seed Source-SAU • Certified seed-Source – GSSC,NSC,
		Pearl millet	GHB 558, 557,538		

		Blackgram.	GU-2	<ul style="list-style-type: none"> •Line sowing •Chemical weed control, •Conservation furrow •Maintenance of plant stand •Water harvesting •Intercultivation 	GUJCOMASOL NFSM, ISOPAM <ul style="list-style-type: none"> • Seed drill under RKVY
		Greengram	GS-39		
		Sesame(GFS-4,5)	GT-2		

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 (Specify month) July 3rd Week	Sandy loam soils	Castor	GCH 4,5,7	<ul style="list-style-type: none"> •Seed treatment with Rhizobium & PSB •Compartmental bunding, •Wider spacing •Line sowing •Chemical weed control, •Conservation furrow •Maintenance of plant stand •Water harvesting •Interculturing •Seed hardening(18 hrs soaking in water followed by 24 hrs shade drying •Reduction in fertilizer application by 20% •Thinning to retain one seedling 	<ul style="list-style-type: none"> • Breeder seed Source-SAU • Certified seed-Source –GSSC,NSC, GUJCOMASOL NFSM ISOPAM • Seed drill under RKVY 		
		Cotton	GM-4				
		Pearlmillet	GHB 558, 557				
		Blackgram	GU-2				
		Paddy	GR-11,12 &13				
		Greengram					
	Sandy to Sandy loam Soils	Bajra	GHB 558, 577			-do-	-do-
		Cotton	GM-4				
		Fennel	GF-1,2&3				
		Groundnut					

		Tur	GT-100, 10, Banas, GTH-1		
		Castor	GCH 4,5,7		
		Blackgram	GU-2		
		Sorghum	GS-39		
	Medium black saline soils	Cotton	GM-4	-do-	-do-
		Pearl millet	GHB 558, 557,538		
		Blackgram.	GU-2		
		Greengram			
		Sesame	GT-2		
		Castor	GCH 4,5,7		
		Sorghum	GS-39		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)	Medium rainfall sandy loam soil (Kadi, Mehsana, Vijapur, Unjha)	Castor	GCH 4,5,7	<ul style="list-style-type: none"> Seed treatment by Rhizobium, Azotobacter, PSB. Seed hardening (18 hrs. soaking in water followed by 24 hrs. shade drying) Compartmental bunding 	<ul style="list-style-type: none"> Breeder seed Source-SAU Certified seed-Source – GSSC, NSC, GUJACOMASOL NFSM ISOPAM Seed drill under RKVY
Delay by 6 weeks August 1 st week		Cotton	GM-4		
		Pearl millet	GHB 558, 557		
		Greengram			

		Blackgram	GU-2	<ul style="list-style-type: none"> • Conservation furrow • Wider spacing • Line sowing • Weed control • Intercultivation • Water harvesting (farm pond) • Fertilizer reduction by 30% 	
		Paddy	GR-11,12 &13		
Low rain fall sandy to sandy loam soil (Kheralu, Visnagar, Satalasana, Vadnagar)		Bajra	GHB 558, 577	-do-	-do-
		Castor	GCH 4,5,7		
		Cotton	GM-4		
		Fennel	GF-1,2&3		
		Groundnut			
		Greengram			
		Blackgram	GU-2		
		Tur	GT-100, 10, Banas, GTH-1		
Low rain fall, medium black saline soil (Becharaji)		Cotton	GM-4	-do-	-do-
		Pearl millet	GHB 558, 557,538		
		Blackgram.	GU-2		
		Greengram	K-851		
		Sorghum	GS-39		
		Sesame	GT-2		
		Castor	GCH 4,5,7		

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 (August 3 rd week)	Medium rainfall sandy loam soils	Castor	GCH 4,5,7	<ul style="list-style-type: none"> Seed treatment by Rhizobium, Azatobactor, PSB. Seed hardening(18 hrs. soaking in water followed by 24 hrs. shade drying) Compartmental bunding Conservation furrow Wider spacing Line sowing Weed control Intercultivation Water harvesting (farm pond) Fertilizer reduction by 50% 	<ul style="list-style-type: none"> Breeder seed Source-SAU Certified seed- Source – GSSC,NSC, GUJACOMASOL NFSM ISOPAM Seed drill under RKVY
		Cotton	GM-4		
		Pearlmillet	GHB 558, 557		
		Greengram			
		Blackgram bean	GU-2		
		Paddy	GR-11,12 &13		
	Sandy to sandy loam soils	Bajra	GHB 558, 577	-do-	-do-
		Castor	GCH 4,5,7		
		Cotton	GM-4		
		Fennel	GF-1,2&3		
		Groundnut			
		Greengram			
		Blackgram	GU-2		
		Sorghum	GS-39		
	Tur	GT-100, 10, Banas, GTH-1			
	Medium black saline soils	Cotton	GM-4	-do-	-do-
		Pearl millet	GHB 558, 557,538		
		Blackgram.	GU-2		
		Greengram			
		Sesame	GT-2		

		Sorghum	GS-39		
		Castor	GCH 4,5,7		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Early season drought (Normal onset) Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc. Normal onset 3 rd week of June	Sandy loam soils	Castor Cotton Pearlmillet Greengram Blackgram Paddy	<ul style="list-style-type: none"> • Maintain the plant population by gap filling & thinning • Re-sowing • Life saving irrigation through MIS • Weed control • Interculturing • Soil mulch by shallow interculturing 	<ul style="list-style-type: none"> • Restrict the fertilizer application if moisture is insufficient • <i>In situ</i> moisture conservation by opening deep furrow • Mulching • Keep one plant per hill • Compartmental bunding • Chemical weed control • Water harvesting 	<ul style="list-style-type: none"> • Supply interculturing implements under RKVY • Supply of mulching material through Govt. agencies on subsidies rate. • Breeder seed from SAUs • Certified seeds from GSSC, NSC, GUJCOMAS OL, NSFM
	Sandy to sandy loam soils	Bajra, Castor Cotton Fennel Groundnut Greengram Blackgram Tur	-do-	-do-	-do-
	Medium black saline soils	Cotton Pearl millet Blackgram. greengram Sesame	-do-	-do-	-do-

Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At vegetative stage	Sandy loam soils	Castor Cotton Pearlmillet Greengram Blackgram Paddy	<ul style="list-style-type: none"> • Reduce the plant population by 15 to 20% by uprooting and use as mulch or fodder • Shallow interculturing • Harvest one row of pearlmillet at an interval of 3 lines and use as fodder. • Alternate furrow irrigation in castor & cotton • Life saving irrigation through micro irrigation systems • Use antitransparents (Kaolin @ 5%) • Removal of weeds 	<ul style="list-style-type: none"> • Post pone top dressing of fertilizer • Soil mulching • Conservation furrow • Removal of lower matured leaves and use as mulch 	<ul style="list-style-type: none"> • Supply of implements under RKVY • Farm pond through IWSM programme • Harvesting of crop lines under NAREGA • Supply of mulching material through Govt. agencies in subsidies rates.
	Sandy to sandy loam soils	Bajra Castor, Cotton Fennel Groundnut Greengram Blackgram Tur	-do-	-do-	-do-
	Medium black saline soils	Cotton Pearl millet Blackgram. greengram Sesame	-do-	-do-	-do-

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Mid season drought (long dry spell) At flowering/ fruiting stage	Sandy loam soils	Castor Cotton Pearlmillet Greengram Blackgram bean Paddy	<ul style="list-style-type: none"> • Reduce the plant population by 15 to 20% by uprooting and use as mulch or fodder • Harvest one row of pearlmillet at an interval of 3 lines and use as fodder. • Alternate furrow irrigation in castor & cotton • Life saving irrigation through MIS • Spraying of Antitransparents (Kaolin @ 5%) • Harvest at physiological maturity stage • Harvest pods of cowpea, clusterbean, and sale them for vegetable and domestic use • Barren plants/tillers harvesting 	<ul style="list-style-type: none"> • Postpone top dressing of fertilizer in pearlmillet, paddy and cotton 	<ul style="list-style-type: none"> • Procure the labours for the harvesting of crops harvesting of crop under NAREGA • Supply of mulching material through Govt. agencies in subsidies rates.
	Sandy to sandy loam soils	Bajra, Castor , Cotton Fennel Groundnut Greengram Blackgram Tur	-do-	-do-	<ul style="list-style-type: none"> • Procure the labours for the harvesting of crops harvesting of crop under NAREGA • Supply of mulching material through Govt. agencies in subsidies rates.
	Medium black saline soils	Cotton Pearl millet, Blackgram greengram Sesame	-do-	-do-	<ul style="list-style-type: none"> • Procure the labours for the harvesting of crops harvesting of crop under NAREGA • Supply of mulching material through Govt. agencies in subsidies rates.

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) At maturity stage	Sandy loam soils	Castor Cotton Pearlmillet Greengram Blackgram Paddy	<ul style="list-style-type: none"> • Reduce the plant population in pearlmillet by 15 to 20% by uprooting and use as mulch or fodder • Harvest one row of bajra at an interval of 3 lines and use as fodder. • Alternate furrow irrigation in castor & cotton • Life saving irrigation through MIS • Spraying of Antitransparents (Kaolin @ 5%) • Harvest at physiological maturity stage • Harvest, pods of cowpea, clusterbean, tur and sell them for vegetable and domestic use • Barren plants/tillers harvesting • Reduce the leaf canopy by 20% 	<ul style="list-style-type: none"> • Land preparation for rabi crops • Procurements of inputs 	<ul style="list-style-type: none"> • Breeder seeds from SAUs • Certified seed from GSSC,NSC,GUJACOMA SOL,NFSM
	Sandy to sandy loam soils	Cotton Pearl millet Blackgram	-do-	<ul style="list-style-type: none"> • Land preparation for rabi crops • Procurements of inputs 	<ul style="list-style-type: none"> • Breeder seeds from SAUs • Certified seed from GSSC,NSC,GUJACOMA SOL,NFSM

	Medium black saline soils	Cotton Pearl millet Blackgram.Bean, greengram Sesame Blackgram	-do-	<ul style="list-style-type: none"> Land preparation for rabi crops Procurements of inputs 	<ul style="list-style-type: none"> Breeder seeds from SAUs Certified seed from GSSC,NSC,GUJA COMASOL,NFS M
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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 release of water in canals due to low rainfall	NOT APPLICABLE				

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in Non Non release of water incanals under delayed onset of moonson in catchment	NOT APPLICABLE				

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	NOT APPLICABLE				

Condition	Major Farming situation	Normal 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			NOT APPLICABLE		

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	Not applicable				
Release of water from canals/tank in the situation of early withdrawal of monsoon or long dry spell of more than one month	Sandy loam soils	Castor Cotton Pearlmillet Greengram Blackgram Paddy	<ul style="list-style-type: none"> • Bt cotton +Green gram(GM-4) • Castor(GCH 4,5,7) • Black gram (GU-2) • Pearl millet(GHB 558, 557) • Paddy (GR-11,12 &13) 	<ul style="list-style-type: none"> •Alternate furrow irrigation •Use sprinkler/drip irrigation •Interculture after irrigation •Apply the remain dose of fertilizer after or before irrigation looking to the soil •Mulch the crop after irrigation and interculturing •Use antitranspirant Kaoline @ 5% 	
	Sandy to sandy loam soils	Bajra Castor, Cotton Fennel Groundnut Greengram Blackgram Tur	<ul style="list-style-type: none"> • Bt cotton +Green gram(GM-4) • Castor(GCH 4,5,7) • Black gram (GU-2) • Pearl millet(GHB 558, 577) • Fennel (GF-1,2&3) • Sorghum (GS-39) • Tur (GT-100, 10, Banas, GTH-1) 	-do-	
	Medium black saline soils	Cotton Pearl millet Blackgram. greengram Sesame	<ul style="list-style-type: none"> • Bt cotton +Green gram(GM-4) • Castor(GCH 4,5,7) • Black gram (GU-2) • Pearl millet(GHB 558, 557,538) • Sorghum (GS-39) • Sesame (GT-2) 	<ul style="list-style-type: none"> •Reduce the plant population by 15 to 20% by uprooting and use as mulch or fodder •Shallow interculturing •Alternate furrow irrigation •Use sprinkler/drip irrigation •Interculture after irrigation •Apply the remain dose of fertilizer after or before irrigation looking to the soil •Mulch the crop after irrigation and interculturing •Use antitranspirant Kaoline @ 5% 	

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
1	Pearlmillet	<ul style="list-style-type: none"> • Provide drainage • Give the supplement application of N @ of 25% of RDN. • Intercultivation • Weed control • Harvest the rain water for ground water recharge for irrigation 	<ul style="list-style-type: none"> • Provide drainage • Give the supplemental application of N @ of 25% of RDN. • Intercultivation • Weed control • Harvest the rain water for ground water recharge for irrigation 	<ul style="list-style-type: none"> • Drain out the excess rain water • Harvest at physiological maturity and sun dry. 	<ul style="list-style-type: none"> • Shift the product at saffer place at ventilated or dehumidified store.
2	Cotton				
3	Castor				
4	Pulses				
5	Sesame				
Horticulture					
1	Citrus	-do-			
2	Aonla	-do-			
3	Ber	-do-			
4	Sapota	-do-			
5	Mango	-do-			
Heavy rainfall with high speed winds in a short span					
1	Pearlmillet	-do-			
2	Cotton	-do-			
3	Castor	-do-			
4	Pulses	-do-			
5	Sesame	-do-			

Horticulture					
1	Citrus	<ul style="list-style-type: none"> • Give mechanical support to trees • Plough the soil for better aeration after drainage. 	<ul style="list-style-type: none"> • Give mechanical support • Plough the soil for better aeration after drainage. 	<ul style="list-style-type: none"> • Drain out the excess rain water • Harvest at physiological maturity and sun dry. 	<ul style="list-style-type: none"> • Shift the product at saffer place and market it
2	Aonla				
3	Ber				
4	Sapota				
5	Mango				

2.3 Floods

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	NOT APPLICABLE			
Sea water intrusion				

2.4 Extreme events: Heat wave

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave	NA			
Pearlmillet	<ul style="list-style-type: none"> Use Sprinkler Irrigation System during noon 	<ul style="list-style-type: none"> Use Sprinkler Irrigation System during noon 	<ul style="list-style-type: none"> Frequent light irrigation 	<ul style="list-style-type: none"> Harvest the crop
Cotton				
Horticulture				
Citrus	-----	<ul style="list-style-type: none"> Frequent light irrigation 	<ul style="list-style-type: none"> Mulching Frequent irrigation 	<ul style="list-style-type: none"> Harvest the crop
Sapota				
Mango				
Cold wave	NOT APPLICABLE			
Frost				
Hailstorm				
Cyclone				

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event ^s	During the event	After the event
Drought	<ul style="list-style-type: none"> • 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) 	<ul style="list-style-type: none"> • Assure and mobilize water supply 	<ul style="list-style-type: none"> • Impact assessment
Feed and fodder availability	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Availing Insurance • Restoration of the mass production of fodder, public grazing land • Restoration of balanced feeding practices for production animals
Drinking water	<ul style="list-style-type: none"> • 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 • 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Awareness & extension programme for judicious usage of water and water resources • Restoration of water management (Harvesting practices at higher scale

Health and disease management	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Culling sick animals • Impact assessment of the condition
Floods	NA		
Cyclone			
Feed and fodder availability			•
Drinking water		<ul style="list-style-type: none"> • Provision of clean and fresh water 	
Health and disease management	<ul style="list-style-type: none"> • Insurance • Immunization • Shifting of livestock • Veterinary preparedness (Establishment of Veterinary Rapid Response Team & stock pilling of medicines) 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Search & Rescue of dead & affected animals • P.M. & Reporting • Handling of zoonotic diseases • Availing insurance
Heat wave and cold wave			
Shelter/environment management	<ul style="list-style-type: none"> • 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) 	<ul style="list-style-type: none"> • 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 	Impact Assessment

		shelter & houses <ul style="list-style-type: none"> Minimize heat loss from the houses as well as from animal body Nutritional manipulation according to condition 	
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		Culling of affected birds

		methionine, biotin, choline chloride and vitamin C etc.		
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2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event	During the event	After the event
1) Drought			
A. Capture			
Marine	NA		
Inland	<ul style="list-style-type: none"> • Insure water storage & supply well in advance • Harvesting & marketing 	<ul style="list-style-type: none"> • Watering of the ponds • Harvesting & marketing 	<ul style="list-style-type: none"> • Restocking of the ponds • Fertilization & manuring of ponds
(i) Shallow water depth due to insufficient rains/inflow	<ul style="list-style-type: none"> • First to ensure the water supply to maintain minimum level of water for fishes in that particular period. If not possible then harvesting & marketing 	<ul style="list-style-type: none"> • To maintain water level is the only option otherwise harvesting & marketing 	<ul style="list-style-type: none"> • Regular operations for the remaining stock and also restoring of new one
(ii) Changes in water quality	<ul style="list-style-type: none"> • Oxygen depletion may lead to death of fishes • Ensure water supply or harvest the stock 	<ul style="list-style-type: none"> • Harvesting & marketing • Emptying of pond 	<ul style="list-style-type: none"> • Manuring, fertilization & rewatering • Establishment of new stock
(iii) Any other			
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	<ul style="list-style-type: none"> • Water is only the major component or necessity for such operations • Ensure water supply or otherwise stoppage of the operation / culling temporary • Water managerial practices 		
(ii) Impact of salt load build up in ponds / change in water quality	<ul style="list-style-type: none"> • Attempts to be made to minimize oxygen depletion from water and also for oxygenation of water 	<ul style="list-style-type: none"> • Oxygenation of water • Stirring of water with pumps 	<ul style="list-style-type: none"> • Re-establishment of normal managerial conditions
(iii) Any other	<ul style="list-style-type: none"> • Training and Awareness 		
2) Floods			
A. Capture			
Marine	Not applicable		
Inland	<ul style="list-style-type: none"> • Fishing should be prohibited because of breeding season 		
(i) Average compensation paid due to loss of human life			

(ii) No. of boats / nets/damaged	<ul style="list-style-type: none"> • Insurance • Arrangement of boats, nets etc in surplus 		
(iii) No. of houses damaged	<ul style="list-style-type: none"> • Co-ordination with the district administration & assurance to fisherman 	<ul style="list-style-type: none"> • Rescue & Help • Programme in collaboration with district system 	<ul style="list-style-type: none"> • Rehabilitation of fisherman for all their necessities
(iv) Loss of stock	<ul style="list-style-type: none"> • Training & Awareness 	<ul style="list-style-type: none"> • Compensation 	<ul style="list-style-type: none"> • Compensation
(v) Changes in water quality	<ul style="list-style-type: none"> • Preparation for checking the inflow of outside runoff water in to the pond runoff water into the ponds 	<ul style="list-style-type: none"> • Arrangement of checking overflow of ponds • Overflow of ponds • Net installations to capture the fishes going out due to overflow 	<ul style="list-style-type: none"> • Proper oxygenation • Maintenance of water pH
(vi) Health and diseases		<ul style="list-style-type: none"> • 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)			
3. Cyclone / Tsunami	Not applicable		
A. Capture	Not applicable		
Marine	Not applicable		