State: Madhya Pradesh

Agriculture Contingency Plan: Khargone (West Nimar) District

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	Madhya Bharat plateau , western Malwa plateau, eastern Gujarat plain, Vindhyan and Satpura range and Narmada valley		
	Agro-Climatic Region (Planning Commission)	9 Western Plateau & Hills Region		
	Agro Climatic Zone (NARP)	XI Nimar Valley		
	List all the districts or part thereof falling under the NARP Zone	Khargone, Khandwa, Barwani, Harda and Dhar (Manawar, Dharampuri and Gandhwani tehsils)		
	Geographic coordinates of district	Latitude	Longitude	Altitude
		75°36' 28" E	21°49' 20" N	283 meters
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Zonal Agricultural Research Station, RVSKVV Khandwa Road, Khargone (West Nimar) Madhya Pradesh (451001)		
	Mention the KVK located in the district	KVK, ZARS, West Nimar, Khargone dist., 451 001 (MP)		
1.2	**Rainfall**	Average (mm)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	835	Last week June	IInd Week October
	NE Monsoon(Oct-Dec):			
	Winter (Jan- March)		-	-
	Summer (Apr-May)		-	-
	Annual	835	-	-

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	Old fallows
	Area (Lakh ha)	6.47790	405.7	1.68595	0.68598	58.6	0.22769	0.0	0.08790	1.8	8.5

Source – Directorate of Farmers welfare and Agriculture, Development of Madhya Pradesh, Bhopal, Agriculture Statistics 2009.

1. 4	**Major Soils**	Area (‘000 ha)	Percent (%) of total
	Deep soil	184.60	23.04
	Medium deep soil	190.20	23.76
	Shallow soils	426.40	53.19
1.5	**Agricultural land use**	Area (‘000 ha)	Cropping intensity %
	Net sown area	405.668	131.80
	Area sown more than once	51.760	
	Gross cropped area	534.706	

1.6	**Irrigation**	Area (‘000 ha)	Percent (%)	
	Net irrigated area	166.939	36.65	
	Gross irrigated area	166.939		
	Rainfed area		63.35	
	Sources of Irrigation	Number	Area (‘000 ha)	% area
	Canals	108	26.555	12.93
	Tanks	144	24.396	11.87
	Open wells	62611	93.662	45.57
	Bore wells	8885	30.926	15.04
	Lift irrigation			
	Other sources (Ponds)			
	Total			
	Pumpsets			
	Micro-irrigation			

	Groundwater availability and use	No. of blocks	% area	Quality of water
	Over exploited			
	Critical			
	Semi- critical			
	Safe			
	Wastewater availability and use			

*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%

Area under major field crops & horticulture etc.

1.7		**Major Field Crops cultivated**	**Area ('000 ha)***		
				Irrigated	**Rainfed**
	1	Cotton	211.450		211.450
	2	Wheat	114.199	114.199	
	3	Soybean	64.465		64.465
	4	Sorghum	47.005		47.005
	5	Maize	26.973		26.973
	6	Pigeon pea	13.879		13.879
	7	Gram	10.478	10.478	
	8	Ground nut	10.387		10.387
	9	Green gram	9.905		9.905
	10	Black gram	4.065		4.065
		Horticultural crops – Fruits	**Total area**	**Irrigated**	**Rainfed**
		Mango	0.020		
		Guava	0.362		
		Banana	0.259		
		Papaya	0.169		
		Others (Water Melon, Musk melon, etc.	0.204		
		Horticultural crops - Vegetables			
		Potato	0.115		
		Onion	0.315		
		Tomato	0.202		
		Spices crops	**Total area**		
		Chilly	17.583	**Irrigated**	**Rainfed**
		Coriander	0.405		
		Ginger	0.160		
		Garlic	0.122		
		Medicinal and Aromatic crops	**Total area**	**Irrigated**	**Rainfed**
		Fodder crops	**Total area**	**Irrigated**	**Rainfed**

		Total fodder crop area			
		Grazing land			
		Sericulture etc			
		Others (Specify)			

1.8	**Livestock**	**Number ('000)**		
	Cattle	476.007		
	Buffaloes total	166.129		
	Commercial dairy farms	-		
	Goat	302.003		
	Sheep	4.996		
	Others (Camel, Pig, Yak etc.)	4.993		
1.9	**Poultry**			
	Commercial			
	Backyard	296.474 Total		
1.10	**Fisheries**	Area (ha)	Yield (t/ha)	Production (tones)
	Brackish water			
	Fresh water			
	Others			

1.11	**Production and Productivity of major crops** (Average of last 3 years: 2006, 07, 08)	**Kharif**		**Rabi**		**Summer**		**Total**	
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)
Crop 1	Cotton	-	659.3					-	659.3
Crop 2	Wheat			200.5	2035.3			200.5	2035.3
Crop 3	Soybean	59.7	1001.0					59.7	1001.0
Crop 4	Sorghum	83.4	1327.7					83.4	1327.7
Crop 5	Maize	40.1	1551.0					40.1	1551.0
Crop 6	Pigeon pea	10.7	708.3					10.7	708.3
Crop 7	Gram			6.4	828.0			6.4	828.0
Crop 8	Ground nut	10.5	929.7					10.5	929.7
Crop 9	Green gram	3.9	373.3					3.9	373.3
Crop 10	Black gram	2.2	340.0					2.2	340.0
	Horticultural crops – Fruits								
	Mango							6	30000
	Guava							7.250	20000
	Banana							23.310	90000
	Papaya							-	-
	Others (Water Melon, Musk melon, etc.							-	-
	Horticultural crops - Vegetables								
	Potato							2.530	22000
	Onion							7.875	25000
	Tomato							4.040	20000
	Medicinal and Aromatic crops								
	Spices crops								
	Chilly							43.957	2500
	Coriander							0.607	1200
	Ginger							2.400	15000
	Garlic							0.158	1300
	Fodder crops								

	Total fodder crop area								
	Grazing land								
	Sericulture etc								

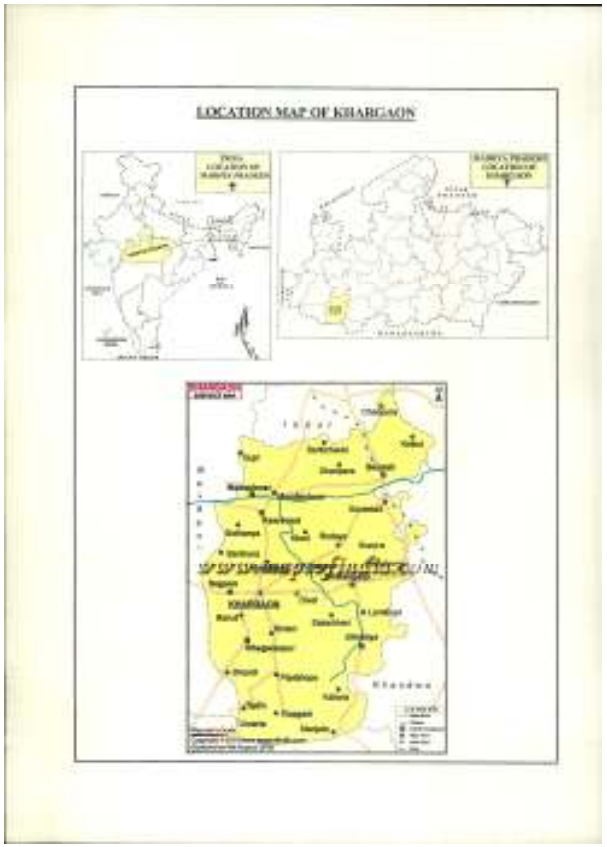
1.12	**Sowing window for 5 major crops (start and end of sowing period)**	Crop 1: Cotton	2: Chilli	3: Soybean	4: Jowar	5: Wheat
	Kharif- Rainfed	IInd Week of June	IInd Week of June to Ist week of July	Last week of June to Ist week of July	Last week of June to Ist week of July	
	Kharif-Irrigated	IInd Week of May to Last week of June	IInd Week of June to Ist week of July			
	Rabi- Rainfed					
	Rabi-Irrigated					IInd week of Nov. to Ist week Janu.

1.13	**What is the major contingency the district is prone to? (Tick mark)**	Regular			Sporadic (specify month of occurrence in brackets)			None
		Severe	Moderate	Mild	Severe	Moderate	Mild	
	Drought					√ (Aug.-Sep.)		
	Flood					√ (Aug.)		
	Cyclone							
	Hail storm							
	Heat wave		√ (May-June)					
	Cold wave							
	Frost							
	Sea water inundation							
	Pests and diseases (specify)	√ (Heliothis & Sucking pest)	√ (Wilting)	√ (Leefspot)				

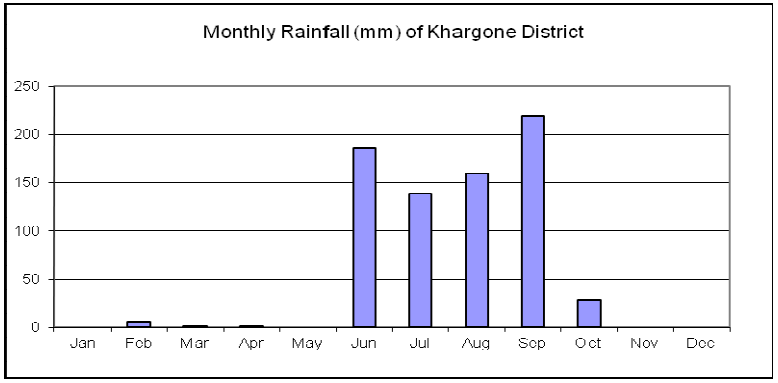
1.14	**Include Digital maps of the district for**	Location map of district with in State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

Annexure I

Location map

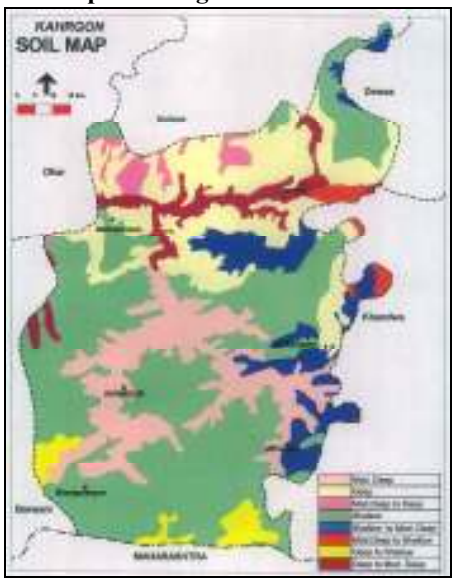


Annexure II
Mean annual rainfall



Annexure III

Soil map of Khargone district



(Source: NBSS&LUP, Amravati Road, 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**
1	2	3	4	5	6
Delay by 2 weeks (July 1st wk) 27MW	Shallow soils	Cotton	No change	Sowing of short duration Bt varieties, Making field free of weeds full utilization of water and nutrients by the crop	Link RKVY for the seed cum fertilizer drills -Supply of certified seeds through seed societies Seeds seed corporation, Agriculture universities
		Sorghum	Sorghum JJ 938, JJ 1041	-Select short duration varieties for sowing -Seed dressing with Thirum + carbendazim in 2:1 ratio 3g/kg seed - Rhyzobium culture + PSB 5g./kg. seed each. 1.0 g. Ammonium Molibdate/kg. of seed for soybean and chickpea cropping sequence -Cultivate the field on receiving pre monsoon showers	
		Soybean	JS 9305, JS 335		
		Maize	Maize HPQM 1,		
		Pigeonpea	No change	Pigeon pea (medium) JKM 189, TJT 501, RVICPH 2671 (Hy.) + Soybean (early) JS 95-60 (2:4 rows)	
		Groundnut	JGN 3, JGN23, TAG -22	Sowing in ridge and furrow system. Seed treatment with culture & fungicides	
	Moderate Deep Soils	Cotton	No change	Sowing of short duration Bt varities, Making field free of weeds full utilization of water and nutrients by the crop	
		Sorghum	Sorghum JJ 938, JJ 1041	-Select short duration varieties for sowing -Seed dressing with Thirum + carbendazim in 2:1 ratio 3g/kg seed - Rhyzobium culture + PSB 5g./kg. seed each. 1.0 g. Ammonium Molibdate/kg. of seed for soybean and chickpea cropping sequence -Cultivate the field on receiving pre monsoon showers	
		Soybean	JS 9305, JS 335		
		Maize	Maize HPQM 1,		
		Pigeonpea	No change	Pigeon pea (medium) JKM 189, TJT 501, RVICPH 2671 (Hy.) + Soybean (early) JS 95-60 (2:4 rows)	
		Groundnut	JGN 3, JGN23, TAG -22	Sowing in ridge and furrow system. Seed treatment with culture & fungicides	

	Deep soils	Cotton	No change	Sowing of short duration Bt varieties, Making field free of weeds full utilization of water and nutrients by the crop	
		Soybean	JS 9305, JS 335	-Select short duration varieties for sowing -Seed dressing with Thirum + carbendazim in 2:1 ratio 3g/kg seed - Rhyzobium culture + PSB 5g./kg. seed each. 1.0 g. Ammonium Molibdate/kg. of seed for soybean and chickpea cropping sequence -Cultivate the field on receiving pre monsoon showers - Intercropping of pigeonpea with soybean (2:4)	
		Pigeonpea	(medium) JKM 189, TJT 501, RVICPH 2671 (Hy.) + Soybean (early) JS 95-60 (2:4 rows)		
		Maize	Maize HPQM 1, JVM 421, Hybrids	-Seed dressing with Thirum + carbendazim in 2:1 ratio 3g/kg seed seed treatment by PSB 5g./kg.	

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**
1	2	3	4	5	6
Delay by 4 weeks (July IIIrd Week)	Shallow soils	Cotton	No change	Sowing of short duration Bt varieties, Making field free of weeds full utilization of water and nutrients by the crop	Link RKVY for the seed cum fertilizer drills -Supply of certified seeds through seed societies Seeds seed corporation, Agriculture universities
		Sorghum	Maize JVM 421, Early varieties	-Select short duration varieties for sowing -Seed dressing with Thirum + carbendazim in 2:1 ratio 3g/kg seed - Rhyzobium culture + PSB 5g./kg. seed each. 1.0 g. Ammonium Molibdate/kg. of seed for soybean and chickpea cropping sequence -Cultivate the field on receiving pre monsoon showers	
		Soybean	JS 9560		
		Maize	Maize HPQM 1,		
		Pigeonpea	No change	Pigeon pea (medium) JKM 189, TJT 501, RVICPH 2671 (Hy.) + Soybean (early) JS 95-60 (2:4 rows)	
		Groundnut	JGN 3, JGN23, TAG -22	Sowing in ridge and furrow system. Seed treatment with culture & fungicides	
	Moderate Deep Soils	Cotton	No change	Sowing of short duration Bt varieties, Making field free of weeds full utilization of water and nutrients by the crop	
		Sorghum	Sorghum JJ 938, JJ 1041	-Select short duration varieties for sowing -Seed dressing with Thirum + carbendazim in 2:1 ratio 3g/kg seed - Rhyzobium culture + PSB 5g./kg. seed each. 1.0 g. Ammonium Molibdate/kg. of seed for soybean and chickpea cropping sequence -Cultivate the field on receiving pre monsoon showers	
		Soybean	JS 9305, JS 335		
		Maize	Maize HPQM 1,		
		Pigeonpea	No change	Pigeon pea (medium) JKM 189, TJT 501, RVICPH 2671 (Hy.) + Soybean (early) JS 95-60 (2:4 rows)	
		Groundnut	JGN 3, JGN23, TAG -22	Sowing in ridge and furrow system. Seed treatment with culture & fungicides	
	Deep soils	Cotton	No change	Sowing of short duration Bt varieties, Making field free of weeds full utilization of water and nutrients by the crop	
		Soybean	JS 9305, JS 335	-Select short duration varieties for sowing -Seed dressing with Thirum + carbendazim in 2:1 ratio 3g/kg seed - Rhyzobium culture + PSB 5g./kg. seed each. 1.0 g. Ammonium Molibdate/kg. of seed for soybean and chickpea cropping sequence -Cultivate the field on receiving pre monsoon showers - Intercropping of pigeonpea with soybean (2:4)	
		Pigeonpea	(medium) JKM 189, TJT 501, RVICPH 2671 (Hy.) + Soybean (early) JS 95-60 (2:4 rows)		
		Maize	HPQM 1, JVM 421, Hybrids	-Seed dressing with Thirum + carbendazim in 2:1 ratio 3g/kg seed seed treatment by PSB 5g./kg.	

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**
1	2	3	4	5	6
Delay by 6 weeks (Aug Ist Week)	Shallow soils	Cotton	Greengram/ Blackgram	Sowing of short duration crops, 20% increase seed rate Making field free of weeds full utilization of water and nutrients by the crop	Link RKVY for the seed cum fertilizer drills -Supply of certified seeds through seed societies Seeds seed corporation, Agriculture universities
		Sorghum			
		Soybean	JS 9560		
		Maize	No change		
		Pigeonpea	No change	Pigeon pea (medium) JKM 189, TJT 501, RVICPH 2671 (Hy.) + Soybean (early) JS 95-60 (2:4 rows)	
		Groundnut	Greengram/ Blackgram	Sowing of short duration crops, 20% increase seed rate	
	Moderate Deep Soils	Cotton	Greengram/ Blackgram	Sowing of short duration crops, 20% increase seed rate Making field free of weeds full utilization of water and nutrients by the crop	
		Sorghum			
		Soybean	JS 9560		
		Maize	No change		
		Pigeonpea	No change	Pigeon pea (medium) JKM 189, TJT 501, RVICPH 2671 (Hy.) + Soybean (early) JS 95-60 (2:4 rows)	
		Groundnut	Greengram/ Blackgram	Sowing of short duration crops, 20% increase seed rate	
	Deep soils	Cotton	Greengram/ Blackgram	Sowing of short duration crops, 20% increase seed rate Making field free of weeds full utilization of water and nutrients by the crop	
		Sorghum			
		Soybean Maize Pigeonpea	JS 9560 No change No change	Pigeon pea (medium) JKM 189, TJT 501, RVICPH 2671 (Hy.)	
		Groundnut	Greengram/ Blackgram	Sowing of short duration crops, 20% increase seed rate	

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**
1	2	3	4	5	6
Delay by 8 weeks (Aug 3rd Week)	Shallow soils	Cotton	Fallow/ Plan for rabi crops	Green manuring, Moisture conservation practices	Link RKVY for the seed cum fertilizer drills -Supply of certified seeds through seed societies
		Sorghum			
		Soybean			
		Maize			
		Pigeonpea			
		Groundnut			
	Moderate Deep Soils	Cotton	Fallow/ Plan for rabi crops	Green manuring, Moisture conservation practices	
		Sorghum			
		Soybean			
		Maize			
		Pigeonpea			
		Groundnut			
	Deep soils	Cotton	Fallow/ Plan for rabi crops	Green manuring, Moisture conservation practices	
		Sorghum			
		Soybean Maize Pigeonpea			
		Groundnut			

***Matrix for specifying condition of early season drought due to delayed onset of monsoon (2, 4, 6 & 8 weeks) compared to normal onset (2.1.1)**

Normal onset (Month and week)	**Month and week for specifying condition of early season drought due to delayed onset of monsoon**			
	Delay in onset of monsoon by			
	2 wks	**4 wks**	**6 wks**	**8 wks**
June 1st wk	June 3rd wk	July 1st wk	July 3rd wk	Aug 1st wk
June 2nd wk	June 4th wk	July 2nd wk	July 4th wk	Aug 2nd wk
June 3rd wk	July 1st wk	July 3rd wk	Aug 1st wk	Aug 3rd wk
June 4th wk	July 2nd wk	July 4th wk	Aug 2nd wk	Aug 4th wk
July 1st wk	July 3rd wk	Aug 1st wk	Aug 3rd wk	Sep 1st wk
July 2nd wk	July 4th wk	Aug 2nd wk	Aug 4th wk	Sep 2nd wk

Condition			**Suggested Contingency measures**		
Early season drought **(Normal onset)**	**Major Farming situation[a]**	**Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
1	2	3	4	5	6
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Shallow soil	Cotton	No change	Sowing of short duration Bt varieties, Making field free of weeds full utilization of water and nutrients by the crop	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Soybean	Gap filling with seed , spray 2% solution of DAP water during the dry spell Spraying of PMA@ 3 ppm solution during dry spell	Frequent intercultural operations and mulching with green leaves.	
		Sorghum	-do-		
		Maize	Gap filling with seed of same variety	-do-	
		Pigeonpea	Gap filling with seed of same variety	-do-	
		Groundnut	Gap filling with maize seed	-do-	
	Moderate Deep soil	Cotton	No change	Sowing of short duration Bt varieties, Making field free of weeds full utilization of water and nutrients by the crop	
		Sorghum	Gap filling with seed , spray 2% solution of DAP water during the dry spell Spraying of PMA@ 3 ppm solution during dry spell	Frequent intercultural operations and mulching with green leaves.	

		Soybean	-do-		
		Maize	Gap filling with seed of same variety	-do-	
		Pigeonpea	Gap filling with seed of same variety	-do-	
		Groundnut	Gap filling with maize seed	-do-	
	Deep soils	Cotton	No change	Sowing of short duration Bt varieties, Making field free of weeds full utilization of water and nutrients by the crop	
		Soybean	Gap filling with seed , spray 2% solution of DAP water during the dry spell Spraying of PMA@ 3 ppm solution during dry spell		
		Maize	Gap filling with seed of same variety		
		Pigeonpea	Gap filling with seed of same variety		

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation[a]**	**Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
1	2	3	4	5	6
At vegetative stage	Shallow soil	Cotton	Foliar application of 2% DAP solution	Life saving irrigation, Making field free of weeds full utilization of water and nutrients by the crops	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Soybean	Interculture operation Dora , Foliar application of 2% solution of Urea or DAP with water during draught Spray profenophos 40EC@2 ml/l of water to control girdle beetle.		
		Sorghum	Delay the spray of urea till optimum soil moisture availability 20% defoliation of lower leaves and use as mulching		
		Maize	-do-		
		Pigeonpea	-do-		
		Groundnut	Life saving irrigation / water spray		
	Moderate Deep soil	Cotton	-do-		
		Sorghum	-do-		
		Soybean	-do-		
		Maize	-do-		
		Pigeonpea	-do-		
		Groundnut	Life saving irrigation / water spray		
	Deep soils	Cotton	-do-		
		Soybean	-do-		
		Maize	-do-		

		Pigeonpea	-do-		
Condition		**Suggested Contingency measures**			
Mid season drought (long dry spell)	**Major Farming situation[a]**	**Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
1	2	3	4	5	6
At reproductive stage	Shallow soil	Cotton	Foliar application of 2% DAP solution	Life saving irrigation Making field free of weeds full utilization of water and nutrients by the crops -Organic mulch/ green leaf mulch	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms/Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Soybean	- 20% defoliation in soybean and use as mulching -Spray of 2% solution of MOP/DAP/ water during the dry spell -Spraying of PMA @3 ppm solution during the dry spell		
		Sorghum	Delay the spray of urea till optimum soil moisture availability 20% defoliation of lower leaves and use as mulching		
		Maize	-do-		
		Pigeonpea	-do-		
		Groundnut	Life saving irrigation / water spray		
	Moderate Deep soil	Cotton	-do-		
		Sorghum	-do-		
		Soybean	-do-		
		Maize	-do-		
		Pigeonpea	-do-		
		Groundnut	-do-		
	Deep soils	Cotton	-do-		
		Soybean	-do-		
		Maize	-do-		
		Pigeonpea	-do-		

Condition			**Suggested Contingency measures**		
Terminal drought	**Major Farming situation[a]**	**Crop/ cropping system[b]**	**Crop management[c]**	**Rabi Crop planning[d]**	**Remarks on Implementation[e]**
1	2	3	4	5	6
	Shallow soil	Cotton	Wherever water resources are available such as pond, wells etc. protective irrigation can be provided to the crop, Harvest sorghum crop for fodder	Repeated interculture operations to keep the field weed free and use of organic mulches *Glyricidia* leaves,, uprooted weeds keeping roots upwards.	Linkage with NSC, MPSC, RVSKVV, farmers' societies, state seed firms / Agril. University and seed corporations for supply of seed and with RKVY for seed drills
		Soybean			
		Sorghum			
		Maize			
		Pigeonpea			
		Groundnut			
	Moderate Deep soil	Cotton			
		Sorghum			
		Soybean			
		Maize			
		Pigeonpea			
		Groundnut			
	Deep soils	Cotton			
		Soybean			
		Maize			
		Pigeonpea			

2.1.2 Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	**Crop/ cropping system**	**Change in crop/ cropping system**	**Agronomic measures**	**Remark on implementation**
1	2	3	4	5	6
Delayed release of water in canals due to low rainfall	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Moderate Deep Soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Deep soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-

Condition			**Suggested Contingency measures**		
	Major Farming situation	**Crop/ cropping system**	**Change in crop/ cropping system**	**Agronomic measures**	**Remark on implementation**
1	2	3	4	5	6
Limited release of water in canals due to low rainfall	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Moderate Deep Soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Deep soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-

Condition			**Suggested Contingency measures**		
	Major Farming situation	**Crop/ cropping system**	**Change in crop/ cropping system**	**Agronomic measures**	**Remark on implementation**
1	2	3	4	5	6
Non release of water in canals under delayed onset of monsoon in catchment	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Moderate deep Soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	
	Deep soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-

Condition			**Suggested Contingency measures**		
	Major Farming situation	**Crop/ cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remark on implementation**
1	2	3	4	5	6
Lack of inflows into tank due to insufficient/delayed onset of monsoon	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Moderate deep Soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Deep soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-

Condition	Major Farming situation	Crop/ cropping system	Change in crop/ cropping system	Agronomic measures	Remark on implementation
1	2	3	4	5	6
Insufficient ground water recharge due to low rainfall	Shallow soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Moderate deep Soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-
	Deep soils	Wheat	Wheat (HW 2004, HI 1554, HI 1500, MP 1203)	Preferred pre sowing Irrigation (Palewa) Balanced fertilization Irrigation at critical growth stage	-
		Chickpea	Chickpea (JG 130, JG 16, JAKI 9218)	Dry sowing Application of IPNM techniques Irrigation at critical growth stages, branching and seed filling stage Inter-culture operation	-

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

Condition	**Suggested contingency measure**			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**
Soybean	• Draining of excess water • Interculture to loosen the soil and to improve aeration • Topdressing with N10-20kg/ha at optimum moisture	• Drain excess water • Interculture to loosen the soil and to improve aeration • Foliar spray with 2% urea/DAP to regain lost vigor	• Drain excess water • Harvesting on a clear sunny day • Shift the produce to safer place	• Maintain optimum moisture content in grain by drying before bagging and marketing
Cotton	• Draining of excess water • Apply 25 kg additional N/ha after draining of excess water	• Draining of excess water • Intercultivation with small blade harrow • Apply 25 kg additional N/ha after draining of excess water	• Draining of excess water	• Harvest cotton bolls in bright sunshine periods.
Sorghum	• Draining of excess water • Apply 25 kg additional N/ha after draining of excess water	• Draining of excess water • Intercultivation with hoe • Apply 25 kg additional N/ha after draining of excess water	• Draining of excess water • Harvest green cobs from dislodged plants for immediate marketing	• Spread the bundles drenched in the rain on the field bunds/ drying floors to quicken drying • Thresh bundles after they are dried properly • Dry the grain to proper moisture content before bagging and storing
Wheat	• Drain excess water • Top dressing of nitrogenous fertilizers 20-30 kg/ha at optimum soil moisture to gain vigour	• Drain excess water • Top dressing of nitrogenous fertilizers 20-30 kg/ha at optimum soil moisture to gain vigour • Adopt need based plant protection measures	• Drain excess water • Adopt need based plant protection measures • Harvest on a clear sunny day	-
Chickpea	• Drain excess water • Interculture along with earthing to loosen the soil and to improve aeration	• Drain excess water • Interculture along with earthing to loosen the soil and to improve aeration	• Drain excess water • Timely harvest of produce on a clear sunny day	• Shifting to safer place and drying the produce before bagging and storage

Horticulture				
Fruits (Mango, Guava, Pomegranate, papaya etc.)	• Application of fungicides to check dumping off (Spray Dithane M-45 3% or Bavistin 1% against anthracnose)	• Immediate drain of water • Application of fertilizers just after drainage	• Earthling and application of fungicides (Spray Dithane M-45 3% or Bavistin 1% against anthracnose) • Harvest on clear weather day	• Store the fruits in well ventilated place before it can be marketed
Vegetables (Onion, Tomato, Cabbage& cauliflower, Cucurbits, Leafy vegetables and others)	• Spray mancozeb@3g/lit to check dumping off	• Drain water immediately • Application n-fertilizers just after drainage	• Earthling and application of fungicides • Stop harvesting till weather clear	• Store the v in well ventilated place before it can be marketed
Heavy rainfall with high speed wind in a short span				
Soybean	• Drain excess water • Top dressing with N 10-20 kg/ha at optimum soil moisture	• Drain excess water • Intercultivation at optimum soil moisture to loosen the soil and improve aeration • Foliar spray 2% urea/ DAP to regain lost vigour	• Stop harvesting till weather clear • Drain excess water • Shift the produce to safer place	Well dry the produce up to 10- 12 % moisture before storage
Cotton	• Draining of excess water • Apply 25 kg additional N/ha after draining of excess water	• Drain of excess water • Intercultivation with hoe • Apply 25 kg additional N/ha after draining of excess water	• Drain of excess water •	•
Wheat	• Drain excess water • Top dressing of nitrogenous fertilizers 20-30 kg/ha at optimum soil moisture to gain vigour	• Drain excess water • Top dressing of nitrogenous fertilizers 20-30 kg/ha at optimum soil moisture to gain vigour • Adopt need based plant protection measures	• Drain excess water • Adopt need based plant protection measures • Harvest on a clear sunny day	• Maintain optimum moisture of grain by drying
Chickpea	• Drain excess water • Foilar spray with 2% urea after cessation of rains	• Drain excess water • Foilar spray with 2% urea after cessation of rains	• Drain excess water • Timely harvest of produce on a clear sunny day	• Shifting to safer place and drying thr produce before bagging and storage

Horticulture				
Fruits (Mango, Guava, Sapota, Pomegranate, papaya etc.)	• Proper drainage and removal of excess water from root zone	• Proper drainage and removal of excess water from root zone	• Proper drainage and removal of excess water from root zone	• Store in well ventilized temporary structures before marketing • Market the produce as early as possible
Vegetables (Tomato, Potato, Cabbage& cauliflower, Cucurbits, Leafy vegetables, green peas and others)	• Proper drainage and removal of excess water from root zone	• Proper drainage and removal of excess water from root zone	• Proper drainage and removal of excess water from root zone	•
Outbreak of pests and diseases due to unseasonal rains				
Soybean	• Early planting to minimize the incidence of girdle beetle and green semilooper • Foliar spray of Triazophos followed by profenophos for the control of girdle beetle and green semilooper	• Monitor moth activity of spodoptera through pheromone traps (10 traps/ha) • Apply Quinalphos 25EC 2ml/l or Emameetin benzoate 5 SG 4 g/10 lit to control spodoptera	-	Well dry the produce up to 10- 12 % moisture before storage
Cotton	Spray for systemic insecticide – imidacloprid/ thimethoxom/ acetameprid for control of sucking pest	. Spray for systemic insecticide – imidacloprid/ thimethoxom/ acetameprid for control of sucking pest - To control new wilt, drenching of 1% urea solution	Spray for systemic insecticide – imidacloprid/ thimethoxom/ acetameprid for control of sucking pest	
Sorghum	Timely sowing of sorghum to control Shootfly and seed treatment by Thiomethixom 25 WG. Use of carbo furodon granules 3G 8-10kg/ha to control stem borer	Spray of Quinolphos/ trizophos for the control of ear head bug	Use of insecticide as dusting with carbrabryl powder (25kg/ha) to control ear head bug Spaying of Earhead bug, web worm, grain mold	Quick drying to prevent molds
Pigeonpea	• Spray triazophos 40 % EC @ 1-1.5 l/ha in chickpea against pest incidence. • "T" shaped pegs placed in late	• Spray triazophos 40 % EC @ 1-1.5 l/ha in chickpea against pest incidence.	• Spray triazophos 40 % EC @ 1-1.5 l/ha in chickpea against pest incidence.	-

	sown chickpea field for biological control of pod borer and for chemical control spraying of Quinolphos 25 EC or Chlorpyriphos 20 EC C or Methyl Parathion 50 EC @ 600 ml dissolve in 500 L of water should be used. Dusting of Felvunerate 0.4% or Endosulphan 4% 15-20 kg or Quinolphas 1.5 WP 20-25 kg /ha with duster.	• T" shaped pegs placed in late sown chickpea field for biological control of pod borer and for chemical control spraying of Quinolphos 25 EC or Chlorpyriphos 20 EC C or Methyl Parathion 50 EC @ 600 ml dissolve in 500 L of water should be used. Dusting of Felvunerate 0.4% or Endosulphan 4% 15-20 kg or Quinolphas 1.5 WP 20-25 kg/ha with duster.	• Carry out critical survey of fields for insect and disease attack in crops	
Wheat	Spray 0.1% Hexaconezol against wheat rust.	Spray 0.1% Hexaconezol against wheat rust.	Spray 0.1% Hexaconezol against wheat rust.	Well dry the produce up to 10- 12 % moisture before storage
Gram	Spray triazophos 40 % EC @ 1-1.5 l/ha in chickpea against pest incidence. · "T" shaped pegs placed in late sown chickpea field for biological control of pod borer and for chemical control spraying of Quinolphos 25 EC or Chlorpyriphos 20 EC C or Methyle Parathion 50 EC @ 600 ml dissolve in 500 L of water should be used. Dusting of Felvunerate 0.4% or Quinolphos 1.5 WP 20-25 per hectare with duster	Spray triazophos 40 % EC @ 1-1.5 l/ha in chickpea against pest incidence. · "T" shaped pegs placed in late sown chickpea field for biological control of pod borer and for chemical control spraying of Quinolphos 25 EC or Chlorpyriphos 20 EC C or Methyle Parathion 50 EC @ 600 ml dissolve in 500 L of water should be used. Dusting of Felvunerate 0.4% or Quinolphos 1.5 WP 20-25 per hectare with duster	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	Well dry the produce up to 10- 12 % moisture before storage Store in well ventilated temporary structures before marketing

Horticulture				
Fruits (Mango, Guava, Sapota, Pomegranate, papaya etc.)	Spray imidacloprid 0.3 ml or dimethoate 1 ml/l to control leaf hopper Drench the seedlings with COC 0.3% against root rot	Spray imidacloprid 0.3 ml or dimethoate 1 ml/l to control leaf hopper	Spray Dithane M-45 3 g/l or carbendazim 1 g/l against anthracnose spray sulphur 0.5% to control powdery mildew	Maintain aeration in storage to prevent fungal infection and blackening of fruits
Vegetables – Chilli, Onion, Colecassia	Spray imidacloprid 0.3 ml or dimethoate 1 ml/l to control leaf hopper	Spray imidacloprid 0.3 ml or dimethoate 1 ml/l to control leaf hopper	Spray imidacloprid 0.3 ml or dimethoate 1 ml/l to control leaf hopper	Maintain aeration in storage to prevent fungal infection and blackening of fruits

2.3 Floods – Not Occurs

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	Light irrigation Provision of Wind breaks	Light irrigation	Light irrigation	Harvest at physiological maturity
Chickpea	-do-	-do-	-do-	-do-
Horticulture				
Fruits	-Protect the seedlings by providing the shed -Arrangement of wind breaks	-Bordeaux paste to exposed bark .branches of the tree to protect from Sun scorching - Mulching arrund the base of trunk of the tree	-Bordeaux paste to exposed bark . branches of the tree to protect from Sun scorching -Mulching arrund the base of trunk of the tree	Harvesting of crop as early as possible and marketed or keep in cold store -Store the produce in shed or safe place.
Vegetables	-Protect the seedlings by providing the shed -Arrangement of wind breaks	Light irrigation at night hours	Application of N-fertilizers	Harvest and marketed as early as possible
Cold wave				
Chick pea	Light irrigation Smoking during night	Light irrigation Smoking during night	Light irrigation Smoking during night	Harvest at physiological maturity
wheat	-do-	-do-	-do-	-do-

Horticulture				
Fruits	-Protect the seedlings by providing the shed net	-Bordeaux paste to exposed bark branches of the tree to protect from Sun scorching - Mulching around the base of trunk of the tree	-Bordeaux paste to exposed bark . branches of the tree to protect from Sun scorching -Mulching around the base of trunk of the tree	Harvesting of crop as early as possible and marketed or keep in cold store -Store the produce in shed or safe place
Vegetables	-Protect the seedlings by providing the shed net	Light irrigation morning / evening time	Application of N-fertilizers	Harvest and marketed as early as possible
Frost				
Wheat	-do-	-do-	-do-	Harvest at physiological maturity
Chick pea	-do-	-do-	-do-	-do-
Horticulture				
Fruits	Light irrigation Smoking during night	Light irrigation Smoking during night	Light irrigation Smoking during night	Harvesting of crop as early as possible and marketed or keep in cold store -Store the produce in shed or safe place.
Vegetables	-do-	-do-	-do-	Harvest and marketed as early as possible
Hailstorm				
Wheat	-	-	Protect the crop from rodents attack	Keep the produce in protected area preferably under the roof
Chick pea	-	-	-do-	-do-
Horticulture				-do-
Fruits	Provide the shed	-	-	-do-
Vegetables	-do-	-	-	-do-
Cyclone : Not occur in the district				
Horticulture				
(specify)				

[k] Such as drainage in black soils, indicate taking up need based inter-culture operations, outbreak of pests/diseases along with their management etc.

[l] Such as drainage in black soils, application of hormones/nutrient sprays to prevent flower drop or promote quick flowering/fruiting and indicate possibility of pest/disease outbreak with need based prophylactic / curative management etc.

[m] Such as drainage in black soils, measures for preventing seed germination etc and Indicate possibility of harvesting at physiological maturity immediately and shifting produce to safer place and protection against pest/disease damage in storage etc.

[n] Such as shifting of produce to safer place for drying and maintaining the quality of grain/fodder and protection against pest/disease damage in storage etc

2.2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

Drought	**Suggested contingency measures**		
	Before the event	**During the event**	**After the event**
Feed and fodder availability	• Adoption of fodder bank , • Use of surplus fodder for silage , • Urea treatment: 4kg Urea 75 litter of water 100 kg fodder. • Insurance	• Use of reserve fodder • Use of stored silage • Balance ration • Use of chaffed fodder • Transportation of fodder from adjoining districts if excess there • Use unconventional feeds as a source of roughage, • use urea treated roughage, • use urea molasses block as a source of nitrogen and energy. • Use low quality processed with mild acid and alkali treatment.	• Feeding green feed/ fodder and conventional feed. • Regularly sprinkling of water on live stock body. • Use of wet *bhusa*. • Availing the insurance. • Separation of unproductive livestock. .
Drinking water	• Provision of hygienic supply of water . • Storage of water in the tank for drinking • Excavations of bore wells .	• Judicious use of stored water . • Use of potassium permanganate 1ppm , • Heat treatment of Water before use.	• Ensure the cleanlinell of drinking water • Water treated with quick lime
Health and disease management	• Deworming , • Regular vaccination of HS , BQ and FMD • Provision of mineral mixture	• Treatment of sick animal through camp. • Isolation of sick animals .	• Culling of sick animal • Vaccination & deworming
Drinking water	Arrange clean and potable water supply for all the cattle camps in accordance with the total number of cattle admitted in these camps	Arrange clean and potable water supply for all the cattle camps in accordance with the total number of cattle admitted in these camps	Arrange clean and potable water supply for all the cattle camps in accordance with the total number of cattle admitted in these camps
Health and disease management	Vaccination should be done well in advance. The hygiene should be given top priority	Keep animals under shade to the extent possible. The hygiene should be given top priority	Keep animals under shade to the extent possible. The hygiene should be given top priority
Cyclone Not Occurs	-	-	-
Heat wave and cold wave	-	-	-
Cold wave			
Shelter/environment management	• House of animal should be N-S direction • Plan of proper housing , • Collection of waste gunny bags for shelter	• Availability of full sun rays in animal shed, keep animal body warm • Use of gunny bags to cover the windows during night hours	• Adopt curative measures to obtain the milk production level • Keep environment uniformly to recover animal

Health and disease management	• Ensure storage of antibiotics, B-complex, liver tonic, anti-inflammatory drugs, anti-stress drugs, vaccines etc for the event • Storage for balanced ration	• Treatment of sick animals • Balanced ration • Use of warm water • Inhalation of *Eucalyptus* water	Vaccination & deworming Culling of sick animals
Heat wave			
Shelter/environment management	• Provision of proper shade • Provision of trees • Reflector paints over roof, two times bathing of animals.	• Provision of cold water • Keep environment uniformly to recover animal	• Vaccination & deworming
Health and disease management	• Ensure storage of antibiotics, B-complex, liver tonic, anti-inflammatory drugs, anti-stress drugs, vaccines etc for the event • -Use suitable drugs depending on condition.	Vaccination & deworming	

based on forewarning wherever available.

2.5.2 Poultry

	Suggested contingency measure		
	Before the event[s]	**During the event**	**After the event**
Drought			
Drought	Insurance of birds	Keep watch on mortality and adopt measures	Materialized the benefit of insurance
Shortage of feed ingredients	-Storage of food ingredients	Mineral mixture feeding, use unconven-tional feed in feeding of poultry ration, use animal protein source like fish meal, silk worm pupa, blood meal by products of slaughter house etc, ration should be made from locally available feed ingredients.	Feeding high quality balance fee
Drinking water	-Storage of Sanitized drinking water	Judicious use of stored water	Fresh drinking water
Health and disease management	• Deworming • Vaccination • Deticking of shed • Provision of rapid growing strain	Use of high weight gain breeding stock Treatment of sick birds	Vaccination and deworming Culling of sick birds

2.5.3 Fisheries

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
1) Drought			
A. Capture	NA		
Marine	NA	-	-
Inland	NA		
(i) Shallow water depth due to insufficient rains/inflow	• All the fish should be marketed • Shifting of small sized fishes to i small storage water bodies such as Plastic or cemented structures	• Harvesting of fish • Shifting of small sized fishes to in small storage water bodies such as Plastic or cemented structures • Provision of net-shed over the tank • Dry ponds should be treated with lime	• - Safe disposal of first event of runoff for storage of only clean water • Waste ware should be protected by net for stay of fishes in the tank. • After onset of monsoon and ponds fill with water seedling the fish seed
(ii Impact of heat and salt load build up in ponds / change in water quality	Apply the lime to neutralize the concentrated water	Apply the lime to neutralize the concentrated water	• Safe disposal of first event of runoff for storage of only clean water • Waste ware should be protected by net for stay of fishes in the tank. • After onset of monsoon and ponds fill with water seedling the fish seed
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	-	Aeration	Rain Gun (Oxygen)
(ii) Impact of salt load build up in ponds / change in water quality	-	-	-
2) Floods			
NA			
B. Aquaculture			
(i) Inundation with flood water	Keeps net in waste weir of ponds	Protect the fish to flow with runoff water	
(ii) Water contamination and changes in water quality	Lime treatment should be done.	Lime treatment and $KMnO_4$ treatment 2 ppm	No seedling of new fish seed
(iii) Health and diseases	-do-	-do-	-do-
(iv) Loss of stock and inputs (feed, chemicals etc)	Manufactured feed should be given in ponds	Manufactured feed should be given in ponds	Natural feed should be available in ponds
(v) Infrastructure damage (pumps, aerators, huts etc)	Dust and debris should be clean in west wear.	Continuous Dust and debris cleans in west wear.	-

3. Cyclone / Tsunami : No any possibilities of event in the district			
NA	-	-	-
4. Heat wave and cold wave			
A. Capture			
Marine	-	-	-
Inland	Net-shed	-	-
B. Aquaculture			
(i) Changes in pond environment (water quality)	Showering of water by pump for proper O_2 in water	Showering of water by pump for proper O_2 in water	-
(ii) Health and Disease management	$KMnO_4$ treatment 2 ppm	$KMnO_4$ treatment 2 ppm	-