

State: Rajasthan
Agriculture Contingency Plan for District: Rajsamand

1.0 District Agriculture profile					
1.1	Agro-Climatic/Ecological Zone				
	Agro Ecological Sub Region (ICAR)		Northern Plain (And Central Highlands) Including Aravallis, Hot Semi-Arid Eco-Region (4.2)		
	Agro-Climatic Zone (Planning Commission)		Western Dry Region (XIV)		
	Agro Climatic Zone (NARP)		Sub Humid Southern Plain Zone (RJ-7)		
	List all the districts or part thereof falling under the NARP Zone		Bhilwara, Bundi, Chittorgarh and Udaipur		
	Geographic coordinates of district headquarters		Latitude	Longitude	Altitude
			25 ⁰ 04'N	73 ⁰ 53'E	532.5
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS		Agricultural Research Station , Maharana Pratap university of Agriculture and technology RCA campus , Udaipur-313001		
Mention the KVK located in the district		Krishi Vigyan Kendra, Dhoinda, Distt. Rajsamand-313342			
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):	476.8	24.7	2 nd Week of June	3 rd Week of September
	NE Monsoon(Oct-Dec):	18.5	1.1		
	Winter (Jan- March)	5.4	0.6	-	-
	Summer (Apr-May)	12.2	1.4	-	-
	Annual	512.9	27.8	-	-

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)	455.093	127.224	24.663	23.580	57.658	118.851	0.016	104.201	7.110	22.383

1.4	Major Soils (common names like red sandy loam deep soils (etc.,))*	Area (*000 ha)	Percent (%) of total
	Black Clayey Deep Soil	2.41	0.53
	Brown Loamy Deep Soil	84.74	18.62
	Brown Loamy Medium Soil	258.31	56.76
	Red Loamy Shallow Soil	11.88	2.61
	Red Gravelly Loam Hilly Soil	94.39	20.74

Yellowish Brown Gravelly Loam Shallow Soil	2.00	0.44
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* 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	97.731	146.72
	Area sown more than once	45.663	
	Gross cropped area	143.394	

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	49.785		
	Gross irrigated area	56.631		
	Rainfed area	93.873		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals		0.00	
	Tanks	-	8.128	16.32
	Open wells	14755	40.291	80.93
	Bore wells	619	1.306	2.62
	Lift irrigation schemes	-	-	-
	Micro-irrigation		-	-
	Other sources (please specify)	-	0.060	0.12
	Total Irrigated Area		49.785	
	Pump sets	5695		
	No. of Tractors	2916		
	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 (as per latest figures) (Specify year 2007-08)

1.7	Major field crops cultivated	Area ('000 ha)							
		Kharif			Rabi			Summer	Grand total
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
Maize	-	-	59.537	-	-	-	-	59.537	
Sorghum	-	-	5.636	-	-	-	-	5.636	
Guarseed	-	-	8.498	-	-	-	-	8.498	
Cotton	-	-	4.473	-	-	-	-	4.473	
Wheat	-	-	-	-	-	34.420	-	34.420	
Barley	-	-	-	-	-	7.168	-	7.168	
Rapeseed & Mustard	-	-	-	-	-	3.681	-	3.681	

Horticulture crops - Fruits	Area ('000 ha)		
	Total	Irrigated	Rainfed
Mango	0.223	-	-
Guava	0.025	-	-
Lime	0.019	-	-
Custard Apple	0.334	-	-
Horticulture crops - Vegetables	Total	Irrigated	Rainfed
Tomato	0.058	-	-
Okra	0.041	-	-
Brinjal	0.056	-	-
Cole Crops	0.202	-	-
Onion	0.055	-	-

Medicinal and Aromatic /Spices	Total	Irrigated	Rainfed
Garlic	0.244	-	-
Red Chilli	0.395	-	-
Ajwain	0.925	-	-
Plantation crops	Total	Irrigated	Rainfed
Fodder crops	Total	Irrigated	Rainfed
Total fodder crop area	-	-	-
Grazing land	57.658	-	-
Sericulture etc	-	-	-

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)	-	-	251.863
	Crossbred cattle	-	-	
	Non descriptive Buffaloes (local low yielding)	-	-	200.184
	Graded Buffaloes	-	-	
	Goat	-	-	499.334
	Sheep	-	-	120.641
	Others (Camel, Pig, Yak etc.)	-	-	10.960
	Commercial dairy farms (Number)			-
1.9	Poultry	No. of farms	Total No. of birds ('000)	
	Commercial	-	30.780	
	Backyard	-		

1.10	Fisheries (Data source: Chief Planning Officer)					
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	
	Nil		3		573	
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)		3416		45.67		156
Others		-				

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)										
	Maize	92.468	1459	-	-	-	-	92.468	1459	-
	Sorghum	11.878	1328	-	-	-	-	11.878	1328	-
	Guarseeds	4.224	829	-	-	-	-	4.224	829	-
	Wheat	-	-	58.706	3054	-	-	58.706	3054	-
	Barley	-	-	9.611	2201	-	-	9.611	2201	-
	Rapeseed & mustard	-	-	3.689	1109	-	-	3.689	1109	-
Major Horticultural crops (Crops to be identified based on total acreage)										
	Mango	3053.0	12720	-	-	-	-	3053.0	12720	-
	Guava	181.9	7688	-	-	-	-	181.9	7688	-
	Lime	150.1	6822	-	-	-	-	150.1	6822	-
	Custard apple	2102.7	5988	-	-	-	-	2102.7	5988	-
	Tomato	17.3	3305	-	-	-	-	17.3	3305	-
	Brinjal	15.5	2330	-	-	-	-	15.5	2330	-

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Maize	Sorghum	Guar seeds	Wheat	Barley	Rapeseed and Mustard
	Kharif- Rainfed	4 th week of June to 1 st week of July	4 th week of June to 2 nd week of July	4 th week of June to 2 nd week of July			
	Kharif-Irrigated	15 – 30 th June	15 June - 30 th July	15 June - 30 th July			
	Rabi- Rainfed				15 Oct – 15 Nov.	15 Oct – 15 Nov.	15 th Sept. - 15 th Oct.
	Rabi-Irrigated				1 st week – 3 rd week of Nov.	1 st week – 3 rd week of Nov.	1 Oct – 20 Oct.

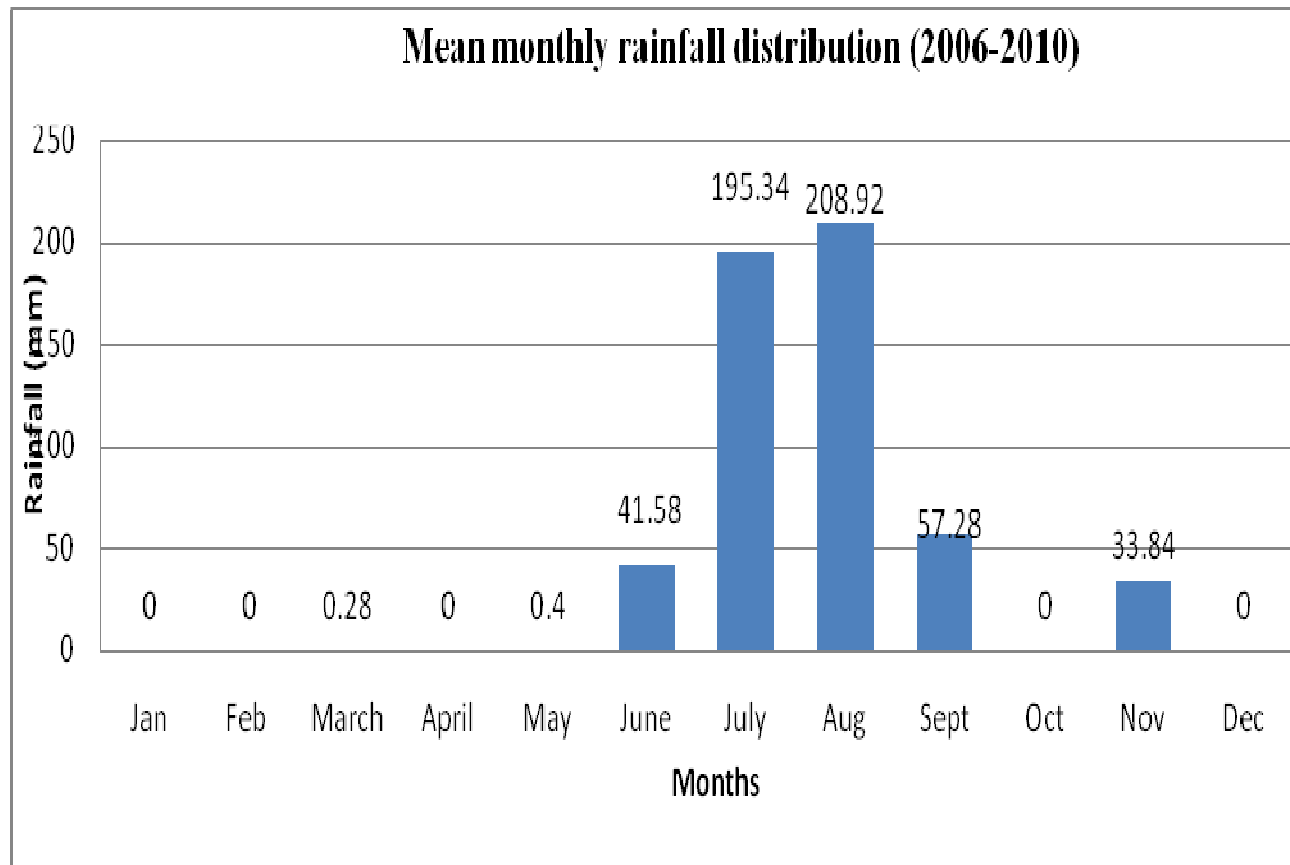
1.13	What is the major contingency the district is prone to? (Tick mark)	Regular	Occasional	None
	Drought	-	√	-
	Flood	-	-	√
	Cyclone	-	-	√
	Hail storm	-	-	√
	Heat wave	-	√	-
	Cold wave	-	√	-
	Frost	-	√	-
	Sea water intrusion	-	-	√
	Pests and disease outbreak (specify) Grass hopper in maize and sorghum	-	√	-
	Others (specify)	-	-	√

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

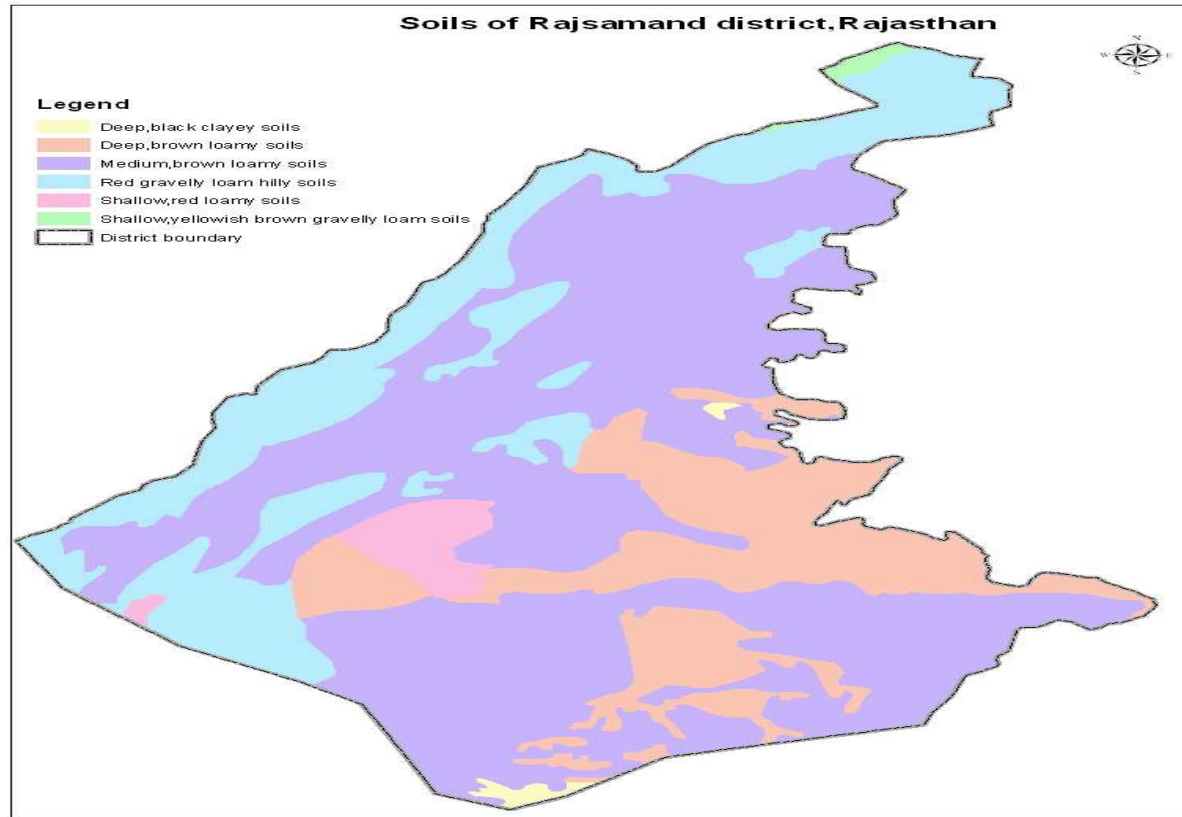
Annexure I
Location map of Rajsamand district



Annexure 2
Mean monthly rainfall graph of Rajsamand district



Annexure 3
Soil map



Source: NBSS&LUP, Regional Centre, Udaipur

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^a	Normal Crop / Cropping system^b	Change in crop / cropping system^c including variety	Agronomic measures^d	Remarks on Implementation^e
Delay by 2 weeks (Specify month)* (July 2 nd wk)	Brown Loamy Medium to deep Soils	Maize: Mahi Dhaval, Navjot,Ganga – 11, Aravali Makka – 1,Him – 129, PEHM-1, PEHM- 2, Pratap Hybrid Maize-1, Pratap Makka-3, Pratap Makka-5	Maize: Aravali Makka-1, Him – 129, PEHM-1, PEHM- 2, Pratap Hybrid Maize-1, Pratap Makka-3, Pratap Makka-5, Mahi Kanchan	<ul style="list-style-type: none"> • Inter cropping of blackgram (2:2) or pigeonpea (1:1) • Dry sowing/ sowing by roto-till-drill • Seed priming of maize (0.1 % thiourea)for 6 hrs 	Seed Drills/rota till drill ay be provided under RKVY
		Sorghum: CSH–6, CSH – 14, CSH – 9, Pratap jowar 1430, CSV-17, CSV-15, CSH-13, CSV- 13, SPV-346 and RJ 96	Sorghum: CSH – 6, CSH – 14, Pratap jowar 1430, CSV-17, CSV-15, CSH-13, CSV- 13, RJ - 96	<ul style="list-style-type: none"> • Increase seed rate by 25 % • Dry sowing/ sowing by roto-till-drill • Apply 20 kg of carbofuron or phorate (3g) granules in the seed row before sowing to check shoot fly infestation •Grow sorghum with green gram in 1:1 row ratio at 30 cm spacing 	Supply of seed through RSSC/ NSC Availability of seed drill for inter cropping through RKVY.
		Groundnut: AK 12- 24, G.G. – 2, J –38, D.H.-86, TG-37-A, J.L. – 24, Pratap mungphali – 1, Pratap mungphali – 2	Groundnut: J.L. – 24, Pratap mungphali – 2, TG – 37 – A	Intercropping with sesame at 6:2 row ratio.	
		Sesame: RT – 46, RT – 125, TC – 25	Sesame: RT – 46, RT – 125, TC – 25	Line sowing	
		Blackgram: Krishna, T– 9, PU-19, RBU-38	Blackgram: T– 9, PU-19, RBU-38	-	

Red Gravelly Loam Hilly Soils	Maize: Mahi dhal, Navjot, Ganga – 11, Aravali Makka – 1, Him – 129, PEHM-1, PEHM- 2, Pratap Hybrid Maize-1, Pratap Makka-3, Pratap Makka-5	Maize: Aravali Makka-1, Him – 129, PEHM-1, PEHM- 2, Pratap Hybrid Maize-1, Pratap Makka-3, Pratap Makka-5, Mahi Kanchan	<ul style="list-style-type: none"> • Inter cropping of blackgram (2:2) or pigeonpea (1:1) • Dry sowing/ sowing by roto-till-drill • Seed priming of maize (0.1 % thiourea) for 6 hrs
	Sorghum: CSH-6, CSH – 14, CSH – 9, Pratap jowar 1430, CSV-17, CSV-15, CSH-13, CSV- 13, SPV- 346 and RJ 96	Sorghum: CSH – 6, CSH – 14, Pratap jowar 1430, CSV-17, CSV-15, CSH-13, CSV- 13, RJ - 96	<ul style="list-style-type: none"> • Increase seed rate by 25 % • Dry sowing/ sowing by roto-till-drill • Apply 20 kg of carbofuron or phorate (3g) granules in the seed row before sowing to check shoot fly infestation • Grow sorghum with green gram in 1:1 row ratio at 30 cm spacing
	Guarseed: RGC – 936, RGC – 986, Durgapura Safed,	Guarseed: RGC – 936	Late Sowing (onset of monsoon)
	Sesame: RT – 46, RT – 125, TC – 25	Sesame: RT – 46, RT – 125, TC - 25	-
	Blackgram: Krishna, T- 9, PU-19, RBU-38	Blackgram: T- 9, PU-19, RBU-38	-

Condition	Major Farming situation ^a	Normal Crop/cropping system ^b	Suggested Contingency measures		
			Change in crop/cropping system ^c	Agronomic measures ^d	Remarks on Implementation ^e
Early season drought (delayed onset) Delay by 4 weeks (Specify month) July 4 th wk	Brown Loamy Medium to deep Soils	Maize/Sorghum/ for fodder or Green gram, sesame, blackgram	Maize (fodder): African Tall, Pratap Makka Chari-6 Sorghum (Fodder): Raj Chari-1, Raj Chari-2, Pratap Char-1080, SSG-59-3 Sesame: RT – 46, RT – 125, TC – 25 Greengram: : K-851, RMG-62, MUM-2, SML-668 Blackgram: T- 9, RBU-38	Increase in seed rate by 10-15% of sesame and green gram	Seed Drills/rota till drill may be provided under RKVY Supply of seed through RSSC/ NSC
	Red Gravelly Loam Hilly Soils	Maize/sorghum for fodder or guarseed, blackgram or sesame	Maize (fodder): African Tall, Pratap Makka Chari-6 Sorghum (fodder): Rajasthan Chari-1, Rajasthan Chari-2,	Increase in seed rate by 10 – 15 per cent in guarseed, sesame	

			Pratap Chari-1080, SSG-59-3 Sesame: RT – 46, RT – 125, TC - 25 Blackgram: T- 9, PU-19, RBU-38 Guarseed: RGC – 936	and blackgram	
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Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation ^a	Normal Crop/cropping system ^b	Change in crop/cropping system ^c	Agronomic measures ^d	Remarks on Implementation ^e
Delay by 6 weeks Aug 2 nd wk	Brown Loamy Medium to deep Soils	Maize/Sorghum (Fodder) or Fallow-mustard	Maize (fodder): African Tall, Pratap Makka Chari-6 Maize + Cowpea (fodder) Sorghum (fodder): Rajasthan Chari-1, Rajasthan Chari-2, Pratap Chari-1080, SSG-59-3 Sorghum + cowpea (fodder) Fallow-Toria/Taramira/ Mustard/Gram	One hoeing may be done for conserve soil moisture	<ul style="list-style-type: none"> Availability of certified seed from RSSC/NSSC, etc
	Red Gravelly Loam Hilly Soils	Maize/Sorghum (Fodder) or Fallow-mustard	Maize (fodder): African Tall, Pratap Makka Chari-6 Maize + Cowpea (fodder) Sorghum (fodder): Rajasthan Chari-1, Rajasthan Chari-2, Pratap Chari-1080, SSG-59-3 Sorghum + cowpea (fodder) Fallow-Toria/Taramira/ Mustard/Gram	One hoeing may be done for conserve soil moisture	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation ^a	Normal Crop /cropping system ^b	Change in crop/cropping system ^c	Agronomic measures ^d	Remarks on Implementation ^e
Delay by 8 weeks Aug 4 th wk	Brown Loamy Medium to deep Soils	Fallow - Mustard/ Taramira	Fallow -Toria/ Taramira/ Mustard(Bio-902 and Laxmi)/Gram(Dahod Yellow and ICCV-10)	Conserve moisture by run of bakhar after every rain fall Sowing preferably by Rota till drill	Availability of seed through RSCC Availability of rota till drill under RKVY
	Red Gravelly Loam Hilly Soils	Fallow - Mustard/ Taramira/ Barley	Fallow – Mustard (Bio-902 and Laxmi)/ barley (RD-2052, RD-2552, RD-2035)	Conserve moisture by run of bakhar after every rain fall Sowing preferably by Rota till drill	

Condition	Major Farming situation ^a	Normal Crop/cropping system ^b	Suggested Contingency measures		
			Crop management ^c	Soil nutrient & moisture conservation measures ^d	Remarks on Implementation ^e
Early season drought (Normal onset)					
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Brown Loamy Medium to deep Soils	Maize, Sorghum, Groundnut, Sesame and Blackgram	<ul style="list-style-type: none"> • If germination is less than 50% then farmers should go for re-sowing except groundnut with early maturing varieties with 25% higher seed rate • If plant population is more than 75% go for gap filling. • In groundnut gap filling can be done by sesame and in maize by blackgram or sesame 	<ul style="list-style-type: none"> • Hoeing by hand hoe to develop soil mulch for conservation of soil moisture. • Removal of Weeds in time. • Use green material for mulching 	Availability of wheel hoe/power weeder for Inter-culture operation through RKVY.
	Red Gravelly Loam Hilly Soils	Maize, Sorghum, Sesame, guarseed and Blackgram	<ul style="list-style-type: none"> • If germination is less than 50% then farmers should go for re-sowing with early maturing varieties with 25% higher seed rate • If plant population is more than 75% go for gap filling. • In maize crop gap filling can be done by blackgram or sesame 	<ul style="list-style-type: none"> • Hoeing by hand hoe to develop soil mulch for conservation of soil moisture. • Removal of Weeds in time. • Use organic material for mulching 	

Condition	Major Farming situation ^a	Normal Crop/cropping system ^b	Suggested Contingency measures		
			Crop management ^c	Soil nutrient & moisture conservation measures ^d	Remarks on Implementation ^e
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)					
At vegetative stage	Brown Loamy Medium to deep Soils	Maize, Sorghum, Groundnut, Sesame and Blackgram	<ul style="list-style-type: none"> • Thinning of plants by 30 to 50% • Weeding 	<ul style="list-style-type: none"> • Ridging in maize. • Life saving irrigation from harvested rain water in pond • Spray of kaolin @ 5% during the dry spell if feasible • Spray of 1000 ppm of thiourea. 	Availability of wheel hoe and power weeder for Inter-culture operations through RKVY.

				<ul style="list-style-type: none"> • Apply stover of sesame, cotton as mulch • Foliar spray of 2% urea on maize and sorghum. 	
	Red Gravelly Loam Hilly Soils	Maize, Sorghum, Sesame, guarseed and Blackgram	<ul style="list-style-type: none"> • Thinning of plants by 30 to 50% • Weeding 	<ul style="list-style-type: none"> • Ridging in maize. • Life saving irrigation from harvested rain water in pond • Mulching green materials within crop rows • Spray of kaolin @ 5% during the dry spell if feasible • Spray of 1000 ppm of thiourea. • Apply stover of sesame, cotton as mulch • Foliar spray of 2% urea on maize and sorghum. 	

Condition	Major Farming situation ^a	Normal Crop/cropping system ^b	Suggested Contingency measures		
			Crop management ^c	Soil nutrient & moisture conservation measues ^d	Remarks on Implementation ^e
Mid season drought (long dry spell)					
At flowering/ fruiting stage	Brown Loamy Medium to deep Soils	Maize, Sorghum, Groundnut, Sesame and Blackgram	<ul style="list-style-type: none"> • Removal of lower leaves for fodder in maize and sorghum. • Detasseling in maize • Harvest maize for baby corn if market is available • Harvesting of maize for green cobs and green fodder 	<ul style="list-style-type: none"> • Life saving irrigation should be done from harvested rain water except sesame • Spray of kaolin @ 5% • Spray of 1000 ppm of thiourea. • Apply stover of sesame, cotton as mulch 	<ul style="list-style-type: none"> • Crop Insurance • Farm Pond construction under RKVY
	Red Gravelly Loam Hilly Soils	Maize, Sorghum, Sesame, guarseed and Blackgram	<ul style="list-style-type: none"> • Removal of lower leaves for fodder in maize and sorghum. • Detasseling in maize • Harvest maize for baby corn if 	<ul style="list-style-type: none"> • Life saving irrigation should be done from harvested rain water except sesame 	<ul style="list-style-type: none"> • Crop Insurance • Farm Pond construction under RKVY

			<ul style="list-style-type: none"> market is available Harvesting of maize for green cobs and green fodder In-situ mulching of weeds. 	<ul style="list-style-type: none"> Spray of kaolin @ 5% Spray of 1000 ppm of thiourea. Apply stover of sesame, cotton as mulch 	
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Condition	Major Farming situation ^a	Normal Crop/cropping system ^b	Suggested Contingency measures		
			Crop management ^c	Rabi Crop planning ^d	Remarks on Implementation ^e
Terminal drought (Early withdrawal of monsoon)	Brown Loamy Medium to deep Soils	Maize, Sorghum, Groundnut, Sesame and Blackgram	Harvest maize for green cobs Life saving irrigation with harvested rain water. Harvest groundnut for green pods	If late season rains are there, after failure of Kharif crops, Rabi crops i.e. Taramira/ Toria etc. can be sown	Crop Insurance Construction of Farm Pond under NREGA and RKVY
	Red Gravelly Loam Hilly Soils	Maize, Sorghum, Sesame, guarseed and Blackgram	Harvest maize for green cobs Life saving irrigation with harvested rain water. Harvest guar as vegetable	If late season rains are there, after failure of Kharif crops, Rabi crops i.e. Taramira/ Toria etc. can be sown	

2.1.2 Drought - Irrigated situation

Condition	Major Farming situation ^f	Normal Crop/cropping system ^g	Suggested Contingency measures		
			Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Delayed release of water in canals due to low rainfall	Mention source of irrigation, topography (upland/lowland) and soil colour & depth Eg; canal irrigated shallow red soils; tankfed medium deep black soils				
	There is no canal in this area				

Condition	Major Farming situation ^f	Normal Crop/cropping system ^g	Suggested Contingency measures		
			Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Limited release of water in canals due to low rainfall	There is no canal in this area				

Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Non release of water in canals under delayed onset of monsoon in catchment	There is no canal in this area				

Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Brown Loamy Medium to deep Soils	Maize-wheat/barley/gram/mustard	If conserve moisture is available due to late season rainfall only gram, mustard and taramira can be grown	<ul style="list-style-type: none"> • Soil mulching by stirring • Weed free environment • Spray of kaolin at 5 % 	Create awareness and skills to the farmers through KVK
		Cotton-wheat			
		Groundnut-wheat/barley			
		Fallow/fodder-wheat/gram/mustard			
	Red Gravelly Loam Hilly Soils	Maize-wheat/barley/gram/mustard	If conserve moisture is available due to late season rainfall only gram, mustard and taramira can be grown	<ul style="list-style-type: none"> • Soil mulching by stirring • Weed free environment • Spray of kaolin at 5 % 	
		Cotton-wheat			
		Groundnut-wheat/barley			
		Fallow/fodder-wheat/gram/mustard			
		Kharif pulses – wheat			

Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Insufficient groundwater recharge due to low rainfall	Brown Loamy Medium to deep Soils	Maize-wheat/barley/gram/mustard Cotton-wheat Groundnut-wheat/barley Fallow/fodder-wheat/gram/	Short Duration Varieties Wheat- HI-1531, HI-1500, HI-8627, Raj-3777, Barley- RD-103, RD-2035, RD – 2052, RD - 2552 Gram – Pratap Chana – 1,	<ul style="list-style-type: none"> • Thinning of excess plants in mustard • Weed free environment • Mulching in crop rows • Irrigation by MIS 	Percolation tanks may be dugout through NREGA or NABARD

Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
		mustard	ICCV – 10, Dahod Yellow Mustard: Laxmi, Bio – 902	<ul style="list-style-type: none"> • Irrigation at critical stages • Spray of Kaolin @ 5% 	
	Red Gravelly Loam Hilly Soils	Maize-wheat/barley/gram/ mustard Cotton-wheat Groundnut-wheat/barley Fallow/fodder-wheat/gram/ mustard Kharif pulses – wheat	Short Duration Varieties Wheat- HI-1531, HI-1500, HI-8627, Raj-3777, Barley- RD-103, RD-2035, RD – 2052, RD - 2552 Gram – Pratap Chana – 1, ICCV – 10, Dahod Yellow Mustard: Laxmi, Bio – 902	<ul style="list-style-type: none"> • Thinning of excess plants in mustard • Weed free environment • Mulching in crop rows • Irrigation by MIS • Irrigation at critical stages • Spray of Kaolin @ 5% 	Percolation tanks may be dugout through NREGA or NABARD

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

Condition	Suggested contingency measure			
	Vegetative stage ^k	Flowering stage ^l	Crop maturity stage ^m	Post harvest ⁿ
Continuous high rainfall in a short span leading to water logging				
Maize Sorghum Soybean Cluster bean Green gram, Black gram, Sesame, Groundnut	<ul style="list-style-type: none"> • Drain excess water by proper drainage • Earthing up of crop for anchorage • Intercultivation with hoe to improve the aeration and to control weeds • Apply 20kg N/ha at optimum moisture content 	<ul style="list-style-type: none"> • Drain excess water by proper drainage • Earthing up of crop for anchorage • Intercultivation with hoe to improve soil aeration and to control weeds • Apply multi nutrient or hormonal spray to promote flowering 	<ul style="list-style-type: none"> • Drain excess water by proper drainage as early as possible • Harvest green cobs from dislodged plants for immediate marketing (Maize, sorghum) • Shift the produce into the shed 	Harvest the cobs after they are dried up properly Dry the grains up to 10-12% moisture level before storage /bagging
Rabi crops	Drain the excess water as early as possible	Drain the excess water as early as possible	<ul style="list-style-type: none"> • Drain the excess water as early as possible • Allow the crop to dry completely before harvesting 	Well dry the produce up to 10- 12% moisture before storage

Horticulture				
Vegetables	Removal excess water from field by formation of small channels	Removal excess water from field by formation of small channels	Removal excess water and harvest vegetables	
Heavy rainfall with high speed winds in a short span²				
Crops	Removal of excess water from field by formation of small channels Tying of 4-5 plants together	Removal of excess water from field by formation of small channels Tying of 4-5 plants together	Removal of excess water from field by formation of small channels Harvest of Green cobs of maize and be marketed	
Horticulture	Removal of excess water from field by formation of small channels	Removal of excess water from field by formation of small channels	Removal of excess water from field by formation of small channels	
Outbreak of pests and diseases due to unseasonal rains				
Maize/	-	Foliar application of Mancozeb 0.25 to 0.4% at 8-10 days interval to control Turcucum leaf blight	<i>Trichoderma</i> mixed with FYM 10gm/kg at 10 days interval prior to its use in the field can be applied to control stalk rot which is likely during post flowering	Quick drying grain 10-12% moisture to avoid storage grain pests
sorghum	Early planting with(in one week) onset of monsoon to avoid shoot fly incidence for kharif crop End of sept 1 st week of October to escape the damage of shoot fly for rabi crop Spraying dithane M-45@2%, 2-3 times during early growth of plants to control rust disease	Stem borer damage can be checked by application of insecticides like carbaryl 3G, furodon 3G@10-12kg/ha in the whorl at 30-35 days after germination	Dusting of carbaryl 50 WP, Carbaryl 3D once or twice at ear emergence to control sorghum midge and ear head bug	Quick drying grain 10-12% moisture to avoid storage grain pests

2.3 Floods(Situation does not exist)

Condition	Suggested contingency measure ^o			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation ¹				
Continuous submergence for more than 2 days ²				

Sea water intrusion ³				
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2.4 Extreme events: Heat wave / Cold wave/Frost/ Hailstorm /Cyclone

Extreme event type	Suggested contingency measure ^f			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave^p				
Horticulture				
Vegetables (Tomato/ Onion/ Chilli /Brinjal)	Protected cultivation in shade net house Spray of borex at 0.1% Arrangement of wind breaks	Light & frequent irrigation	Light & frequent irrigation	Timely picking of fruits
Cold wave				
Wheat	Light irrigation , Smoking during night and provision of wind breaks	Light irrigation , Smoking during night	<ul style="list-style-type: none"> • Spray of H2SO4 @ 0.1%, • Burning of crop residues around the field • Light irrigation 	Harvest at physiological maturity
Mustard	-do-	-do-		-do-
Gram	-do-	-do-		-do-
Horticulture				
Pea, tomato, brinjal	Protected cultivation in shade net house Spray of borex at 0.1%	Light irrigation , Smoking during night	<ul style="list-style-type: none"> • Spray of H2SO4 @ 0.1%, • Burning of crop residues around the field • Light irrigation 	Harvest and marketed as early as possible
Frost				
Wheat	Light irrigation , Smoking during night	Light irrigation , Smoking during night	<ul style="list-style-type: none"> • Spray of H2SO4 @ 0.1%, • Burning of crop residues around the field • Light irrigation 	
Mustard	Light irrigation , Smoking during night	Light irrigation , Smoking during night		
Gram	Light irrigation , Smoking during night	Light irrigation , Smoking during night		
Horticulture				
Pea, tomato, brinjal	Protected cultivation in shade net house Spray of borex at 0.1%		<ul style="list-style-type: none"> • Spray of H2SO4 @ 0.1%, • Burning of crop residues around the field • Light irrigation 	
Hailstorm	Situation does not exist			
Cyclone	Situation does not exist			

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	<p>As the district is occasionally prone to drought the under mentioned measures may be taken to enhance the availability of feed and fodder base at the village/ household level</p> <p>Sowing of horsegram/Lucerne etc., during NE monsoon</p> <p>Preservation green maize fodder as silage</p> <p>All the 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.</p> <p>Harvest the top fodder (Khejari, Neem, Subabul, Acasia, Pipol etc) and create fodder banks at village level</p> <p>Establishment of silvi-pastoral system in CPRs with <i>Stylosanthus hamata</i> and <i>Cenchrus ciliaris</i> as grass with <i>Leucaena leucocephala</i> as tree component</p> <p>Top dressing of N in 2-3 split doses @ 20-25 kg N/ha in CPRs with the monsoon pattern for higher biomass production</p> <p>Increase area under short duration fodder crops</p>	<p>Harvest and use all the failed crop (Maize, Blackgram, Sorghum, Ground nut, Cluster bean, Wheat, Barley, Green gram, Soybean etc.) material as fodder and feed the Livestock.</p> <p>Use judiciously the karabi, Preserved sewan /Dhaman /Bharut, Wheat straw, Lopped Khejari</p> <p>High productive animals should be Supplemented with tree fodder</p> <p>Available feed and fodder should be cut from CPRs and stall fed in order to reduce the energy requirements of the animals</p> <p>Provision of emergency grazing/feeding (Cow-calf camps or other special arrangements to protect high productive & breeding stock)</p> <p>Available kitchen waste should be mixed with dry fodder while feeding</p> <p>Arrangements should be made for mobilization of small ruminants across the districts where no drought exits</p> <p>Subsidized loans should be provided to the livestock keepers for procurement of feed</p>	<p>Flushing the stock to recoup</p> <p>Replenish the feed and fodder banks</p>

	<p>of sorghum/bajra/maize(UP chari, MP chari, HC-136, HD-2, GAIN T BAJRA, L-74, K-677, Ananad/African Tall, Kisan composite, Moti, Manjari, B1-7 etc.) on farmers fields with some input subsidy</p> <p>Avoid burning of wheat straw</p> <p>Harvesting and collection of perennial vegetation particularly grasses which grow during monsoon</p> <p>Proper drying, bailing and densification of harvested grass</p> <p>Capacity building and preparedness of the stakeholders and official staff for the extreme events</p>		
Heat & Cold wave	<p>Arrangement for protection from heat wave</p> <ul style="list-style-type: none"> i) Provision shed with bamboo/thatched material ii) Plantation around the shed iii) H₂O sprinklers / foggers in the shed iv) Application of white reflector paint on the roof <p>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)</p>	<p>Allow the animals early in the morning or late in the evening for grazing during heat waves</p> <p>Allow for grazing between 10AM to 3PM during cold waves</p> <p>Feed green fodder/silage / concentrates during day time and roughages / hay during night time in case of heat waves</p> <p>Add 25-50 ml of edible oil in concentrates and fed to the animal during cold waves</p> <p>Put on the foggers / sprinklers during heat waves and heaters during cold waves</p> <p>In severe cases, vitamin 'C' and electrolytes should be added in H₂O during severe heat waves.</p> <p>Apply / sprinkle lime powder in the animal shed during cold waves to neutralize ammonia accumulation</p>	<p>Feed the animals as per routine schedule</p> <p>Allow the animals for grazing (normal timings)</p>
Health and Disease management	<p>Procure and stock emergency medicines and vaccines for important endemic diseases of the area</p> <p>All the stock must be immunized for endemic diseases of the area</p> <p>Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district</p> <p>Adequate refreshment training on draught</p>	<p>Carryout deworming to all animals entering into relief camps</p> <p>Identification and quarantine of sick animals</p> <p>Constitution of Rapid Action Veterinary Force</p> <p>Performing ring vaccination (8 km radius) in case of any outbreak</p> <p>Restricting movement of livestock in case of any epidemic</p> <p>Rescue of sick and injured animals and their treatment</p>	<p>Keep close surveillance on disease outbreak.</p> <p>Undertake the vaccination depending on need</p> <p>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</p>

	management to be given to VAS, Jr.VAS, LI with regard to health & management measures. Procure and stock multivitamins & area specific mineral mixture	Organize with community, daily lifting of dung from relief camps	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 wheat, sorghum, bajra etc, Culling of weak birds	Supplementation only for productive birds with house hold grain Supplementation of shell grit (calcium) for laying birds	Supplementation to all
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 IB	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 lime 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/Aquaculture: Not Applicable