

**State: Madhya Pradesh**

**Agriculture Contingency Plan for District: Dindori**

<b>1.0 District Agriculture profile</b>			
<b>1.1</b>	<b>Agro-Climatic/Ecological Zone</b>		
	Agro Ecological Sub Region (ICAR)	Central Highlands (Malwa And Bundelkhand), Hot Subhumid (Dry) Eco-Sub region (10.4)	
	Agro-Climatic Zone (Planning Commission)	Eastern Plateau And Hills Region (VII)	
	Agro Climatic Zone (NARP)	North Hill Zone of Chattisgarh (MP-3)	
	List all the districts or part thereof falling under the NARP Zone	Shahdol, Anuppur, Dindori, Mandla	
	Geographic coordinates of district headquarters	Latitude	Longitude
		<b>22° 17' to 23° 22' N</b>	<b>80° 35' to 81° 58' E</b>
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	RARS, Near Collectorate, Dindori (M.P.)	
	Mention the KVK located in the district	Programme Coordinator, Krishi Vigyan Kendra, JNKVV, Tribal Agricultural Research Station, Dist. Dindori 481 880 (M.P.)	
<b>1.2</b>	<b>Rainfall</b>	<b>Normal RF(mm)</b>	<b>Normal Onset</b>
	SW monsoon (June-Sep):	1230	2 <sup>nd</sup> week of June
	NE Monsoon(Oct-Dec):	59.5	-
	Winter (Jan-Feb)	50.2	-
	Summer (Mar.-May)	37	-
	Annual	1376.7	-

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)	358.9	268.9	25.3	26.9	12.5	14.3	0.0	10.9	34.4	30.8

\* Net sown area + current fallow + old fallow

1.4	Major Soils (common names like red sandy loam deep soils (etc.,))*	Percent (%) of total
	Deep soils	28.3
	Medium deep soils	26.9
	Shallow soils	44.6

Source : NBSS & LUP, Nagpur

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	203.7	135
	Area sown more than once	71.1	
	Gross cropped area	274.8	

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

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	1.7		
	Gross irrigated area	1.7		
	Rainfed area	202.0		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals	38	1.1	64.7
	Tanks	0	0	0
	Open wells	397	0.2	11.7
	Bore wells	0	0	0
	Lift irrigation schemes	NA	NA	
	Micro-irrigation	NA		

	Other sources (reservoir)	697	0.4	23.5
	Total Irrigated Area		1.7	
	Pump sets	765		
	No. of Tractors	703		
	<b>Groundwater availability and use* (Data source: State/Central Ground water Department /Board)</b>	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%				

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

1.7	Major Field Crops cultivated	Area ('000 ha)							Summer	Total
		Kharif			Rabi					
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total			
	Rice	-	-	79.4	-	-	-	-	79.4	
	Kodo kutki			43.9	-	-	-	-	43.9	
	Niger			35.9	-	-	-	-	35.9	
	Maize			25.0	-	-	-	-	25.0	
	Soybean			6.5	-	-	-	-	6.5	
	Blackgram			5.8	-	-	-	-	5.8	
	Wheat		-		-		48.8	-	48.8	
	Mustard		-		-		25.9	-	25.9	
	Lentil		-		-		25.7	-	25.7	
	Linseed		-		-		9.4	-	9.4	
	Pea		-		-		9.1	-	9.1	
	Chickpea						7.8		7.8	
	Others (specify)	-	-	-	-	-	-	-	-	
	<b>Horticulture crops -</b>	<b>Total area</b>			<b>Irrigated</b>		<b>Rainfed</b>			

	<b>Fruits</b>			
	Fruits	0.25	-	-
	Others (specify)	-	-	-
	<b>Horticultural crops - Vegetables</b>	<b>Total area</b>	<b>Irrigated</b>	<b>Rainfed</b>
	Vegetables	0.41	-	-
	Others (specify)	-	-	-
	Spices	0.46	-	-

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

	<b>Medicinal and Aromatic crops</b>	<b>Total area</b>	<b>Irrigated</b>	<b>Rainfed</b>
	Medicinal and Aromatic crops	0.057	-	-
	Others (specify)	-	-	-

	<b>Plantation crops</b>	<b>Total area</b>	<b>Irrigated</b>	<b>Rainfed</b>
	Others such as industrial pulpwood crops etc (specify)	NA-	-	-
	<b>Fodder crops</b>	<b>Total area</b>	<b>Irrigated</b>	<b>Rainfed</b>
	Others (specify)	-	-	-
	<b>Total fodder crop area</b>	-	-	-
	<b>Grazing land</b>	-	-	-
	<b>Sericulture etc</b>	-	-	-
	<b>Others (Specify)</b>	-	-	-

<b>1.8</b>	<b>Livestock</b>	<b>Male ('000)</b>	<b>Female ('000)</b>	<b>Total ('000)</b>
	Non descriptive Cattle (local low yielding)	-	-	287.3
	Crossbred cattle	-	-	NA
	Non descriptive Buffaloes (local low yielding)	-	-	NA
	Graded Buffaloes	-	-	48.3
	Goat	-	-	57.1
	Sheep	-	-	0.2

	Others (Pig, horse, others)	-	-	10.9		
	Commercial dairy farms (Number)			NA		
<b>1.9</b>	<b>Poultry</b>	<b>No. of farms</b>	<b>Total No. of birds ('000)</b>			
	Commercial	-	-			
	Backyard	-	5000			
<b>1.10</b>	<b>Fisheries (Data source: Chief Planning Officer)</b>					
	<b>A. Capture</b>					
	<b>i) Marine</b> (Data Source: Fisheries Department)	<b>No. of fishermen -</b>	<b>Boats</b>		<b>Nets</b>	<b>Storage facilities (Ice plants etc.)</b>
			Mechanized	Non-mechanized		
		-	-	-	-	-
	<b>ii) Inland</b> (Data Source: Fisheries Department)	<b>No. Farmer owned ponds -</b>		<b>No. of Reservoirs</b>	<b>No. of village tanks</b>	
		Not available		-	521	
	<b>B. Culture</b>					
		<b>Water Spread Area (ha)</b>		<b>Yield (t/ha)</b>		<b>Production ('000 tons)</b>
	<b>i) Brackish water</b> (Data Source: MPEDA/ Fisheries Department)					
	<b>ii) Fresh water</b> (Data Source: Fisheries Department)	425.3		-		1097
	<b>Others</b>					

### 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)							
	Rice	61.6	825				-	61.68	825	-

	Soybean	3.3	637			NA	-	3.3	637	-
	Maize	18.5	971				-	18.5	971	-
	Blackgram	0.7	225				-	0.7	225	-
	Kodo kutki	8.4	192				-	8.4	192	-
	Niger	5.4	190				-	5.4	190	-
	<b>Wheat</b>			20.2	606		-	20.2	606	-
	Chickpea			3.4	486		-	3.4	486	-
	Lentil			6.5	266		-	6.5	266	-
	Mustard			11.8	617		-	11.8	617	-
	Pea			1.6	213		-	1.6	213	-
<b>Major Horticultural crops (Crops to be identified based on total acreage)</b>										
	Mango	-	-	-	-	-	-	2.3	42.9	-
	Guava	-	-	-	-	-	-	2.2	42.1	-
	Lime	-	-	-	-	-	-	2.2	42.0	-
	Aonla	-	-	-	-	-	-	1.3	31.7	-
	Papaya	-	-	-	-	-	-	1.3	31.7	-
	Banana	-	-	-	-	-	-	1.4	32.5	-
	Other	-	-	-	-	-	-	0.2	15.9	-
<b>Vegetables</b>	Potato	-	-	-	-	-	-	1.2	22.6	-
	Brinjal	-	-	-	-	-	-	1.2	22.6	-
	Tomato	-	-	-	-	-	-	1.2	22.6	-
	Veg. Pea	-	-	-	-	-	-	0.3	18.0	-
	Cauliflower	-	-	-	-	-	-	0.3	18.0	-
	Cabbage							0.8	18.9	-
	Onion	-	-	-	-	-	-	0.5	15.1	-
	Radish	-	-	-	-	-	-	0.5	15.1	-
	Sem	-	-	-	-	-	-	0.5	16.5	-
	Bitter guard	-	-	-	-	-	-	0.4	13.5	-
	Bottle guard	-	-	-	-	-	-	0.3	12.3	-
	Pumpkin	-	-	-	-	-	-	0.4	14.0	-
	Others	-	-	-	-	-	-	0.08	5.7	-
<b>Flowers</b>	Marigold	-	-	-	-	-	-	0.03	8.0	-
	Rose	-	-	-	-	-	-	0.02	7.0	-
<b>Spices</b>	Chilli	-	-	-	-	-	-	40.5	240.0	-
	Ginger	-	-	-	-	-	-	9.2	93.0	-

	Coriander	-	-	-	-	-	-	12.8	121.0	-
	Garlic	-	-	-	-	-	-	9.09	101.0	-
	Other							14.9	86.0	-
<b>Medicinal &amp; Aromatic</b>	Safed Moosli	-	-	-	-	-	-	0.6	16.0	-
	Aswagandha	-	-	-	-	-	-	0.3	11.6	-
Others	-	-	-	-	-	-	-			-

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

\*\* Department of horticulture District, Dindori M.P.

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Rice	Maize	Kodo, Kutki, Ragi	Niger	Pigeonpea
	Kharif- Rainfed	2 <sup>nd</sup> week of June – 2 <sup>nd</sup> week of July	2 <sup>nd</sup> week of June- 4 <sup>th</sup> week of June	2 <sup>nd</sup> week of June – 2 <sup>nd</sup> week of July (upto 10 <sup>th</sup> July)	2 <sup>nd</sup> week of July – 2 <sup>nd</sup> week of August	2 <sup>nd</sup> week of June – 2 <sup>nd</sup> week of July
	Kharif-Irrigated	2 <sup>nd</sup> week of June - 2 <sup>nd</sup> week of July	-	-	-	-
		<b>Wheat</b>	<b>Chickpea</b>	<b>Pea</b>	<b>Lentil</b>	<b>Mustard</b>
	Rabi- Rainfed	3 <sup>rd</sup> week of October- 2 <sup>nd</sup> week of November	2 <sup>nd</sup> week of October - 2 <sup>nd</sup> week of November	2 <sup>nd</sup> week of October – 2 <sup>nd</sup> week of November	2 <sup>nd</sup> week of October - 2 <sup>nd</sup> week of November.	2 <sup>nd</sup> week of October- 4 <sup>th</sup> week of October
	Rabi-Irrigated	2 <sup>nd</sup> week of November-3 <sup>rd</sup> week of December	2 <sup>nd</sup> week of October - 3 <sup>rd</sup> week of November	2 <sup>nd</sup> week of October to 2 <sup>nd</sup> 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			✗

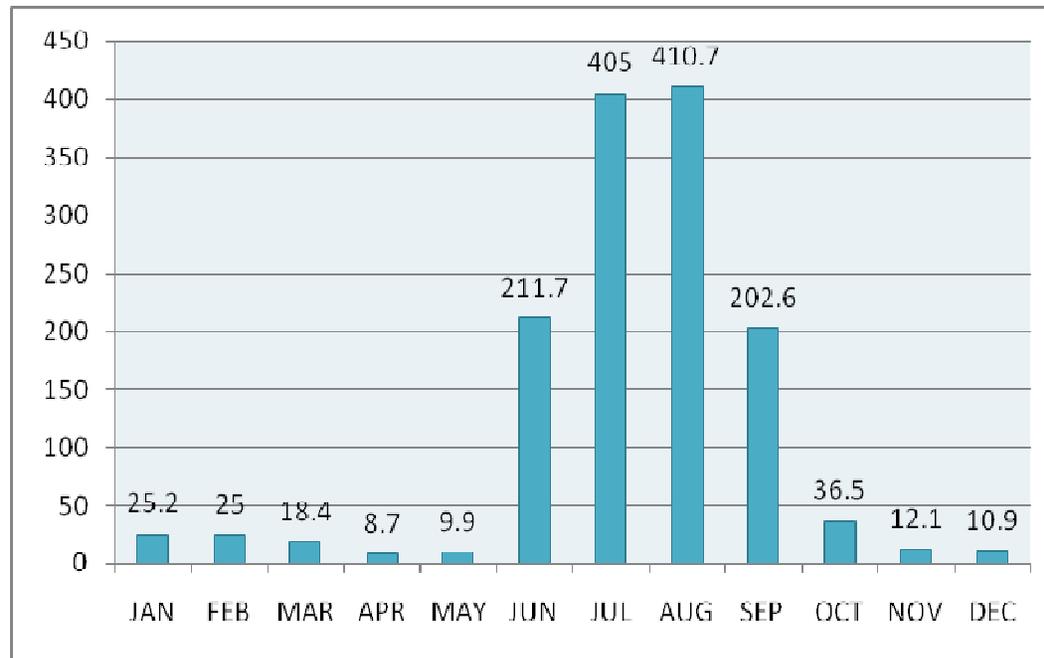
	Pests and disease outbreak (specify)		✓	
	Others (specify)			

<b>1.14</b>	<b>Include Digital maps of the district for</b>	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

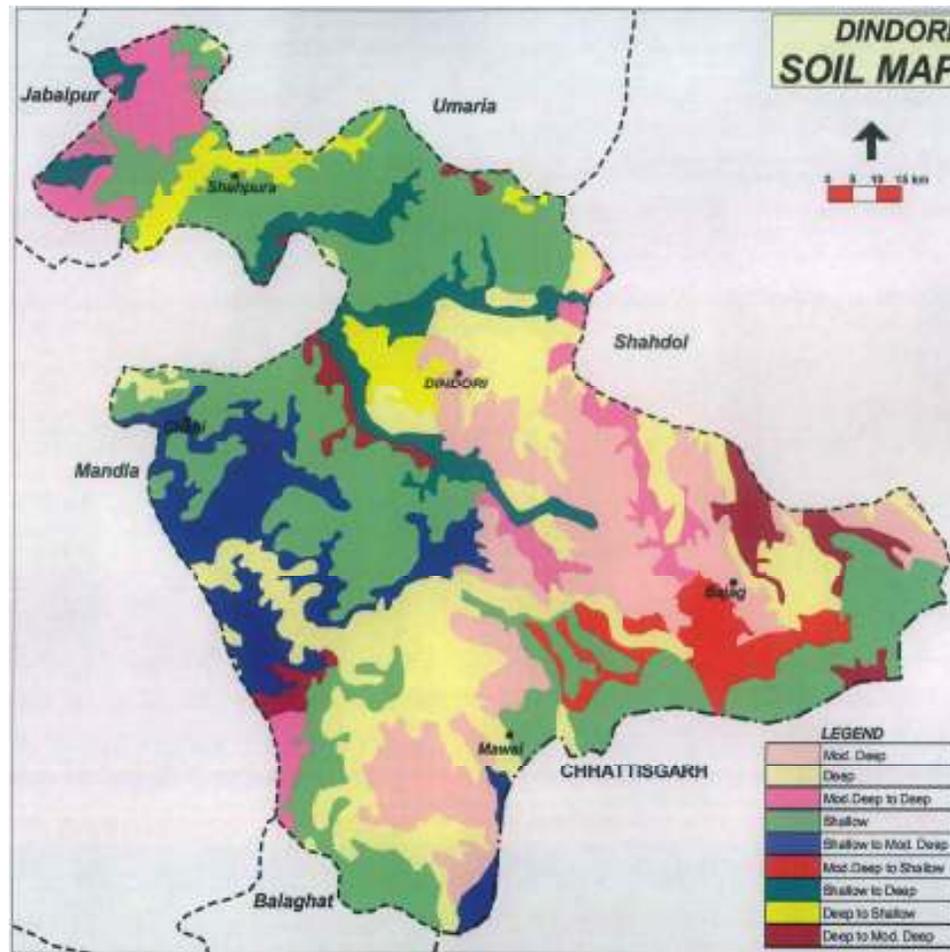




## Annexure II



Annexure III



Source: NBSS & LUP, Nagpur

## 2.0 Strategies for weather related contingencies

### 2.1 Drought

#### 2.1.1 Rainfed situation

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)  Delay by 2 weeks  4 <sup>th</sup> week of June	Upland unbanded shallow soils	Maize	No change	Follow normal recommended package of practices  Timely Sowing can be done	Source of seed SAU, NSC & SSC For Agronomic Measures the Ongoing scheme like RKVY NREGS etc
		Kodo			
		Kutki			
		Niger			
		Soybean			
		Blackgram			
	Upland banded shallow (gravelly sandu) soils	Paddy	No change		
		Maize			
		Pigeonpea			
	Lowland banded deep and medium deep soils	Paddy-Chickpea/lentil	No change		
		Paddy-Wheat/ lentil/Mustard			
		Soybean			

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)  Delay by 4 weeks  2 <sup>nd</sup> week of July	Upland unbanded shallow soils	Maize	<b>Donot sow maize</b>  <b>Prefer alternate crops like Kodo/ kutki</b> <b>Kodo-</b> Jawahar Kodo-1, 2, 41, 62, 101, 147, 439, Jawahar-48, Jawahar, 155, JK-106  <b>Kutki -</b> Jawahar Kutki 1, 2, 8, JK 36	Moisture conservation practices like ridging, conservation furrows, dust mulch etc.,	Source of seed SAU, NSC & SSC For Agronomic Measures the Ongoing scheme like RKVY NREGS etc
		Kodo			

			62, 101, 147, 439, Jawahar-48, Jawahar, 155, JK-106		
		Kutki	<b>Kutki</b> - Jawahar Kutki 1, 2, 8, JK 36		
		Niger	<b>Niger</b> —JNC-6, JNC-1, JNC-9, JVN-1		
		Soybean	<b>Soybean:</b> JS 335, JS 95-60 <b>(Prefer to sow soybean before 10<sup>th</sup> July)</b>		
		Blackgram	<b>Blackgram</b> – JU-2, JU-3, JU-86, T-9, JBG-623, LBG 684, TAU-1, Berkha, PU-30,35,19		
	Upland bunded shallow(gravelly sandu) soils	Paddy	<b>Paddy:</b> JR- 201		
		Maize	<b>Donot sow maize</b>  Prefer alternate crops like Sesame, kodo, kutki, Blackgram, Greengram and Pigeonpea.		
		Pigeonpea	<b>Pigeonpea-</b> Pragati, Jagriti,,Asha ,Nmuber-148,JKM-7,JA-4, Type-21-Pusa-855, ICPL-85063 (Laxmi), JKM-189		
	Lowland bunded deep and medium deep soils	Paddy-Chickpea/lentil	<b>Paddy:</b> JR- 201		
		Paddy-Wheat/ lentil/Mustard			
		Soybean	<b>Soybean:</b> JS 335, JS 95-60 <b>(Prefer to sow soybean before 10<sup>th</sup> July)</b>		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 6 weeks	Upland unbunded shallow soils	Maize	<b>Donot sow soybean after 10<sup>th</sup> July</b>	1. Blade harrowing (Bakhar) for moisture	Source of seed SAU, NSC & SSC For Agronomic
		Kodo			
		Kutki			

4 <sup>th</sup> week of July		Soybean	Donot sow Maize, Kodo, Kutki, Blackgram and Greegram  Prefer alternate crops like kodo, kutki, Sesame and Niger  <b>Sesame-</b> TKG -306, TKG-35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1  <b>Niger</b> —JNC-6, JNC-1, JNC-9, JVN-1  <b>Kodo-</b> Jawahar Kodo-1, 2, 41, 62, 101, 147, 439, Jawahar-48, Jawahar, 155, JK-106  <b>Kutki</b> - Jawahar Kutki 1, 2, 8, JK 36	2. conservation of Intercropping of Sesame and niger with Pigeonpea	Measures the Ongoing scheme like RKVY NREGS etc
		Blackgram			
		Niger			
	Upland banded shallow (gravelly sandu) soils	Paddy	Prefer to sow alternate crops like kodo, kutki, Sesame and Niger		
		Maize			
		Pigeonpea			
Lowland banded deep and medium deep soils	Paddy-Chickpea/lentil	Prefer to sow alternate crops like kodo, kutki, Sesame and Niger  <b>(Donot sow soybean after 10<sup>th</sup> July)</b>			
	Paddy-Wheat/ lentil/Mustard				
	Soybean				

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)					
Delay by 8 weeks	Upland unbanded shallow soils	Maize Kodo	Prefer alternate crops, Niger, Castor in kharif and	1. Blade harrowing (Bakhar) for	Source of seed SAU, NSC & SSC

<b>2<sup>nd</sup> week of August</b>		Kutki	plan for early rabi crops like mustard, linseed ,lentil.	moisture conservation 2. Intercropping of Sesame and Niger with Pigeonpea. 3. Moisture conservation by repeat ploughing. 4. Prepration of field for rabi crop	For Agronomic Measures the Ongoing scheme like RKVY NREGS etc
		Niger			
		Soybean			
		Blackgram			
	Upland banded shallow(gravelly sandu) soils	Paddy			
		Maize			
		Pigeonpea			
	Lowland banded deep and medium deep soils	Paddy-Chickpea/lentil			
		Paddy-Wheat/ lentil/Mustard			
Soybean					

<b>Condition</b>	<b>Major Farming situation</b>	<b>Normal Crop/cropping system</b>	<b>Suggested Contingency measures</b>		
			<b>Crop management</b>	<b>Soil nutrient &amp; moisture conservation measure</b>	<b>Remarks on Implementation</b>
Early season drought (Normal onset)					
<b>Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.</b>	Upland unbanded shallow soils	Maize	1. Prefer alternate crops like Soybean, Pigeonpea, Greengram and Blackgram on bunds 2. Weed management by using hand hoe between crop row.	1. Blade harrowing (Bakhar) for moisture conservation 2. Adopt moisture conservation practices. 3. Conservation of excess rain water in high rainfall areas. 4. Mulching. 5. Provide light irrigation through farm pond.	Source of seed SAU, NSC & SSC For Agronomic Measures the Ongoing scheme like RKVY NREGS etc
		Kodo			
		Kutki			
		Niger			
		Soybean			
	Upland banded shallow(gravelly sandu) soils	Paddy	1. Resowing of direct seeded rice		
		Maize	1. Prefer alternate crops like Soybean, Pigeonpea, Greengram and Blackgram on bunds 2. Weed management using hand hoe between crop row.		
		Pigeonpea			
	Paddy-Chickpea/lentil				
	Lowland banded deep and medium deep soils	Paddy-Wheat/ lentil/Mustard			
Soybean					

<b>Condition</b>	<b>Major Farming situation</b>	<b>Normal Crop/cropping system</b>	<b>Suggested Contingency measures</b>		
			<b>Crop management</b>	<b>Soil nutrient &amp; moisture conservation measures</b>	<b>Remarks on Implementation</b>
<b>Mid season drought (long dry spell, consecutive 2 weeks rainless (&gt;2.5 mm) period)</b>					

<b>At vegetative stage</b>	Upland unbunded shallow soils	Maize	Life saving irrigation if available  Maintain optimum plant population	1. Interculture with Dora/Kulpha/Hand hoe in between rows 2. Use uprooted weeds as mulch for moisture conservation. 2. Ridges are made after 15-20 lines of crops for the moisture conservation 3. Adopt plant protection measures	-
		Kodo			
		Kutki			
		Niger			
		Soybean			
	Blackgram				
	Upland banded shallow (gravelly sandu) soils	Paddy			
		Maize			
		Pigeonpea			
	Lowland banded deep and medium deep soils	Paddy-Chickpea/lentil			
		Paddy-Wheat/ lentil/Mustard			
		Soybean			

<b>Condition</b>			<b>Suggested Contingency measures</b>		
<b>Mid season drought (long dry spell)</b>	<b>Major Farming situation</b>	<b>Normal Crop/cropping system</b>	<b>Crop management</b>	<b>Soil nutrient &amp; moisture conservation measures</b>	<b>Remarks on Implementation</b>
<b>At Flowering stage</b>	Upland unbanded shallow soils	Maize	Life saving irrigation if available	1. Interculture with Dora/Kulpha/H and hoe in between rows . 2. Use of uprooted weeds use as mulch for moisture conservation. 3. Ridges are made after 15-20 lines of crops for the moisture conservation 4. Adopt plant protection measures	-
		Kodo			
		Kutki			
		Niger			
		Soybean			
	Blackgram				
	Upland banded shallow (gravelly sandu) soils	Paddy			
		Maize			
		Pigeonpea			
	Lowland banded deep and medium deep soils	Paddy-Chickpea/lentil			
		Paddy-Wheat/ lentil/Mustard			
		Soybean			

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Rabi Crop planning	Remarks on Implementation
Terminal drought (Early withdrawal of monsoon)	Upland unbunded shallow soils	Maize Kodo Kutki Niger Soybean Blackgram	1. Life saving irrigation through sprinkler. 2. Soil moisture conservation by use of mulch. 3. Prefer to sow short duration crop varieties .	1. Prefer to sow Lentil, Linseed, Chickpea, irrigated and unirrigated wheat 2. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers 3. Sowing of small seeded grains mix with FYM and vermicompos 4. Apply light irrigation to Kharif crops for proper grain filling if required and this will helpful in field preparation of Rabi crops	Source of seed SAU, NSC & SSC For Agronomic Measures the Ongoing scheme like RKVY NREGS etc
	Upland banded shallow (gravelly sandu) soils	Paddy Maize Pigeonpea			
	Lowland banded deep and medium deep soils	Paddy-Chickpea/lentil Paddy-Wheat/ lentil/Mustard Soybean			

### 2.1.2 Irrigated situation

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of	Medium deep to	Paddy-Wheat/ lentil/Mustard	Green gram-Mustard/	Adopt water saving	--

water in canals due to low rainfall	deep soils	Paddy-Chickpea/lentil	Black gram-Wheat/ Black gram- Chickpea Fallow-Chickpea	<p>methods like direct seeded rice, SRI Cultivation, Aerobic rice</p> <p><b>Wheat</b> Prefer short duration low water requirement varieties of wheat.</p> <p>Protective irrigation at CRI stage in wheat.</p> <p><b>Chickpea</b> should be sown with residual moisture after harvest of soybean or give pre sowing irrigation to chickpea.</p> <p>Maintain optimum plant population</p>	
-------------------------------------	------------	-----------------------	--	---	--

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in canals due	Medium deep to deep soils	Rice-Wheat	Rice-Chickpea / Green gram-Wheat(Early)	Adopt water saving methods like direct	-

to low rainfall		Rice -Chickpea	Black gram/ Greengram-Wheat	seeding seeded rice, SRI Cultivation, Aerobic rice  <b>Blackgram/          Greengram:</b> Adopt <i>in-          situ</i> moisture conservation practices at 30DAS  Maintain optimum plant population  Irrigate at critical stages  Conservation tillage <b>Wheat</b> Prefer short duration low water requirement varieties of wheat.  Protective irrigation at CRI stage in wheat.  <b>Chickpea</b> should be sown with residual moisture after harvest of soybean or give p re sowing irrigation to chickpea	
-----------------	--	----------------	-----------------------------	---	--

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	Medium deep to deep soils	Rice-Wheat Rice -Chickpea	Rice-Chickpea / Green gram-Wheat(Early) Blackgram-Chickpea/ wheat	<b>Blackgram/          Greengram:</b> Adopt <i>in-          situ</i> moisture conservation practices at	-

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
in catchment				30DAS Maintain optimum plant population Irrigate at critical stages Conservation tillage	

Condition	Suggested Contingency measures				
	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	Not applicable				

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	Not applicable				

## 2.2 Unusual rains (untimely, unseasonal etc)] (for both rain fed and irrigated situations)

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Continuous high rainfall in a short span leading to water logging				
Rice	Drain the excess water as	Drain the excess water as	Drain the excess water as	Drain out water and spread

	<p>early as possible</p> <p>Apply 20 kg N + 10 kg K /ha after draining excess water</p> <p>Take up gap filling either with available nursery or by splitting the tillers from the surviving hills</p> <p>Take up suitable plant protection</p> <p>Measures in anticipation of pest &amp; disease out breaks</p>	<p>early as possible</p> <p>Apply 20 kg N + 10 kg K /ha after draining excess water</p> <p>Take up suitable plant protection</p> <p>Measures in anticipation of pest &amp; disease out breaks</p>	<p>early as possible</p> <p>Take up suitable plant protection measures in anticipation of pest &amp; disease out breaks</p>	<p>sheaves loosely in field or field bunds where there is no water stagnation</p> <p>Spray common salt at 5% on panicles to prevent germination and spoilage of straw from moulds</p> <p>Thresh after drying the sheaves properly</p> <p>Ensure proper grain moisture before storing</p>
Maize	<p>Drain the excess water as early as possible</p> <p>Apply 20 kg N + 10 kg K /ha after draining excess water</p> <p>Take up inter cultivation and at optimum soil moisture condition to loosen and aerate the soil and to control weeds</p> <p>Earthing up the crop for anchorage</p> <p>Spray KNO<sub>3</sub> 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition</p> <p>Take up timely control measures for Pink stem borer, sheath blight and Turcicum leaf blight</p>	<p>Drain the excess water as early as possible</p> <p>Apply 20 kg N + 10 kg K /ha after draining excess water</p> <p>Spray KNO<sub>3</sub> 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition</p> <p>Take up timely control measures for sheath blight and post flowering stalk rots</p>	<p>Drain the excess water as early as possible</p> <p>Allow the crop to dry completely before harvesting</p>	<p>Harvest the cobs after the they are dried up properly.</p> <p>Dry the grain to optimum moisture condition before storing</p>
Pulses & Minor millets	<p>Provide drainage, care should be taken that rain water does not stagnate in the field.</p>	<p>Care should be taken that rain water does not stagnate in the field.</p>	<p>Care should be taken that rain water does not stagnate in the field.</p>	<p>Produce should be placed under shade.</p> <p>Or protect the produce by tarpaulin kept in T flown</p>
Wheat	<p>Care should be taken that rain water does not stagnate in the field and not allow to top drashing of nitrogenous fertilizers.</p>	<p>Care should be taken that rain water does not stagnate in the field and not allow to top drashing of nitrogenous fertilizers.</p>	<p>Proper drainage should be provided and adopt all plant protection measures</p>	-
Chickpea	<p>Care should be taken that rain</p>	<p>Care should be taken that rain</p>	<p>Proper drainage should be</p>	

	water does not stagnate in the field and not allow to top drashing of nitrogenous fertilizers.	water does not stagnate in the field and not allow to top drashing of nitrogenous fertilizers.	provided and adopt all plant protection measures	
<b>Heavy rainfall with high speed wind in a short span</b>	Not applicable			
<b>Out break of pests and diseases due to unseasonal rains</b>				
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	-
Maize	Plant protection measures for stem borer, army worm. Control stem borer.  For control of leaf blight spray Mancozeb @ 2.5g/l.	Plant protection measures for Rust, TLB. Control cob worm and rust  PP measures for Stalk rot/rust//TLB by spraying Hexaconazole @ 0.1 %	Plant protection measures for Rust / TLB/Leaf spot in Maize	-
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 % 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 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 Chloropyriphos 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 Endosulfan 4% 15-20 kg or Quinolphas 1.5 WP 20-25 per	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 Chloropyriphos 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 Endosulfan 4% 15-20 kg or Quinalphos 1.5 WP 20-25 per	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	-

	hectare with duster.	hectare with duster.		
<b>Horticulture</b>				
Tomato	-	Use of Bird perchrs @ 50/ha. Spray of Endosulfan @ 1.0 Lit /ha.against Fuit borer management at ETL	Spray of Endosulfan @ 1.0 Lit /ha.against Fuit borer management	-
Brinjal	-	Use of Bird perchrs @ 50/ha. Spray of Endosulfan @ 1.0 Lit /ha.against Fuit & shoot borer management at ETL	Spray of Endosulfan @ 1.0 Lit /ha.against Fuit borer management	-
Chilli	-	Management of Chilli Thrips Use of Imidacloprid @ 3ml/10 lit. of water	Management of Chilli Thrips Use of Imidacloprid @ 3ml/10 lit. of water	-
Cauliflower	-	Management of DBM, Aphids Use of Imidacloprid @ 3ml/10 lit. of water	Management of DBM , Aphids Use of Imidacloprid @ 3ml/10 lit. of water	-

### 2.3 Floods

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

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

Extreme event type	Suggested contingency measure <sup>r</sup>			
	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	Repeated irrigation at the appearance of hairline cracks in soil surface	Harvest crop at physiological maturity

		deficiency and for crop establishment.		
Maize, 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
<b>Horticulture</b>	-	-	-	-
Mango , Guava	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
<b>Cold wave</b>	-	-	-	-
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
<b>Frost</b>				
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	Moisture conservation practices like ridging, conservation furrows, dust mulch etc.,	Harvest at physiological maturity -
<b>Horticulture</b>				
Tomato	Delay or late raising of Nursery		Moisture conservation practices like ridging, conservation furrows, dust mulch etc.,	-
Potato	Cold Tolerant Variety is grown i.e. Pusa Sheetal of Tomato			-
Chilli, Dhania Methi, Cauliflower	-	-		-
<b>Hailstorm</b>	-	-	-	-
Wheat, chickpea	Re-sowing in case of severe damage	Light and frequent irrigation.	<ul style="list-style-type: none"> <li>• Apply 10% additional nitrogen</li> <li>• Light and frequent irrigation</li> </ul>	Timely harvesting and shifting of produce to safer

				place in case of early forewarning
Mango , Guava- fruit crops	Not applicable	Prune damaged branches and twigs and apply Bordeaux paste 1% to avoid fungal infections	Prune damaged branches and twigs and apply Bordeaux paste 1% to avoid fungal infections Apply hormonal spray NAA 20 ppm + 1 % urea to prevent flower board	Immediate harvesting, grading and marketing of produce
<b>Cyclone</b>	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
<b>Drought</b>			
Feed and fodder availability	<p>As the district is occasionally prone to drought the following practices may be implemented to prevent fodder shortage problem</p> <p>Sowing of cereals (fodder varieties of Sorghum/ Bajra) and leguminous crops (Lucerne, Berseem, Horse gram, Cowpea) during North-East monsoon under dry land system for fodder production.</p> <p>Collection of soybean and chick pea stover for use as feed supplement during drought</p> <p>Preserving the green maize fodder as silage</p> <p>Encourage fodder production with Bajra – stylo-Bajra on rotation basis and also to cultivate short-term fodder crops like sunhemp</p>	<p>Harvest and use biomass of dried up crops (Rice, wheat, Maize, Soybean, Black gram, Green gram, chick pea etc., ) material as fodder</p> <p>Harvest all the top fodder available (Subabul, Glyricidia, Pipol, Prosopis etc) and feed the LS during drought</p> <p>Concentrate ingredients such as Grains, brans, chunnies &amp; 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</p> <p>Promotion of Horse gram as contingent crop</p>	<p>Encourage progressive farmers to grow multi cut fodder crops of sorghum/bajra/maize with input subsidy</p> <p>Supply of quality stem cuttings of Hybrid napier (CO1), paragrass, guinea grass etc., well before monsoon</p> <p>Encourage growing fodder crops like Berseem in winter and Juar in summer season</p> <p>Flushing the stock to recoup</p> <p>Replenish the feed and fodder banks</p>

		<p>and harvesting it at vegetative stage as fodder</p> <p>Continuous supplementation of minerals and vitamin to prevent infertility.</p> <p>Encourage mixing available kitchen waste with dry fodder while feeding to the milch animals</p>	
Drinking water	<p>Adopt various water conservation methods at village level to improve the ground water level for adequate water supply.</p> <p>Identification of water resources</p> <p>De-silting of ponds</p> <p>Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals)</p> <p>Construction of drinking water tanks in herding places/village junctions/relief camp locations</p> <p>Community drinking water trough can be arranged in sandies /community grazing areas</p>	<p>Adequate supply of drinking water.</p> <p>Restrict wallowing of animals in water bodies/resources; Add alum in stagnated water bodies</p>	<p>Watershed management practices shall be promoted to conserve the rainwater. Bleach (0.1%) drinking water / water sources</p> <p>Provide clean drinking water</p>
Health and diseases management	<p>Procure and stock emergency medicines and vaccines for important endemic diseases of the area</p> <p>All the stock must be immunized for endemic diseases of the area</p> <p>Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district</p> <p>Adequate refreshment training on draught management to be given to VAS, Jr.VAS, LI with regard to health &amp; management measures</p> <p>Procure and stock multivitamins &amp; area specific mineral mixture</p>	<p>Carryout deworming to all animals entering into relief camps</p> <p>Identification and quarantine of sick animals</p> <p>Constitution of Rapid Action Veterinary Force</p> <p>Performing ring vaccination (8 km radius) in case of any outbreak</p> <p>Restricting movement of livestock in case of any epidemic</p> <p>Tick control measures be undertaken to prevent tick borne diseases in animals</p> <p>Rescue of sick and injured animals and their treatment</p> <p>Organize with community, daily lifting of</p>	<p>Keep close surveillance on disease outbreak.</p> <p>Undertake the vaccination depending on need</p> <p>Keep the animal houses clean and spray disinfectants Farmers should be advised to breed their milch animals during July-September so that the peak milk production does not coincide with mid summer</p>

		dung from relief camps	
<b>Floods</b>	NA		
<b>Cyclone</b>	NA		
<b>Heat wave and cold wave</b>			
<b>Heat wave</b>	<ul style="list-style-type: none"> <li>i) Plantation around the shed</li> <li>ii) H<sub>2</sub>O sprinklers / foggers in the shed</li> <li>iii) Application of white reflector paint on the roof</li> <li>iv) Thatched sheds should be provided as a shelter to animal to minimize heat stress</li> </ul>	<p>Allow the animals early in the morning or late in the evening for grazing during heat waves</p> <p>Feed green fodder/silage / concentrates during day time and roughages / hay during night time in case of heat waves</p> <p>Put on the foggers / sprinklers /fans during heat waves in case of high yielders (Jersey/HF crosses)</p> <p>In severe cases, vitamin ‘C’ and electrolytes should be added in H<sub>2</sub>O during heat waves.</p>	<p>Feed the animals as per routine schedule</p> <p>Allow the animals for grazing (normal timings)</p>
<b>Cold wave</b>	Covering all the wire meshed walls / open area with gunny bags/ polyethylene sheets (with a mechanism for lifting during the day time and putting down during night time)	<p>Allow for grazing between 10AM to 3PM during cold waves</p> <p>Add 25-50 ml of edible oil in concentrates and fed to the animal during cold waves</p> <p>Apply / sprinkle lime powder in the animal shed during cold waves to neutralize ammonia accumulation</p>	<p>Feed the animals as per routine schedule</p> <p>Allow the animals for grazing (normal timings)</p>
<b>Insurance</b>	Encouraging insurance of livestock	Listing out the details of the dead animals	<p>Submission for insurance claim and availing insurance benefit</p> <p>Purchase of new productive animals</p>

### 2.5.2 Poultry

	Suggested contingency measures		
	Before the event	During the event	After the event
<b>Drought</b>			
Shortage of feed	Storing of house hold grain like maize,	Supplementation only for productive birds	Supplementation to all survived

ingredients	broken rice etc, in to use as feed in case of severe drought	with house hold grain Supplementation of shell grit (calcium) for laying birds Culling of weak birds	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
<b>Floods</b>	NA		
<b>Cyclone</b>	NA		
<b>Heat wave and cold wave</b>			
<b>Shelter/environment management</b>	<b>Heat wave:</b> 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
	<b>Cold wave:</b> 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
<b>Health and disease management</b>	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**

	<b>Suggested contingency measures</b>		
	<b>Before the event</b>	<b>During the event</b>	<b>After the event</b>
<b>Drought</b>			
Shallow water in ponds due to insufficient rains/inflow	<ol style="list-style-type: none"> <li>1. Restricted release of water from reservoir.</li> <li>2. Supplementary water harvest structures like pond and tanks have to be developed.</li> <li>3. Renovation and maintenance of existing water harvest structures</li> </ol>	<ol style="list-style-type: none"> <li>1. Restrict lifting of water for irrigation purpose of crops</li> <li>2. Catch the stock, market the produce to reduce the density of population in ponds.</li> </ol>	<ol style="list-style-type: none"> <li>1. Excavate the ponds to increase the depth.</li> <li>2. Try to release water into the pond if it rains in off-season</li> </ol>
Impact of heat & salt load build up in ponds / change in water quality	<ol style="list-style-type: none"> <li>1. Prepare to release water into the habitat</li> </ol>	<ol style="list-style-type: none"> <li>1. Mixing of water from the water harvest structure like ponds and tanks into the fish habitat.</li> </ol>	<ol style="list-style-type: none"> <li>1. Monitoring the water quality and health of aquatic organisms</li> </ol>
<b>Floods</b>	<b>NA</b>		
<b>Cyclone</b>	<b>NA</b>		
<b>Heat wave and cold wave</b>			
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