

State: MADHYA PRADESH

Agriculture Contingency Plan for District: HARDA

1.0 District Agriculture profile			
1.1	Agro-Climatic/Ecological Zone		
	Agro Ecological Sub Region (ICAR)	Central Highlands (Malwa And Bundelkhand), Hot Subhumid (Dry) Eco-Sub region (10.1)	
	Agro-Climatic Zone (Planning Commission)	Western Plateau And Hills Region (IX)	
	Agro Climatic Zone (NARP)	Central Narmada valley (MP-6)	
	List all the districts or part thereof falling under the NARP Zone	Hoshangabad, Narsinghpur, Harda.	
	Geographic coordinates of district headquarters	Latitude	Longitude
		21°53' to 22°36' N	76°47' to 77°20' E
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Altitude	
		302 m	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Zonal Agricultural Research Station, Powarkheda (M.P.)	
	Mention the KVK located in the district	JNKVV, Krishi Vigyan Kendra, HARDA (M.P.)-461331	
1.2	Rainfall	Normal RF(mm)	Normal Onset
	SW monsoon (June-Sep):	1274.6	2 nd week of June
	NE Monsoon(Oct-Dec):	67.4	4 th week of September
	Winter (Jan- Feb)	17.5	-
	Summer (March-May)	15	-
	Annual	1374.5	-

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)	330.6	182.2	104.8	8.7	13.7	5.10	0.4	15.70	0.1	1.5

* Net sown area + current fallow + Old fallow

1.4	Major Soils (common names like red sandy loam deep soils (etc.,))*	Area ('000 ha)	Percent (%) of total
	Deep Black soils	146.8	44.2
	Medium deep black soils	60.2	18.1
	Shallow soils	125.2	37.6

* mention colour, texture (sandy, loamy, clayey etc), depth and give vernacular name in brackets
NBSS & LUP, Nagpur

Source:

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	180.6	176
	Area sown more than once	137.5	
	Gross cropped area	318.1	

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	141.4		
	Gross irrigated area	141.4		
	Rainfed area	39.20		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals	01	79.5	56.4

	Tanks	01	1.0	0.7
	Open wells	8140	30.7	21.8
	Bore wells	1894	14.2	10.0
	Lift irrigation schemes	NA	-	
	Micro-irrigation	NA	-	
	Other sources (reservoir)	12	16.9	12.0
	Total Irrigated Area		141.4	
	Pump sets	38124		
	No. of Tractors	5172	-	-
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils 03	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited			
	Critical	01	70	
	Semi- critical	01	34	
	Safe	01	68	
	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. (2008-09)

1.7	Major Field Crops cultivated	Area ('000 ha)							
		<i>Kharif</i>			<i>Rabi</i>			Summer	Total
		<i>Irrigated</i>	<i>Rainfed</i>	Total	<i>Irrigated</i>	<i>Rainfed</i>	Total		
	Soybean	-		165.0	-	-	-	NA	165.0
	Cotton	-		3.2	-	-	-	-	3.2
	Pigeonpea	-		1.6	-	-	-	-	1.6
	Maize	-		1.2	-	-	-	-	1.2

	Rice			0.8	-	-	-	-	0.8
	Wheat	-	-	-			114.7	-	114.7
	Chickpea	-	-	-			27.5	-	27.5
	Pea						0.4		0.4
	Sugarcane	-	-	-			0.3	-	0.3
	Lentil	-	-	-	-	-	0.1		0.1
	Horticulture crops - Fruits	Total area			Irrigated		Rainfed		
	Mango	0.1			-		0.1		
	Orange	0.2			0.26				
	Sapota	0.0			0.02		-		
	Gauava	0.2			-		0.2		
	Papaya	0.03			0.03		-		
	Anola	0.2			-		0.21		
	Horticultural crops - Vegetables								
	Garden Pea	0.4			0.40		-		
	Tomato	0.1			0.10		-		
	Potato	0.08			0.08		-		
	Cabbage	0.06			0.06		-		
	Cauliflower	0.05			0.05		-		

1.7	Major Field Crops cultivated	Area ('000 ha)							Total
		<i>Kharif</i>			<i>Rabi</i>			Summer	
		<i>Irrigated</i>	<i>Rainfed</i>	Total	<i>Irrigated</i>	<i>Rainfed</i>	Total		
	Chilli							0.2	
	Garlic							0.04	
	Onion							0.2	
	Coriander							0.04	

	Methi				0.02
	Ladiesfinger				0.14
	Medicinal and Aromatic crops				
	Ashyagandha				0.005
	LemonGrass				0.01
	Tulsi				0.01
	Others				0.02
	Marigold				0.18
	Rose				0.02

	Plantation crops	Total area	Irrigated	Rainfed
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	Others such as industrial pulpwood crops etc (specify)			
	Fodder crops	Total area	Irrigated	Rainfed
	Barseem	0.450	0.450	-
	Chari	0.346	0.346	-
	Others (specify)			
	Total fodder crop area			
	Grazing land	13.70		
	Sericulture etc	0.051	0.051	
	Others (Specify)			

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)	0.054	0.16	0.22
	Crossbred cattle	0.41	1.94	2.35
	Non descriptive Buffaloes (local low yielding)	8.60	64.23	72.83
	Graded Buffaloes	81.01	86.72	167.73

	Goat	13.74	36.66	50.41
	Sheep	-	-	-
	Pig, horse	0.31	0.95	1.26
	Commercial dairy farms (Number)			-
1.9	Poultry	No. of farms	Total No. of birds ('000)	
	Commercial	---	---	
	Backyard :- Hens	---	70.755	

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	
		84		03		193	
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)	854.1		2.42		112.1	
	Others						

1.11 Production and Productivity of major crops

1.11	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder ('000 tons)
		Production ('000 t)	Productivity (kg/ha)							
Major Field crops (Crops to be identified based on total acreage)										
	Soybean	213.7	1311	-	-	-NA	-	213.7	1311	
	Pigeonpea	2.4	913.0	-	-	-	-	2.4	913.0	
	Cotton	2.2	641	-	-	-	-	2.2	641	
	Maize	1.7	1211	-	-	-	-	1.7	1211	
	Rice	1.5	1771	-	-	-	-	1.5	1771	
	Sorghum	1.3	1495					1.3	1495	
	Wheat	-	-	319.1	2697	-	-	319.1	2697	
	Gram	-	-	33.1	1543	-	-	33.1	1543	
	Sugarcane	-	-	0.6	2743	-	-	0.6	2743	
	Pea	-	-	0.1	369	-	-	0.1	369	
	Lentil			0.1	464			0.1	464	
Major Horticultural crops (Crops to be identified based on total acreage)- NA										
	-	-	-	-	-	-	-	-	-	-

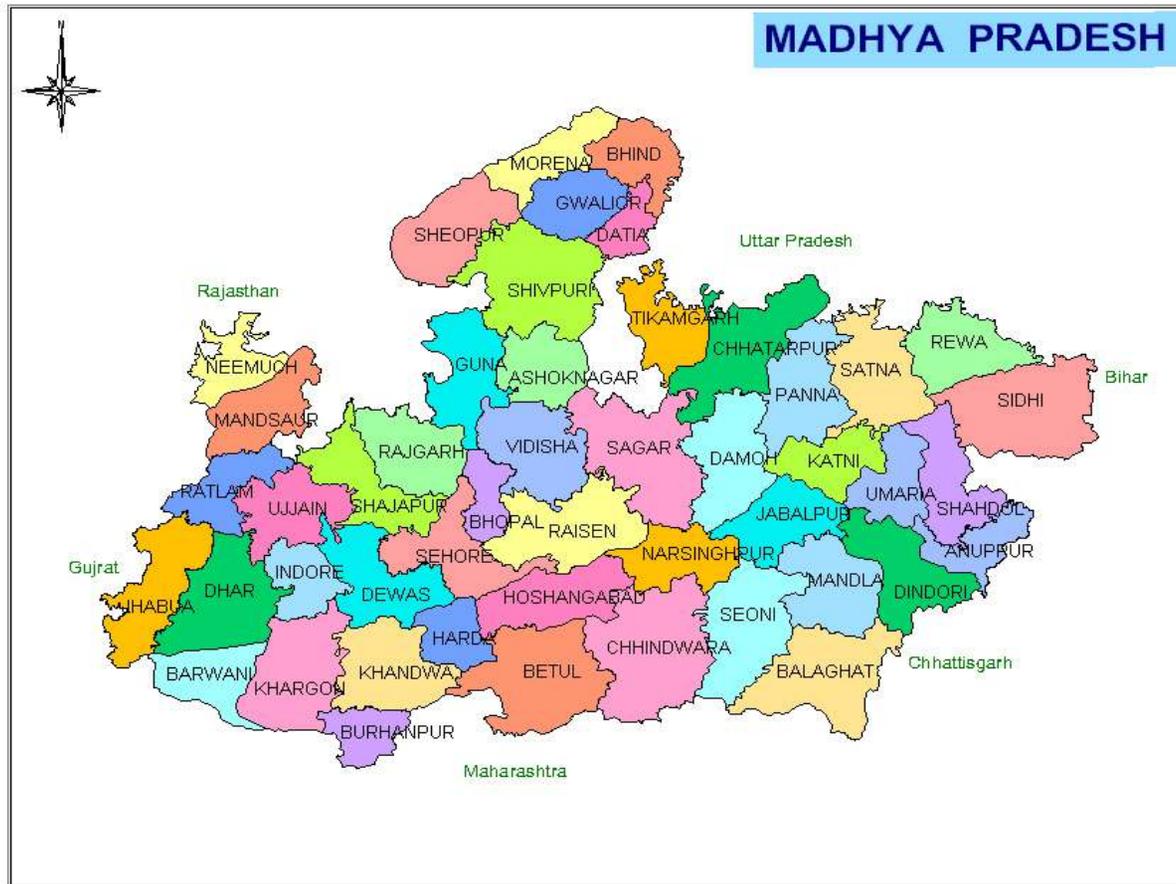
1.12	Sowing window for 5 major crops (start and end of sowing period)	Soybean	Cotton	Pigeonpea	Maize	Rice	Wheat	Chickpea
	Kharif-Rainfed	3 rd week of June – 2 nd week of July	3 rd week of June - 2 nd week of July	3 rd week of June – 2 nd week of July	2 nd week of June- 2 nd week of July	1 st week of July- 2 nd week of July	-	-
	Kharif-Irrigated	2 nd week of June – 4 th week of July	1 st week of May – 2 nd week of July			2 nd week of July- 4 th week of July	-	
	Rabi-Rainfed	-		-	-	-	-	-

	Rabi-Irrigated	-		-	-	-	2 nd week of October – 4 th week of December	1 st week of October - 4 th week of November
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1.13	What is the major contingency the district is prone to? (Tick mark)	Regular	Occasional	None
	Drought		√	
	Flood			√
	Cyclone			√
	Hail storm		✓	
	Heat wave		✓	
	Cold wave			√
	Frost			√
	Sea water intrusion			√
	Pests and disease outbreak (specify)		✓	
	Others (specify)			

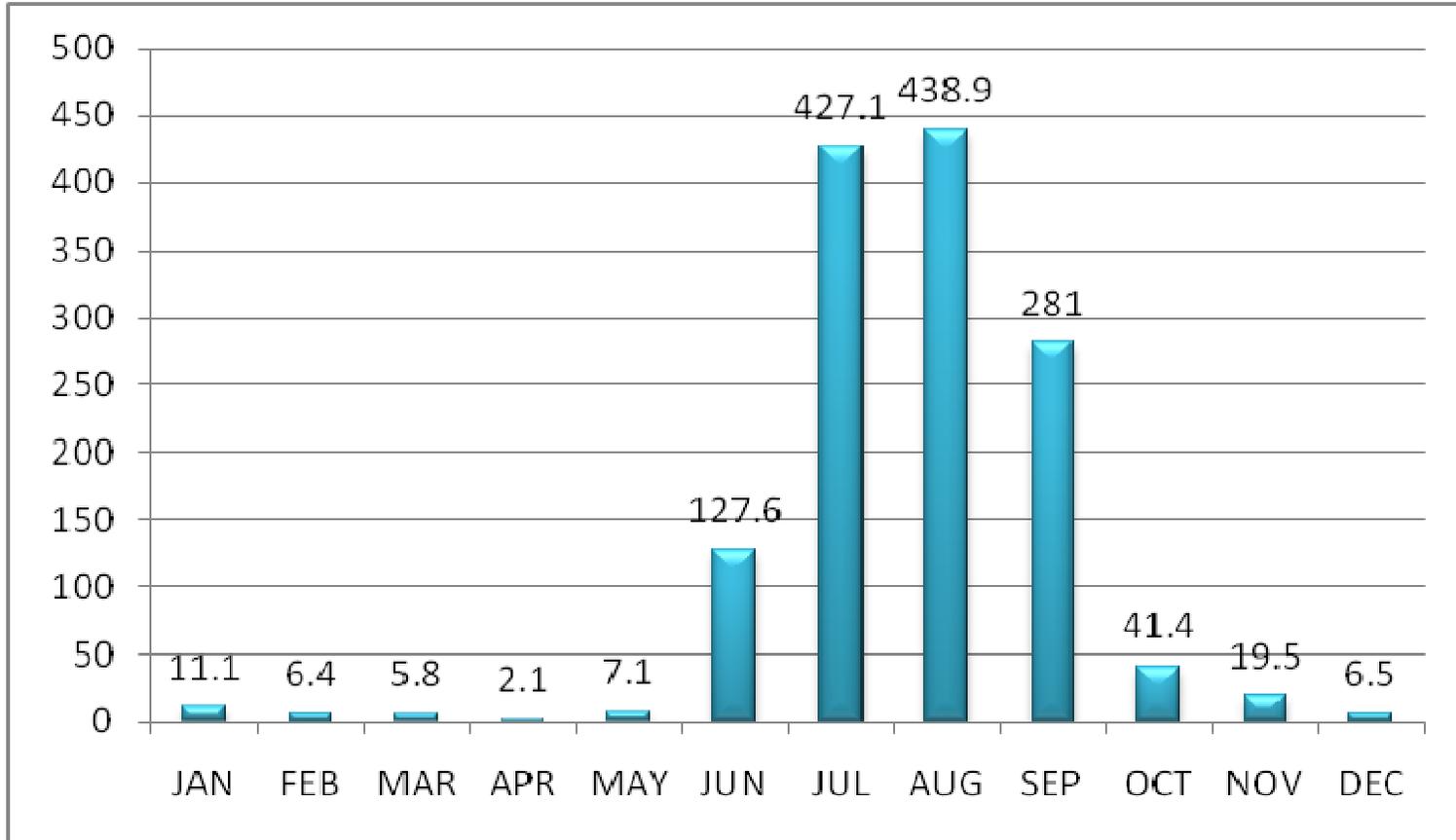
1.14	Include Digital maps of the district for		
		Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

Annexure I

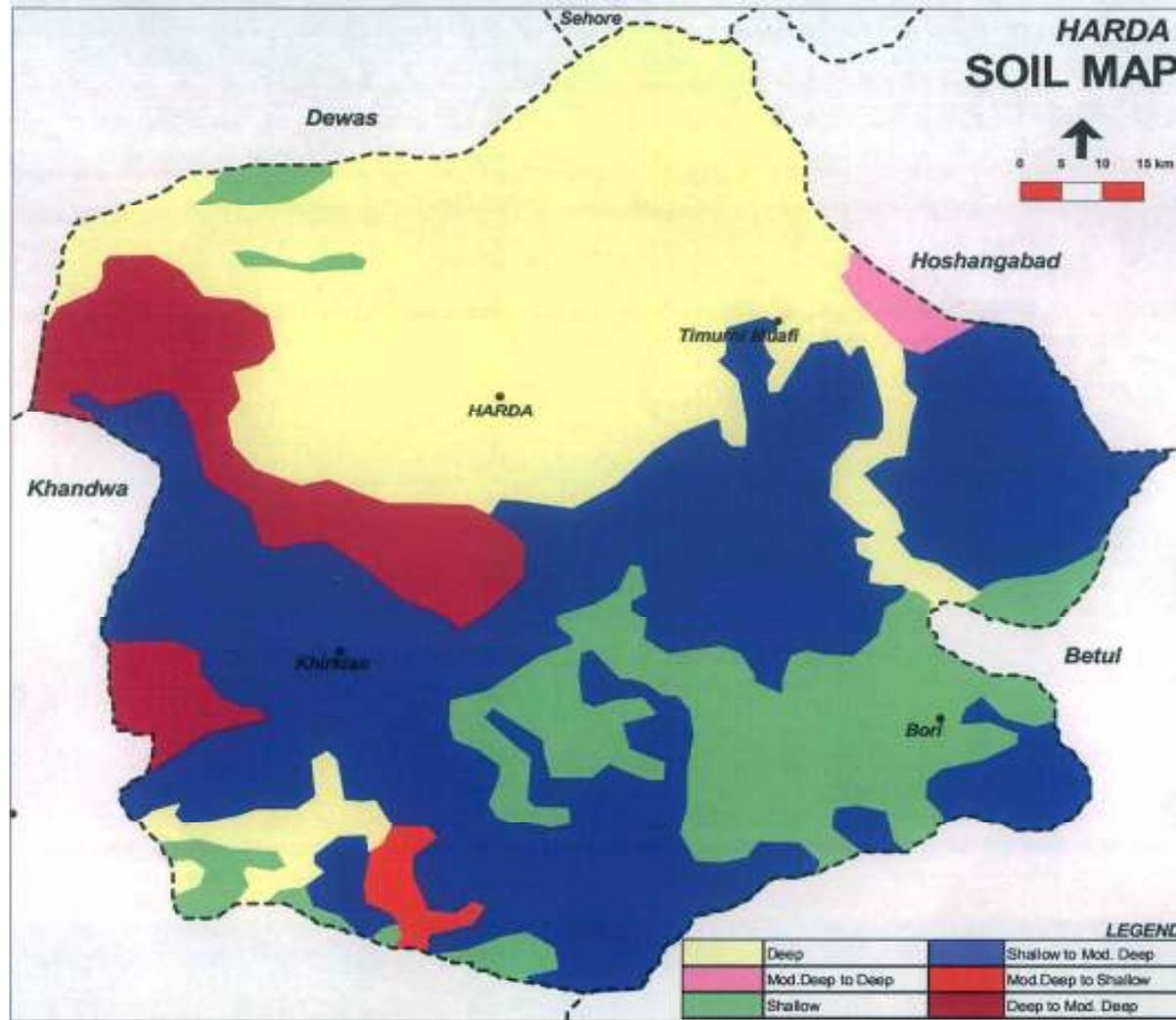




Annexure II



Annexure III



Source: NBSS & LUP, Nagpur

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	Crop/ cropping system	Change in crop/cropping system	Agronomic measures	Remark on implementation
Delay by 2 weeks (4 th week of June)	Deep to medium black Soils	Cotton-Wheat	No change	Sowing with short duration Bt.hybrids -Making field free of weeds full utilization of water and nutrients by the crops	Seeds seed corporation, Agriculture universities Improved Ridge and furrow maker implement available at CIAE adjustable with seed cum ferti drill
		Soybean-Wheat	No change	Making field free of weeds full utilization of water and nutrients by the crops,	
	Shallow black soils	Soybean/ Pigeompea / maize	No change	-Making field free of weeds full utilization of water and nutrients by the crops	JNKVV, RVSKVV, Seed corporation)

Condition		Suggested Contingency measures			
Early season drought (delayed onset)	Major Farming situation	Crop/ cropping system	Change in crop/cropping system	Agronomic measures	Remark on implementation
Delay by 4 weeks (2 nd week of July)	Deep black Soil	Cotton-Wheat	Donot prefer sowing of soybean beyond 10th July, if sown there will be yield reduction	Hybrid Sorghum with increased seed rate up to 25 %.	JNKVV, RVSKVV, Seed corporation)
		Soybean-Wheat			

			Sorghum-Wheat Hybrid Sorghum: CHS-6 and CHS- 14		
	Shallow black soils	Soybean/	Prefer blackgram/ greengram/ sesame in place of soybean Greengram: JM-721,K-851), Blackgram: JU-2,T-9 Sesame: JT-7,TKG-21,TKG-22	Provide light irrigation may be applied during initial growth stages	
		Pigeompea / maize	No change		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Crop/ cropping system	Change in crop/cropping system	Agronomic measures	Remark on implementation
Delay by 6 weeks (4 th week of July)	Deep black Soils	Cotton-Wheat	Donot prefer sowing of soybean Blackgram/ Greengram/ Sesame Greengram: JM-721,K851 Blackgram: JU-2,T-9), Sesame: JT-7,TKG-21,TKG-22	Provide light irrigation may be applied during initial growth stages	JNKVV, RVSKVV, Seed corporation)
		Soybean -Wheat	Sesame –Wheat Sesame: JT-7,TKG-21,TKG-22		

	Shallow black soils	Soybean/ Pigeompea / Maize	Sesame –Wheat/ Sorghum-Wheat Sesame: JT-7,TKG- 21,TKG-22	Provide life saving irrigation may be applied during initial growth stages	
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Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Crop/ cropping system	Change in crop/cropping system	Agronomic measures	Remark on implementation
Delay by 8 weeks (2 nd week of August)	Deep black Soil	Cotton-Wheat	Fallow in kharif	Soil moisture conservation. Field preparation for rabi crop. Prefer to sow alternate crop like toria, mustard, linseed, lentil (in line sowing)	JNKVV, RVSKVV, Seed corporation)
	Shallow black soils	Soybean- Wheat	Do not prefer sowing of soybean Prefer to sow Niger/ Sesame		

Condition			Suggested Contingency measures		
Early season drought (Normal onset)	Major Farming situation	Crop/ cropping system	Crop management	Soil nutrient & moisture conservation measures	Remark on implementation
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Deep black Soil	Cotton-Wheat	Reduction of plant density and it is always better to re sowing with subsequent rain rather than allowing sub-optional poor plant stand to persist.	1.Frequent inter culture to facilitate effect of loose soil as dust mulch 2.Mulching with subabul lopping, straw etc. to conserve the soil moisture	JNKVV, RVSKVV, Seed corporation)
	Light Black soils	Soybean-Wheat	Repeated intercultural operation to keep the field weed free. Plant population may be reduced and shallow intercultural (dust mulching) may be practiced	Frequent inter culture to facilitate effect of loose soil as dust mulch. Ridge & Furrow sowing	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless(>2.5 mm period))	Major Farming situation	Crop/ cropping system	Crop management	Soil nutrient & moisture conservation measures	Remark on implementation
At vegetative stage	Deep black soil	Cotton-Wheat	Repeated intercultural operation to keep the field weed free	Development of ridge and furrow across the slop for effective conservation of soil moisture as well as rainwater Use of micro-irrigation system such as drip and sprinkler may be adopted wherever feasible and in the event of limited water availability	JNKVV, RVSKVV, Seed corporation)
		Soybean-Wheat			
	Shallow black soil	Soybean-Wheat/ Chickpea			

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major Farming situation	Crop/ cropping system	Crop management	Soil nutrient & moisture conservation measures	Remark on implementation
At reproductive stage	Deep black Soil	Cotton-Wheat	Foliar application of 2.5 % urea with 2.5 % KCL or MOP	Adopt alternate furrow irrigation to effect water economy. Remove weeds and used as surface mulch to conserve soil moisture	-
		Soybean-Wheat			
	Shallow black soil	Soybean-Wheat/ Chickpea			

Condition			Suggested Contingency measures		
Terminal drought	Major Farming situation	Crop/ cropping	Crop management	Soil nutrient & moisture conservation measures	Remark on implementation

	Deep black Soil	Cotton-Wheat	Provide protective irrigation (Wherever water resources are available such as lake, pond, wells etc.)	Repeated intercultural operation to keep the field weed free and use of organic mulches. Plan for Rabi crops like lentil, linseed, chickpea etc.	-
		Soybean-Wheat			
	Shallow black soil	Soybean-Wheat/ Chickpea			

2.1.1 Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remark on implementation
Delayed/limited release of water in canals due to low rainfall	Deep black Soil	Cotton-Wheat	Soybean-Wheat	Adopt alternate furrow irrigation and use of micro-irrigation system such as drip and sprinkler may be adopted.	-
		Soybean-Wheat	Black gram-Wheat	Strengthen the field bunds. Take up necessary soil and water conservation measures for minimizing water flow and to minimize soil loss from the fields	
	Shallow black soil	Soybean-Wheat/ Chickpea	Maize-Mustard	Strengthen the field bunds. Take up necessary soil and water conservation measures for minimizing water flow and to minimize soil loss from the fields	
			Sesame-Chickpea	Adopt alternate furrow irrigation and use of micro-irrigation system such as drip and sprinkler may be adopted	

Condition			Suggested Contingency measures		
	Major Farming situation	Crop/ cropping system	Change in crop/cropping system	Agronomic measures	Remark on implementation
Non release of water in canals under delayed onset of monsoon in catchment	Deep black Soil	Cotton-Wheat	Soybean-Wheat	Prefer short duration varieties If cotton to be taken adopt skip furrow irrigation or irrigation at critical stages . In case of soybean one pre sowing irrigation and if necessary one irrigation at critical stage at pod development to be given	
		Soybean-Wheat	Black gram-Wheat	Prefer short duration varieties In case of soybean, adopt sowing on ridges and give one pre sowing irrigation and if necessary one irrigation at critical stage i.e., pod development to be given	
	Shallow black soils	Soybean-Wheat/ Soybean-Chickpea	Maize-Mustard	Prefer short duration varieties Adopt sowing on ridges and furrows and provide irrigation at critical stage	
			Sesame-Chickpea	Prefer short duration varieties Sesame: JT-7,TKG-21,TKG-22	

Condition			Suggested Contingency measures		
	Major Farming situation	Crop/ cropping system	Change in crop/cropping system	Agronomic measures	Remark on implementation
Lack of inflows into tank due to insufficient/delayed onset of monsoon	Deep black Soil	Cotton-Wheat	Soybean-Wheat	Take up repair of farm ponds, cleaning of drains. Take up inter terrace land management practices like compartmental bending etc., as recommended	-
		Soybean-Wheat	Black gram-Wheat	Necessary activities may be taken up for development and construction of rain water harvesting structures like farm pond.	
	Light Black soil	Soybean-Wheat	Maize-Mustard	-	
		Soybean-Chickpea	Sesame-Chickpea	-	

Condition			Suggested Contingency measures		
	Major Farming situation	Crop/ cropping system	Change in crop/cropping system	Agronomic measures	Remark on implementation
Insufficient groundwater	Deep black Soil	Cotton-Wheat	Soybean-Wheat	Major emphasis on in-situ rain water conservation, harvesting excess run-off for re-use and groundwater recharge.	-

(open wells and borewells) recharge due to low rainfall				Adopt Improved irrigation systems (drip, sprinkler etc) to increase water use efficiency.	
		Soybean-Wheat	Blackgram-Wheat	Major emphasis on in-situ rain water conservation, harvesting excess run-off for re-use and groundwater recharge	
	Shallow black soils	Soybean-Wheat/Chickpea	Soybean-Chickpea/Wheat	Chickpea should be sown under residual moisture immediately after harvest of soybean or give pre sowing irrigation to chickpea	
				Prefer short duration low water requirement varieties of wheat. Protective irrigation at CRI stage in wheat.	
		Sesame-Chickpea	Major emphasis on in-situ rain water conservation, harvesting excess run-off for re-use and groundwater recharge	-	

2.2 Unusual rains (untimely, un seasonal etc)

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Continuous high rainfall in a short span leading to water logging				
Soybean	Care should be taken that rain water does not stagnate in the field.	Care should be taken that rain water does not stagnate in the field.	Care should be taken that rain water does not stagnate in the field.	Produce should be placed in dry and shade place.
Cotton	Proper drainage should be provided and adopt all plant protection measures	Remove and destroy <i>Parthenium hysterophorus</i> weed, particularly in the vicinity of cotton crop since it plays host to mango mealy bug. Proper drainage should be provided and adopt all plant protection measures	Proper drainage should be provided and adopt all plant protection measures. Cotton is at boll development/bursting stage. Pick up cotton lint timely.	-
Maize, Pigeon pea	Proper drainage Sowing with ridge & furrow method,	Drainage of excess water, Foliar spray of suitable hormone.	Drainage of excess water. Harvesting of crop at physiological maturity.	Safe storage of grains

	Top dressing of urea to recover of crop.	Interculture		
Wheat	Care should be taken that rain water does not stagnate in the field and not allow to top dressing of nitrogenous fertilizers.	Care should be taken that rain water does not stagnate in the field and not allow to top dressing of nitrogenous fertilizers.	Proper drainage should be provided and adopt all plant protection measures	-
Chickpea	Care should be taken that rain water does not stagnate in the field and not allow to top dressing of nitrogenous fertilizers.	Care should be taken that rain water does not stagnate in the field and not allow to top dressing g of nitrogenous fertilizers.	Proper drainage should be provided and adopt all plant protection measures	
Horticulture				
Tomato, Chilli, Brinjal,	Sowing of seeds and transplanting of seedlings with raised bed method,	Drainage of excess water	Drainage of excess water	-
Cow pea, Okra	Sowing of seeds with raised bed method,	Drainage of excess water	Drainage of excess water	-
Heavy rainfall with high speed wind in a short span	Not applicable			
Out break of pests and diseases due to un seasonal rains	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Soybean, Pigeonpea, Maize	Carry out critical survey of fields for insect and disease attack in crops	Carry out critical survey of fields for insect and disease attack in crops	Carry out critical survey of fields for insect and disease attack in crops	-
Cotton	Adopt recommended measures against pest attack in cotton.	Adopt recommended measures against pest attack in cotton. Spray Emmamectin benzoate, Spinosad against bollworm Remove and destroy <i>Parthenium hysterophorus</i> weed, particularly in the vicinity of cotton crop since it	Carry out critical survey of fields for insect and disease attack in crops	

		plays host to mango mealy bug.		
Wheat	Spray 0.2 % Mancozeb 76% WP or Hexaconazole against wheat rust.	Spray 0.2 % Mancozeb 76% WP or Hexaconazole against wheat rust.	Carry out critical survey of fields for disease attack in crops	
Chickpea	Spray Triazophos 40 % EC @ 1-1.5 l/ha in chickpea against pest incidence. “T” shaped pegs @ 50/ha placed in late sown chickpea field for biological control of pod borer and for chemical control spraying of Quinalphos 25 EC or Chlorpyriphos 20 EC or Indoxacarb 14.5 SC or Spinosad 45 SC.	Spray Triazophos 40 % EC @ 1-1.5 l/ha in chickpea against pest incidence. “T” shaped pegs @ 50/ha placed in late sown chickpea field for biological control of pod borer and for chemical control spraying of Quinalphos 25 EC or Chlorpyriphos 20 EC or Indoxacarb 14.5 SC or Spinosad 45 SC.	Spray Triazophos 40 % EC @ 1-1.5 l/ha in chickpea against pest incidence. Carry out critical survey of fields for insect and disease attack in crops	-

2.3 Floods: Not Applicable

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation				
Continuous submergence for more than 2 days	Not Applicable			
Sea water intrusion	Not Applicable			

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

Extreme event type	Suggested contingency measure ^r			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave	NA			
Wheat ,Chickpea Lentil,Pigeonpea Linseed,Musturd	Protect the crop with the help of light irrigation, wind breaks are necessary where cold and heat wave in regular	Protect the crop with the help of light irrigation; wind breaks are necessary where cold and heat wave in regular	Protect the crop with the help of light irrigation; wind breaks are necessary where cold and heat wave in regular	Protect the crop with the help of light irrigation
Horticulture	Not applicable			

Vegetables				
Cold wave	Not applicable			
Frost	Not applicable			
Hailstorm				
Wheat, Chickpea Lentil Pigeonpea Linseed Musturd	Re-sowing in case of severe damage	Light and frequent irrigation	<ul style="list-style-type: none"> Apply 10% additional nitrogen Light and frequent irrigation 	Timely harvesting and shifting of produce to safer place in case of early forewarning
Horticulture				
Vegetables				
Cyclone	Not applicable			

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 following practices may be implemented to prevent fodder shortage problem</p> <p>Sowing of cereals (fodder varieties of Sorghum/ Bajra) and leguminous crops (Lucerne, Berseem, Horse Chickpea, Cowpea) during North-East monsoon under dry land system for fodder production.</p> <p>Collection of soybean and chick pea stover for use as feed supplement during drought</p>	<p>Harvest and use biomass of dried up crops (Rice, wheat, Maize, Soybean, Black gram, Green gram, chick pea etc.,) material as fodder</p> <p>Harvest all the top fodder available (Subabul, Glyricidia, Pipol, Prosopis etc) and feed the LS during drought</p> <p>Concentrate ingredients such as Grains, brans, chunnies & oilseed cakes, low</p>	<p>Encourage progressive farmers to grow multi cut fodder crops of sorghum/bajra/maize with input subsidy</p> <p>Supply of quality stem cuttings of Hybrid napier (CO1), paragrass, guinea grass etc., well before monsoon</p> <p>Encourage growing fodder crops like Berseem in winter and Juar</p>

	<p>Preserving the green maize fodder as silage</p> <p>Encourage fodder production with Bajra – stylo-Bajra on rotation basis and also to cultivate short-term fodder crops like sunhemp</p>	<p>grade grains etc. unfit for human consumption should be procured from Govt. Godowns for feeding as supplement for high productive animals during drought</p> <p>Promotion of Horse gram as contingent crop and harvesting it at vegetative stage as fodder</p> <p>Continuous supplementation of minerals and vitamin to prevent infertility.</p> <p>Encourage mixing available kitchen waste with dry fodder while feeding to the milch animals</p>	<p>in summer season</p> <p>Flushing the stock to recoup</p> <p>Replenish the feed and fodder banks</p>
Drinking water	<p>Adopt various water conservation methods at village level to improve the ground water level for adequate water supply.</p> <p>Identification of water resources</p> <p>De-silting of ponds</p> <p>Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals)</p> <p>Construction of drinking water tanks in herding places/village junctions/relief camp locations</p> <p>Community drinking water trough can be arranged in sandies /community grazing areas</p>	<p>Adequate supply of drinking water.</p> <p>Restrict wallowing of animals in water bodies/resources; Add alum in stagnated water bodies</p>	<p>Watershed management practices shall be promoted to conserve the rainwater. Bleach (0.1%) drinking water / water sources</p> <p>Provide clean drinking water</p>
Health and diseases management	<p>Procure and stock emergency medicines and vaccines for important endemic diseases of the area</p>	<p>Carryout deworming to all animals entering into relief camps</p> <p>Identification and quarantine of sick animals</p>	<p>Keep close surveillance on disease outbreak.</p> <p>Undertake the vaccination</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 management to be given to VAS, Jr.VAS, LI with regard to health & management measures</p> <p>Procure and stock multivitamins & area specific mineral mixture</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>Tick control measures be undertaken to prevent tick borne diseases in animals</p> <p>Rescue of sick and injured animals and their treatment</p> <p>Organize with community, daily lifting of dung from relief camps</p>	<p>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 not coincide with mid summer</p>
Floods	NA		
Cyclone	NA		
Heat wave and cold wave			
Heat wave	<ul style="list-style-type: none"> i) Plantation around the shed ii) H₂O 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 	<p>Allow the animals early in the morning or late in the evening for grazing during heat waves</p> <p>Feed green fodder/silage / concentrates during day time and roughages / hay during night time in case of heat waves</p> <p>Put on the foggers / sprinklers /fans during heat waves in case of high yielders (Jersey/HF crosses)</p> <p>In severe cases, vitamin 'C' and electrolytes should be added in H₂O during heat waves.</p>	<p>Feed the animals as per routine schedule</p> <p>Allow the animals for grazing (normal timings)</p>
Cold wave	<p>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 for grazing between 10AM to 3PM during cold waves</p> <p>Add 25-50 ml of edible oil in concentrates and fed to the animal during cold waves</p> <p>Apply / sprinkle lime powder in the animal shed during cold waves to neutralize ammonia</p>	<p>Feed the animals as per routine schedule</p> <p>Allow the animals for grazing (normal timings)</p>

		accumulation	
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		
	Before the event	During the event	After the event
Drought			
Shortage of feed ingredients	Storing of house hold grain like maize, broken rice etc, in to use as feed in case of severe drought	Supplementation only for productive birds with house hold grain Supplementation of shell grit (calcium) for laying birds Culling of weak birds	Supplementation to all survived birds
Drinking water		Use water sanitizers or offer cool hygienic drinking water	
Health and disease management	Culling of sick birds. De-worming and vaccination against RD and IBD	Mixing of Vit. A,D,E, K and B-complex including vit C in drinking water (5ml in one litre water)	Hygienic and sanitation of poultry house Disposal of dead birds by burning / burying with lime powder in pit
Floods	NA		
Cyclone	NA		
Heat wave and cold wave			
Shelter/environment management	Heat wave: 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

	Cold wave: 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	De-worming and vaccination against RD and fowl pox	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

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event	During the event	After the event
Drought			
Shallow water in ponds due to insufficient rains/inflow	1. Restricted release of water from reservoir. 2. Supplementary water harvest structures like pond and tanks have to be developed. 3. Renovation and maintenance of existing water harvest structures	1. Restrict lifting of water for irrigation purpose of crops 2. Catch the stock, market the produce to reduce the density of population in ponds.	1. Excavate the ponds to increase the depth. 2. Try to release water into the pond if it rains in off-season
Impact of heat & salt load build up in ponds / change in water quality	1. Prepare to release water into the habitat	1. Mixing of water from the water harvest structure like ponds and tanks into the fish habitat.	1. Monitoring the water quality and health of aquatic organisms
Floods	NA		
Cyclone	NA		
Heat wave and cold wave			
Management of pond environment	Good water quality to be maintained, Water depth to be maintained	Recirculation of water and pruning	Water treatment with lime
Health and diseases management	Prophylactic measures to be taken	Maintain good quality water in ponds	Treatment of pond water with lime and medicines