

State: GUJARAT

Agriculture Contingency Plan for District: BANASKANTHA

1.0 District Agriculture profile					
1.1	Agro-Climatic/Ecological Zone				
	Agro Ecological Sub Region (ICAR)	Western Plain, Kachchh And Part Of Kathia (2.3)			
	Agro-Climatic Zone (Planning Commission)	Gujarat Plains and Hills Region (XIII)			
	Agro Climatic Zone (NARP)	North Gujarat zone and North -West (GJ-4, GJ-5)			
	List all the districts or part thereof falling under the NARP Zone	<ul style="list-style-type: none"> Banaskantha Sabarkantha, Gandhinagar, Mehsana (Kadi, Kheralu, Mehsana, Visnagar and Vijapur), Patan (Siddhpur and Chanasma) Kutch malia (Rajkot dist.) , Halvad, Dhrangadhra and Dasada (Surendranagar dist.) Sami , Harij, Satalpur and Radhanpur (Patan dist.), kankrej, Deodar, Vav and Tharad (Banaskantha dist), (Ahmedabad dist.) 			
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude	
		23.03 ⁰ N to 24.45 ⁰ N	71.03 ⁰ E & 73.02 ⁰ E	152m MSL	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	<ul style="list-style-type: none"> S.D. Agricultural University, Head Quarter, Potato and Sorghum Research Station, Deesa, Agriculture Research Station, Aseda 			
Mention the KVK located in the district	Krushi Vigyan Kendra, Deesa				
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):	578	25	4 th week of June	2 nd week of September
	NE Monsoon(Oct-Dec):				
	Winter (Jan- Feb)			-	-
	Summer (Mar-May)			-	-
	Annual	578	25	-	-

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)	1044.4	744.0	110.6	52.9	65.1	17.5	-	30.9	23.4	-

1.4	Major Soils (common names like red sandy loam deep soils (etc.,))*		Area ('000 ha)	Per cent (%) of total
	Medium black soils		22.7	3.0
	Loamy Sand to Sandy loamy soils (Goradu)		325.7	43.7
	Sandy Soils		395.6	53.1

* mention colour, depth and texture (heavy, light, sandy, loamy, clayey etc) and give vernacular name, if any, in brackets

1.5	Agricultural land use		Area ('000 ha)	Cropping intensity %
	Net sown area		744.0	138.8
	Area sown more than once		289.4	
	Gross cropped area		1033.4	

1.6	Irrigation			Area ('000 ha)
	Net irrigated area			
	Gross irrigated area			472.1
	Rainfed area			
	Sources of Irrigation			Number
	Canals			218 Km length
	Tanks			34
	Open wells			50796
	Bore wells			14591
	Lift irrigation schemes			-
	Micro-irrigation			15254
	Other sources (please specify)			
	Total Irrigated Area			472.1
	Pump sets			69182
	No. of Tractors			14992
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)			No. of blocks/ Tehsils
	Over exploited			-
	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 , Banaskantha

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)							
			Kharif			Rabi			Summer	Grand total
			Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
1	Bajra		176.3	176.3	-	-	-	-	176.3	
2	Castor	71.7	-	71.7	-	-	-	-	71.7	
3	Pulses (Clusterbean, Mung, Mothbean)	-	56.9	56.9	-	-	-	-	56.9	
4	Groundnut	-	17.8	17.8	-	-	-	-	17.8	
5	Cotton	16.7	-	16.7	-	-	-	-	16.7	

S.No.	Horticulture crops - Fruits	Area ('000 ha)		
		Total		
1	Citrus	1.5		
2	Pomegranate	0.6		
3	Aonla	0.6		
4	Mango	0.5		
5	Sapota	0.4		
	Other s (specif y)			

	Horticulture crops - Vegetables	Total
1	Brinjal	5.0
2	Clusterbean	4.7
3	Tomato	4.2
4	Cowpea	3.7
	Medicinal and Aromatic crops	Total

	Plantation crops	Total	Irrigated	Rainfed
	Fodder crops	Total	Irrigated	Rainfed

	Total fodder crop area	176.1	106.0	70.1
	Grazing land			
	Sericulture etc			
	Others (specify)			

1.8	Livestock Source: 26 th survey Report (08-09), Dept. of A. H., Gujarat State	Male ('000)	Female (No's)	Total (No's)
	Non descriptive Cattle (local low yielding)			480.9
	Crossbred cattle			
	Non descriptive Buffaloes (local low yielding)			715.3
	Graded Buffaloes			
	Goat			330.9
	Sheep			179.7
	Others (Camel, Pig, Yak etc.)			4.5
	Commercial dairy farms (Number)			
1.9	Poultry	No. of farms	Total No. of birds (No's)	
	Commercial		183169	
	Backyard		89077	

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)
NA						

	ii) Inland (Data Source: Fisheries Department)	No. Farmer owned ponds	No. of Reservoirs	No. of village tanks
			32 (8931 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)			123
	Others			

1.11 Production and Productivity of major crops (Average of last 5 years: 2004, 05, 06, 07, 08, 09; specify years)

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Bajra	Castor	Pulses (Clusterbean, Mung, Mothbean)	Groundnut	Cotton
	Kharif-Rainfed	3 rd week of June- 1 st week of July.	-	3 rd week of June- 1 st week of July.	3 rd week of June- 1 st week of July.	-

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										
1	Bajra	97.2	533.0	-	-	-	-	97.2	533.0	194.4
2	Castor	141.3	1956.0	-	-	-	-	141.3	1956	
3	Pulses (Clusterbean, Mung, Mothbean)	30.6	526.0	-	-	-	-	30.6	1344.0	61.2
4	Groundnut	25.1	1344.0					25.1	1344.0	62.3
5	Cotton	72.5	751.0					72.5	751.0	
Major Horticultural crops										
1	Citrus			-	-	-	-	19.0	12880	
2	Pomegranate							4.0	7270	
3	Aonla							5.3	9640	
4	Mango							1.4	2800	
5	Sapota							3.9	10400	6

	Kharif-Irrigated	-	15 th July -15 th Aug.	-	-	1 st week of June- 1 st week of July
	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)	-	✓	✓
	Others (specify)	-		

1.14	Include Digital maps of the district for		Enclosed: Yes / No
		Location map of district within State as Annexure 1	Enclosed: Yes / No
		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	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implement
Early season drought					

(delayed onset)					ation
Delay by 2 weeks(1^s week of July)	Medium rainfall Medium Black Soils	Maize	GM-1, GM-3,	<ul style="list-style-type: none"> • Seed treatment with Rhizobium & PSB • Conservation furrow • Maintenance of plant stand • Water harvesting • Intercultivation 	<ul style="list-style-type: none"> • Breeder seed Source- SAU • Certified seed- Source – GSSC, N SC, GUJCOMA SOL NFSM ISOPAM • Seed drill under RKVY
		Blackgram, Tur	GU-1		
		Groundnut	GG-5,7&20		
		Maize + Tur	GM-3 Maize (GM-3) + Blackgram (GU-1) Maize (GM-4) + Tur (GT-100 & GT-101)		
		Fennel	No change		
	Loamy Sand to sandy loam soils	Castor	Castor(GCH-4,5 &7), Castor(GCH-4,5&7) + Cowpea(GC-4&5), No change		
		Pulses (Clusterbean	GG-1&2		
		Greengram	GM-4		
		Bajra	Bajra(GHB-538), Sesame(GT-1&2),		
		Groundnut	GG-5,7&20		
Fennel		No change			

	Sandy soils	Bajra	Bajra(GHB-538 & 577),		
		Castor	GCH-4,5 & 7, Castor (GCH-4,5&7) +Greengram(GM-4), Castor(GCH-4,5 & 7) + Cowpea (GC-5),		
		Clusterbean	GG-1&2,		
		Cotton	Cotton (Bt) + Greengram (GM-4), Cotton (Bt) + Cowpea (GC-5),		
		Sesame	GT-1&2,		
		Mothbean	GMO-2		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures	•	•
Early season drought (delayed onset)			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 4 weeks (July 3rd Week)	Medium Black Soils	Maize	GM-1, GM-3	<ul style="list-style-type: none"> • Seed treatment with Rhizobium & PSB • Conservation furrow • Intercultivation 	<ul style="list-style-type: none"> • Breeder seed Source-SAU • Certified seed-Source –GSSC,NSC, GUJCOMASOL NFSM ISOPAM • Seed drill under RKVY
		Blackgram, Tur	GU-1		

		Groundnut	GG-5,7&20		
		Maize + Tur	Maize (GM-3) Maize (GM-3) + Blackgram (GU-1) Maize (GM-4) + Tur (GT-100& GT-101)		
		Fennel	GF-2		
	Loamy Sand to sandy loam soils	Castor, pulses	Castor(GCH-4,5 &7), Castor(GCH-4,5&7) + Cowpea(GC-4&5),		
		(Clusterbean	GG-1&2		
		Greengram	GM-4		
		Bajra	Bajra(GHB-538 & 577), Sesame(GT-1&2),		
		Groundnut	GG-5,7&20		
		Fennel	GF-2		
		Sandy soils	Bajra	GHB-558	
	Castor , Pulses		Castor(GCH-4,5 &7), Castor (GCH-4,5 &7)+Greengram (GM-4), Castor(GCH-4,5 &7) + Cowpea (GC-5),		

		Clusterbean	GG-1&2		
		Mothbean	GMO-2		
		Cotton	Cotton (Bt) + Greengram (GM-4), Cotton (Bt)+Cowpea (GC-5),		
		Sesame	GT-1&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 6 weeks (August 1 st week)	Medium Black Soils	Maize	GM-1, GM-3 Maize (GM-3) Maize (GM-3) + Blackgram (GU-1)	<ul style="list-style-type: none"> • Seed treatment with Rhizobium & PSB • Intercultivation 	<ul style="list-style-type: none"> • Breeder seed Source-SAU • Certified seed-Source – GSSC, NSC, GUJCOMASOL NFSM, ISOPAM • Seed drill under RKVY
		Blackgram	GU-1		
		Tur,	BDN-2		
		Maize + Tur	Maize (GM-4) + Tur (GT-100 & GT-101)		
		Groundnut	GG-2		
		Fennel	local		

Loamy Sand to sandy loam soils	Castor,Pulses	GCH-4,5 &7, Castor(GCH-4,5&7) + Cowpea(GC-4&5 Sesame(GT-1&2),
	Clusterbean	GG-1&2
	Greengram	GM-4
	Fennel	GF-2
Sandy soils	Bajra	GHB-558
	Castor , Pulses	Castor(GCH-4,5 &7), Castor(GCH-4,5 &7) + Cowpea (GC-5),
	Clusterbean	GG-1&2
	Mothbean	GMO-2
	Cotton	
	Sesame	Sesame(Purva),

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 Black Soils	Maize ,Maize + Tur	Maize (GM-4) + Tur (GT-100 & GT-101)	<ul style="list-style-type: none"> •Seed treatment with Rhizobium & PSB •Intercultivation 	<ul style="list-style-type: none"> • Breeder seed Source-SAU • Certified seed-Source – GSSC,NSC, GUJCOMASOL, NFSM ISOPAM • Seed drill under RKVY
		Pulses	Blackgram, (T-9) Tur (BDN-2)		
		Groundnut	GG-2		
		Fodder Sorghum	Malvan, GJ-39		
		Castor	GCH-4, 5 &7		
		Fennel	GF-2		
	Loamy Sand to sandy loam soils	Castor, Pulses	Castor (GC H-4,5 &7), Castor (GCH-4, 5 &7) + Cowpea (GC-5)		
		Clusterbean,	GC-1&2		

		Greengram	k-851		
		Groundnut	GG-2		
		Bajra	GHB-558		
		Fennel (local)	Fennel (GF-1&2)		
	Sandy soils	Bajra(GHB-558),	GHB-558		
		Castor (GCH-4,5) Pulses	Castor(GCH-4,5 &7), Castor(GCH-4,5 &7) + Cowpea (GC-5),		
		Clusterbean –local,	GG-1&2		
		Mothbean-local)]	Mothbean (GMO-2) Castor (GCH-4,5 &7) + Mothbean (GMO-2),		
		Sesame (local) Cotton (Private Bt)	Purva		

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 rainfall Medium Black Soils	Maize Blackgram, Tur Groundnut Fennel Maize + Tur	<ul style="list-style-type: none"> • Maintain the plant population by gap filling & thinning • Re-sowing • Life saving irrigation through MIS • Weed control • Interculturing • Keep one plant per hill 	<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 • Compartmental bunding • Soil mulch by shallow interculturing 	<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,GUJCOMASO L, NSFM
	Loamy Sand to sandy loam soils	Castor Pulses Greengram Bajra Groundnut Fennel			<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,GUJCOMASO L, NSFM
	Sandy soils	Bajra Castor Pulses Mothbean Cotton Sesame			<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,GUJCOMASO L, NSFM

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	Medium Black Soils	Maize Blackgram, Tur Groundnut Fennel (local) Maize + Tur	<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 Bajra/maize at an interval of 3 lines and use as fodder. • Alternate furrow irrigation in castor & cotton • Life saving irrigation through MIS • Use antitransparents (Kaolin @ 5%) • Removal of weeds • Removal of lower matured leaves and use as mulch 	<ul style="list-style-type: none"> • Postpone top dressing of fertilizer • Soil mulching • Conservation furrow • 	<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.
	Loamy Sand to sandy loam soils	Castor Pulses Greengram Bajra Groundnut Fennel			<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.
	Low rainfall, Sandy soil (Deodar, Kankrej, Tharad, Vav, Bhabhar)	Bajra, Castor Pulses Clusterbean Mothbean Cotton Sesame			<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.

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)	Medium Black Soils	Maize Blackgram, Tur Groundnut Fennel Maize + Tur	<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 Bajra/maize 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 maize cobs, pods of cowpea, clusterbean, tur and sell them for vegetable and domestic use • Barren plants/tillers harvesting 	<ul style="list-style-type: none"> • Post pone top dressing of fertilizer 	<ul style="list-style-type: none"> • Procure the labours for the harvesting of crops • Supply of mulching material through Govt. agencies in subsidies rates.
	Loamy Sand to sandy loam	Castor Pulses Clusterbean Greengram Bajra Groundnut Fennel			

	Sandy soils	Bajra Castor Pulses Clusterbean , Mothbean Cotton Sesame			<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.
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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	Medium Black Soils	Maize , Blackgram, Tur Groundnut Fennel Maize + Tur	<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 Bajra/maize 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 maize cobs, 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 • Procuremens of inputs 	<ul style="list-style-type: none"> • Breeder seeds from SAUs • Certified seed from GSSC,NSC,GUJ ACOMASOL,NF SM

	Loamy Sand to sandy loam soils	Castor Pulses [(Clusterbean (local),Greengram Bajra Groundnut Fennel			<ul style="list-style-type: none"> • Breeder seeds from SAUs • Certified seed from GSSC,NSC,GUJ ACOMASOL,NF SM
	Sandy soils	Bajra Castor Pulses (Clusterbean) Mothbean Cotton Sesame			<ul style="list-style-type: none"> • Breeder seeds from SAUs • Certified seed from GSSC,NSC,GUJ ACOMASOL,NF SM

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	NA				

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation

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			NA		

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			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	NA				
Release of water from canals/tank in the situation of early withdrawal of monsoon or Lang dry spell of more than one month	Medium rainfall Medium Black Soil (Danta)	Maize Groundnut Blackgram Tur Maize + Tur Fennel	Maize (GM-1, GM-3) Ground nut (GG-5,7&20) Blackgram (GU-1) Maize (GM-3) Maize (GM-3) + Blackgram (GU-1) Maize (GM-4)+ Tur (GT-100 & GT-101)	<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% 	
	Medium rainfall, Loamy Sand to sandy loam (Dhanera, Palanpur, Vadgam, Amirgadh, Dantiwada and Deesa)	Castor, Pulses Clusterbean Greengram Bajra Groundnut Fennel	Castor(GCH-4,5 &7) Clusterbean (GG-1&2), Greengram (GM-4) Bajra(GHB-538), Sesame(GT-1&2), Ground nut (GG-5,7&20) Castor(GCH-4,5&7) + Cowpea(GC-4&5),		
	Low rainfall, Sandy soil (Deodar, Kankrej, Tharad,	Bajra Castor Pulses	Bajra(GHB-538 & 577), Castor(GCH-4,5 &7), Castor (GCH-4,5&7) +Greengram(GM-4), Castor(GCH-4,5 &7) + Cowpea		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
	Vav, Bhabhar)	Clusterbean, Mothbean-Cotton Sesame	(GC-5), Clusterbean (GG-1&2), Mothbean (GMO-2) Cotton (Bt) + Greengram (GM-4), Cotton (Bt) + Cowpea (GC-5), Sesame(GT-1&2),		

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				
Bajra	<ul style="list-style-type: none"> • Provide drainage • Give the supplement application of N @ of 25% of Recommended dose of Nitrogen. • Intercultivation • Weed control • Harvest the rain water for ground water recharge for irrigation 	<ul style="list-style-type: none"> • Provide drainage • Give the supplement application of N @ of 25% of Recommended dose of Nitrogen • 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 safer place at ventilated or dehumidified store.
Castor				
Pulses				
Groundnut				
Cotton				

Horticulture	Provide drainage	Provide drainage Take up need based plant protection measures	Provide drainage	Harvest the fruits
Citrus				
Pomegranate				
Anola				
Mango				
Sapota				

Heavy rainfall with high speed winds in a short span²	NA			
Bajra				
Castor				
Pulses				
Groundnut				
Cotton				
Horticulture	<ul style="list-style-type: none"> • Give mechanical support • 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. 		Collect the dropped fruits on the ground for market
Citrus				
Pomegranate				
Aonla				
Mango				
Sapota				
Outbreak of pests and diseases due to unseasonal rains				

2.3 Floods

Condition	Suggested contingency measure			
	Seedling/Nursery Stage	Vegetative stage ^k	Reproductive Stage	At Harvest
Continuous high rainfall in a short span leading to water logging				
Outbreak of pests and diseases due to unseasonal rains	NA			

2.4 Extreme events: Heat wave

Extreme event type	Suggested contingency measure ^r			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave				
Bajra	<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
Fodder crops				
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
Pomegranate				
Mango				
Cold wave	NA			
Frost				
Hailstorm				
Cyclone				

Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event	During the event	After the event
Drought	<ul style="list-style-type: none"> Veterinary preparedness 	<ul style="list-style-type: none"> Assure and mobilize water supply 	<ul style="list-style-type: none"> Impact assessment

	<ul style="list-style-type: none"> • Assessment of resources • Integration with the district system • Plan for rapid mobilization of resources specially Silage. • Dry fodder (fodder bank), complete feed blocks (CFBs) 		
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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Fodder banks at taluka places • Supply of fodder to affected animals 		
Drinking water		<ul style="list-style-type: none"> • Sterilization / sanitization of water for drinking purpose • Treatment of water to minimize water borne diseases 	
Health and disease management	<ul style="list-style-type: none"> • Veterinary preparedness with medicines • Vaccination programme for contagious diseases like HS, BQ, etc • Insurance 	<ul style="list-style-type: none"> • Organizing animal health camps • Deworming programmes • Safe & hygienic disposal of carcasses 	<ul style="list-style-type: none"> • P.M. and reporting • Impact assessment of the condition and managerial operations • Future planning
Cyclone	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> Storage of fodder at safer places (Fodder godown) 	<ul style="list-style-type: none"> Maintain supply of feed & fodder to the shifted animals 	<ul style="list-style-type: none"> Nutritional supplementation to animals (Vitamins, minerals, balanced feed)
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 Measures 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
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	Before the event	During the event	After the event	programs, if any
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

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	<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 managemental 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 managemental conditions
(iii) Any other	<ul style="list-style-type: none"> • Training and Awareness 		
2) Floods			
A. Capture			
Marine	NA		
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			
Marine	NA		