State: GUJARAT

Agriculture Contingency Plan for District: PATAN

1.0 District Agriculture profile					
1.1	**Agro-Climatic/Ecological Zone**				
	Agro Ecological Sub Region (ICAR)	Rajasthan Bagar, North Gujarat plain and South Western Punjab plain, hot typic arid eco-subregion (2.3)			
	Agro-Climatic Zone (Planning Commission)	Gujarat Plains and Hills Region (XIII)			
	Agro Climatic Zone (NARP)	North West Agroclimatic zone (GJ-5)			
	List all the districts or part thereof falling under the NARP Zone	Banaskantha, Kutch, Surendranagar and Patan			
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude	
		23^0 52' N	72^0 20' E	84 m	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Agricultural Research Station, S.D. Agricultural University, Adiya Dry Farming Research Station, S.D. Agricultural University Radhanpur			
	Mention the KVK located in the district	Krushi Vigyan Kendra, Saraswati Gram Vidhyapith, Samoda, Ta. Sidhpur			
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):	535	25	4^{th} week of June	2^{nd} week of September
	NE Monsoon(Oct-Dec):	-	-	-	-
	Winter (Jan- March)	-	-	-	-
	Summer (Apr-May)	-	-	-	-
	Annual	535	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)	566.8	383.3	46.6	45.1	28.3	14.0	-	15.5	34.0	-

(Source: District Panchayat Report, Report of Agriculture Department)

1. 4	**Major Soils (common names like red sandy loam deep soils (etc.,)***	**Area ('000 ha)**	**Per cent (%) of total**
	Medium black to black salts affected soil	252.1	44.5
	Loamy sand to sandy loam soil	163.1	28.8
	Others (specify):		

* 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	383.3	116.7
	Area sown more than once	64.2	
	Gross cropped area	447.5	

1.6	**Irrigation**	Area ('000 ha)		
	Net irrigated area	115.8		
	Gross irrigated area	138.3		
	Rainfed area	267.5		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals		5.8	4.1
	Tanks	728	0.5	0.3
	Open wells	4396	14.5	10.3
	Bore wells	11143	117.0	83.6
	Lift irrigation schemes		-	17.0
	Micro-irrigation	773	2.3	
	Other sources (please specify)			
	Total Irrigated Area		140.1	
	Pump sets	5809		
	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			
	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 , Patan

1.7 Area under major field crops & horticulture (as per latest figures) (Average of 2004-05 to 2007-08)

1.7	Major field crops cultivated	Area ('000 ha)							
		Kharif			*Rabi*				
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Summer	Grand total
	Cotton	-	80.3	80.3	-	-	-	-	80.3
	Bajra	-	79.1	79.1	-	-	-	3.9	83.0
	Mustard				47.1		47.1		47.1
	Pulses (Mung, Urd, Clusterbean, Mothbean, Cowpea)	-	34.7	34.7	-	-	-	-	34.7
	Castor	-	30.7	30.7	-	-	-	-	30.7
	Cumin				26.8		26.8		
	Wheat	-	-	-	24.9	-	24.9	-	24.9
	Horticulture crops - Fruits	**Area ('000 ha)**							
		Total							
	Citrus	0.56							
	Ber	0.31							
	Aonla	0.18							

	Chiku	0.14
	Pomegranate	0.11
	Horticulture crops - Vegetables	**Total**
	Cowpea	0.56
	Clusterbean	0.53
	Brinjal	0.19
	Cucumber	0.08
	Okra	0.07
	Medicinal and Aromatic crops	**Total**
	Dillseed	5.0
	Fennel	3.3
	Plantation crops	**Total**
	Eg., industrial pulpwood crops etc.	
	Fodder crops	**Total**
	Sorghum	125.1
	Total fodder crop area	125.1
	Grazing land	
	Sericulture etc	
	Others (specify)	

Source: Statistical information received from District Panchayat , Patan

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)			122662
	Crossbred cattle			8354
	Non descriptive Buffaloes (local low yielding)			
	Graded Buffaloes			363514
	Goat			102937
	Sheep			53750
	Others (Camel, Pig, Yak etc.)			3357(camel) + 131(pigs)=3488
	Commercial dairy farms (Number)			
1.9	**Poultry**	**No. of farms**	**Total No. of birds (No's)**	
	Commercial		10850 (layer) + 1220(broilers) + 09(ducks) =12079	
	Backyard		14122	

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)
		-	**1**		

ii) Inland (Data Source: Fisheries Department)	**No. Farmer owned ponds**	**No. of Reservoirs**	**No. of village tanks**
		25 (815 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)			**10**
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: 2004, 05, 06, 07, 08; 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)										
	Cotton	120.0	260	-	-	-	-	120.0	260	360
	Bajra	43.1	570	-	-	9.0	2275	52.1	655	108
	Mustard			62.8	1332			62.8	1332	188
	Pulses	16.7	477	-	-	-	-	16.7	477	33
	Castor	47.3	1509	-	-	-	-	47.3	1509	71
	Cumin			12.2	456			12.2	456	24
	Wheat			61.8	2489			61.8	2489	71
Major Horticultural crops (Crops to be identified based on total acreage)										
	Citrus	616.0	11000					616.0	11000	
	Ber	2790.0	9000					279.0	9000	
	Aonla	154.7	8500					154.7	8500	
	Chiku	129.2	9100			-	-	129.2	9100	
	Pomegranate	99.0	9000					99.0	9000	

Source: Statistical information received from District Panchayat , Patan

1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	Cotton	Bajra	Mustard	Pulses	Castor	Cumin	Wheat
	Kharif- Rainfed	3rd week of June-3rd week of July	3rd week of June- 1st week of July.		3rd week of June- 1st week of July.	3rd week of July -3rd week of Aug.		
	Kharif-Irrigated	3rd week of June-3rd week of July	.			3rd week of July -3rd week of Aug.		
	Rabi- Rainfed							3rd week to 4th week of Nov.
	Rabi-Irrigated			2nd week to 4th week of October			1st to 2nd week of Nov.	3rd week to 4th week of Nov.

1.13	**What is the major contingency the district is prone to?** (Tick mark)	**Regular**	**Occasional**	**None**
	Drought		✓	
	Flood			✓
	Cyclone			✓
	Hail storm			✓
	Heat wave		✓	
	Cold wave			✓
	Frost			✓
	Sea water intrusion			✓
	Pests and disease outbreak (specify)			✓

1.14	**Include Digital maps of the district for**	Location map of district within State as Annexure I	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			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system[c] including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks. i.e. July 1st week	Low rainfall, medium black to black salt affected soils (Sami, Harij, Radhanpur, Santalpur)	Cropping system: Bajra-Mustard, Bajra-Cumin, Pulse-Wheat Cotton (V-797 & Kalyan),	No change	No change	
		Bajra GHB-558,538,577,719,732	• Grow short duration early maturing varieties of Bajra viz.GHB-538, GHB-577	• 20 Per Cent higher seed rate • Seed priming with thiourea (0.05%) for four hours • Sowing by adopting compartmental bunding (3.0 X 4.5 m)	• Breeder seed source SAU • Certified seed source NSC,GSSC, GUJCOMASOL • Seed drill under RKVY (costing Rs. 30000/-)
		Green gram Guj.Mung-1,2,3 & 4, K-851	No change	No change	do
		Black gram Zandewal, T-9, TPU-4, Pusa-1, Guj.Urad-1	No change	No change	do
		Clusterbean Pusa Navbahar, S.160-1, HG-75, Guj.Guar-1 & 2	No change	No change	do
		Mothbean Baleswar-12, Guj.Moth-1, RMO-40, RMO-257,GMO-2	No change	No change	do
		Cowpea Pusa falguni, Guj.cowpea-1,2,4 & 5, V-16, Chharodi	No change	No change	do
		Castor	No change	• Ridge & furrow method of	• Ridge & furrow maker can be

		GCH-2,GCH-3,GCH-5,GCH-6 (root rot resistance), GCH-7 (wilt resistance), GAUCH-1		sowing (90 cm) Or • Compartmental bunding (3.6 X 6.0 m)	provided under RKVY or other Govt. Agency. • Breeder seed source SAU • Certified seed source NSC,GSSC, GUJCOMASOL • Seed drill under RKVY (costing Rs. 30000/-)
		Sesame Patan-64, Guj.Til-1 & 2, Mrug-1, Guj Til-10 (Black seed)	No change	No change	• Breeder seed source SAU • Certified seed source NSC,GSSC, GUJCOMASOL • Seed drill under RKVY (costing Rs. 30000/-)
		Fodder crop Jowar: GFS-4,5 S-1049 (sundhiya jowar)	Jowar**:** S-1049, SSG-59-3 (Multicut) Bajra: GF Bajra-1 (Multicut)	As such	• Seed source NSC, GUJCOMASOL, GSSC.
		Maize local:	African tall	As Such	do
	Low rainfall, loamy sand to sandy loam soils (Patan, Siddhpur, Chanasma)	Cropping System: Bajra-Mustard, Bajra-Cumin, Pulse-Wheat Castor GCH-2,GCH-3,GCH-5,GCH-6 (root rot resistance), GCH-7 (wilt resistance), GAUCH-1	No change	• Ridge & furrow method of sowing (90 cm) Or • Compartmental bunding (3.6 X 6.0 m)	• Ridge & furrow maker can be provided under RKVY or other Govt. Agency. • Breeder seed source SAU • Certified seed source NSC,GSSC, GUJCOMASOL • Seed drill under RKVY (costing Rs. 30000/-)
		Bajra GHB-558,538,577,719,732	• Grow short duration early maturing varieties of Bajra viz.GHB-538, GHB-577	• 20 Per Cent higher seed rate • Seed priming with thiourea (0.05%) for four hours • Sowing by adopting compartmental bunding (3.0 X 4.5 m)	• Breeder seed source SAU • Certified seed source NSC,GSSC, GUJCOMASOL • Seed drill under RKVY (costing Rs. 30000/-)
		Green gram	No change	No change	do

		Guj.Mung-1,2,3 & 4, K-851			
		Black gram Zandewal, T-9, TPU-4, Pusa-1, Guj.Urad-1	No change	No change	do
		Clusterbean Pusa Navbahar, S.160-1, HG-75, Guj.Guar-1 & 2	No change	No change	do
		Mothbean Baleswar-12, Guj.Moth-1, RMO-40, RMO-257,GMO-2	No change	No change	do
		Cotton Kalyan & private hybrid, Bt. Cotton	No change	No change	
		Fodder crop Jowar: GFS-4,5 S-1049 (sundhiya jowar)	Jowar**:** S-1049, SSG-59-3 (Multicut) Bajra: GF Bajra-1 (Multicut)	As such	Seed source NSC, GUJCOMASOL, GSSC.
		Maize local:	African tall	As Such	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[d]**	**Remarks on Implementation**
Delay by 4 weeks (Specify month) **July 4th Week**	Low rainfall, medium black to black salt affected soils (Sami, Harij, Radhanpur, Santalpur)	Cropping system: Bajra-Mustard, Bajra-Cumin, Pulse-Wheat Cotton (V-797 & Kalyan),	• Early maturing Bt-Cotton + Green gram or Black gram (1:1 Row ratio)	• Conservation furrow at every third row	• Furrow maker can be provided under RKVY or other Govt. Agency.
		Bajra GHB-558,538,577,719,732	• Short duration early maturing Var. GHB-538 and 577 • Karingdo as a mixed crop	• Sowing at 60 cm-seed priming with thiurea (0.05%) for four hours • Sowing by adopting	• Breeder seed source SAU • Certified seed source NSC,GSSC,GUJCOMASOL • Seed drill under RKVY (costing Rs.

			along with pearl millet third row • Reduce 25% acreage of pear millet by Guar and Mothbean	compartmental bunding (3.0 X 4.5 m)	30000/-)
		Green gram Guj.Mung-1,2,3 & 4, K-851	Gujarat Mung-4	• Sowing at 60 cm spacing • Fertilizer reduction by 30 Per Cent	do
		Black gram Zandewal, T-9, TPU-4, Pusa-1, Guj.Urad-1	Gujarat Urad-1	do	do
		Clusterbean Pusa Navbahar, S.160-1, HG-75, Guj.Guar-1 & 2	HG-75,Guj Guar-1 and 2	• Sowing at 60 cm spacing • Seed hardening (3 to 4 hours soaking in water followed by shade drying) • Fertilizer reduction by 30 Per Cent	do
		Mothbean Baleswar-12, Guj.Moth-1, RMO-40, RMO-257,GMO-2	Gujarat Mothbean-1, GMO-2	• Sowing at 60 cm spacing • Fertilizer reduction by 30 Per Cent	• Breeder seed source SAU • Certified seed source NSC,GSSC,GUJCOMASOL • Seed drill under RKVY (costing Rs. 30000/-)
		Cowpea Pusa falguni, Guj.cowpea-1,2,4 & 5, V-16, Chharodi	Guj.Cowpea-1, Guj.Cowpea-2, Guj.Cowpea-4, Guj.Cowpea-5, Only as a vegetable purpose, green pod marketing	• Sowing at 60 cm spacing • Reduce the fertilizer application by 30 Per Cent	do
		Castor GCH-2,GCH-3,GCH-5,GCH-6 (root rot resistance), GCH-7 (wilt	No Change	• Ridge & furrow method of sowing (90 cm) Or	• Breeder seed source SAU • Certified seed source NSC,GSSC,GUJCOMASOL • Seed drill under RKVY (costing Rs.

		resistance), GAUCH-1		• Compartmental bunding (3.6 X 6.0 m)	30000/-) • Ridge & furrow maker can be provided under RKVY or other Govt. Agency.
		Sesame Patan-64, Guj.Til-1 & 2, Mrug-1, Guj Til-10 (Black seed)	Early maturing var. of sesamum Guj.Til -1 & 2	• 60 cm Row to Row spacing • Thin the plant at 20 cm spacing • Fertilizer reduction by 30 Per Cent	• Breeder seed source SAU • Certified seed source NSC,GSSC,GUJCOMASOL • Seed drill under RKVY (costing Rs. 30000/-)
		Fodder crop Jowar: GFS-4,5 S-1049 (sundhiya 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
	Low rainfall, loamy sand to sandy loam soils (Patan, Siddhpur, Chanasma)	Cropping System: Bajra-Mustard, Bajra-Cumin, Pulse-Wheat Castor GCH-2,GCH-3,GCH-5,GCH-6 (root rot resistance), GCH-7 (wilt resistance), GAUCH-1	No Change	• Ridge & furrow method of sowing (90 cm) Or • Compartmental bunding (3.6 X 6.0 m)	• 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.
		Bajra GHB-558,538,577,719,732	• Short duration early maturing Var. GHB-538 and 577 • Karingdo as a mixed crop along with pearl millet third row • Reduce 25% acreage of pear millet by Guar and	• Sowing at 60 cm-seed priming with thiurea (0.05%) for four hours • Sowing by adopting compartmental bunding (3.0 X 4.5 m)	• Breeder seed source SAU • Certified seed source NSC,GSSC,GUJCOMASOL • Seed drill under RKVY (costing Rs. 30000/-)

			Mothbean		
		Green gram Guj.Mung-1,2,3 & 4, K-851	Gujarat Mung-4	• Sowing at 60 cm spacing • Fertilizer reduction by 30 Per Cent	do
		Black gram Zandewal, T-9, TPU-4, Pusa-1, Guj.Urad-1	Gujarat Urad-1	• Sowing at 60 cm spacing • Fertilizer reduction by 30 Per Cent	do
		Clusterbean Pusa Navbahar, S.160-1, HG-75, Guj.Guar-1 & 2	HG-75,Guj Guar-1 and 2	• Sowing at 60 cm spacing • Seed hardening (3 to 4 hours soaking in water followed by shade drying) • Fertilizer reduction by 30 Per Cent	do
		Mothbean Baleswar-12, Guj.Moth-1, RMO-40, RMO-257,GMO-2	Gujarat Mothbean-1, GMO-2	• Sowing at 60 cm spacing • Fertilizer reduction by 30 Per Cent	do
		Cotton Kalyan & private hybrid, Bt. Cotton	• Early maturing Bt-Cotton + Green gram or Black gram (1:1 Row ratio)	• Conservation furrow at every third row	• Furrow maker can be provided under RKVY or other Govt. Agency.
		Fodder crop Jowar: GFS-4,5 S-1049 (sundhiya 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[d]**	**Remarks on Implementation**
Delay by 6 weeks August 2nd week	Low rainfall, medium black to black salt affected soils (Sami, Harij, Radhanpur, Santalpur)	Cropping system: Bajra-Mustard, Bajra-Cumin, Pulse-Wheat Cotton (V-797 & Kalyan),	• Castor (GCH-4,5 or 7) • Castor (GCH-4,5 or 7) + Clusterbean (Guj Guar 1 or 2) • One row of Cowpea or Clusterbean between regular two row of castor without giving any fertilizer	• Seed hardening (soaking the seed 8 hours in water followed by shadow drying) • Sow the castor crop at 120 cm spacing • Compartmental bunding (3.6 X 6.0 m)	• 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.
		Bajra GHB-558,538,577,719,732	• Clusterbean HG-75, Gujarat Guar 1 or 2	• 25% higher seed rate with 60 cm spacing • Reduce the fertilizer by 40 Per Cent • Seed hardening (soaking the seed 3 to 4 hours in water followed by shadow drying)	do
			• Fodder sorghum GJ-39 and Malvan	• Wider spacing at 60 cm with 25 Per Cent higher seed rate • Reduce the fertilizer application by 40 Per Cent • 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 subsidies rate by Govt. Agency.
		Green gram Guj.Mung-1,2,3 & 4, K-851	Fodder sorghum-GJ-39, Malvan	do	• Breeder seed source SAU • Certified seed source NSC,GSSC,GUJCOMASOL • Seed drill under RKVY (costing Rs.

					30000/-)
		Black gram Zandewal, T-9, TPU-4, Pusa-1, Guj.Urad-1	Fodder sorghum-GJ-39, Malvan	• Wider spacing at 60 cm with 25 Per Cent higher seed rate • Reduce the fertilizer application by 40 Per Cent • In fodder Sorghum, apply 20 kg S/ha through Gypsum	do
		Clusterbean Pusa Navbahar, S.160-1, HG-75, Guj.Guar-1 & 2	HG-75, Gujarat Guar-1&2	• 20 Per Cent higher seed rate with 60 cm spacing • Seed hardening (soaking the seed 3 to 4 hours in water followed by shadow drying)	do
		Mothbean Baleswar-12, Guj.Moth-1, RMO-40, RMO-257,GMO-2	Gujarat Mothbean-1 and GMO-2	• Sowing at 60 cm spacing • Fertilizer reduction by 30 Per Cent	do
		Cowpea Pusa falguni, Guj.cowpea-1,2,4 & 5, V-16, Chharodi	Only fodder cowpea GFC-1, GFC-2, GFC-3, GFC-4,EC-4216	• Sowing distance 45 cm with 40 kg seed/ha • Reduce the fertilizer application by 40 Per Cent	do
		Castor GCH-2,GCH-3,GCH-5,GCH-6 (root rot resistance), GCH-7 (wilt resistance), GAUCH-1	Castor (GCH-4,5 or 7) + Mothbean (GMO-2) (1:2 row ratio) (two line of Mothbean in regular spacing of Castor)	• Seed hardening (soaking the seed 4 to 6 hours in water followed by shadow drying) • Compartmental bunding (3.6 X 5.0 m) • Reduction in fertilizer application by 50 Per Cent • Sowing distance 120 cm for castor • No fertilizer application for inter crop	• Breeder seed source SAU • Certified seed source NSC,GSSC,GUJCOMASOL • Seed drill under RKVY (costing Rs. 30000/-) • Bund maker provide under RKVY

		Sesame Patan-64, Guj.Til-1 & 2, Mrug-1, Guj Til-10 (Black seed)	Fodder sorghum-GJ-39, Malvan	• Wider spacing at 60 cm with 25 Per Cent higher seed rate • Reduce the fertilizer pplication by 40 Per Cent • 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/-) • Gypsum provided under subsidies rate by Govt. Agency.
		Fodder crop Jowar: GFS-4,5 S-1049 (sundhiya 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	• Compartmental Bunding (3.6 m x 6.0 m) • S applicaton @ 20 kg/ha in form of Gypsum	• Bund maker can be provided under RKVY
	Low rainfall, loamy sand to sandy loam soils (Patan, Siddhpur, Chanasma)	Cropping System: Bajra-Mustard, Bajra-Cumin, Pulse-Wheat			
		Castor GCH-2,GCH-3,GCH-5,GCH-6 (root rot resistance), GCH-7 (wilt resistance), GAUCH-1	Castor (GCH-4,5 or 7) + Mothbean (GMO-2) (1:2 row ratio) (two line of Mothbean in regular spacing of Castor)	• Seed hardening (soaking the seed 4 to 6 hours in water followed by shadow drying) • Compartmental bunding (3.6 X 5.0 m) • Reduction in fertilizer application by 50 Per Cent • Sowing distance 120 cm for castor • No fertilizer application for inter crop	• Breeder seed source SAU • Certified seed source NSC,GSSC,GUJCOMASOL • Seed drill under RKVY (costing Rs. 30000/-) • Bund maker provide under RKVY
		Bajra GHB-558,538,577,719,732	• Clusterbean HG-75, Gujarat Guar 1 or 2	• 25% higher seed rate with 60 cm spacing • Reduce the fertilizer by 40 Per Cent	• Breeder seed source SAU • Certified seed source NSC,GSSC,GUJCOMASOL • Seed drill under RKVY (costing Rs.

				• Seed hardening (soaking the seed 3 to 4 hours in water followed by shadow drying)	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 Per Cent higher seed rate • Reduce the fertilizer application by 40 Per Cent • 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 subsidies rate by Govt. Agency.
		Green gram Guj.Mung-1,2,3 & 4, K-851	Fodder sorghum-GJ-39, Malvan	• Wider spacing at 60 cm with 25 Per Cent higher seed rate • Reduce the fertilizer application by 40 Per Cent • 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/-)
		Black gram Zandewal, T-9, TPU-4, Pusa-1, Guj.Urad-1	Fodder sorghum-GJ-39, Malvan	do	do
		Clusterbean Pusa Navbahar, S.160-1, HG-75, Guj.Guar-1 & 2	HG-75, Gujarat Guar-1 & 2	• 20 Per Cent higher seed rate with 60 cm spacing • Seed hardening (soaking the seed 3 to 4 hours in water followed by shadow drying)	do
		Mothbean Baleswar-12, Guj.Moth-1, RMO-40, RMO-257,GMO-2	Gujarat Mothbean-1 and GMO-2	• Sowing at 60 cm spacing • Fertilizer reduction by 30 Per Cent	• Breeder seed source SAU • Certified seed source NSC,GSSC,GUJCOMASOL • -Seed drill under RKVY (costing Rs. 30000/-)

		Cotton Kalyan & private hybrid, Bt. Cotton	• Castor (GCH-4,5 or 7) • Castor (GCH-4,5 or 7) + Clusterbean (Guj Guar 1 or 2) • One row of Cowpea or Clusterbean between regular two row of castor without giving any fertilizer	• Seed hardening (soaking the seed 8 hours in water followed by shadow drying) • Sow the castor crop at 120 cm spacing • Compartmental bunding (3.6 X 6.0 m)	• 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 crop Jowar: GFS-4,5 S-1049 (sundhiya 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	• Compartmental Bunding (3.6 m x 6.0 m) • S applicaton @ 20 kg/ha in form of Gypsum	• 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[c] including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8 weeks **August 4th week**	Low rainfall, medium black to black salt affected soils (Sami, Harij, Radhanpur, Santalpur)	Cropping system: Bajra-Mustard, Bajra-Cumin, Pulse-Wheat Cotton (V-797 & Kalyan),	Clusterbean Hg-75, Gujarat Guar 1 or 2 Fodder Jowar GJ-39, Malvan	• 25% higher seed rate with 60 cm spacing • Reduce the fertilizer by 40 Per Cent • Seed hardening (soaking the seed 3 to 4 hours in water followed by shadow 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

				• In fodder Sorghum, apply 20 kg S/ha through Gypsum	Govt. Agency. • Gypsum provided under subsidies rate by Govt. Agency.
		Bajra GHB-558,538,577,719,732	Fodder Jowar GJ-39, Malvan	• Wider spacing at 60 cm with 25 Per Cent higher seed rate • Reduce the fertilizer application by 40 Per Cent • In fodder Sorghum, apply 20 kg S/ha through Gypsum	do
		Green gram Guj.Mung-1,2,3 & 4, K-851	Fodder Jowar GJ-39, Malvan	• Wider spacing at 60 cm with 25 Per Cent higher seed rate • Reduce the fertilizer application by 40 Per Cent • 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/-) • Gypsum provided under subsidies rate by Govt. Agency.
		Black gram Zandewal, T-9, TPU-4, Pusa-1, Guj.Urad-1	Fodder Jowar GJ-39, Malvan	• Wider spacing at 60 cm with 25 Per Cent higher seed rate • Reduce the fertilizer application by 40 Per Cent • 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/-) • Gypsum provided under subsidies rate by Govt. Agency.
		Clusterbean Pusa Navbahar, S.160-1, HG-75, Guj.Guar-1 & 2	Clusterbean HG-75, Gujarat Guar 1 or 2 Fodder Jowar GJ-39, Malvan	• 25% higher seed rate with 60 cm spacing • Reduce the fertilizer by 40 Per Cent • Conservation furrow at every third row • Seed hardening (soaking the seed 3 to 4 hours in water followed by shadow drying) • 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 subsidies rate by Govt. Agency.
		Mothbean Baleswar-12, Guj.Moth-1, RMO-40,	Fodder Jowar GJ-39, Malvan	• Wider spacing at 60 cm with 25 Per Cent higher seed rate • Reduce the fertilizer	• Breeder seed source SAU • Certified seed source NSC,GSSC,GUJCOMASOL

		RMO-257,GMO-2		application by 40 Per Cent • In fodder Sorghum, apply 20 kg S/ha through Gypsum	• Seed drill under RKVY (costing Rs. 30000/-) • Gypsum provided under subsidies rate by Govt. Agency.
		Cowpea Pusa falguni, Guj.cowpea-1,2,4 & 5, V-16, Chharodi	Only fodder cowpea GFC-1, GFC-2, GFC-3, GFC-4,EC-4216	• Sowing distance 45 cm with 40 kg seed/ha • Reduce the fertilizer application by 40 Per Cent	• Breeder seed source SAU • Certified seed source NSC,GSSC,GUJCOMASOL • Seed drill under RKVY (costing Rs. 30000/-)
			Cowpea as green vegetable Guj Cowpea-1,2 & 4,5	• Sowing at 60 cm spacing • Reduce the fertilizer application by 50 Per Cent • Conservation furrow at every third row	• Breeder seed source SAU • Certified seed source NSC,GSSC,GUJCOMASOL • Seed drill under RKVY (costing Rs. 30000/-) • Furrow opener can be provided under RKVY
		Castor GCH-2,GCH-3,GCH-5,GCH-6 (root rot resistance), GCH-7 (wilt resistance), GAUCH-1	• Castor (GCH-4,5 or 7) + Cowpea (GC-4 (one line of Cowpea in regular spacing of castor) Or • Castor (GCH-4,5 or 7) + Purva Til (purva-1) (1:1 Row ratio)	• Seed hardening (soaking the seed 4 to 6 hours in water followed by shadow drying) • Reduction in fertilizer application by 50 Per Cent • Sowing distance 120 cm for castor • No fertilizer application for inter crop	• Breeder seed source SAU • Certified seed source NSC,GSSC,GUJCOMASOL • Bund maker provide under RKVY • Seed drill can be provided under RKVY or any other Govt. Agency on subsidies rate
		Sesame Patan-64, Guj.Til-1 & 2, Mrug-1, Guj Til-10 (Black seed)	Purva (semi rabi var.) Purva-1	• As such	• Breeder seed source SAU • Certified seed source NSC,GSSC,GUJCOMASOL
		Fodder crop Jowar: GFS-4,5, S-1049 (sundhiya jowar)	Jowar:S-1049, SSG-59-3 (Multicut) Bajra:GF Bajra-1 (Multicut) Reduce the 25 % seed rate	• 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 • Bund maker can be provided under RKVY
		Maize local:	Jowar:S-1049, SSG-59-3 (Multicut)	• Compartmental Bunding(3.6 m x 6.0 m)	• Bund maker can be provided under RKVY

			Bajra: GF Bajra-1 (Multicut) Reduce the 25 % seed rate	• S applicaton @ 20 kg/ha in form of Gypsum	• Gypsum may supplied by GSFC under subsidies rate
	Low rainfall, loamy sand to sandy loam soils (Patan, Siddhpur, Chanasma)	Cropping System: Bajra-Mustard, Bajra-Cumin, Pulse-Wheat			
		Castor GCH-2,GCH-3,GCH-5,GCH-6 (root rot resistance), GCH-7 (wilt resistance), GAUCH-1	• Castor (GCH-4,5 or 7) + Cowpea (GC-4 (one line of Cowpea in regular spacing of castor) Or • Castor (GCH-4,5 or 7) + Purva Til (purva-1) (1:1 Row ratio)	• Seed hardening (soaking the seed 4 to 6 hours in water followed by shadow drying) • Reduction in fertilizer application by 50 Per Cent • Sowing distance 120 cm for castor • No fertilizer application for inter crop	• Breeder seed source SAU • Certified seed source NSC,GSSC,GUJCOMASOL • Bund maker provide under RKVY • Seed drill can be provided under RKVY or any other Govt. Agency on subsidies rate
		Bajra GHB-558,538,577,719,732	Fodder Jowar GJ-39, Malvan	• Wider spacing at 60 cm with 25 Per Cent higher seed rate • Reduce the fertilizer application by 40 Per Cent • 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 subsidies rate by Govt. Agency.
		Green gram Guj.Mung-1,2,3 & 4, K-851	Fodder Jowar GJ-39, Malvan	do	• Breeder seed source SAU • Certified seed source NSC,GSSC,GUJCOMASOL • Seed drill under RKVY (costing Rs. 30000/-) • Gypsum provided under subsidies rate by Govt. Agency.
		Black gram Zandewal, T-9, TPU-4, Pusa-1, Guj.Urad-1	Fodder Jowar GJ-39, Malvan	do	do
		Clusterbean	Clusterbean HG-75,	• 25% higher seed rate with 60	• Breeder seed source SAU

		Pusa Navbahar, S.160-1, HG-75, Guj.Guar-1 & 2	Gujarat Guar 1 or 2 Fodder Jowar GJ-39, Malvan	cm spacing • Reduce the fertilizer by 40 Per Cent • Conservation furrow at every third row • Seed hardening (soaking the seed 3 to 4 hours in water followed by shadow drying) • In fodder Sorghum, apply 20 kg S/ha through Gypsum	• 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 subsidies rate by Govt. Agency.
		Mothbean Baleswar-12, Guj.Moth-1, RMO-40, RMO-257,GMO-2	Fodder Jowar GJ-39, Malvan	• Wider spacing at 60 cm with 25 Per Cent higher seed rate • Reduce the fertilizer application by 40 Per Cent • 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/-) • Gypsum provided under subsidies rate by Govt. Agency.
		Cotton Kalyan & private hybrid, Bt. Cotton	Clusterbean Hg-75, Gujarat Guar 1 or 2 Fodder Jowar GJ-39, Malvan	• 25% higher seed rate with 60 cm spacing • Reduce the fertilizer by 40 Per Cent • Seed hardening (soaking the seed 3 to 4 hours in water followed by shadow drying) • 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 subsidies rate by Govt. Agency.
		Fodder crop Jowar: GFS-4,5, S-1049 (sundhiya jowar)	Jowar:S-1049, SSG-59-3 (Multicut) Bajra:GF Bajra-1 (Multicut) Reduce the 25 % seed rate	• 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 • Bund maker can be provided under RKVY
		Maize local:	do	do	• Bund maker can be provided under RKVY • Gypsum may supplied by GSFC

					under subsidies rate

Condition			**Suggested Contingency measures**		
Early season drought **(Normal onset)**	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measues**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Low rainfall, medium black to black salt affected soils (Sami, Harij, Radhanpur, Santalpur)	Cropping system: Bajra-Mustard, Bajra-Cumin, Pulse-Wheat Cotton (V-797 & Kalyan),	• Gap filling and thinning to retain one plant / hill	• Conservation of soil moisture by hoeing and weeding. Use weeds as mulch	• Implements for hoeing & weeding be procured under RKVY or Govt. subsidies rate
		<u>Bajra</u> GHB-558,538,577,719,732	• Thinning to maintain 10 to 15 cm plant to plant distance	• do	• do
		<u>Green gram</u> Guj.Mung-1,2,3 & 4, K-851	----	do	do
		<u>Black gram</u> Zandewal, T-9, TPU-4, Pusa-1, Guj.Urad-1	----	do	do
		<u>Clusterbean</u> Pusa Navbahar, S.160-1, HG-75, Guj.Guar-1 & 2	----	do	do
		<u>Mothbean</u> Baleswar-12, Guj.Moth-1, RMO-40, RMO-257,GMO-2	----	do	do
		<u>Cowpea</u> Pusa falguni, Guj.cowpea-1,2,4 & 5, V-16, Chharodi	----	do	do
		<u>Castor</u> GCH-2,GCH-3,GCH-5,GCH-6 (root rot resistance), GCH-7 (wilt resistance), GAUCH-1	Gap filling and Thinning to retain one plant/hill	do	do

		Sesame Patan-64, Guj.Til-1 & 2, Mrug-1, Guj Til-10 (Black seed)	Thinning to maintain 15 to 20 cm plant to plant distance	Conservation of soil moisture by hoeing and weeding. Use weeds as mulch	Implements for hoeing & weeding be procured under RKVY or Govt. subsidies rate
		Fodder crop Jowar: GFS-4,5 S-1049 (sundhiya jowar)	As such	As such	--------
		Maize local:	As such	As such	-----
	Low rainfall, loamy sand to sandy loam soils (Patan, Siddhpur, Chanasma)	Cropping System: Bajra-Mustard, Bajra-Cumin, Pulse-Wheat			
		Castor GCH-2,GCH-3,GCH-5,GCH-6 (root rot resistance), GCH-7 (wilt resistance), GAUCH-1	Gap filling and Thinning to retain one plant/hill	Conservation of soil moisture by hoeing and weeding. Use weeds as mulch	Implements for hoeing & weeding be procured under RKVY or Govt. subsidies rate
		Bajra GHB-558,538,577,719,732	Thinning to maintain 10 to 15 cm plant to plant distance	do	do
		Green gram Guj.Mung-1,2,3 & 4, K-851	----	do	do
		Black gram Zandewal, T-9, TPU-4, Pusa-1, Guj.Urad-1	----	do	do
		Clusterbean Pusa Navbahar, S.160-1, HG-75, Guj.Guar-1 & 2	----	do	do
		Mothbean Baleswar-12, Guj.Moth-1, RMO-40, RMO-257,GMO-2	----	do	do
		Cotton Kalyan & private hybrid, Bt. Cotton	Gap filling and thinning to retain one plant / hill	do	do

		Fodder crop Jowar: GFS-4,5 S-1049 (sundhiya jowar)	As such	As such	--------
		Maize local:	As such	As such	-----

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 measues**	**Remarks on Implementation**
At vegetative stage	Low rainfall, medium black to black salt affected soils (Sami, Harij, Radhanpur, Santalpur)	Cropping system: Bajra-Mustard, Bajra-Cumin, Pulse-Wheat Cotton (V-797 & Kalyan),	• Reduce the plant population by 15 to 20 Per Cent and use as mulching material • Alternate furrow irrigation or irrigation through MIS if possible	• Conservation of soil moisture by hoeing and weeds use as mulch • Mulching of farm byproduct @ 10t/ha (castor shell or Bajra husk) • Postponed the top dressing of N fertilizers • Mulch9ing (Plastic film 25 micron & 200 kg/ha)	• Implements for hoeing & weeding be procured under RKVY or Govt. subsides rate • Mulching material under RKVY or Govt. subsides rate • Water harvested structure can be constructed under NAREGA
		Bajra GHB-558,538,577,719,732	• Thinning of 20 to 25 % plants within row • Life saving irrigation if possible	• Conservation of soil moisture by hoeing and weeding • Postponed the top dressing of N fertilizers • Spraying of 5 % kaoline solution	do
		Green gram Guj.Mung-1,2,3 & 4, K-851	• Removal of 20% plant from the row	Interculturing	Implements for hoeing & weeding be procured under RKVY or Govt. subsidies rate

			• Weeding • Protection against sucking pest (Spraying of Methyle o demeton or Diamethioate 10 ml/10 lit of water) • If possible life saving irrigation through MIS		
		Black gram Zandewal, T-9, TPU-4, Pusa-1, Guj.Urad-1	• Removal of 20% plant from the row • Weeding • Protection against sucking pest (Spraying of Methyle o demeton or Diamethioate 10 ml/10 lit of water) • If possible life saving irrigation through MIS	Interculturing	Implements for hoeing & weeding be procured under RKVY or Govt. subsidies rate
		Clusterbean Pusa Navbahar, S.160-1, HG-75, Guj.Guar-1 & 2	• Removal of 20% plant from the row • Weeding • Protection against sucking pest (Spraying of Methyle o demeton or Diamethioate 10 ml/10 lit of water) • If possible life saving irrigation through MIS	do	do
		Mothbean Baleswar-12, Guj.Moth-1, RMO-40, RMO-257,GMO-2	• Removal of 20% plant from the row • Weeding • Protection against sucking pest (Spraying of Methyle o demeton or Diamethioate 10 ml/10 lit of water) • If possible life saving irrigation through MIS	do	do

		Cowpea Pusa falguni, Guj.cowpea-1,2,4 & 5, V-16, Chharodi	• Removal of 20% plant from the row • Weeding • Protection against sucking pest (Spraying of Methyle o demeton or Diamethioate 10 ml/10 lit of water) • If possible life saving irrigation through MIS	do	do
		Castor GCH-2,GCH-3,GCH-5,GCH-6 (root rot resistance), GCH-7 (wilt resistance), GAUCH-1	• Reduce the plant population by 10 to 15 Per Cent and use as mulch • Alternate furrow irrigation • If possible life saving irrigation through MIS	• Conservation of soil moisture by hoeing and weeds use as mulch • Mulching of farm byproduct @ 10t/ha (castor shell or Bajra) • Postponed the top dressing of N fertilizers • Mulching (Plastic film 25 micron @ 200 kg/ha)+ Spraying of 5% kaolin solution	• Implements for hoeing & weeding be procured under RKVY or Govt. subsidies rate • Mulching material under RKVY or Govt. subsidies rate • Water harvested structure can be constructed under NAREGA • MIS can be provided under subsidies rate through GGRC
		Sesame Patan-64, Guj.Til-1 & 2, Mrug-1, Guj Til-10 (Black seed)	• Removal of 20% plant from the row • Weeding • Protection against sucking pest (Spraying of Methyle o demeton or Diamethioate 10 ml/10 lit of water) • If possible life saving irrigation through MIS	Interculturing	• Implements for hoeing & weeding be procured under RKVY or Govt. subsides rate • MIS can be provided under subsidies rate through GGRC
		Fodder crop Jowar: GFS-4,5 S-1049 (sundhiya jowar)	• Interculturing • Soil mulch by selo interculturing • Life saving irrigation if	• Restrict the fertilizer application if moisture is insufficient • Reduce 25% plant	---

			possible.	population	
		Maize local:	do	do	---
	Low rainfall, loamy sand to sandy loam soils (Patan, Siddhpur, Chanasma)	Cropping System: Bajra-Mustard, Bajra-Cumin, Pulse-Wheat			
		Castor GCH-2,GCH-3,GCH-5,GCH-6 (root rot resistance), GCH-7 (wilt resistance), GAUCH-1	• Removal of 20% plant from the row • Weeding • Protection against sucking pest (Spraying of Methyle o demeton or Diamethioate 10 ml/10 lit of water) • If possible life saving irrigation through MIS	• Interculturing	• Implements for hoeing & weeding be procured under RKVY or Govt. subsides rate • MIS can be provided under subsidies rate through GGRC
		Bajra GHB-558,538,577,719,732	• Thinning of 20 to 25 % plants within row • Life saving irrigation if possible	• Conservation of soil moisture by hoeing and weeding • Postponed the top dressing of N fertilizers • 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 harvested structure can be constructed under NAREGA
		Green gram Guj.Mung-1,2,3 & 4, K-851	• Removal of 20% plant from the row • Weeding • Protection against sucking pest (Spraying of Methyle o demeton or Diamethioate 10 ml/10 lit of water) • If possible life saving irrigation through MIS	Interculturing	• Implements for hoeing & weeding be procured under RKVY or Govt. subsidies rate

		Black gram Zandewal, T-9, TPU-4, Pusa-1, Guj.Urad-1	do	do	do
		Clusterbean Pusa Navbahar, S.160-1, HG-75, Guj.Guar-1 & 2	do	do	do
		Mothbean Baleswar-12, Guj.Moth-1, RMO-40, RMO-257,GMO-2	• Removal of 20% plant from the row • Weeding • Protection against sucking pest (Spraying of Methyle o demeton or Diamethioate 10 ml/10 lit of water) • If possible life saving irrigation through MIS	Interculturing	• Implements for hoeing & weeding be procured under RKVY or Govt. subsidies rate
		Cotton Kalyan & private hybrid, Bt. Cotton	• Reduce the plant population by 15 to 20 Per Cent and use as mulching material • Alternate furrow irrigation or irrigation through MIS if possible	• Conservation of soil moisture by hoeing and weeds use as mulch • Mulching of farm byproduct @ 10t/ha (castor shell or Bajra husk) • Postponed the top dressing of N fertilizers • Mulch9ing (Plastic film 25 micron & 200 kg/ha)	• Implements for hoeing & weeding be procured under RKVY or Govt. subsides rate • Mulching material under RKVY or Govt. subsides rate • Water harvested structure can be constructed under NAREGA
		Fodder crop Jowar: GFS-4,5 S-1049 (sundhiya jowar)	• Interculturing • Soil mulch by selo interculturing • Life saving irrigation if possible.	• Restrict the fertilizer application if moisture is insufficient • Reduce 25% plant population	---
		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 measues**	**Remarks on Implementation**
At flowering/ fruiting stage	Low rainfall, medium black to black salt affected soils (Sami, Harij, Radhanpur, Santalpur)	Cropping system: Bajra-Mustard, Bajra-Cumin, Pulse-Wheat			
		Cotton (V-797 & Kalyan),	• Reduce the plant population by 15 to 20 Per Cent and use as mulching material • Alternate furrow irrigation or irrigation through drip system • Protect the crop against parawilt: • Band application of organic manures and 25% NPK as additional dose • Spraying of 0.5 % $MgSO_4$ solution • Drenching of *Trichoderma Viride* and *Pseudomonas fluorescence* (PGPS) 100 gm in 10 lit. water	• Avoid top dressing of N fertilizers • Mulching of farm byproduct @ 10t/ha (castor shell or Bajra husk) • Mulching (Plastic film 25 micron @ 200 kg/ha)	• Mulching material like plastic film can be provided under RKVY or Cotton Mission
		<u>Bajra</u> GHB-558,538,577,719,732	• Remove the barren tillers and use as fodder • Remove the 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
		<u>Green gram</u> Guj.Mung-1,2,3 & 4, K-851	• Removal of 20% to 25 % plant from the row and use as fodder • Life saving irrigation • Protection against sucking pest (Spraying of Methyle o demeton or Diamethioate 10 ml/10 lit of water) • Protection against podborer (spraying of monocrotophos 10	---	• Sprayers and duster be procured under RKVY or pulse production mission

			ml, endosulphan 20 ml or Acefet 20 gm in 10 lit of water at 50% flowering followed by 15 day)		
		Black gram Zandewal, T-9, TPU-4, Pusa-1, Guj.Urad-1	• Removal of 20% to 25 % plant from the row and use as fodder • Life saving irrigation • Protection against sucking pest (Spraying of Methyle-o-demeton or Diamethioate 10 ml/10 lit of water) • Protection against podborer (spraying of monocrotophos 10 ml, endosulphan 20 ml or Acefet 20 gm in 10 lit of water at 50% flowering followed by 15 day)	---	• Sprayers and duster be procured under RKVY or pulse production mission
		Clusterbean Pusa Navbahar, S.160-1, HG-75, Guj.Guar-1 & 2	do	---	do
		Mothbean Baleswar-12, Guj.Moth-1, RMO-40, RMO-257,GMO-2	do	---	do
		Cowpea Pusa falguni, Guj.cowpea-1,2,4 & 5, V-16, Chharodi	do	---	do
		Castor GCH-2,GCH-3,GCH-5,GCH-6 (root rot resistance), GCH-7 (wilt resistance), GAUCH-1	• Removal of plant population from 20% and use as mulch • Alternate furrow irrigation or irrigation through MIS if possible • Remove the 2 lower elder leaves and use as mulch	• Avoid top dressing of N fertilizers • Spraying of 5% kaolin solution • Mulching of farm byproduct @ 10t/ha (castor shell or Bajra husk) • Mulching (Plastic film 25 micron @ 200 kg/ha)	• Kaolin and mulching material provided under RKVY or other Govt. Agency • MIS can be provided under GGRC

		Sesame Patan-64, Guj.Til-1 & 2, Mrug-1, Guj Til-10 (Black seed)	• Removal of 20% to 25 % plant from the row and use as fodder • Life saving irrigation • Protection against sucking pest (Spraying of Methyle o demeton or Diamethioate 10 ml/10 lit of water) if possible through MIS • Protection against podborer (spraying of monocrotophos 10 ml, endosulphan 20 ml or Acefet 20 gm in 10 lit of water at 50% flowering followed by 15 day)	---	• Sprayers and duster be procured under RKVY or pulse production mission
		Fodder crop Jowar: GFS-4,5 S-1049 (sundhiya jowar)	• Life saving irrigation if possible.	• Restrict the fertilizer application if moisture is insufficient • Reduce 30 % plant population	---
		Maize local:	• Life saving irrigation if possible.	• Reduce 25% plant population	---
	Low rainfall, loamy sand to sandy loam soils (Patan, Siddhpur, Chanasma)	Cropping System: Bajra-Mustard, Bajra-Cumin, Pulse-Wheat			
		Castor GCH-2,GCH-3,GCH-5,GCH-6 (root rot resistance), GCH-7 (wilt resistance), GAUCH-1	• Removal of plant population from 20% and use as mulch • Alternate furrow irrigation or irrigation through MIS if possible • Remove the 2 lower elder leaves and use as mulch	• Avoid top dressing of N fertilizers • Spraying of 5% kaolin solution • Mulching of farm byproduct @ 10t/ha (castor shell or Bajra husk) • Mulching (Plastic film 25 micron @ 200 kg/ha)	• Kaolin and mulching material provided under RKVY or other Govt. Agency • MIS can be provided under GGRC
		Bajra GHB-558,538,577,719,732	• Remove the barren tillers and use as fodder • Remove the every fourth row and use as dry fodder	• Spraying of 5% kaolin solution	• Labour for harvesting can be provided under MANREGA • Kaolin provided

			• Life saving irrigation if possible		under RKVY or NFSM
		Green gram Guj.Mung-1,2,3 & 4, K-851	• Removal of 20% to 25 % plant from the row and use as fodder • Life saving irrigation • Protection against sucking pest (Spraying of Methyle o demeton or Diamethioate 10 ml/10 lit of water) • Protection against podborer (spraying of monocrotophos 10 ml, endosulphan 20 ml or Acefet 20 gm in 10 lit of water at 50% flowering followed by 15 day)	---	• Sprayers and duster be procured under RKVY or pulse production mission
		Black gram Zandewal, T-9, TPU-4, Pusa-1, Guj.Urad-1	• Removal of 20% to 25 % plant from the row and use as fodder • Life saving irrigation • Protection against sucking pest (Spraying of Methyle-o-demeton or Diamethioate 10 ml/10 lit of water) • Protection against podborer (spraying of monocrotophos 10 ml, endosulphan 20 ml or Acefet 20 gm in 10 lit of water at 50% flowering followed by 15 day)	---	• Sprayers and duster be procured under RKVY or pulse production mission
		Clusterbean Pusa Navbahar, S.160-1, HG-75, Guj.Guar-1 & 2	• Removal of 20% to 25 % plant from the row and use as fodder • Life saving irrigation • Protection against sucking pest (Spraying of Methyle o demeton or Diamethioate 10 ml/10 lit of water) • Protection against podborer (spraying of monocrotophos 10 ml, endosulphan 20 ml or Acefet 20 gm in 10 lit of water at 50% flowering followed by 15 day)	---	• Sprayers and duster be procured under RKVY or pulse production mission

		Mothbean Baleswar-12, Guj.Moth-1, RMO-40, RMO-257,GMO-2	• Removal of 20% to 25 % plant from the row and use as fodder • Life saving irrigation • Protection against sucking pest (Spraying of Methyle o demeton or Diamethioate 10 ml/10 lit of water) • Protection against podborer (spraying of monocrotophos 10 ml, endosulphan 20 ml or Acefet 20 gm in 10 lit of water at 50% flowering followed by 15 day)	---	• Sprayers and duster be procured under RKVY or pulse production mission
		Cotton Kalyan & private hybrid, Bt. Cotton	• Reduce the plant population by 15 to 20 Per Cent and use as mulching material • Alternate furrow irrigation or irrigation through drip system • Protect the crop against parawilt: • Band application of organic manures and 25% NPK as additional dose • Spraying of 0.5 % $MgSO_4$ solution • Drenching of *Trichoderma Viride* and *Pseudomonas fluorescence* (PGPS) 100 gm in 10 lit. water	• Avoid top dressing of N fertilizers • Mulching of farm byproduct @ 10t/ha (castor shell or Bajra husk) • Mulching (Plastic film 25 micron @ 200 kg/ha)	• Mulching material like plastic film can be provided under RKVY or Cotton Mission
		Fodder crop Jowar: GFS-4,5 S-1049 (sundhiya jowar)	• Life saving irrigation if possible.	• Restrict the fertilizer application if moisture is insufficient • Reduce 30 % plant population	---
		Maize local:	• Life saving irrigation if possible.	• 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	Low rainfall, medium black to black salt affected soils (Sami, Harij, Radhanpur, Santalpur)	Cropping system: Bajra-Mustard, Bajra-Cumin, Pulse-Wheat			
		Cotton (V-797 & Kalyan),	• Pick up lint from brusted ball • Alternate furrow irrigation • Cut down the lower unproductive twings and kept as mulch	• Land preparation for rabi crop according to ground water recharging • Procurements of inputs	---
		<u>Bajra</u> GHB-558,538,577,719,732	• Harvest the crop at physiological maturity stage	• Land preparation for rabi crop according to ground water recharging • Procurements of inputs	---
		<u>Green gram</u> Guj.Mung-1,2,3 & 4, K-851	• Life saving irrigation • Harvest mature pods	• Land preparation for rabi crop according to ground water recharging • Procurements of inputs	---
		<u>Black gram</u> Zandewal, T-9, TPU-4, Pusa-1, Guj.Urad-1	do	do	---
		<u>Clusterbean</u> Pusa Navbahar, S.160-1, HG-75, Guj.Guar-1 & 2	do	do	---
		<u>Mothbean</u> Baleswar-12, Guj.Moth-1, RMO-40, RMO-257,GMO-2	do	do	---
		<u>Cowpea</u> Pusa falguni, Guj.cowpea-1,2,4 & 5, V-16, Chharodi	do	do	---

		Castor GCH-2,GCH-3,GCH-5,GCH-6 (root rot resistance), GCH-7 (wilt resistance), GAUCH-1	• Alternate furrow irrigation • Harvest the mature spike • Harvest the spike at physiological maturity stage	---	---
		Sesame Patan-64, Guj.Til-1 & 2, Mrug-1, Guj Til-10 (Black seed)	• Harvest the crop at physiological maturity stage	• Land preparation for rabi crop according to ground water recharging • Procurements of inputs	---
		Fodder crop Jowar: GFS-4,5 S-1049 (sundhiya jowar)	Harvest the crop and drying	do	---
		Maize local:	do	do	---
	Low rainfall, loamy sand to sandy loam soils (Patan, Siddhpur, Chanasma)	Cropping System: Bajra-Mustard, Bajra-Cumin, Pulse-Wheat			
		Castor GCH-2,GCH-3,GCH-5,GCH-6 (root rot resistance), GCH-7 (wilt resistance), GAUCH-1	• Alternate furrow irrigation • Harvest the mature spike • Harvest the spike at physiological maturity stage	---	---
		Bajra GHB-558,538,577,719,732	• Harvest the crop at physiological maturity stage	• Land preparation for rabi crop according to ground water recharging • Procurements of inputs	---
		Green gram Guj.Mung-1,2,3 & 4, K-851	• Life saving irrigation • Harvest mature pods	do	---
		Black gram Zandewal, T-9, TPU-4, Pusa-1, Guj.Urad-1	do	do	---

		Clusterbean Pusa Navbahar, S.160-1, HG-75, Guj.Guar-1 & 2	• Life saving irrigation • Harvest mature pods	• Land preparation for rabi crop according to ground water recharging • Procurements of inputs	---
		Mothbean Baleswar-12, Guj.Moth-1, RMO-40, RMO-257,GMO-2	do	do	---
		Cotton Kalyan & private hybrid, Bt. Cotton	• Pick up lint from brusted ball • Alternate furrow irrigation • Cut down the lower unproductive twings and kept as mulch	do	---
		Fodder crop Jowar: GFS-4,5 S-1049 (sundhiya jowar)	• Harvest the crop and drying	do	• Breeder seeds from SAUs • Certified seeds from GUJCOMOSOL, GSSC, NSC, NFSM
		Maize local:	do	do	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	**Situation does not arise**				

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 incanals under delayed onset of moonson in catchment	**Situation does not arise**				

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	**Situation does not arise**				

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	**Situation does not arise**				

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	Low rainfall, medium black to black salt affected soils (Sami, Harij, Radhanpur, Santalpur)	Wheat: GW 496, GW 273, GW 322, GW 366	• 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. Dillseed 1 Barley: RD 2052 Isabgol: Guj.Isabgul 1 &2	• Pressurized irrigation at critical stage • Narrow and short water basin in all the crops	• Seed sources Breeder-SAUs Certified: GSSC, GUJCOMASOL, NSC • Pressurized irrigation system through Gujarat Green Revolution Co.Ltd, under subsidized rate.
		Cotton: Bt cotton	-	• Adoption of drip irrigation and mulching (plastic mulch 50 micron 370 kg/ha)	• Pressurized irrigation system through Gujarat Green Revolution Co.Ltd, under subsidized rate.
		Castor	-	do	do

		Mustard	• Replace area under mustard and replace by Gram : CCC 4, Gram Gujarat 1 & 2 Dill Seed: Guj. Dillseed 1 Barley: RD 2052 Isabgul: Guj.Isabgul 1 &2 Leafy Vegetables: Palak, Methi	• Pressurized irrigation at critical stage • Narrow and short water basin in all the crops	• Seed sources Breeder-SAUs Certified: GSSC, GUJCOMASOL, NSC • Pressurized irrigation system through Gujarat Green Revolution Co.Ltd, under subsidized rate.
		Cumin: GC-2, GC-4	Dilseed: G. Dilseed -3	• Raise bed furrow irrigation system	• Implement can be provided under RKVY
		Isabgul: GI-1,2,3	• Reduce the 25% area	• Raise bed furrow irrigation system	• Implement can be provided under RKVY
		Cucurbits	Bottle guard: Pusa navin, Anand-1 Bitter gourd: Arka harit Musk melon: Durgapura Madhu, Durgapura selection	• Double row furrow basin planting Alternate furrow irrigation	—
		Okra: Guj Okra-1, Parbhani kranti	Cluster bean Pusa Navabahar	• Double row furrow basin planting Alternate furrow irrigation	

		Brinjal: GOB-1, Doli-5, Pusa Purple round, Pusa Purple long	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/ cauliflower Snow ball-16, hissar-1, Cabbage Pride of India, Early drum head, Pusa drum head,	• Alternate furrow irrigation through drip system	• Mulching material can be provided under RKVY
		Cowpea (summer) Pusa falguni	• Reduce the 25% area	• Ridge & furrow method Sowing • Alternate furrow irrigation	• Implement can be provided under RKVY
		Cluster bean Pusa Navabahar	• Reduce the 25% area	• Alternate furrow irrigation through drip system	• Drip system can be provided under GGRC
		Dilseed: G. Dilseed - 1,2,3	• Reduce the 25% area	• Raise bed furrow irrigation system	• Implement can be provided under RKVY
		Turmeric: Kesar	-----	• Ridge & furrow irrigation	• Ridge & furrow system can be provided under RKVY
		Lucerne:GALL-1 (Anand-2) Local (Kachchhi)	GALL-1	As such	Seed source from NSSC
		Oat: Cant, Local	Bajra (multicut) GF Bajra-1	As such	Seed source from NSSC

	2. low rainfall, loamy sand to sandy loam soils (Patan, Siddhpur, Chanasma)	Wheat: GW 496, GW 273, GW 322, GW 366	• Wheat GW 11 & 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. Dillseed 1 Barley: RD 2052 Isabgol: Guj.Isabgul 1 &2	• Pressurized irrigation at critical stage • Narrow and short water basin in all the crops	• Seed sources Breeder-SAUs Certified: GSSC, GUJCOMASOL, NSC • Pressurized irrigation system through Gujarat Green Revolution Co.Ltd, under subsidized rate.
		Cotton: Bt cotton	-	• Adoption of drip irrigation and mulching (plastic mulch 50 micron 370 kg/ha)	• Pressurized irrigation system through Gujarat Green Revolution Co.Ltd, under subsidized rate.
		Castor	-	do	do
		Mustard	• Replace area under mustard and replace by Gram : CCC 4, Gram Gujarat 1 & 2 Dill Seed: Guj. Dillseed 1 Barley: RD 2052 Isabgul: Guj.Isabgul 1 &2 Leafy Vegetables: Palak, Methi	• Pressurized irrigation at critical stage • Narrow and short water basin in all the crops	• Seed sources Breeder-SAUs Certified: GSSC, GUJCOMASOL, NSC • Pressurized irrigation system through Gujarat Green Revolution Co.Ltd, under subsidized rate.
		Cumin: GC-2, GC-4	Dilseed: G. Dilseed -3	• Raise bed furrow irrigation system	• Implement can be provided under RKVY
		Isabgul: GI-1,2,3	• Reduce the 25% area	do	do

		Cucurbits	Bottle guard: Pusa navin, Anand-1 Bitter gourd: Arka harit Musk melon: Durgapura Madhu, Durgapura selection	• Double row furrow basin planting Alternate furrow irrigation	__
		Okra: Guj Okra-1, Parbhani kranti	Cluster bean Pusa Navabahar	• Double row furrow basin planting Alternate furrow irrigation	
		Brinjal: GOB-1, Doli-5, Pusa Purple round, Pusa Purple long	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/ cauliflower Snow ball-16, hissar-1, Cabbage Pride of India, Early drum head, Pusa drum head,	• Alternate furrow irrigation through drip system	• Mulching material can be provided under RKVY
		Cowpea (summer) Pusa falguni	• Reduce the 25% area	• Ridge & furrow method Sowing • Alternate furrow irrigation	• Implement can be provided under RKVY
		Cluster bean Pusa Navabahar	do	• Alternate furrow irrigation through drip system	• Drip system can be provided under GGRC
		Dilseed: G. Dilseed - 1,2,3	do	• Raise bed furrow irrigation system	• Implement can be provided under RKVY

		Turmeric: Kesar	-----	• Ridge & furrow irrigation	• Ridge & furrow system can be provided under RKVY
		Lucerne:GALL-1 (Anand-2) Local (Kachchhi)	GALL-1	As such	Seed source from NSSC
		Oat: Cant, Local	Bajra (multicut) GF Bajra-1	As such	Seed source from NSSC

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				
Cotton	• Surface drainage(for water logging) • Interculturing for aeration • Apply 25 kg N/ha as additional dose	• Surface drainage(for water logging) • Apply 25 kg N/ha as additional dose • Protect the crop against whitefly and sucking pest(acefet 75 CE 15 gm, Trizophos 40 EC 25 ml, Emidachloropid 2.5 ml in 10 lit of water)	• Surface drainage (for water logging) • Protect the crop against Ball Warm(Endosulphan 35 EC Politreen C 44 EC 20 ml in 10 lit of water) • Apply 25 kg N/ha as additional dose	• Cover the produce with plasticsheet(100 micron UV stabilized colour plastic)
Wheat	-	-	• Surface drainage (for management of water logging, lodging crop and to control black point in grain.) Spray Mancozeb 0.2%	• To cover produce with plastic sheet (100 µm, UV stabilized colour plastic) or shift produces to farm shed and protection against pest/disease damage in storage etc,
Mustard	• Surface drainage (For management of water logging & diseases) • Spray Mancozeb 0.2% to control Cumin blight, 0.2% wettable sulphur for protection against PM	• Surface drainage(For management of water logging & diseases, • Spray Mancozeb 0.2% to control Cumin blight, 0.2 % wettable sulphur for protection against PM	• Surface drainage (for management of water logging)	do
Pulses	-	-	• Quick drainage , Harvest mature pods	do

Cumin	• Surface drainage (For management of water logging & diseases) • Spray Mancozeb 0.2% to control Cumin blight, 0.2% wettable sulphur for protection against PM	do	• Surface drainage (for management of water logging)	do
Bajra	-	-	• Harvest mature ear heads	• To cover produce with plastic sheet (100 µm, UV stabilized colour plastic) or shift produces to farm shed and protection against pest/disease damage in storage etc,
Horticulture				
Ber	-	• Spray 0.2 % wettable sulphur 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 • Provide drainage	• Harvest the matured fruits • Provide drainage • Protect the fruit against fruit spot (Difenconazole 0.05%spray)	• Transfer the fruits to safer place
Pomegranate	-	do	• Harvest the matured fruits • Provide drainage • Protect the fruit against fruit spot (Difenconazole 0.05%spray)	do
Aonla	-	do	• Harvest the fruits • Protect the crop against fruit spots disease(Carbendazin 0.025 %)	do
Heavy rainfall with high speed winds in a short span[2]				
Cotton	• Surface drainage(for water logging)	• Surface drainage(for water logging)	• Surface drainage (for water logging)	• Cover the produce with plasticsheet(100 micron UV

	• Interculturing for aeration • Apply 25 kg N/ha as additional dose	• Apply 25 kg N/ha as additional dose • Protect the crop against whitefly and sucking pest(acefet 75 CE 15 gm, Trizophos 40 EC 25 ml, Emidachloropid 2.5 ml in 10 lit of water)	• Protect the crop against Ball Warm(Endosulphan 35 EC Politreen C 44 EC 20 ml in 10 lit of water) • Apply 25 kg N/ha as additional dose	stabilized colour plastic)
Wheat	• Surface drainage (to control water logging condition)	• Surface drainage (to control water logging condition)	• Surface drainage (for management of water logging, lodging crop and to control black point in grain, Spray Mancozeb 0.2%)	• To cover produce with plastic sheet (100 µm , UV stabilized colour plastic) or shift produces to farm shed and protection against pest/disease damage in storage etc,
Mustard	• Surface drainage (For management of water logging & diseases).	• Surface drainage(For management of water logging & diseases)	• Surface drainage (for management of water logging)	do
Pulses	-	-	Quick drainage , Harvest mature pods	do
Castor				
Cumin	• Surface drainage (For management of water logging & diseases). • Spray Mancozeb 0.2% to control Cumin blight, or 0.2% wettable sulphur for protection against PM	• Surface drainage(For management of water logging & diseases) • Mancozeb 0.2% to control Cumin blight)), or 0.2% wettable sulphur for protection against PM	• Surface drainage (for management of water logging)	do
Bajra	-	-	• Harvest mature ear heads, Quick surface drainage	do
Horticulture				
Ber	-	• Spray 0.2 % wettable sulphur 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 • Provide drainage	• Harvest the matured fruits • Provide drainage • Protect the fruit against fruit spot (Difenconazole 0.05%spray)	• Transfer the fruits to safer place
Pomegranate	-	• 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)	do
Aonla	-	• Spray 0.2% wettable sulphur or 0.05% Hexaconazole for protection against powdery mildew • Provide drainage	• Harvest the fruits • Protect the crop against fruit spots disease (Carbendazin 0.025 %)	Transfer the fruits to safer place
Outbreak of pests and diseases due to unseasonal rains				
Cotton	• Surface drainage(for water logging) • Interculturing for aeration • Apply 25 kg N/ha as additional dose	• Surface drainage(for water logging) • Apply 25 kg N/ha as additional dose • Protect the crop against whitefly and sucking pest(acefet 75 CE 15 gm, Trizophos 40 EC 25 ml, Emidachloropid 2.5 ml in 10 lit of water)	• Surface drainage (for water logging) • Protect the crop against Ball Warm(Endosulphan 35 EC Politreen C 44 EC 20 ml in 10 lit of water) • Apply 25 kg N/ha as additional dose	Cover the produce with plasticsheet(100 micron UV stabilized colour plastic)
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%	-
Mustard	• Spray Mancozeb 0.2% (To control white rust) • Spray Sulphur (300 mesh) @25 kg/ha for controlling Powdery mildew	• Spray Mancozeb 0.2% (To control white rust) • Spray Sulphur (300 mesh) @25 kg/ha for controlling Powdery mildew	• Spray Mancozeb 0.2% (To control white rust) • Spray Sulphur (300 mesh) @25 kg/ha for controlling Powdery mildew	
Pulses				

Castor				
Cumin	• Spray Mancozeb 0.2% (To control Cumin blight)	• Spray Mancozeb 0.2% (To control Cumin Blight)	• Spray 0.2% wettable sulphur (To control PM)	-
Bajra	-	-	Spray Mancozeb 0.2% (To control rust)	-
Horticulture				
Ber	-	• Spray 0.2 % wettable sulphur 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 • Provide drainage	• Harvest the matured fruits • Provide drainage • Protect the fruit against fruit spot (Difenconazole 0.05%spray)	Transfer the fruits to safer place
Pomegranate	-	do	do	do
Aonla	-	do	• Harvest the fruits • Protect the crop against fruit spots disease(Carbendazin 0.025 %)	do

2.3 Floods

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation[1]	Not Expected in this District			
Continuous submergence for more than 2 days[2]	Not Expected in this District			
Sea water intrusion[3]	Not Expected in this District			

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

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave	Light & frequent irrigation to all crops	Light & frequent irrigation to all crops	Light & frequent irrigation to all crops	-
Cold wave	NA	NA	NA	NA
Frost	NA	NA	NA	NA
Hailstorm	NA	NA	NA	NA
Cyclone	NA	NA	NA	NA

2.4 (A) Extreme events: Frost

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Frost				

Castor Cotton Brinjal	----	• Irrigate the crop according to forecast report • Apply additional 25% dose of N if crops are damaged • Cut and remove the affected parts of the crops.	• Irrigate the crop according to forecast report • Cut and remove the affected parts of the crops.	• Harvest the crop at physiological maturity
Horticulture				
Citrus	----------	• Irrigate the crops		

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Drought	• 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	As the district is occasionally prone to drought the following measures to be taken to ameliorate the fodder deficiency Avoid burning of wheat straw Establishment of fodder bank at village level with available dry fodder (paddy /wheat straw and stover of bajra/sorghum) Increase area under perennial fodder cultivation with high yielding Hybrid Napier varieties.	Harvest and use biomass of dried up crops (Bajra, Maize, Sorghum , Wheat, Green gram, cowpea etc.,) material as fodder Utilizing fodder from fodder bank reserves. Utilizing stored silage/hay. Transporting complete feed/fodder and dry roughages to the affected areas. Concentrate ingredients such as Grains, brans, chunnies	Training/educating farmers for feed & fodder storage. Maintenance / repair of silo pits and feed/fodder stores. Encourage progressive farmers to grow multi cut fodder crops of

	Conservation of maize/bajra/sorghum green fodder as silage Sowing of cereals (Sorghum/Bajra) and leguminous crops (Lucerne, Berseem, Horse gram, Cowpea) during early monsoon under dry land system for fodder production Encourage fodder production with Maize, Jowar, Bajra , Cowpea, Barseem, Lucerne etc., Processing & storage of feed/fodder and roughages in the form of complete feed/blocks.	& oilseed cakes, low grade grains etc. unfit for human consumption should be procured from Govt. Godowns for feeding as supplement for high productive animals during drought Continuous supplementation of mineral mixture to prevent infertility. Encourage mixing available kitchen waste with dry fodder while feeding to the milch animals	sorghum/bajra/maize(UP chari, MP chari, HC-136, HD-2, GAINT BAJRA, L-74, K-677, Ananad/African Tall etc., Supply of quality fodder seed (multi cut sorghum/bajra/maize varieties) and fodder slips of Napier, guinea grass well before monsoon Replenish the feed and fodder banks
Drinking water	Adopt various water conservation methods at village level to improve the ground water level for adequate water supply. Identification of water resources Desilting of ponds Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals) Construction of drinking water tanks in herding places/village junctions/relief camp locations Community drinking water trough can be arranged in shandies /community grazing areas	Adequate supply of drinking water. Restrict wallowing of animals in water bodies/resources Add alum in stagnated water bodies	Watershed management practices shall be promoted to conserve the rainwater. Bleach (0.1%) drinking water / water sources Provide clean drinking water
Health and disease management	Procure and stock emergency medicines and vaccines for important endemic diseases of the area All the stock must be immunized for endemic diseases of the area	Carryout deworming to all animals entering into relief camps Identification and quarantine of sick animals Constitution of Rapid Action Veterinary Force	Keep close surveillance on disease outbreak. Undertake the vaccination depending on need

	Vaccination for HS & FMD Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district Adequate refreshment training on draught management to be given to VAS, Jr.VAS, LI with regard to health & management measures Procure and stock multivitamins & area specific mineral mixture	Performing ring vaccination (8 km radius) in case of any outbreak Restricting movement of livestock in case of any epidemic Drainage of water from and around animal sheds, pasture areas. Tick control measures be undertaken to prevent tick borne diseases in animals Rescue of sick and injured animals and their treatment Organize with community, daily lifting of dung from relief camps	Keep the animal houses clean and spray disinfectants Farmers should be advised to breed their milch animals during July-September so that the peak milk production does not coincide with mid summer
Floods	**Not applicable**		
Cyclone	**Not applicable**		
Cold wave	**Not applicable**		
Heat wave	Arrangement for protection from **heat wave** i) Plantation around the shed ii) H_2O sprinklers / foggers in the shed **iii)** Application of white reflector paint on the roof **iv)** Thatched sheds should be provided as a shelter to animal to minimize heat stress	Allow the animals early in the morning or late in the evening for grazing during heat waves Feed green fodder/silage / concentrates during day time and roughages / hay during night time in case of heat waves Put on the foggers / sprinkerlers/fans during heat weaves in case of high yielders (Jersey/HF crosses) In severe cases, vitamin 'C' and electrolytes should be added in H_2O during heat waves.	Feed the animals as per routine schedule Allow the animals for grazing (normal timings)
Insurance	Encouraging insurance of livestock	Listing out the details of the dead animals	Submission for insurance claim and availing insurance benefit Purchase of new productive

			animals

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

2.5.3 Fisheries/ Aquaculture

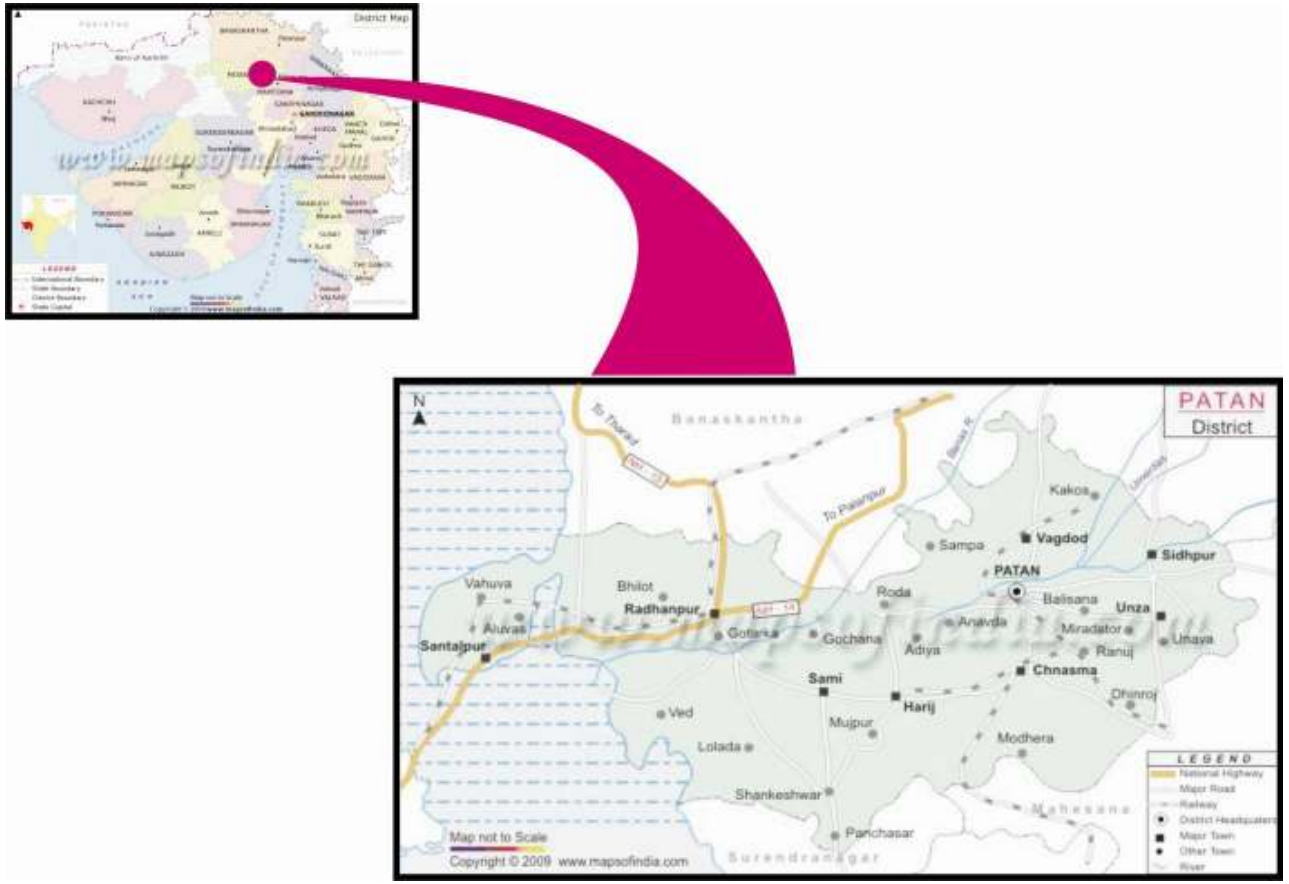
	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
1) Drought			
A. Capture			
Marine	Nil	Nil	
Inland	• Insure water storage & supply well in advance • Harvesting & marketing	• Watering of the ponds • Harvesting & marketing	• Restoking of the ponds • Fertilization & 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	• Fishing should be prohibited because of breeding season		
(i) Average compensation paid due to loss of human life			
(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			

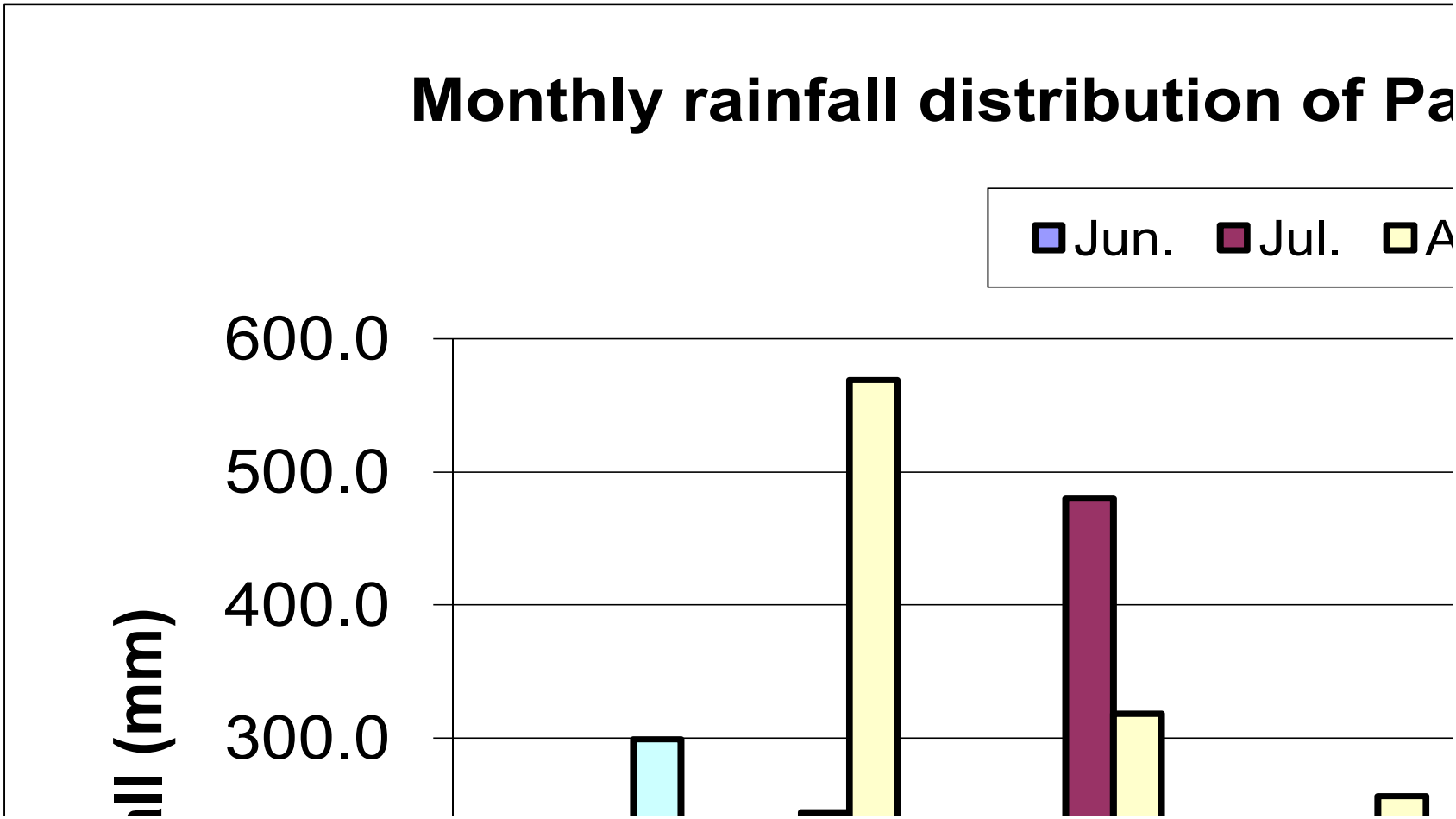
B. Aquaculture			
(i) Overflow / flooding of ponds			
(ii) Changes in water quality (fresh water / brackish water ratio)			
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)			
(vi) Any other			
4. Heat wave and cold wave			
A. Capture			
Marine			
Inland			
B. Aquaculture			
(i) Changes in pond environment (water quality)			
(ii) Health and Disease management			
(iii) Any other			

Annexure-I

LOCATION MAP OF PATAN DISTRICT (GUJARAT)



Annexure-II


Monthly rainfall distribution of Pa
Jun.
Jul.
A
600.0
500.0
400.0
300.0
ll (mm)