State: RAJASTHAN

Agriculture Contingency Plan for District: BARMER

1.0 District Agriculture profile					
1.1	**Agro-Climatic/Ecological Zone**				
	Agro Ecological Sub Region (ICAR)	Western Plain, Kachchh And Part Of Kathiawar Peninsula, Hot Arid Eco-Region (2.1)			
	Agro-Climatic Zone (Planning Commission)	Western Dry Region (XIV)			
	Agro Climatic Zone (NARP)	Arid Western Zone (RJ-1)			
	List all the districts or part thereof falling under the NARP Zone	Barmer, Jodhpur, Churu, Jaisalmer			
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude	
		25° 45' 6.10"N	71° 22' 52.63"E	259.3m	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Zonal Director Research, Agricultural Research Station, Mandor, Jodhpur-342001			
	Mention the KVK located in the district	Krishi Vigyan Kendra P.B. No. 29 Danta District Barmer-334001			
1.2	**Rainfall (Mean 1997 – 2007)**	Normal RF(mm)	Normal Rainy days (number)	Normal Onset	Normal Cessation
	SW monsoon (June-Sep):	246	-	1st week of July	3rd week of September
	NE Monsoon(Oct-Dec):	-	-	-	-
	Winter (Jan- Feb.)	-	-	-	-
	Summer (March-May)	-	-	-	-
	Annual	246	-	-	-

1.3	**Land use pattern of the district** (latest statistics) **2007 - 08**	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)	2817.3	2184.7	32.0	72.8	202.3	199.3	0.04	125.7	224.4	306.6

1. 4	**Major Soils (common names like red sandy loam deep soils (etc.,)**	**Area ('000 ha)**	**Percent (%) of total**
	Sandy	2086.2	74.0
	Loamy	516.1	18.3
	Gravelly sand & loam	187.0	6.6
	Gravelly loam hilly	27.8	0.98

1.5	**Agricultural land use**	Area (‘000 ha)	Cropping intensity %
	Net sown area	1653.7	106.2
	Area sown more than once	102.7	
	Gross cropped area	1756.4	

1.6	**Irrigation**	Area (‘000 ha)		
	Gross irrigated area	196.6		
	Rainfed area	1559.7		
	Sources of Irrigation	Number	Area (‘000 ha)	Percentage of total irrigated area
	Canals	-		
	Tanks	-	-	-
	Open wells	24.7	196.6	100.0
	Bore wells	-		-
	Lift irrigation schemes	-	-	-
	Micro-irrigation	-	-	-
	Other sources (please specify) Rahat	1.2	-	-
	Total Irrigated Area	196.6	196.6	100.0
	Pump sets	23.5		
	No. of Tractors	6.7		
	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	5	-	-
	Critical	2	-	-
	Semi- critical	-	-	-
	Safe	-	-	-
	Wastewater availability and use	-	-	-
	Ground water quality	-		
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

1.7 Area under major field crops & horticulture etc. (2000-01 - 2007-08

1.7	Major Field Crops cultivated (2000-01)	Kharif			Area ('000 ha) Rabi			Summer	Total
	Crop	**Irrigated**	**Rain fed**	**Total**	**Irrigated**	**Rainfed**	**Total**		
	Pearl millet	17.1	912.4	929.5	-	-	-	-	929.5
	Cluster bean	0.6	346.0	346.6	-	-	-	-	346.6
	Moth bean	0.7	223.3	224.0	-	-	-	-	224.0
	Green gram	0.1	51.2	51.3	-	-	-	-	51.3
	Sesame	-	3.8	3.8	-	-	-	-	3.8
	Cumin	-	-	-	60.9	-	60.9	-	60.9
	Isabgol	-	-	-	39.1	-	39.1	-	39.1
	Wheat	-	-	-	13.9	-	13.9	-	13.9
	Mustard	-	-	-	21.2	-	21.2	-	21.2

	Horticulture crops - Fruits	**Total area (000'ha)**	**Irrigated**	**Rainfed**
	Ber	0.2	0.2	-
	Aonla	0.02	0.02	-
	Horticultural crops - Vegetables	-	-	-
	Plantation crops	**Total area**	**Irrigated**	**Rainfed**
	Others such as industrial pulpwood crops etc	-	-	-
	Fodder crops	**Total area**	**Irrigated**	**Rainfed**
	Sorghum	0.01	0.01	-
	Total fodder crop area	-	-	-
	Grazing land	-	-	-
	Sericulture etc	-	-	-
	Others (Specify)		-	-

1.8	**Livestock - 2003 (P)**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Non descriptive Cattle (local low yielding)	-	-	537.2
	Crossbred cattle	-	-	-
	Non descriptive Buffaloes (local low yielding)	-	-	130.8
	Graded Buffaloes	-	-	-

	Goat	-	-	1460.7
	Sheep	-	-	1067.2
	Others (Camel, Pig, Yak etc.)	-	-	Horse 1.5, Camel 69.7 Pig-8.0
	Commercial dairy farms (Number)			
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**	
	Commercial	-	9.7	
	Backyard	-	-	

1.10 Fisheries (Data source: Chief Planning Officer) **Information not available**

A. Capture

i) Marine (Data Source: Fisheries Department)	**No. of fishermen**	**Boats**		**Nets**		**Storage facilities (Ice plants etc.)**
		Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
	-	-	-	-	-	-

ii) Inland (Data Source: Fisheries Department)	**No. Farmer owned ponds**	**No. of Reservoirs**	**No. of village tanks**
	-	-	-

B. Culture

	Water Spread Area (ha)	**Yield (t/ha)**	**Production ('000 tons)**
i) **Brackish water** (Data Source: MPEDA/ Fisheries Department)	-	-	-
ii) **Fresh water** (Data Source: Fisheries Department)	-	-	-
Others	-	-	-

1.11 Production and Productivity of major crops (Average of last 7 years: 2000-01 to 2007- 08)

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)										
	Pearlmillet	224.5	532	-	-	-	-	224.5	532	-
	Mothbean	65.5	292	-	-	-	-	65.5	292	-
	Clusterbean	63.4	183	-	-	-	-	63.4	183	-
	Greengram	9.4	184	-	-	-	-	9.4	184	-

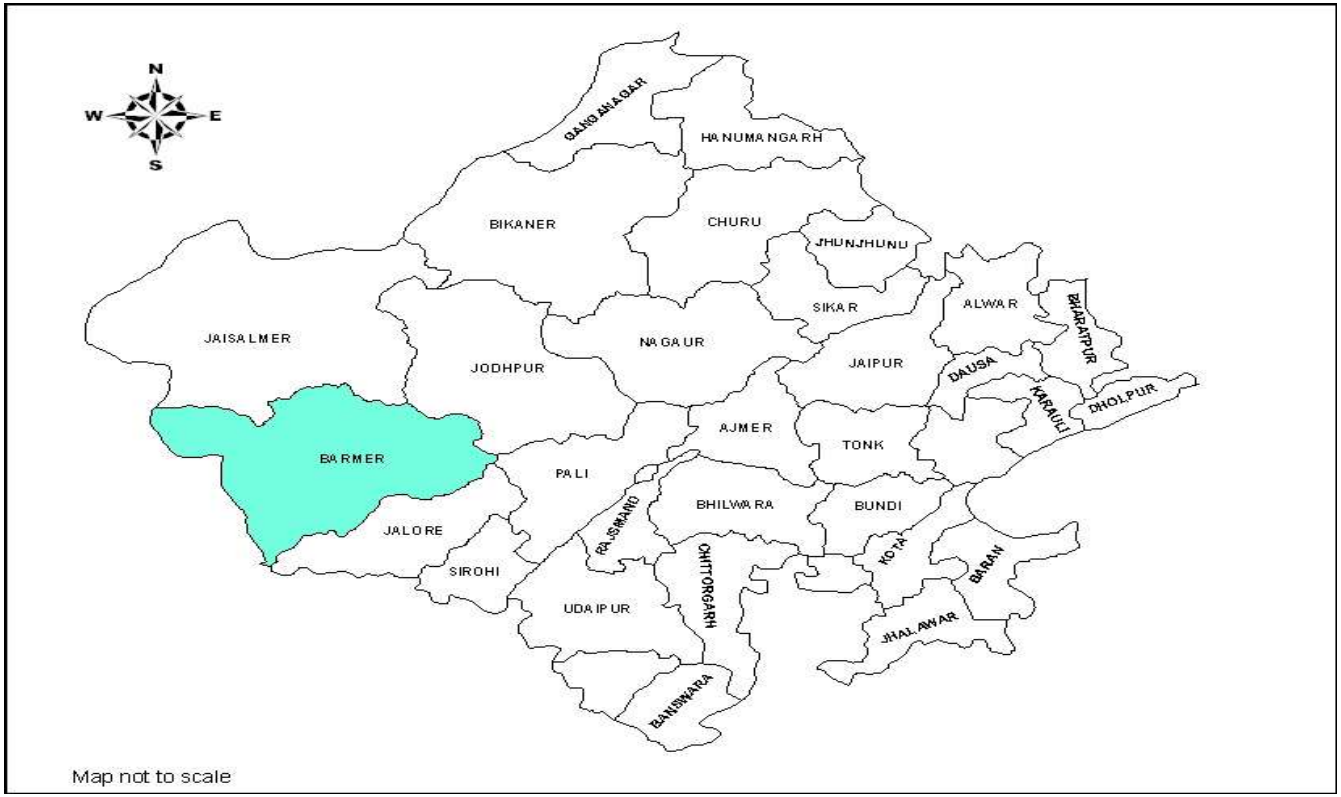
	Sesame	0.6	172	-	-	-	-	0.6	172	-
	Wheat	-	-	21.1	1516	-	-	21.1	1516	-
	Cumin	-	-	24.2	398	-	-	24.2	398	-
	Isabgol	-	-	14.0	358	-	-	14.0	358	-
	Mustard	-	-	22.6	1066	-	-	22.6	1066	-
Major Horticultural crops (Crops to be identified based on total acreage)										
	Ber	0.20	-	-	-	-	-	0.20	-	-

1.12	**Sowing window for 5 major field crops**	Pearl millet	Moongbean	Clusterbean	Mothbean	Sesame
	Kharif- Rainfed	1st July – 30th July	1st July-21st July	1st July- 7th Aug	1st July- 7th Aug	1st July- 7th Aug
	Kharif-Irrigated	15th June- 30th June	1st July -15th July	15th July – 30th July	15th July – 30th July	15th July – 30th July
	Rabi- Rainfed	Mustard 30th Sept-15 Oct	Sorghum fodder 15th Sept – 30 Sept	-	-	-
	Rabi-Irrigated	Mustard 1st -15th Oct	Wheat 15th Nov – 7th Dec.	Isabgol 1st - 31st Nov	Cumin 7th - 21st 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)	Pearl millet: Downy mildew	Moong & Moth: Leaf curl mosaic	Sesame: Macrophomina phyllody

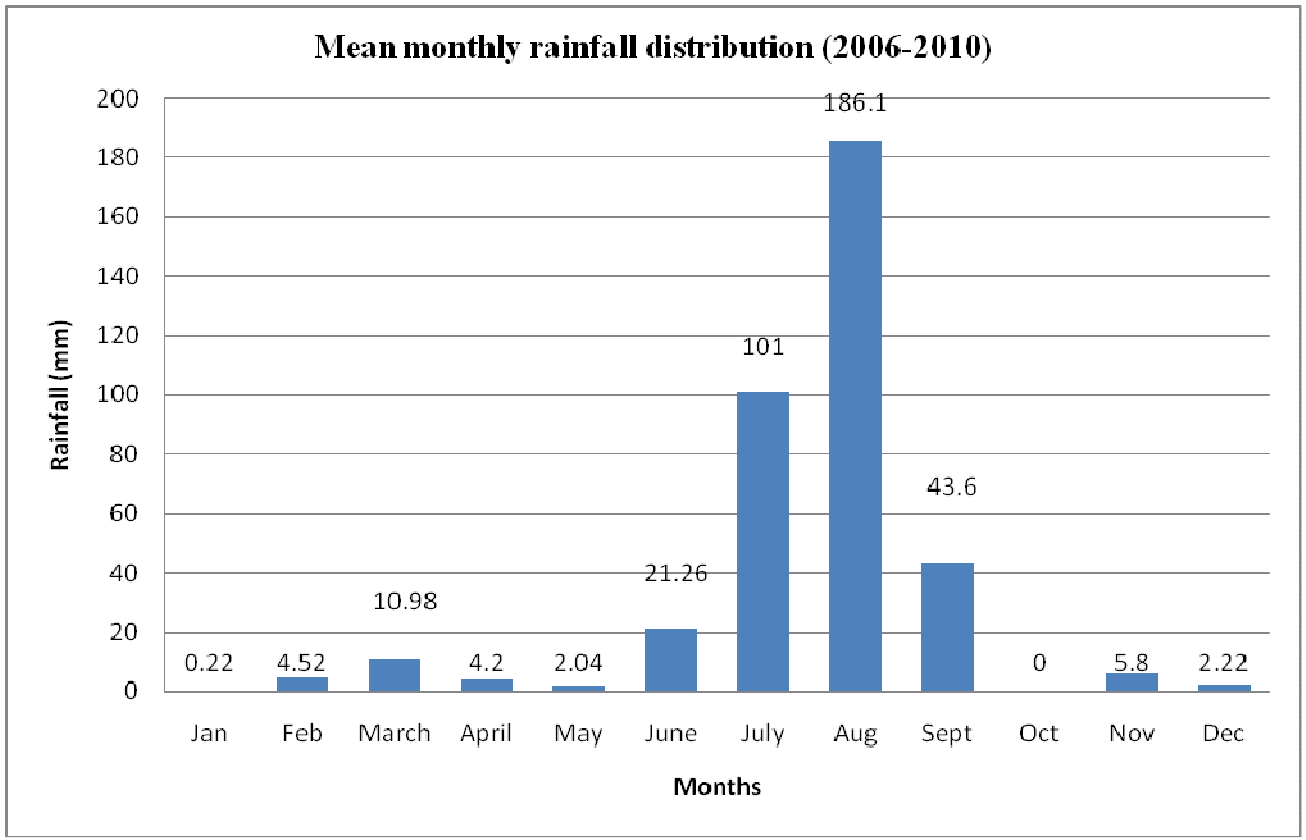
1.14	**Include Digital maps of the district for**	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

Annexure – I
Location map of Barmer district

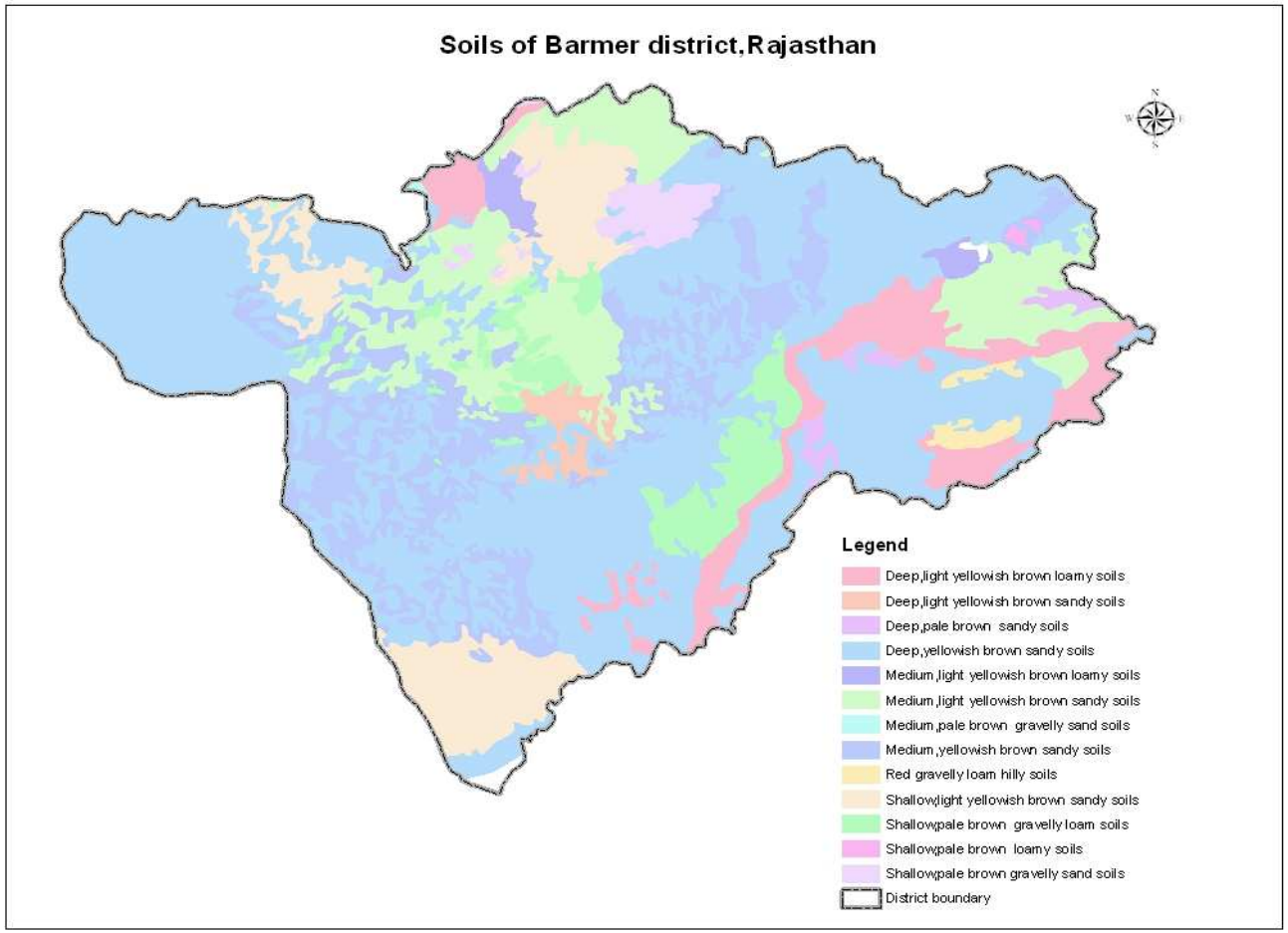


Annexure –II

Mean monthly rainfall graph of Barmer district



Annexure –III
Soil map



Source: NBSS&LUP, Regional Centre, Udaipur

2.0 Strategies for weather related contingencies
2.1 Drought
2.1.1 Rain fed situation

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks (3rd week of july))	Sand Dunes with undulating inter-dunal spaces/ Deep sandy plain / Coarse to fine textured hard pan (Low rainfall)	Pearl millet	No change	Gap filling with seedlings in gaps raised from the community or staggered nursery In case of severe gaps (more than 40%) re sowing the crop with press wheel behind tyne to secure good germination. Seed soaking with thiourea (0.05%) for four hours	Link Use NSC, RSSC, SAU wheel device, RKVY. For good quality seed and seeding devices
		Sesame	No change	Use good quality seed	
		Moth bean	No change	Seed soaking with thiourea (0.05%) for four hours.	
		Moong bean	No change	-do-	
		Cluster bean	No change	-do-	

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 4 weeks (1st week of August)	Sand Dunes with undulating inter-dunal spaces/ Deep sandy plain / Coarse to fine textured hard pan (Low rainfall)	Pearl millet	No change Prefer extra early hybrids viz. HHB 67, ICMH 356 GHB 358 Or moth bean + guar intercropping	Reduce 25% acreage Sowing at a 60 cm and use press wheel	Link NSC, RSSC, SAU, RKVY for good quality seed and press wheel device
		Sesame	No change Prefer varieties like RT 127 & RT 346	Use certified seed	

		Moth bean	No change Prefer varieties like RMO 40 & RMO 257	• seed priming with 0.05% thiourea and • Increase seed rate of by 10-15%	
		Moongbean	Moth bean and guar	-do-	
		Cluster bean	No change Prefer var. like RGC 936, RGC 1003 & RGM 112	-do-	

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 (3rd week of August)	Sand Dunes with undulating inter-dunal spaces/ Deep sandy plain / Coarse to fine textured hard pan (Low rainfall)	Pearl millet	Guar, moth bean and sorghum fodder	• seed priming with 0.05% thio-urea in moth and guar • Increase seed rate of moth guar by 15-20 %.	Link NSC, RSSC, SAU and department of agriculture for good quality seed, press wheel and thio urea
		Sesame	Moth bean and guar	-	
		Moth bean	No change Prefer var. like R- 40	• Seed priming with 0.05% thio-urea • Increase seed rate of by 15-20 %.	
		Moongbean	Moth bean , guar	-	
		Cluster bean	No change Prefer variety like RGC 936	• Seed priming with 0.05% thio-urea • Increase seed rate of by 15-20 %.	

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop and cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8 weeks 1st week of September	Sand Dunes with undulating inter-dunal spaces/ Deep sandy plain / Coarse to fine textured hard pan (Low rainfall)	Pearl millet	Keep fallow	Conserve soil moisture by *Bhakhar* Planking and utilize residual soil moisture for rabi crops lik taramira (RTM 314), & fodder sorghum (Raj chari 2)	Link NSC, RSSC, SAU and department of agriculture for good quality seed, press wheel.
		Sesame	-do-		
		Moth bean	-do-		
		Moongbean	-do-		
		Cluster bean	-do-		

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.	Sand Dunes with undulating inter-dunal spaces/ Deep sandy plain / Coarse to fine textured hard pan (Low rainfall)	Pearl millet	Gap filling with the seedlings raised either from community nursery.	Timely weed control with weeder Dust much with inter cultivation	CIAE wheel hand hoe for inter-culture operation under RKVY
		Sesame	-do-	-do-	
		Moth bean	-do-	-do-	
		Moongbean	-do-	-do-	
		Cluster bean	-do-	-do-	

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period) **At vegetative stage**	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
	Sand Dunes with undulating inter-dunal spaces/ Deep sandy plain / Coarse to fine	Pearl millet	Remove 25% within row	Dust mulch with weeder Vegetative mulch either with any organic material in crop rows Life saving irrigation with water in farm pond/	Link MGNREGA, NHM, RKVY, NFSM, ISOPOM , Watersheds, NERGS for support of water harvesting

	textured hard pan (Low rainfall)			harvesting structure(Alternate furrow irrigation) Avoid top dressing of urea during the dry spell	technology and to provide subsidy for thiourea
		Sesame	Spray of Urea (2%) after relief of dry spell	-do--	
		Moth bean	Spray of thiourea at 500 ppm	-do-	
		Moongbean	-do-	-do-	
		Cluster bean	-do-	-do-	

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period) **Reproductive stage**	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
	Sand Dunes with undulating inter-dunal spaces/ Deep sandy plain / Coarse to fine textured hard pan (Low rainfall)	Pearl millet	Spray of thiourea 500 ppm	Life saving irrigation-	Link MGNREGA, NHM, RKVY, NFSM, ISOPOM , Watersheds, NERGS for support of water harvesting technology and to provide subsidy for the urea
		Sesame	-do-	-do--	
		Moth bean	-do-	-do--	
		Moongbean	-do-	-do--	
		Cluster bean	-do-	-do-	

Condition			**Suggested Contingency measures**		
Terminal drought	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Rabi Crop planning measures**	**Remarks on Implementation**
(Early withdrawal of monsoon)	Sand Dunes with undulating inter-dunal spaces/ Deep sandy plain / Coarse to fine textured hard pan (Low rainfall)	Pearl millet	Life saving irrigation Harvest for fodder if damage will be very severe	Sowing of Barley using poor quality water in Luni basin	Link watersheds, NREGS for the support of farm pond/water harvesting structure technology
		Sesame	-do-	-	

		Moth bean	-do-	-	
		Moongbean	-do-	-	
		Cluster bean	-do-	-	

2.1.2 Irrigated situation

Condition			**Suggested Contingency measures**		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delayed release of water in canals due to low rainfall	**Not applicable**				

Condition			**Suggested Contingency measures**		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Limited release of water in canals due to low rainfall	**Not applicable**				

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

Condition			**Suggested Contingency measures**		
	Major Farming situation	**Normal Crop/ cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	**Not applicable**				

Condition			Suggested Contingency measures		
	Major Farming situation	**Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Insufficient groundwater recharge due to low rainfall	Sand Dunes with undulating inter-dunal spaces/ Deep sandy plain / Coarse to fine textured hard pan	Groundnut,	Reduce area under groundnut cotton, castor and chillies as per availability of irrigation water	Use low water requiring cultivars Irrigation at critical crop growth stages Conjunctive use of ground water with rainwater Alternate furrow irrigation Use sprinkler or drip irrigation system	• Use certified seed of from NSC, RSSC SAU • Provide subsidy for MIS
		castor	Cluster bean/ castor	-do-	
		cotton	Castor/ground nut	-do-	
		chilli	Reduce the area of chillies and allocate more area under castor	-do-	
		Wheat, mustard,	Wheat	Prefer early maturing and drought resistant var. of wheat (Raj 3765, Raj 3077, Raj 3777 Micro irrigation systems like sprinkler if feasible Alternate furrow irrigation	
		Mustard	Mustard	Prefer early maturing and drought resistant var. of mustard (Bio 902). Micro irrigation systems like sprinkler if feasible Alternate furrow irrigation	
		cumin	Cumin(RZ 209) or Taramira (RTM 314))or Isabgol (RI 1	Micro irrigation systems like sprinkler if feasible Alternate furrow irrigation	

2.2 Un-timely (unseasonal) rains

Condition - Continuous high rainfall in a short span leading to water logging				
Crop	**Suggested contingency measure**			
	Vegetative stage	**Flowering stage**	**Crop maturity stage**	**Post Harvest**
	N.A			

Condition -Heavy rainfall with high speed winds in a short span				
Crop	**Suggested contingency measure**			
	Vegetative stage	**Flowering stage**	**Crop maturity stage**	**Post Harvest**
crop	**N.A.**			
Horticulture				
Ber		Foliar spray of NAA 50 ppm	-	Dispose of the dropped fruits or prepare value added products

Outbreak of pests and diseases due to un-seasonal rains				
Cumin	**N.A.**	Blight Powdery mildew	Spraying 0.2% Mancozeb/ carbendazim Spray of wettable sulphur/ sulphur dusting	Dry the produce before storage to prevent storage pest and fungal infection
Mustard	**N.A.**	White rust	Spraying of 0.2 % mancozeb	-do-

2.3 Floods

Condition	**Suggested contingency measure**			
Transient water logging/ partial inundation	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Sea water inundation	**N.A.**	**N.A.**	**N.A.**	**N.A.**

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				
Wheat	-	-	Apply surface irrigation, spray 1000 ppm thiourea at grain filling stage	-
Mustard	-	-	-do-	-
Chickpea	-	-	-do-	-
Cotton	-	-	Spray with 2% KNO_3	-
Horticulture	-	-	-	-
Kinnow	-	-	-	-
Cold wave				
Mustard	-	-	Apply light surface irrigation or spray 500 ppm thiourea	-
Chickpea	-	-	-do-	-
Castor	-	-	-do-	-
Horticulture			-	-
Aonla	-	-	Spray 500 ppm thiourea	-
Frost				
Mustard	-	-	Smoking at night, apply light irrigation	-
Chickpea	-	Apply surface irrigation, Spray 500 ppm thiourea	Smoking at night, apply light surface irrigation	-
Castor	-	-	Smoking at night, apply light surface irrigation	-

Horticulture				
Aonla	-	-	Spray 500 ppm thiourea	-
Hailstorm	**N.A.**			
Cyclone	**N.A.**			

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Drought			
Feed and Fodder availability	As the district frequently prone to drought, it should have some feed and fodder reserves at any point of the year for mobilization to the drought affected villages, Hence the under mentioned feed reserves should be created at district head quarter Urea molasses mineral bricks (UMMB):50-100 t Hay:100-250 t Concentrates: 20-50 t Minerals and vitamin supplements mixture:5-10 t Available crop residues especially Bajra Karabi, Wheat/barley straw/ Chopped sewan/Dhaman/Bharut/ Dry leaves of Jharberi/ Groundnut bhusa should be stored properly in the farm of hay at individual farmer level. Harvest the top fodder (Khejari, Neem, Subabul, Acasia, Pipol etc) and create fodder banks at village level Establishment of silvi-pastoral system in CPRs with ***Stylosanthus hamata*** and ***Cenchrus ciliaris***	Harvest and use all the failed crop (Sorghum, Mothbean, Clusterbean, Greengram Wheat, Groundnut etc.,) material as fodder and feed the Livestock. Use judiciously the karabi, Preserved sewan /Dhaman /Bharut, Wheat straw, Lopped Khejari High productive animals should be Supplemented with tree fodder Available feed and fodder should be cut from CPRs and stall fed in order to reduce the energy requirements of the animals **In case of Severe drought:** UMMB, hay, concentrates and vitamin & mineral mixture should be transported to the drought affected villages All the hay should be enriched with 2% Urea molasses solution or 1% common salt solution and fed to LS Herd should be split and supplementation should be given only to the highly productive and breeding animals Provision of emergency grazing/feeding (Cow-calf camps or other special arrangements to protect high productive & breeding stock) Available kitchen waste should be mixed with dry fodder while feeding Arrangements should be made for mobilization of small ruminants across the districts where no drought exits Unproductive livestock should to be culled during severe drought	Flushing the stock to recoup Replenish the feed and fodder banks

	as grass with ***Leucaena leucocephala*** as tree component Top dressing of N in 2-3 split doses @ 20-25 kg N/ha in CPRs with the monsoon pattern for higher biomass production Increase area under short duration fodder crops of sorghum/bajra/maize(UP chari, MP chari, HC-136, HD-2, GAINT BAJRA, L-74, K-677, Ananad/African Tall, Kisan composite, Moti, Manjari, B1-7 etc.,) on farmers fields with some input subsidy Avoid burning of wheat straw Harvesting and collection of perennial vegetation particularly grasses which grow during monsoon Proper drying, bailing and densification of harvested grass Capacity building and preparedness of the stakeholders and official staff for the extreme events	Create transportation and marketing facilities for the culled and unproductive animals (10000-20000 animals) Subsidized loans should be provided to the livestock keepers for procurement of feed	
Heat & Cold wave	Arrangement for protection from **heat wave** i) Provision shed with bamboo/thatched material ii) Plantation around the shed iii) H_2O sprinklers / foggers in the shed **iv)** Application of white reflector paint on the roof **Cold wave :** Covering all the wire meshed walls / open area with gunny bags/ polyethylene sheets (with a mechanism for lifting during the day time and putting down during night time)	Allow the animals early in the morning or late in the evening for grazing during heat waves Allow for grazing between 10AM to 3PM during cold waves Feed green fodder/silage / concentrates during day time and roughages / hay during night time in case of heat waves Add 25-50 ml of edible oil in concentrates and fed to the animal during cold waves Put on the foggers / sprinkerlers during heat weaves and heaters during cold waves In severe cases, vitamin 'C' and electrolytes should be added in H_2O during severe heat waves. Apply / sprinkle lime powder in the animal shed during cold waves to neutralize ammonia accumulation	Feed the animals as per routine schedule Allow the animals for grazing (normal timings)
Health and	Procure and stock emergency medicines and	Carryout deworming to all animals entering into relief	Keep close surveillance on disease

Disease management	vaccines for important endemic diseases of the area All the stock must be immunized for endemic diseases of the area 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	camps Identification and quarantine of sick animals Constitution of Rapid Action Veterinary Force Performing ring vaccination (8 km radius) in case of any outbreak Restricting movement of livestock in case of any epidemic Rescue of sick and injured animals and their treatment Organize with community, daily lifting of dung from relief camps	outbreak. Undertake the vaccination depending on need 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
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
Drinking water	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	Restrict wallowing of animals in water bodies/resources Provide clean drinking water	Bleach (0.1%) drinking water / water sources Provide clean drinking water

2.5.2 Poultry

	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
Drought			
Shortage of feed ingredients	Storing of house hold grain like	Supplementation only for productive birds with house	Supplementation to all

	wheat, sorghum, bajra etc, Culling of weak birds	hold grain Supplementation of shell grit (calcium) for laying birds	
Drinking water	Rain water harvesting	Sanitation of drinking water	Give sufficient water as per the bird's requirement
Health and disease management	Culling of sick birds. Deworming and vaccination against RD and IBD	Mixing of Vit. A,D,E, K and B-complex including vit C in drinking water	Hygienic and sanitation of poultry house Disposal of dead birds by burning / burying with line powder in pit
Heat wave			
Shelter/environment management	Provision of proper shelter with good ventilation	In severe cases, foggers/water sprinklers/wetting of hanged gunny bags should be arranged Don't allow for scavenging during mid day	Routine practices are followed
Health and disease management	Deworming and vaccination against RD and IBD	Supplementation of house hold grain Provide cool and clean drinking water with electrolytes and vit. C In hot summer, add anti-stress probiotics in drinking water or feed	Routine practices are followed
Cold wave			
Shelter/environment management	Provision of proper shelter Arrangement for brooding Assure supply of continuous electricity	Close all openings with polythene sheets In severe cases, arrange heaters Don't allow for scavenging during early morning and late evening	Routine practices are followed
Health and disease management	Arrangement for protection from chilled air	Supplementation of grains Antibiotics in drinking water to protect birds from pneumonia	Routine practices are followed

2.5.3 Fisheries: Not Applicable.