State: Madhya Pradesh

Agriculture Contingency Plan for District: Jabalpur

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)	Central Plateau And Hills Region (VIII)		
	Agro Climatic Zone (NARP)	Kymore Plateau and Satpura Hill Zone (MP-4)		
	List all the districts or part thereof falling under the NARP Zone	Rewa, Satna, Panna, Jabalpur, Seoni, Katni, Sidhi and Singrouli		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		23° 17' N	79° 95' E	394 msl
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	ADR, ZARS O/o Director Research Services, JNKVV, Jabalpur 482 004		
	Mention the KVK located in the district	Programme Coordinator Krishi Vigyan Kendra JNKVV Distt. Jabalpur – 482004		
1.2	**Rainfall**	Normal RF(mm)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	1115.7	2nd week of June	1st week of October
	NE Monsoon(Oct-Dec):	49.9		
	Winter (Jan- Feb)	39.1	-	-
	Summer (March-May)	22.6	-	-
	Annual	1227.3	-	-

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)	519.8	306.1	77.7	36.7	39.7	22.6	0.1	37.0	16.2	16.1

* Net sown area + Current fallows + old fallow

1. 4	**Major Soils (common names like red sandy loam deep soils (etc.,)***	**Area ('000 ha)**	**Percent (%) of total**
	1. Deep soils	261.0	50.1
	2. Medium deep soils	89.6	17.2
	3. Shallow soils	169.2	32.5

* Source: NBSS & LUP, Nagpur

1.5	**Agricultural land use**	Area ('000 ha)	Cropping intensity %
	Net sown area	273.8	136
	Area sown more than once	98.0 0	
	Gross cropped area	371.8	

1.6	**Irrigation**	Area (‘000 ha)		
	Net irrigated area	117.4		
	Gross irrigated area	133.2		
	Rainfed area	156.4		
	Sources of Irrigation	Number	Area (‘000 ha)	Percentage of total irrigated area
	Canals	56	9.40	7.05
	Tanks	36	0.1	0.08
	Open wells	8010	26.1	19.5
	Bore wells	8832	81.5	61.1
	Lift irrigation schemes	NA		
	Micro-irrigation	NA		
	Other sources (Reservoir)	853	16.10	12.08
	Total Irrigated Area		133.2	
	Pump sets	21437		
	No. of Tractors	4401		
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils 07	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited	-		Nil
	Critical	-		Nil
	Semi- critical	-		Nil
	Safe	07	100	Nil
	Wastewater availability and use	05		Nil
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

(Source : Agriculture Statistics 2009, Directorate of Farmer Welfare and Agriculture Development Madhya Pradesh, Bhopal)

1.7 Area under major field crops & horticulture etc. (2008-09)

1.7	Major Field Crops cultivated	Area ('000 ha)							
		Kharif			*Rabi*			Summer	Total
		Irrigated	*Rainfed*	Total	*Irrigated*	*Rainfed*	Total		
	Rice	***12.80***	47.4	60.2					60.2
	Blackgram		28.1	28.1					28.1
	Kodo-Kutki		11.5	11.5					11.5
	Pigeonpea		8.1	8.1					08.1
	Niger		6.0	6.0					06.0
	Maize		5.0	5.0					05.0
	Sorghum		4.3	4.3					04.3
	Wheat				60.2	28.4	88.6		88.6
	Chickpea				26.0	40.2	66.2		66.2
	Lentil				12.4	27.7	40.1		40.1
	Pea				36.4	--	36.4		36.4
	Mustard				03.9	--	03.9		03.9
	Linseed					02.50	02.5		02.5
	Horticulture crops - Fruits	**Total area (ha)**			**Irrigated**			**Rainfed**	
	Mango	665							
	Guava	198							
	Citrus	2							
	Horticultural crops - Vegetables	**Total area**			**Irrigated**			**Rainfed**	
	Potato	601							
	Onion	519							
	Chilli	288							
	Ginger	172							
	Garlic	11							

(Source : Agriculture Statistics 2009, Directorate of Farmer Welfare and Agriculture Development Madhya Pradesh, Bhopal)

	Medicinal and Aromatic crops	Total area	Irrigated	Rainfed

	Plantation crops	Total area	Irrigated	Rainfed
	-	-	-	-
	Others such as industrial pulpwood crops etc (specify)	0.4		
	Fodder crops	**Total area (000 ha)**	**Irrigated**	**Rainfed**
	Sorghum	0.5	Nil	0.5
	Berseem	0.5	0.5	Nil
	Total fodder crop area	1	0.5	0.5
	Grazing land	614	-	614
	Sericulture etc	--	-	-
	Others (Specify)	--	-	-

1.8	Livestock	Male ('000)	Female ('000)	Total (No.) ('000)
	Non descriptive Cattle (local low yielding)			366.6
	Crossbred cattle			127.6
	Non descriptive Buffaloes (local low yielding)			96.3
	Graded Buffaloes			51.6
	Goat			116
	Sheep			3.9
	Others (Pig and horse			15.9
	Commercial dairy farms (Number)			156
1.9	**Poultry**	**No. of farms**	**Total No. of birds (No)**	
	Commercial	74	27099	
	Backyard		580	
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**		
		21	3	678		
	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)	19135	1.8	1820.8		
	Others					

1.11 Production and Productivity of major crops (Average of last 5 years: 2004, 05, 06, 07, 08; specify)

1.11	Name of crop	**Kharif**		Name of crop	**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)	
	Rice	55.5	912	Wheat	165.1	1966	NA				
	Blackgram	7.28	312	Chickpea	71.13	1066					
	Kodo-Kutki	4.12	335	Lentil	19.48	485					

	Pigeonpea	9.8	1248	Pea	13.1	501					
	Maize	6.52	1412	Mustard	3.74	890					
Major Horticultural crops (Crops to be identified based on total acreage)											
	Okra	30.4	2240	Brinjal	93.1	1280		Okra	8.3	1072	
	Cowpea	17.7	1430	Tomato	122.8	1530		Cowpea	21.4	2082	
	Bottle gourd	31.2	3060	Cauliflower	17.9	1458					
	Sponge gourd	20.0	2280								

Source: Agriculture Statistics 2009, Directorate of Farmer Welfare and Agriculture Development Madhya Pradesh, Bhopal)

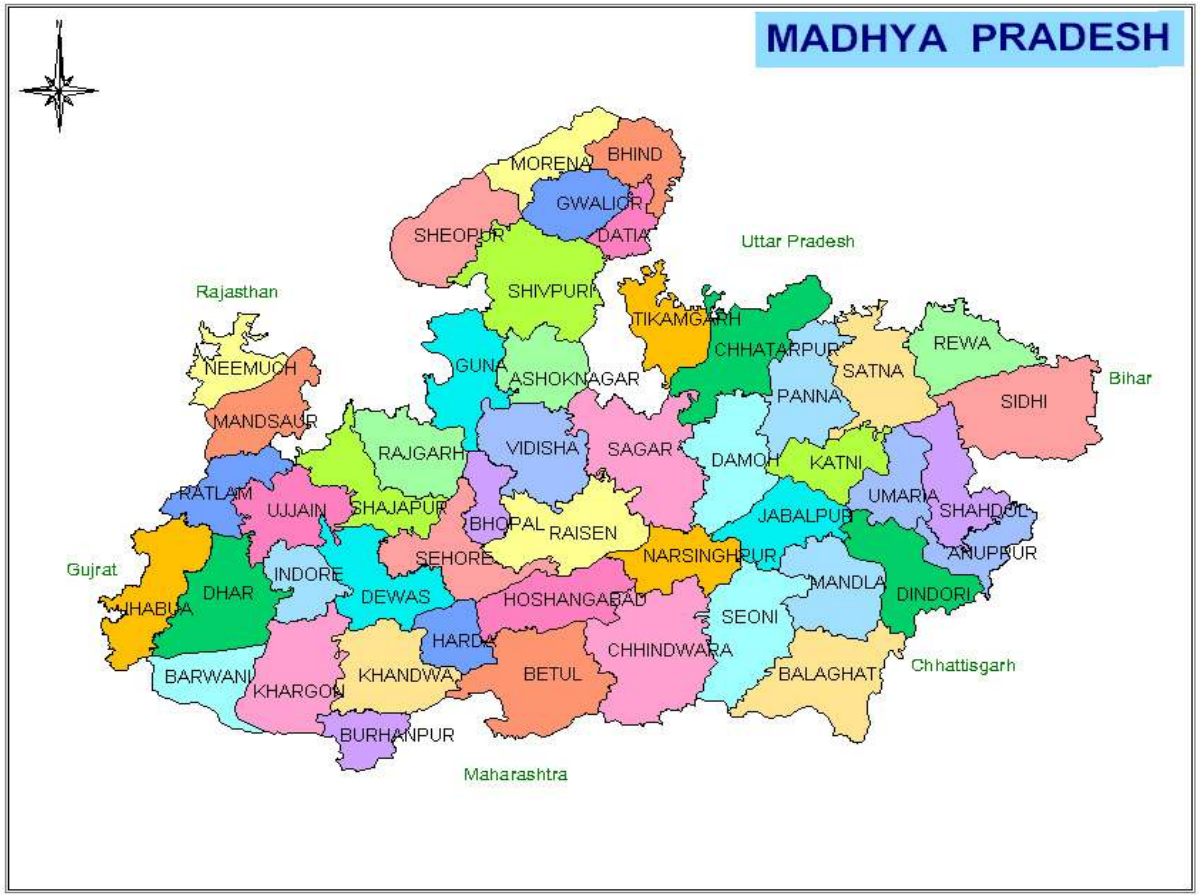
1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	**Rice**	**Soybean**	**Pigeonpea**	**Sesame**	**Blackgram**
	Kharif- Rainfed	3rd week of July – 2nd week of August	3rd week of June – 1st week of July	3rd week of June – 2nd week of July	2nd week of July – 4th week of July	1st week of July- 2nd week of July
			Maize			
	Kharif-Irrigated	2nd week of July – 3rd week of July	3rd week of May – 1st week of June	-	-	-
		Wheat	**Chickpea**	**Lentil**	**Linseed**	**Mustard**
	Rabi- Rainfed	3rd week of October – 2nd week of November	2nd week of October - 4th week of October	2nd week of October –	3rd week of October	2nd week of October - 4th week of October
	Rabi-Irrigated	2nd week of November -4th week of December	2nd week of October – 2nd week of November	2nd week of October – 2nd week of November	2nd week of October -2nd week of November	4th week of October - 2nd week of November

1.13	**What is the major contingency the district is prone to?** (Tick mark)	Regular	Occasional	None
	Drought	√		
	Flood		√	
	Cyclone			√
	Hail storm			√
	Heat wave		√	
	Cold wave		√	

	Frost				√	
	Sea water intrusion			-	-	-
	Pests and disease outbreak (specify)	1. Chickpea	Wilt	√	-	-
		2. Chickpea	Pod borer	√	-	-
		3. Pigeonpea	Pod fly & borer	√	-	-
		4. Lentil	Wilt	√	-	-
		5. Rice	Shoot borer	√	-	-
	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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MORENA
BHIND
GWALIOR
SHEOPUR
DATIA
Uttar Pradesh
Rajasthan
SHIVPURI
TIKAMGARH
CHHATARPUR
REWA
NEEMUCH
GUNA
ASHOKNAGAR
SATNA
Bihar
PANNA
SIDHI
MANDSAUR
RAJGARH
VIDISHA
SAGAR
DAMOH
KATNI
RATLAM
UMARIA
UJJAIN
SHAJAPUR
BHOPAL
JABALPUR
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SEHORE
NARSINGHPUR
ANUPPUR
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INDORE
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HOSHANGABAD
DINDORI
JHABUA
SEONI
HARDA
CHHINDWARA
Chhattisgarh
BARWANI
KHANDWA
BETUL
BALAGHAT
KHARGON
BURHANPUR
Maharashtra


AGROCLIMATIC ZONES
AGROCLIMATIC ZONES OF MADHYA PRADESH
MORENA
BHIND
GWALIOR
DATIA
SHEOPUR
SHIVPUR
TIKAMGARH
CHHATARPUR
REWA
SATNA
PANNA
SIDHI
GUNA
ASHOKNAGAR
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JHABUA
DHAR
INDORE
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CHHINDWARA
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BARWANI
BETUL
BALAGHAT
BURHANPUR
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180
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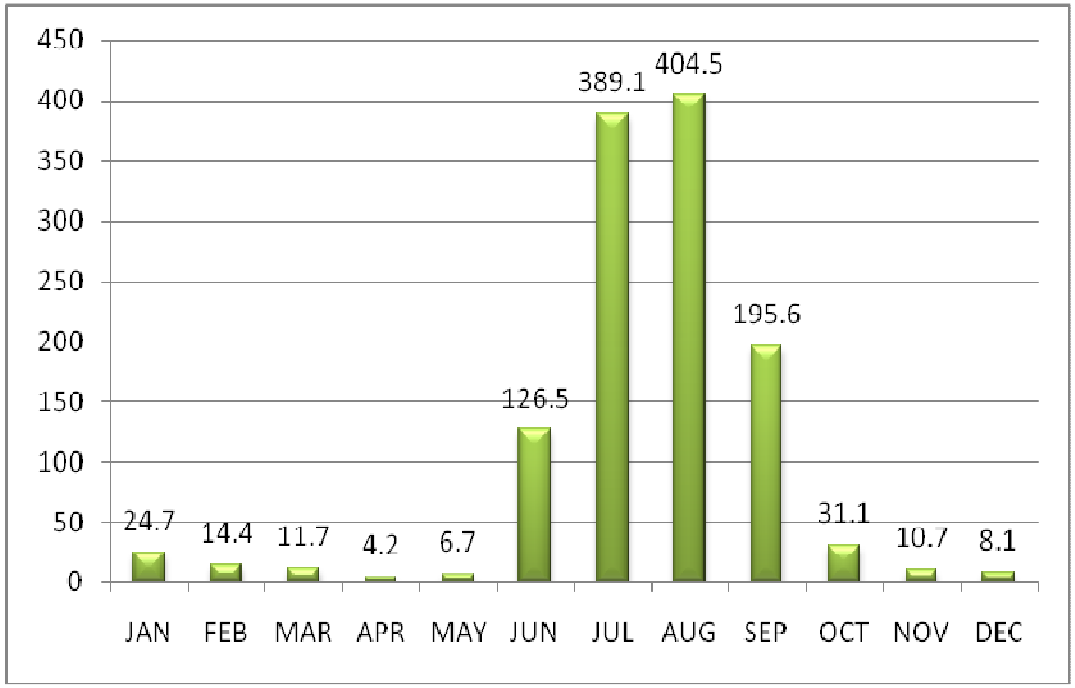
Annexure II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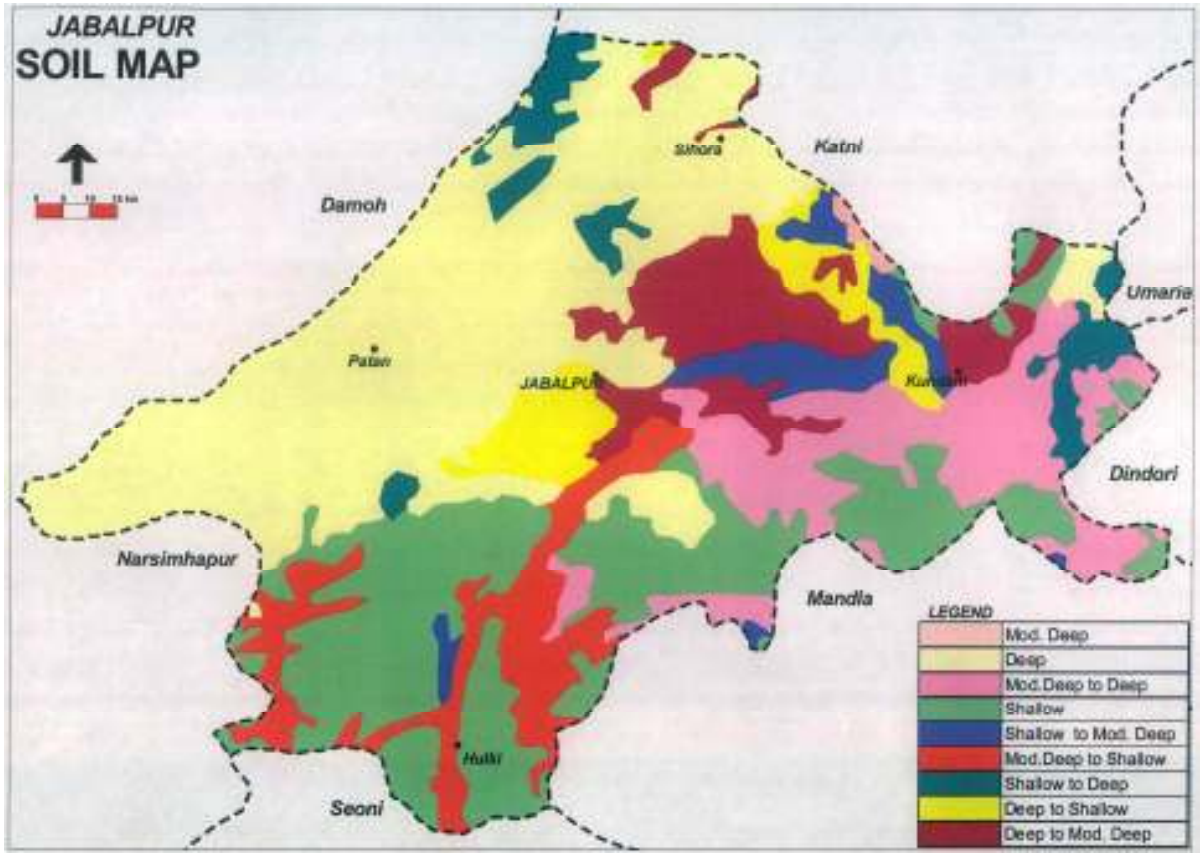
Annexure III



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**	**Normal Crop / Cropping system**	**Change in crop / cropping system[c] including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks **4th week of June**	Medium lands deep and medium deep black soils	Rice-wheat	No Change **Rice-**Upland field: IR-36, JR-201, JR-503, vandna, porrnima, Ananda, Narendra 97, Govinda and hybrid rice JRH 4, 5 and 8 Lowland field WGL-32100, MR-219, Mhamaya, IR-36,IR-64, HMT, Swarna, Madhuri, Pusa basmati, Karnal basmati, Pusa sugandha3, 4,and5 and Hybrid rice (PRH-10, PA6201, PHB71, Pro Agro 6444)	1. For early maturing varieties, adopt 15x15 cm geometry but seedlings are not more than 18 to 21 days old 2. Blade harrowing (Bakhar) for moisture conservation 3. Seed treatment with mixture of Thiram (1.5g) + Carbendazim (1.5g) /kg seed followed by treated with biofertilizers. 4. Intercultivation	SAU's and Beej Nigam
		Soybean-Chickpea	**Pigeonpea-** Asha ,No-148,JKM-7, JA-4,ICPL-85063 (Laxmi), JKM-189 **Greengram -** Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2, Tarme1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139 **Blackgram –** JU-2, JU-3, JU-86, T-9, JBG-623, LBG684, TAU-1, Berkha, PU-30,35,19 **Soybean**- JS-335,JS 80-21,JS 97-42, JS 94-60, JS 9305 **Kodo millet**- Jawahar Kodo-1, 2, 41, 62, 101, 147, 439, Jawahar-48, Jawahar, 155, JK-106 **Kutki -** Jawahar Kutki 1, 2, 8, JK 36		
	Bunded uplands shallow	Rice-wheat	No. Change **Rice-**Upland field: IR-36, JR-201, JR-503,		

	soil		vandna, porrnima, Ananda, Narendra 97, Govinda **Pigeonpea-** Asha ,No-148,JKM-7, JA-4,ICPL-85063 (Laxmi), JKM-189 **Grengram-** Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2, Tarme-1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139 **Blackgram –** JU-2, JU-3, JU-86, T-9, JBG-623, LBG684, TAU-1, Berkha, PU-30,35,19 **Kodo**millet Jawahar Kodo-1, 2, 41, 62, 101, 147, 439, Jawahar-48, Jawahar, 155, JK-106 **Kutki -** Jawahar Kutki 1, 2, 8, JK 36		
		Rice -Chickpea			
	Haveli system medium deep soils	Rice- wheat	No change	-	

Condition					
Early season drought (delayed onset)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Suggested Contingency measures**		**Remarks on Implementation**
			Change in crop/cropping system (Selection for Early Crop Varieties)	**Agronomic measures[d]**	SAU's and Beej Nigam
Delay by 4 weeks **2nd week of July**	Medium lands deep and medium deep black soils	Rice-wheat	No.Change Dont sow soybean **Rice –** IR-36 JR-201, Poornima , JR-503, Vandna **Pigeonpea-** Pragati, Jagriti, Asha ,Nmuber-148,JKM-7,JA-4, Type-21-Pusa-855, ICPL-85063 (Laxmi), JKM-189 **Greengram-** Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2, Tarme-1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139 **Blackgram –** JU-2,JU-3,JU-86,T-9,JBG-623,LBG684,TAU-1, Berkha,PU-30,35,19 **Sesame -** TKG -306, TKG-35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1 **Kodomillet** - Jawahar Kodo-1, 2, 41, 62, 101, 147, 439, Jawahar-48, Jawahar, 155, JK-106 **Kutki -** Jawahar Kutki 1, 2, 8, JK 36	1. For early maturing varieties, adopt 15x15 cm geometry but seedlings are not more than 18 to 21 days old 2. Blade harrowing (Bakhar) for moisture conservation	
		Soybean-Chickpea	**Pigeonpea-** Pragati, Jagriti, Asha ,Nmuber-148,JKM-7,JA-4, Type-21-Pusa-855, ICPL-85063 (Laxmi), JKM-189 **Greengram-** Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2, Tarme-1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139		

			Blackgram – JU-2,JU-3,JU-86,T-9,JBG-623,LBG684,TAU-1, Berkha,PU-30,35,19 **Sesame -** TKG -306, TKG-35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1 **Kodo**- Jawahar Kodo-1, 2, 41, 62, 101, 147, 439, Jawahar-48, Jawahar, 155, JK-106 **Kutki -** Jawahar Kutki 1, 2, 8, JK 36		
	Bunded uplands shallow soil	Rice-wheat /chickpea	**Rice –** IR-36 JR-201, Poornima , JR-503, Vandna **Pigeonpea-** Pragati, Jagriti, Asha, Nmuber-148, JKM-7,JA-4, Type-21-Pusa-855, ICPL-85063 (Laxmi), JKM-189 **Greengram-** Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2, Tarme-1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139 **Blackgram –** JU-2, JU-3, JU-86, T-9, JBG-623, LBG684, TAU-1, Berkha, PU-30, 35, 19 **Sesame -** TKG -306, TKG-35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1 **Dont sow soybean**		SAU's and Beej Nigam
	Haveli system medium deep soils	Rice- wheat	**Greengram-** Pusa vishal, K851, JM721, Jawahar 99 -37, Hum-1, Hum-2, Tarme-1 L.G.450, T.M.98-50, JM-98-90, PDM 11, 54 and 139 **Blackgram –** JU-2, JU-3, JU-86, T-9, JBG-623, LBG684, TAU-1,		

			Berkha, PU-30,35,19 **Kodo-** Jawahar Kodo-1, 2, 41, 62, 101, 147, 439, Jawahar-48, Jawahar, 155, JK-106 **Kutki -** Jawahar Kutki 1, 2, 8, JK 36		

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures[d]**	**Remarks on Implementation**
Delay by 6 weeks **4th week of July**	Medium lands deep and medium deep black soils	Rice-wheat	**Rice – Upland field : Don't sown the rice crop and sowing of alternate crops, Pigeonpea, Blackgram ,Greengram, Til,** Ramtil, Castor, Kodo, Kutki **Sesame -** TKG -306, TKG-35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1 **Don't sow soybean and maize**	1. Blade harrowing (Bakhar) for moisture conservation 2. 100 kg seed /ha required for lehi system in rice. 3. Don't sow maize 4. Intercropping of Sesame and niger with Pigeonpea	SAU's and Beej Nigam
		Soybean-Chickpea	**Sesame -** TKG -306, TKG-35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1		
	Bunded uplands shallow soil	Rice-wheat Rice-Chickpea	**Rice** –Lowland field : Sowing of JR-201, JR-503, Poornima, Vandna, Narendra-97, Govinda by Lehi system **Sesame -** TKG -306, TKG-35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1 **Don't sown soybean and maize**		

	Haveli system medium deep soils	Rice- wheat	**No crop to be sown**	-	

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 **2nd week of August**	Medium lands deep and medium deep black soils	Rice-wheat /chickpea	**Niger**–JNC-6, JNC-1, JNC-9, JVN-1	1. Blade harrowing (Bakhar) for moisture conservation 2. 100 kg seed /ha required for lehi system in rice. 3. Don't sow maize 4. Intercropping of niger with Pigeonpea	SAU's and Beej Nigam
		Soybean-Chickpea	**Niger**–JNC-6, JNC-1, JNC-9, JVN-1		
	Bunded uplands shallow soil	Rice-wheat / Rice-Chickpea	**Niger**–JNC-6, JNC-1, JNC-9, JVN-1		
	Haveli system medium deep soils	Rice- wheat	**No crop to be sown**		

Condition			**Suggested Contingency measures**		
Early season drought **(Normal onset)**	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remark on Implementation[e]**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Medium lands deep and medium deep black soils	Rice-wheat /Chickpea	Maintenance of optimum plant population by thinning of plants. Resowing of crop with medium to early varieties if the plant population below 70 per cent	1. Blade harrowing (Bakhar) for moisture conservation 2. Adopt moisture conservation practices. 3. Conservation of excess rain water in high rainfall areas	-
		Soybean-Chickpea			
	Bunded uplands shallow soil	Rice-wheat /chickpea			
	Haveli system medium deep soils	Rice- wheat			

			Practice of Dora/Kulpha/Hand hoe in between rows and use of removed weeds	.	

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remark on Implementation**
At vegetative stage	Medium lands deep and medium deep black soils	Rice-wheat / Rice –Chickpea/other pulses	Life saving irrigation, if available. Use of hand hoe for weed control	1. Interculture with Dora/Kulpha/Hand hoe in between rows 2.Use uprooted weeds as mulch for moisture conservation. 3. Ridges are made after 15-20 lines of crops for the moisture conservation 4.Adopt plant protection measures	
		Soybean-Chickpea			
	Bunded uplands shallow soil	Rice-wheat /Chickpea			
	Haveli system medium deep soils	Rice- wheat			

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remark on Implementation**
At flowering/ fruiting stage	Medium lands deep and medium deep black soils	Rice-wheat / Rice –Chickpea/other pulses	Life saving irrigation, if available Use of hand hoe for weed control.	1. Interculture with Dora/Kulpha/Hand hoe in between rows . 2. Use of uprooted weeds use as mulch for moisture conservation. 3. Ridges are	-
		Soybean-Chickpea			
	Bunded uplands shallow soil	Rice-wheat / Rice-Chickpea			
	Haveli system medium deep soils	Rice- wheat			

				made after 15-20 lines of crops for the moisture conservation 4. Adopt plant protection measures	

Condition			**Suggested Contingency measures**		
Terminal drought (Early withdrawal of monsoon)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Rabi planning**	**Remark on Implementation**
	Medium lands deep and medium deep black soils	Rice-wheat / Rice –Chickpea/other pulses	Harvest crop at physiological maturity. Plan for early rabi crop planning or paira/ Utera cropping with short duration pulses. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers Sowing of small seeded grains mix with FYM and vermicompost	Prefer the alternate crops like Lentil, Linseed, Chickpea, irrigated and unirrigated wheat -Line sowing of Lentil, Linseed, Chickpea in moist zone	-
		Soybean-Chickpea			
	Bunded uplands shallow soil	Rice-wheat / Rice-Chickpea			
	Haveli system medium deep soils	Rice- wheat			

2.1.2 Irrigated situation

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]**
Delayed release of water in canals due	Deep medium black Soils	Rice –wheat	Soybean –Chickpea	Adopt furrow irrigation and use of micro-irrigation	-

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]**
to low rainfall				system such as drip and sprinkler system Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice Prefer early maturing Cultivars. Irrigate at critical stages	
	Shallow (Red and yellow mixed) soils	Rice –wheat	Pigeonpea/greengram - Chickpea	Adaption of soil and water conservation practices like ridge & furrow system	

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 catchments	Deep medium black Soils	Rice –wheat	Soybean –Chickpea	**Rice**- Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice	
	Shallow (Red and yellow mixed) soils	Rice –wheat			
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Deep medium black Soils	Rice –wheat	Soybean –Chickpea	Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice Maintain optimum plant population Conservation tillage	
	Shallow (Red and yellow mixed) soils	Rice –wheat	Rice- Chickpea		

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	Deep medium black Soils	Rice –wheat	Soybean –Chickpea Or Rice- Chickpea; Prefer short duration low water requirement varieties of wheat.	Chickpea should be sown with residual moisture after harvest of soybean or give p re sowing irrigation to chickpea. Protective irrigation at CRI stage in wheat. Adopt furrow irrigation and use of micro-irrigation system Adaptation of soil and water conservation practices. Control the soil erosion	-
	Red and yellow mixed soils	Rice –wheat			
		Soybean- Wheat/Chickpea			

2.2 Unusual rains (untimely, unseasonal etc]) (for both rain fed 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**
Rice	Drain the excess water as early as possible Apply 20 kg N + 10 kg K /ha after draining excess water Take up gap filling either with available nursery or by splitting the tillers from the surviving hills Take up suitable plant protection Measures in anticipation of pest & disease out breaks	Drain the excess water as early as possible Apply 20 kg N + 10 kg K /ha after draining excess water Take up suitable plant protection Measures in anticipation of pest & disease out breaks	Drain the excess water as early as possible Take up suitable plant protection measures in anticipation of pest & disease out breaks	Drain out water and spread sheaves loosely in field or field bunds where there is no water stagnation Spray common salt at 5% on panicles to prevent germination and spoilage of straw from moulds Thresh after drying the sheaves properly Ensure proper grain moisture before storing

Soybean	Provide drainage care should be taken that rain water does not stagnate in the field.	Change 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 under shade. or protect the produce by tarpaulin kept in T flown
Wheat	Care should be taken that rain water does not stagnate in the field and not allow to top drashing of nitrogenous fertilizers.	Care should be taken that rain water does not stagnate in the field and not allow to top drashing 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 drashing of nitrogenous fertilizers.	Care should be taken that rain water does not stagnate in the field and not allow to top drashing of nitrogenous fertilizers.	Proper drainage should be provided and adopt all plant protection measures	
Heavy rainfall with high speed wind in a short span	NA			
Out break of pests and diseases due to unseasonal rains				
Rice	Spraying of Monocrotophos 36 EC 14 ml or Cypermethrin 10 EC 6 ml per 10 liter of water against stem borer	Spraying of Monocrotophos 36 EC 14 ml or Cypermethrin 10 EC 6 ml per 10 liter of water against stem borer	Removal and destruction of infected panicles due to Loose smut	
Soybean	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	-
Wheat	Spray 0.2 % mencozeb 76% WP against wheat rust.	Spray 0.2 % mencozeb 76% WP 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 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 methyl parathion 50 EC @ 600	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 Quinalphos 25 EC or Chlorpyriphos 20 EC or	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	-

	ml dissolve in 500 L of water should be used. Dusting of Fenvalerate 0.4% or Quinalphos 1.5 WP 20-25 per hectare with duster.	methyl parathion 50 EC@ 600 ml dissolve in 500 L of water should be used. Dusting of Fenvalerate 0.4% or Quinalphos 1.5 WP 20-25 per hectare with duster.		
Horticulture	-	-	-	-

2.3 Floods -NA

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

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				
Rice	Light and repeated irrigation at the appearance of hair line cracks in soil surface, Correct iron deficiency with 0.5% iron sulphate spray.	Repeated irrigation at the appearance of hair line cracks in soil surface, pounding of water for 15 days after transplanting to check Fe deficiency and for crop establishment.	Repeated irrigation at the appearance of hairline cracks in soil surface	Harvest crop at physiological maturity
Soybean, Pigeonpea	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				
Mango , Guava	Protect the crop with the help of light irrigation,	Protect the crop with the help of light irrigation;	Protect the crop with the help of light irrigation;	Harvest at physiological maturity

	wind breaks are necessary where cold and heat wave in regular	wind breaks are necessary where cold and heat wave in regular	wind breaks are necessary where cold and heat wave in regular	
Cold wave				
Chick pea Wheat	Light irrigation Smoke generation at night time to rise temperature	Light irrigation Smoke generation at night time to rise temperature	Light irrigation Smoke generation at night time to rise temperature	Harvest at physiological maturity
Frost				
Chickpea, Lentil, Pigeonpea	Give light irrigation, Smoke generation at night time to rise temperature wind breaks are necessary where cold and heat wave in regular	Protect the crop with the help of light irrigation; Smoke generation at night time to rise temperature wind breaks are necessary where cold and heat wave in regular	Protect the crop with the help of light irrigation, Smoke generation at night time to rise temperature wind breaks are necessary where cold and heat wave in regular	Harvest at physiological maturity
Hailstorm	Not applicable			
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	As the district is occasionally prone to drought the following practices may be implemented to prevent fodder shortage problem Sowing of cereals (fodder varieties of Sorghum/ Bajra) and leguminous crops (Lucerne, Berseem, Horse gram, Cowpea) during North-East monsoon under dry land system for fodder production. Collection of soybean and chick pea stover for use as feed supplement during drought Preserving the green maize fodder as silage Encourage fodder production with Bajra – stylo-	Harvest and use biomass of dried up crops (Rice, wheat, Maize, Soybean, Black gram, Green gram, chick pea etc.,) material as fodder Harvest all the top fodder available (Subabul, Glyricidia, Pipol, Prosopis etc) and feed the LS during drought Concentrate ingredients such as Grains, brans, chunnies & oilseed cakes, low grade grains etc. unfit for human	Encourage progressive farmers to grow multi cut fodder crops of sorghum/bajra/maize with input subsidy Supply of quality stem cuttings of Hybrid napier (CO1), paragrass, guinea grass etc., well before monsoon Encourage growing fodder crops like Berseem in winter and Juar in summer season

	Bajra on rotation basis and also to cultivate short-term fodder crops like sunhemp	consumption should be procured from Govt. Godowns for feeding as supplement for high productive animals during drought Promotion of Horse gram as contingent crop and harvesting it at vegetative stage as fodder Continuous supplementation of minerals and vitamin to prevent infertility. Encourage mixing available kitchen waste with dry fodder while feeding to the milch animals	Flushing the stock to recoup Replenish the feed and fodder banks
Drinking water	Adopt various water conservation methods at village level to improve the ground water level for adequate water supply. Identification of water resources De-silting 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 sandies /community grazing areas	Adequate supply of drinking water. Restrict wallowing of animals in water bodies/resources; Add alum in stagnated water bodies	Watershed management practices shall be promoted to conserve the rainwater. Bleach (0.1%) drinking water / water sources Provide clean drinking water
Health and diseases management	Procure and stock emergency medicines and vaccines for important endemic diseases of the area All the stock must be immunized for endemic diseases of the area Surveillance and disease monitoring network to	Carryout deworming to all animals entering into relief camps Identification and quarantine of sick animals Constitution of Rapid Action Veterinary Force Performing ring vaccination (8 km radius) in case of any outbreak	Keep close surveillance on disease outbreak. Undertake the vaccination depending on need Keep the animal houses clean and spray disinfectants Farmers should be advised to breed their

	be established at Joint Director (Animal Husbandry) office in the district Adequate refreshment training on draught management to be given to VAS, Jr.VAS, LI with regard to health & management measures Procure and stock multivitamins & area specific mineral mixture	Restricting movement of livestock in case of any epidemic Tick control measures be undertaken to prevent tick borne diseases in animals Rescue of sick and injured animals and their treatment Organize with community, daily lifting of dung from relief camps	milch animals during July-September so that the peak milk production does not coincide with mid summer
Floods	**NA**		
Cyclone	NA		
Heat wave and cold wave			
Heat wave	i) Plantation around the shed ii) H_2O sprinklers / foggers in the shed **iii)** Application of white reflector paint on the roof **iv)** Thatched sheds should be provided as a shelter to animal to minimize heat stress	Allow the animals early in the morning or late in the evening for grazing during heat waves Feed green fodder/silage / concentrates during day time and roughages / hay during night time in case of heat waves Put on the foggers / sprinklers /fans during heat weaves in case of high yielders (Jersey/HF crosses) In severe cases, vitamin 'C' and electrolytes should be added in H_2O during heat waves.	Feed the animals as per routine schedule Allow the animals for grazing (normal timings)
Cold wave	Covering all the wire meshed walls / open area with gunny bags/ polyethylene sheets (with a mechanism for lifting during the day time and putting down during night time)	Allow for grazing between 10AM to 3PM during cold waves Add 25-50 ml of edible oil in concentrates and fed to the animal during cold waves Apply / sprinkle lime powder in the animal shed during cold waves to neutralize ammonia accumulation	Feed the animals as per routine schedule Allow the animals for grazing (normal timings)
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