State: Madhya Pradesh

Agriculture Contingency Plan for District: Raisen

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)	Vindhya Plateau Zone (MP-5)		
	List all the districts or part thereof falling under the NARP Zone	Bhopal, Sagar, Damoh, Vidisha, Raisen and Sehore		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		22° 47' to **23° 33' N**	**77° 21' to 78° 49' E**	466 msl
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	RARS, Sagar		
	Mention the KVK located in the district	Programme Coordinator Krishi Vigyan Kendra Village: Naktara PO.: Bankhedi, NH-86 Ext. Raisen, Sagar Road Distt. Raisen – 466 551		
1.2	**Rainfall**	Normal RF(mm)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	1143.2	2nd week of June	1st week of October
	NE Monsoon(Oct-Dec):	52.6	-	-
	Winter (Jan- Feb	26.9	-	-
	Summer (March-May)	14.9	-	-
	Annual	1237.6	-	-

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)	848.7	435.0	333.7	39.7	24.6	12.1	0.1	3.5	0.9	3.0

*** 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 soil	451.2	53.3
	Medium deep soils	105.8	12.5
	Shallow soils	287.8	34.0

Source: NBSS & LUP, Nagpur

1.5	**Agricultural land use**	Area ('000 ha)	Cropping intensity %
	Net sown area	431.1	118
	Area sown more than once	79.3	
	Gross cropped area	510.4	

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

1.6	**Irrigation**	Area ('000 ha)		
	Net irrigated area	210.1		
	Gross irrigated area	210.1		
	Rainfed area	221.0		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals	15	64.2	30.8
	Tanks	129	2.0	0.9
	Open wells	11433	28.2	13.5

	Bore wells	15490	81.1	38.9
	Lift irrigation schemes	NA	-	-
	Micro-irrigation	NA	-	-
	Other sources (reservoir)	2	34.8	16.7
	Total Irrigated Area	-	210.1	-
	Pump sets	26354		
	No. of Tractors	14543		
	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	-		
	Critical	-		
	Semi- critical	-		
	Safe	07		
	Wastewater availability and use	-		
	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**		-	-
	Soybean	-		135.3					-	135.3
	Pigeon pea	-		23.9					-	23.9
	Rice	-		20.6					-	20.6
	Maize	-		6.3	-	-			-	6.3
	Blackgram	-		3.9	-	-			-	3.9
	Wheat						147.0			147.0
	Chickpea						145.3			145.3
	Lentil						45.5			45.5
	Pea						11.4			11.4
	Linseed						2.5			2.5

Horticulture crops - Fruits		**Total area (ha)**	**Irrigated**		**Rainfed**
	Mango	04			
	Guava	30			
	Lime	37			

	Others (ber, Jamun, Papaya)	-			
Horticultural crops - Vegetables		**Total area(ha)**	**Irrigated**		**Rainfed**
	Onion	396	396		
	Tomato	420	420		
	Chillies	115	115		
	Potato	166	166		
	Brijal	193	193		
	Others (specify)				
Medicinal and Aromatic crops		**Total area (ha)mn - NA**	**Irrigated**		**Rainfed**

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

	Plantation crops- NA	**Total area**	**Irrigated**	**Rainfed**
	Others such as industrial pulpwood crops etc (specify)	-		
	Fodder crops- NA	**Total area**	**Irrigated**	**Rainfed**
	Others (specify)	-		
	Total fodder crop area			
	Grazing land	24.60 th. Ha.		
	Sericulture etc			
	Others (Specify)			

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Non descriptive Cattle (local low yielding)	-	-	267.3
	Crossbred cattle	-	-	-
	Non descriptive Buffaloes (local low yielding)	-	-	-
	Graded Buffaloes	-	-	178.8
	Goat	-	-	90.9
	Sheep	-	-	1.1
	Others (Pig,horse,others)	-	-	4.5
	Commercial dairy farms (Number)	-	-	NA
1.9	**Poultry - NA**	-	-	
	Commercial	-	-	
	Backyard	-	-	

1.10	**Fisheries** (Data source: Chief Planning Officer)						
	A. Capture						
	i) Marine (Data Source: Fisheries Department) **Not applicable**	**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**	
		Not applicable		**-**		**-**	

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

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

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)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
Major Field crops (Crops to be identified based on total acreage)										
	Soybean	106.4	1090			-	--	106.4	1090	
	Pigeon pea	12.8	623			--	--	12.8	623	
	Maize	5.5	1418			--	--	5.5	1418	
	Rice	10.4	788			--	--	10.4	788	
	Blackgram	0.5	311			--	--	0.5	311	
	Wheat			258.8	1604	--	--	258.8	1604	
	Chickpea			146.08	1059			146.0	1059	
	Lentil			25.06	597			25.0	597	

	Linseed			2.78	773			2.7	773	
	Pea			7.48	651			7.4	651	
Major Horticultural crops (Crops to be identified based on total acreage) NA										

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

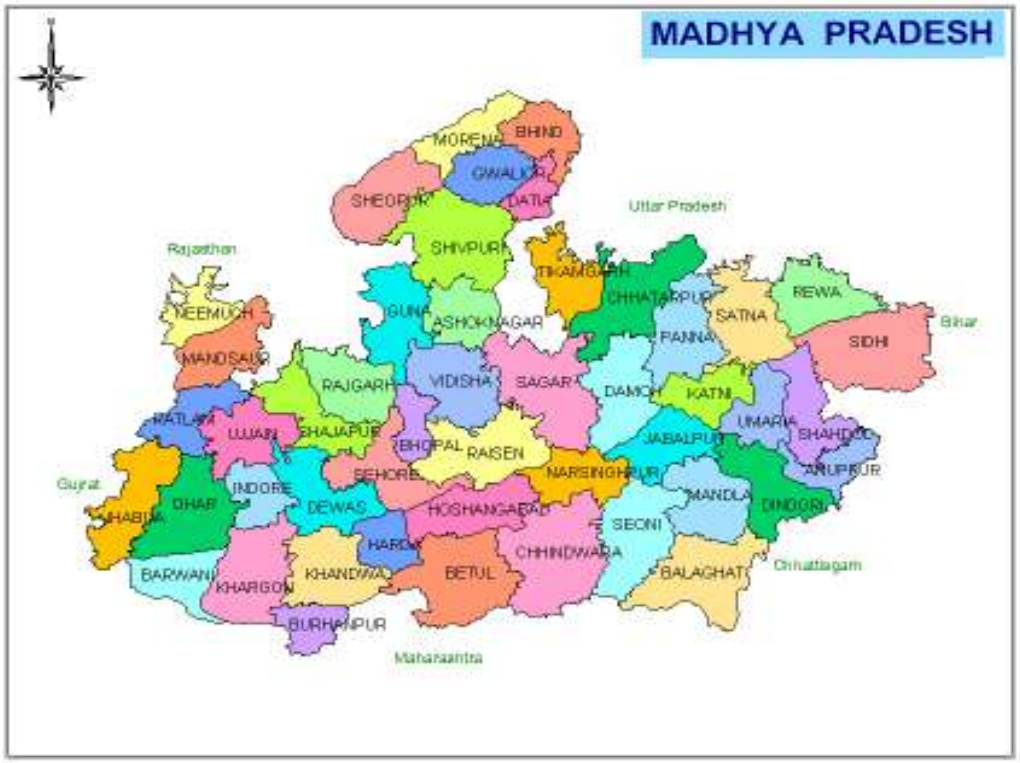
1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	**Soybean**	**Rice**	**Maize**	**Pigeonpea**	**Chickpea**	**Wheat**	**Lentil**
	Kharif- Rainfed	2nd week of June- 2nd week of July	4th week of June- 3rd week of July	3rd week of June- 1st week of July	2nd week of June- 4th week of July	-	-	-
	Kharif-Irrigated	-		1st week of June – 2nd week of June	-	-	-	-
	Rabi- Rainfed							2nd week of October- 4th week of October
	Rabi-Irrigated					2nd week of October-1st week of November	1st week of November -4th 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) Soybean	Semilooper, Girdle beetle	Tobacco caterpillar	√
	Pigeon Pea	Plume moth, Pod bug, Pod fly	Leaf folder, Chickpea pod borer	

	Rice	Hoppers, Borers, Gandhi Bug	Leaf Folder	
	Maize	Stem fly, Stem borer	Cob borer	
	Chickpea	Pod borer	Cut worm	
	Wheat	Termite, Root aphid	Stem borer	
	Lentil	Aphid	Pod borer	
	Other (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
DATIA
SHEOPUR
Uttar Pradesh
SHIVPURI
TIKAMGARH
CHHATARPUR
REWA
SATNA
Bihar
SIDHI
PANNA
NEEMUCH
GUNA
ASHOKNAGAR
MANDSAUR
RAJGARH
VIDISHA
SAGAR
DAMOH
KATNI
UMARIA
SHAHDOL
RATLAM
UJJAIN
SHAJAPUR
BHOPAL
RAISEN
JABALPUR
ANUPPUR
SEHORE
NARSINGHPUR
Gujrat
INDORE
MANDLA
DINDORI
DHAR
DEWAS
HOSHANGABAD
SEONI
JHABUA
HARDA
CHHINDWARA
BALAGHAT
Chhattisgarh
BARWANI
KHANDWA
BETUL
KHARGON
BURHANPUR
Maharashtra


AGROCLIMATIC ZONES
BUNDELKHAND
CENTRAL NARMADA VALLEY
CHATTISGARH PLAIN BALAGHAT
GRID REGION
JHABUA HILLS
KYMORE PLATEAU SATPURA HILLS
MALWA PLATEAU
NIMAR PLAINS
NOTHERN HILL REGION OF CHATTISGARH
SATPURA PLATEAU
VINDHYA PLATEAU
AGROCLIMATIC ZONES OF MADHYA PRADESH
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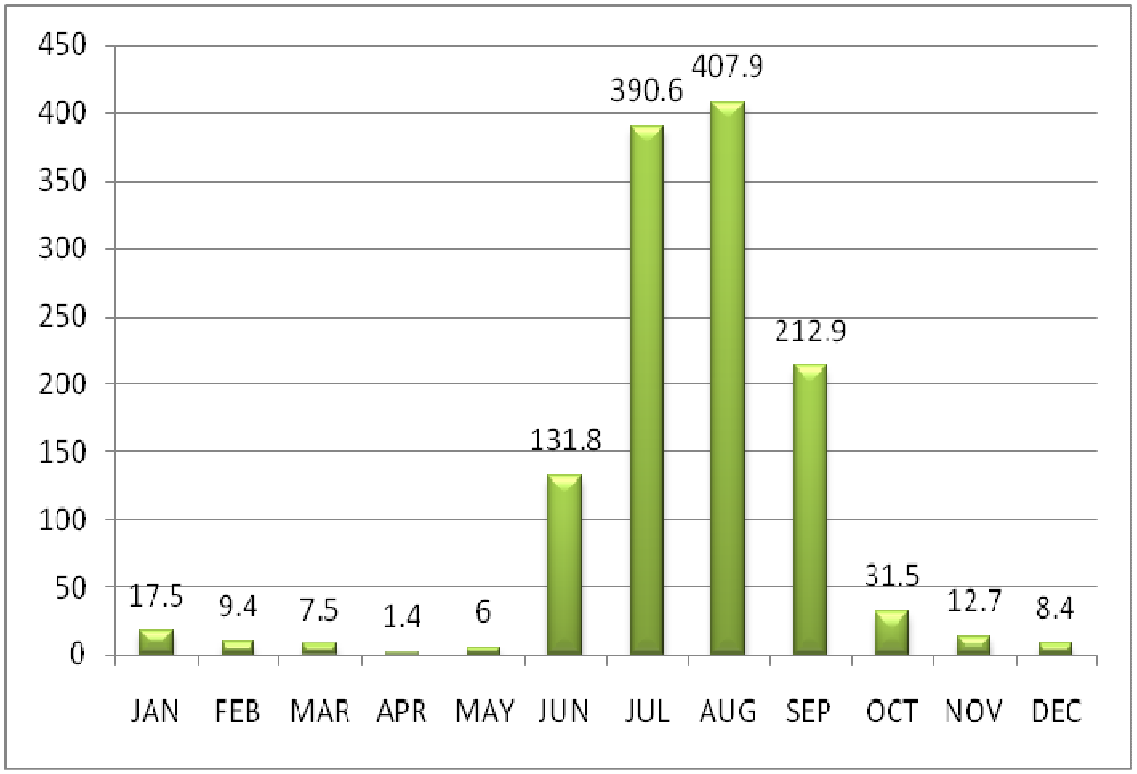
Annexure II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212.9
31.5
12.7
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JAN
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OCT
NOV
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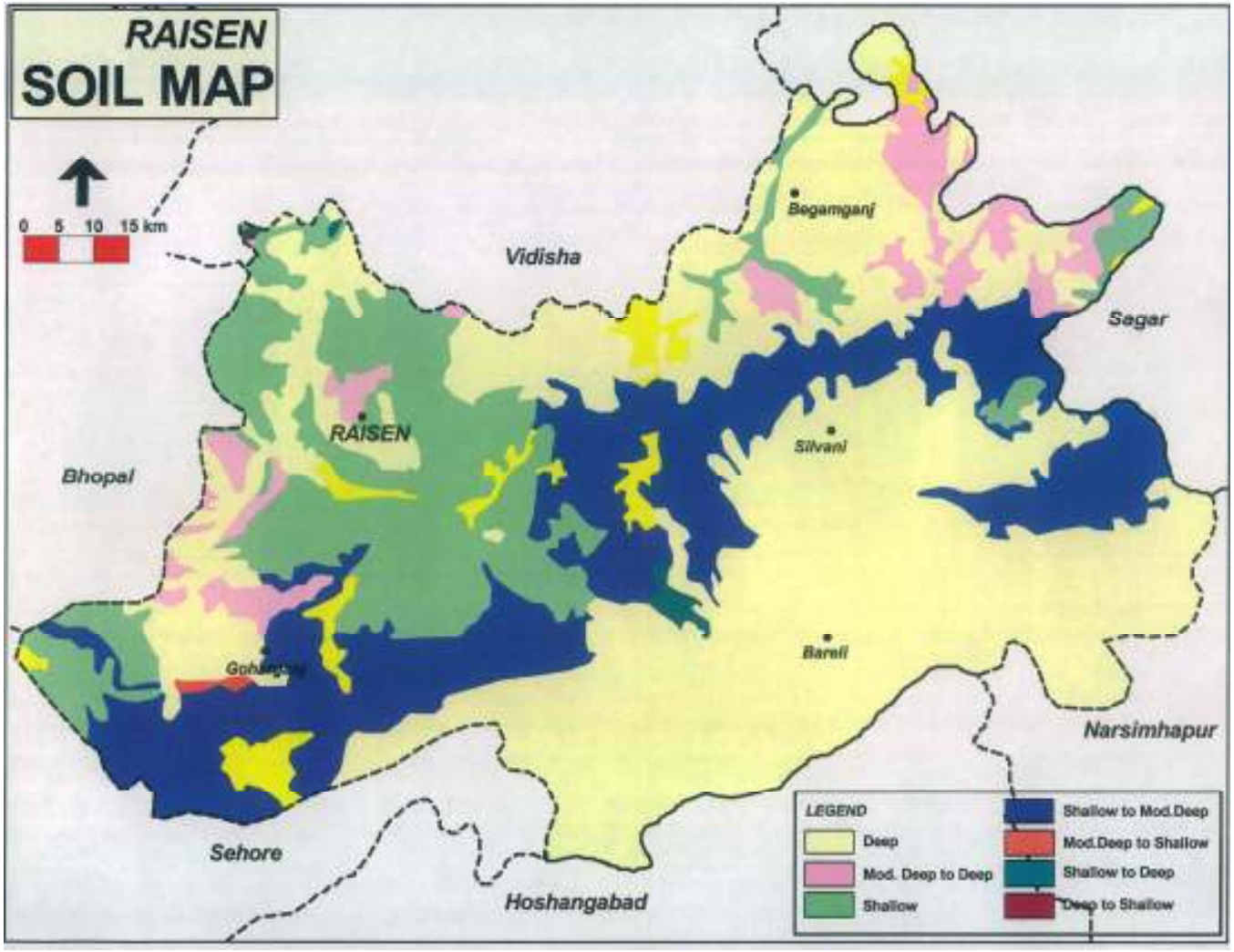
Annexure III



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 including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks 4th week of June	Deep to medium black soils	Soybean-wheat /Chickpea/lentil/linseed **Soybean-** JS-335 , JS 80-21, JS 97-52, JS 94-60, JS 93-05, PK-472, JS97-42 **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) **Pigeonpea-** Pragti ,Jagrati, Asha , Number-148, JKM-7, JA-4, ICPL-85063 (Laxmi) ,JKM-189 **Maize** –Hybrid varieties : Ganga -12, Ganga Safed-2, JKM-175 **Composite varieties:** HPQM-1, Jawahar Maize-12,Jawahar Maize-8 , Jawahar Maize-216, Jawahar Maize-13,JVM-421 **Sesame:**Local	No Change in crops and varieties	1. For higher production adopt recommended packages by sowing of soybean, Pigeonpea, Greengram and Blackgram on bunds 2. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers	SAU's, Beej Nigam & NSC
	Shallow black soils	Soybean-wheat/Chickpea/lentil/linseed **Soybean-** JS 95-60, JS 93-05, PK-472, JS-80-21, JS9 42 **Pigeonpea-** Number-148, JKM-7, JA-4,	No change		

		ICPL-85063 (Laxmi) ,JKM-189 **Maize** – Ganga -12, Ganga Safed-2, JKM-175 **Composite varieties:** Maize-8 , Jawahar Maize-216, Jawahar Maize-13, JVM-421			

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 4 weeks 2nd week of July	Deep to medium black soils	Soybean Pigeonpea, Rice, Maize, Blackgram, Greengram	**Donot prefer sowing of soybean beyond 10th July, if sown there will be yield reduction** **For the following crops prefer the varieties** **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, Mahamaya, 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) **Pigeonpea**- Pragati , Jagriti, Asha ,Numberr-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 **Sesame -** TKG -306, TKG-35 , JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-	1. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers 2. Application of balanced fertilizer and biofertilizer according to recommendation to crop and application of zinc where deficiency is occurred. 3. Sowing of crops against the slope depends on crops.	SAU's, Beej Nigam & NSC

			12,Jange		
	Shallow black soils	Soybean, Maize, Pigeonpea, Blackgram	**Donot prefer sowing of soybean beyond 10th July, if sown there will be yield reduction** **Pigeonpea-** Number-148, JKM-7, JA-4, ICPL-85063 (Laxmi) ,JKM **Blackgram** – JU-2,JU-3,JU-86,T-9,JBG-623,LBG684,TAU-1,Berkha **Sesame -** TKG -306, TKG-35 , JGS-8, JT-21, JT-22, JT-55, PKTS-11,		

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 6 weeks 4th week of July	Deep to medium black soils	Soybean Pigeonpea, Rice, Maize, Blackgram, Greengram	**Donot prefer sowing of soybean** Lowland field WGL-32100, MR-219, Mahamaya, 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) **Greengram**- Pusa vishal, K851, JM721, Jawahar 99 -37,Hum-1, Hum-2, Tarme-1L. 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	1. Blade harrowing (Bakhar) for moisture conservation and destroy of weeds in late onset of monsoon 2. Timely weeding is done and use of uprooted weeds as mulch between row of crops for moisture conservation 3. Application of biofertilizer and potash fertilizer under late sown condition	SAU's, Beej Nigam & NSC

	Shallow black soils	Soybean, Maize, Pigeonpea, Blackgram	**Donot prefer sowing of soybean** 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) **Pigeonpea-** Number-148, JKM-7, JA-4, ICPL-85063 (Laxmi) ,JKM-189 **Maize** – Ganga -12, Ganga Safed-2, JKM-175 **Composite varieties:** Maize-8, Jawahar Maize-216, Jawahar Maize-13, JVM-421		

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8 weeks **2nd week of August**	Deep to medium black soils	Soybean Pigeonpea, Rice, Maize, Blackgram, Greengram	**Donot prefer sowing of soybean, maize** **Sesame -** TKG -306, TKG-35 , JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12,JT-1 **Niger**-–JNC-6, JNC-1, JNC-9, JVN-1	1. Blade harrowing (Bakhar) for moisture conservation and destroy of weeds in late onset of monsoon 2. Application of biofertilizer and potash fertilizer under late sown condition	
	Shallow black soils	Soybean, Maize, Pigeonpea, Blackgram	**Donot prefer sowing of soybean** **Sesame -** TKG -306, TKG-35 , JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12,JT-1 **Niger**-–JNC-6, JNC-1, JNC-9, JVN-1		

Condition			**Suggested Contingency measures**		
Early season drought **(Normal onset)**	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**

Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Deep to medium black soils Shallow black soils	Soybean/ Blackgram/ Greengram (short duration variety) Rice/ Pigeonpea	1.Resowing with short duration varieties 2.Gap filling, in case of poor plant population	1. Storage of water in lower side of the field and make use for life saving irrigation in *Rabi* crops 2. Hand hoeing with dora/kulpha for interculture operation in between rows and use of removed weeds use as mulch for moisture conservation. 3. Application of FYM and vermicompost at the time of sowing for increase of water holding capacity 4. Ridges are made after 15-20 lines of crops for the moisture conservation	Sources of seed SAU, NSC & SSC For Agronomic Measures the Ongoing scheme like RKVY NREGS etc.

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**	**Remarks on Implementation**
At vegetative stage	Deep to medium black soils Shallow black soils	Soybean/ Blackgram/ Greengram (short duration variety) Rice/ Pigeonpea	Protective irrigation by sprinkler or Drip method	1. Soil mulching 2. Foliar spray of nutrients in pulses (DAP 2.5%), Non pulses (Urea 2%) 3. Storage of water in lower side of the field and make use for life saving irrigation in *Rabi* crops 4. Hand hoeing with dora/kulpha for interculture operation in between rows and use of removed weeds use as mulch for moisture conservation. 5. Application of FYM and vermicompost at the time of sowing for increase of water holding capacity 6. Ridges are made after 15-20 lines of crops for the moisture conservation	

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**

At flowering/ fruiting stage	Deep to medium black soils Shallow black soils	Soybean/ Blackgram/ Greengram (short duration variety) Rice/ Pigeonpea	Provide life saving irrigation	1.Foliar spray of nutrients in pulses(DAP 2.5%), Non pulses (Urea 2%) 2. Storage of water in lower side of the field and make use for life saving irrigation in *Rabi* crops 3.Ridges are made after 15-20 lines of crops for the moisture conservation	

Condition			**Suggested Contingency measures**		
Terminal drought (Early withdrawal of monsoon)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
	Deep to medium black soils Shallow black soils	Soybean/ Blackgram/ Greengram (short duration variety) Rice/ Pigeonpea	Life saving Irrigation Harvest at physiological Maturity	1. Plan for early rabi crop planning with Lentil Linseed, Chickpea, irrigated and un irrigated Wheat 2. Selection of short duration of varieties with increased seed rate up to 25% 3. Line sowing of Lentil, Linseed, Chickpea in moisture zone 4. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed then after treated with biofertilizers 5. Sowing of small seeded grains mix with FYM and vermicompost 6. Apply light irrigation to *Kharif* crops for proper grain filling if required, this will helpful in field preparation for *Rabi* crops	

2.1.2 Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delayed/ limited release of water in canals due to low rainfall	Medium deep to light black soils	Soybean-Wheat Rice-Wheat	Prefer alternate crops like semi Rabi sesame/ Chickpea/ Wheat Go for delayed sowing with early maturing varieties In case of severe shortage of water in canals, plan for sowing of soybean with short duration varieties (JS-335, JS-9560)	Mulching, Mechanical weed control Pre sowing irrigation is given for good germination	Sources of seed SAU, Ongoing scheme like RKVY NREGS ets.NSC & SSC

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Non release of water in canals under delayed onset of monsoon in catchment	Medium deep to light black soils	Soybean-Wheat Soybean Chickpea/lentil	Fallow-Chickpea/ Linseed/ Lentil/ **F**ieldpea **Sorghum:** Prefer dual purpose varities/ hybrids	Apply vermicompost. Water harvesting for life saving irrigation. Interculture operation. Provide life saving irrigation at critical stages. Pre sowing irrigation is given for good germination **Blackgram/ Greengram:** Adopt *in-situ* moisture conservation practices at 30DAS	

Condition			Suggested Contingency measures		
	Condition Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Medium deep to light black soils	Soybean/Wheat-Chickpea	Fallow-Chickpea/ Linseed/ Lentil 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 Soybean (JS-95-60) or Blackgram/ Greengram/ sesame etc. Prefer to sow hybrid Jowar	Mulching. Provide supplement irrigation using sprinkler at critical stage of crop High seed rate (25% more) with seed treatment Prefer raised bed sowing Reduce the dosage of fertilizer to 25%. Weed management with weedicide Imazethapyr @ 750 ml/ha in soybean Use of Pendimethaline @ 1kg/ha as PPI/PRE in Blackgram and greengram Use of Alachlor @ 1kg/ha as PRE in sesame	Awareness programme to farmers.

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Insufficient groundwater recharge due to low rainfall	Medium deep to light black soils	Soybean-Wheat-Chickpea	Sowing of pulses & oilseed in place of cereals (Soybean-Chickpea/lentil/linseed) Fallow-Chickpea/ Linseed / Lentil Chickpea should be sown with residual moisture after harvest of soybean or give pre sowing irrigation to chickpea	Spray of hormones & anti transpirant (Kaolin@ 6%). Mulching. Interculture Irrigate the crop at critical stages and if possible with sprinklers Mulching. Adopt furrow irrigation and use of micro-irrigation system	

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, Pigeon pea, Rice	Sowing with ridge & furrow method; Top dressing of urea. Provide drainage care should be taken that rain water does not stagnate in the field.	Drainage of excess water. Interculture	Drainage of excess water. Harvesting at physiological maturity.	Safe storage of produce after drying Produce should be placed under shade. or protect the produce by tarpaulin kept in T flown
Wheat, Chickpea, Lentil	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. -Planting in ridge and furrow.	Drain excess rain water from field. -Harvesting of crop in clear weather condition.	- Produce should be placed under shade. Protect the produce by

	-Planting in ridge and furrow. -Interculture operation for aeration.	-Interculture operation for aeration. - Spray of 2% DAP.	-Keep the harvested produce in safe place.	tarpaulin kept in T floor. Sun dry of the produce.
Horticulture				
Tomato, Chilli, Brinjal				
Heavy rainfall with high speed winds in a short span	Not applicable			
Horticulture	Not applicable			
Outbreak of pests and diseases due to unseasonal rains				
Soybean	Carry out critical survey of fields for insect and disease attack in crops	-	-	--
Wheat	Spray 0.2 % mancozeb 76% WP against wheat rust.	Spray 0.2 % mancozeb 76% WP against wheat rust.	Carry out critical survey of fields for disease attack in crops	
Chickpea	Spray t 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 C or 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.	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 C or Methyl Parathion 50 EC @ 600 ml dissolve in 500 L of water should be used. Dusting of Fenvalerate or Quinalphos 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	-
Tomato, Chilli, Brinjal				

2.3 Floods: Not available

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

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
Blackgram,Greengram 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	Harvest at physiological maturity
Horticulture				
Onion, Tomato, Brinjal	Grow under shade house Prefer to sow heat tolerant varieties	May be cultivated under net house Provide light irrigation Protect the plants by wind breaks/shelter belts	May be cultivated under net house Provide light irrigation Protect the plants by wind breaks/shelter belts	Harvest at physiological maturity
Mango, guava, papaya	Growing of nursery under protected irrigation preparation of mist chamber	Frequent Irrigation	Fencing with wind breaks in NW direction Frequent Irrigation	Fencing with wind breaks in NW direction Frequent Irrigation
Frost				
Chickpea Wheat Lentil	Create smoke, Light irrigation in night	Create smoke Light irrigation in night		Early harvest

Horticulture				
Tomato, potato Chilli, Brinjal	Grow in shade house Growing of heat tolerant varieties	May be cultivated in net house & supply of irrigation water, protect the plants by wind breaks/shelter belts	May be cultivated in net house & supply of irrigation water, protect the plants by wind breaks/shelter belts	Early harvest
Mango, guava, papaya	Growing of nursery under protected cultivation; Preparation of mist chamber	Frequent Irrigation	-Fencing with wind breaks in NW direction -Frequent Irrigation	-Fencing with wind breaks in NW direction -Frequent Irrigation
Cold wave				
Chickpea, Wheat Lentil, Pigeonpea	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	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
Mango, guava, papaya	Growing of nursery under protected cultivation	Fencing with wind breaks in NW direction Frequent Irrigation	Fencing with wind breaks in NW direction Frequent Irrigation	Fencing with wind breaks in NW direction Frequent Irrigation
Horticulture				
Tomato, potato, Chilli, Brinjal	Grow under shade house Growing of cold tolerant varieties	May be cultivated in net house & supply of irrigation water; protect the plants by wind breaks/shelter belts	May be cultivated in net house & supply of irrigation water; Protect the plants by wind breaks/shelter belts	
Hailstorm	Not Available			
Cyclone	Not Available			
Sea water intrusion	Not Available			

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-Bajra on rotation basis and also to cultivate short-term fodder crops like sunhemp	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 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	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 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	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

	places/village junctions/relief camp locations Community drinking water trough can be arranged in sandies /community grazing areas		
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 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	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 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	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 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	Allow for grazing between 10AM to 3PM during cold waves	Feed the animals as per routine schedule

	putting down during night time)	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	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