

State: Madhya Pradesh
Agriculture Contingency Plan for District: Katni

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	Panna, Satna, Sidhi, Jabalpur, Katni, Rewa, Seoni	
	Geographic coordinates of district headquarters	Latitude	Longitude
		23° 47' N	80° 27' E
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	ZARS, Jabalpur	
	Mention the KVK located in the district	Programme Coordinator Krishi Vigyan Kendra, Agriculture Farm, Piprodh, Distt. Katni-483 442 (M.P.)	
1.2	Rainfall	Normal RF(mm)	Normal Onset (specify week and month)
	SW monsoon (June-Sep):	1055.3	2 nd week of July
	NE Monsoon(Oct-Dec):	49.8	
	Winter (Jan- Feb)	47.3	
	Summer (March -May)	19	-
	Annual	1171.4	-

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)	493.1	246.3	100.0	12.8	38.6	39.5	0.1	55.8	27.5	26.1

* 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 soils	187.6	37.9
	Medium deep soils	181.0	36.6
	Shallow soils	125.6	25.4

Source: NBSS & LUP, Nagpur

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	192.70	128
	Area sown more than once	53.20	
	Gross cropped area	245.90	

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

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	49.2		
	Gross irrigated area	59.9		
	Rainfed area	143.5		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals	144	12.8	21.38
	Tanks	258	0.7	1.17
	Open wells	11008	30.1	50.27
	Bore wells	921	1.2	2.00
	Lift irrigation schemes	NA		

	Micro-irrigation	NA		
	Other sources (reservoir)	1623	15.10	25.22
	Total Irrigated Area		59.90	
	Pump sets	17910		
	No. of Tractors	2200		
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils 06	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited			
	Critical			
	Semi- critical			
	Safe	6	100	
	Wastewater availability and use			
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

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

1.7	Major Field Crops cultivated	Area ('000 ha)							
		<i>Kharif</i>			<i>Rabi</i>			Summer	Total
		<i>Irrigated</i>	<i>Rainfed</i>	Total	<i>Irrigated</i>	<i>Rainfed</i>	Total		
	Rice			106.8				106.8	
	Pigeonpea (Tur)			4.7				4.7	
	Kodo kutki			4.6				4.6	
	Maize			3.4				3.4	
	Blackgram			3.0				3.0	
	Wheat						65.0	65.0	
	Chickpea						28.3	28.0	
	Lentil						16.7	16.7	
	Pea						5.9	5.9	
	Linseed						5.0	5.0	
	Horticulture crops – Fruits	Total area (ha)			Irrigated		Rainfed		

	Mango	887		
	Papaya	7		
	Guava	94		
	Ber	0.28		
	Others (specify)			

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

	Horticultural crops – Vegetables	Total area (ha)	Irrigated	Rainfed
	Potato	662		
	Tomato	283		
	Brinjal	277		
	Cauliflower	103		
	Onion	450		
	Cabbage	97		
	Others (specify)			
	Medicinal and Aromatic crops	Total area	Irrigated	Rainfed
	Lemongrass	0.014	0.014	
	Palmarosa	0.011	0.011	
	Ashwagandha	0.233	0.233	
	Isabgol	0.0025	0.0025	
	Others (specify)			

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

	Plantation crops –	Total area	Irrigated	Rainfed
		NA		
	Others such as industrial pulpwood crops etc (specify)			
	Fodder crops-	Total area	Irrigated	Rainfed
		NA		

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

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)		
	Non descriptive Cattle (local low yielding)			416		
	Crossbred cattle			NA		
	Non descriptive Buffaloes (local low yielding)			NA		
	Graded Buffaloes			83.4		
	Goat			85.7		
	Sheep			8.3		
	Others (Pig + Horses)			6.0		
	Commercial dairy farms (Number)			NA		
1.9	Poultry	No. of farms	Total No. of birds ('000)			
	Commercial	2	2.5			
	Backyard		29.9			
1.10	Fisheries (Data source: Chief Planning Officer) NA					
	A. Capture					
	i) Marine (Data Source: Fisheries Department)	No. of fishermen	Boats		Nets	Storage facilities (Ice plants etc.)
			Mechanized	Non-mechanized		
		-	-	-	-	-
	ii) Inland (Data Source: Fisheries Department)	No. Farmer owned ponds		No. of Reservoirs	No. of village tanks	
		343		58	495	
	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)	4473	2282	2431.28 MT
	Others			

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

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

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										
	Rice	74.22	734					74.22	734	
	Maize	3.34	918					3.34	918	
	Pigeonpea	2.80	639					2.80	639	
	Kodo kutki	0.94	184					0.94	184	
	Blackgram	0.48	153					0.48	153	
	Sesame	0.48	174					0.48	174	
	Wheat			56.75	1005			56.75	1005	
	Chickpea			14.03	637			14.03	637	
	Lentil			5.70	336			5.70	336	
	Linseed			2.06	403			2.06	403	
	Pea			1.82	339			1.82	339	
Major Horticultural crops -Fruits										
	Mango	17.19	10010							
	Papaya	8.2	29320							
	Guava	8.14	17110							
	Aonla	5.0	12190							
	Ber	2.33	8310							

Major Horticultural crops -Vegetables										
	Potato	37.84	22150							
	Tomato	32.37	24690							
	Brinjal	17.84	19160							
	Cauliflower	10.49	20760							
	Onion	14.02	18300							
	Cabbage	7.51	23330							

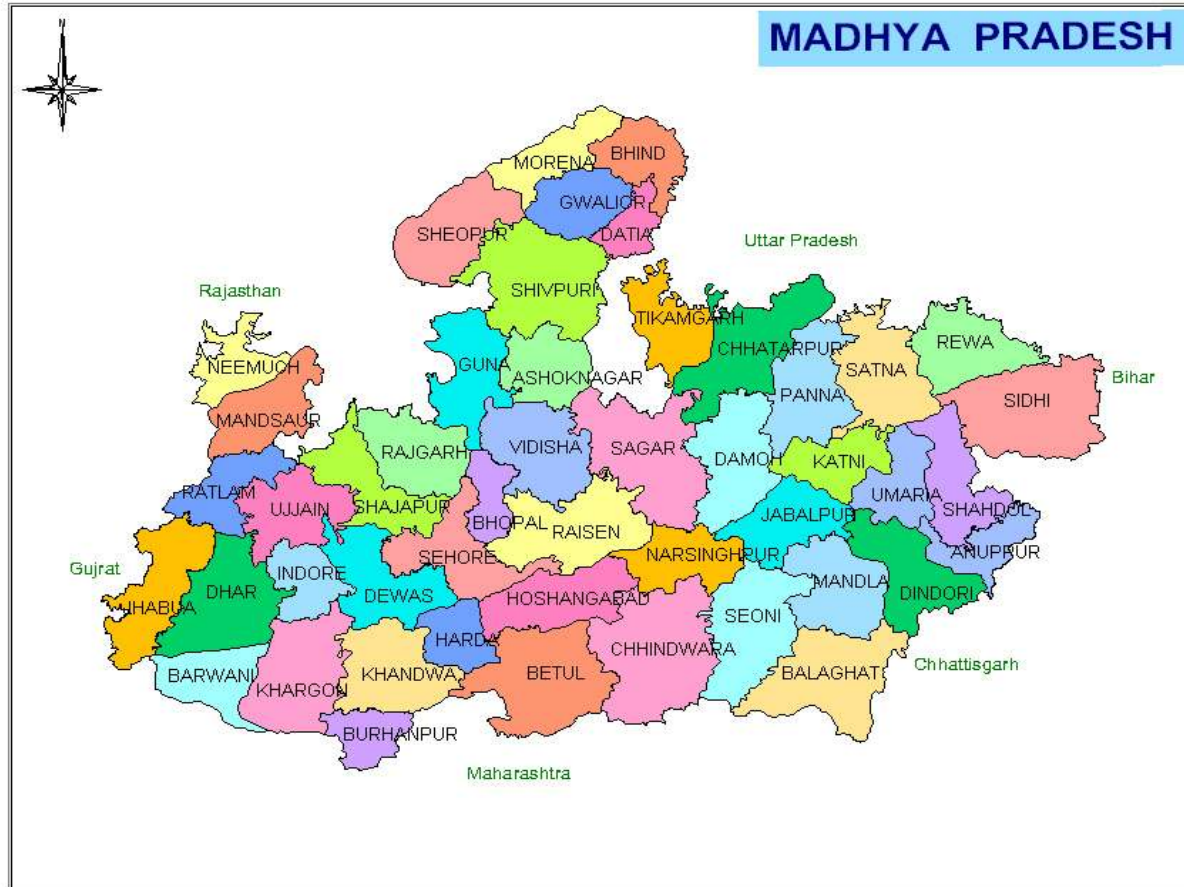
1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Rice	Soybean	Pigeonpea	Maize	Blackgram
	Kharif- Rainfed	3 rd week of July – 2 nd week of August	3 rd week of June – 1 st week of July	3 rd week of June – 2 nd week of July	3 rd week of May – 1 st week of June	1 st week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

1.13	What is the major contingency the district is prone to? (Tick mark)	Regular	Occasional	None
	Drought		√	
	Flood			√
	Cyclone			√

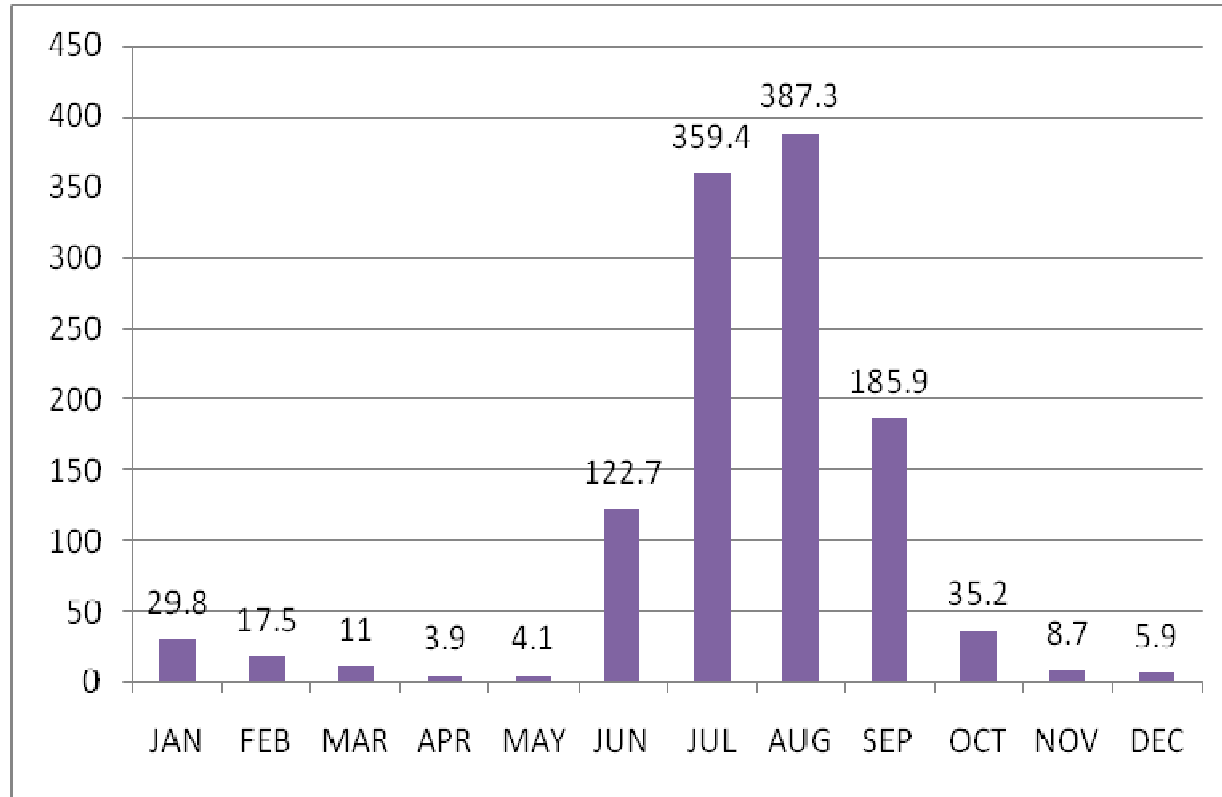
	Hail storm			√
	Heat wave		√	
	Cold wave		√	
	Frost		√	
	Sea water intrusion			√
	Pests and disease outbreak (specify) <ul style="list-style-type: none"> • Wilt in Pulse crop • YMV in Blackgram, Greengram, Soybean, Lentil, Okra, etc. • Pod borer in pulse • Smut in wheat 	√		
	Others (specify)			

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

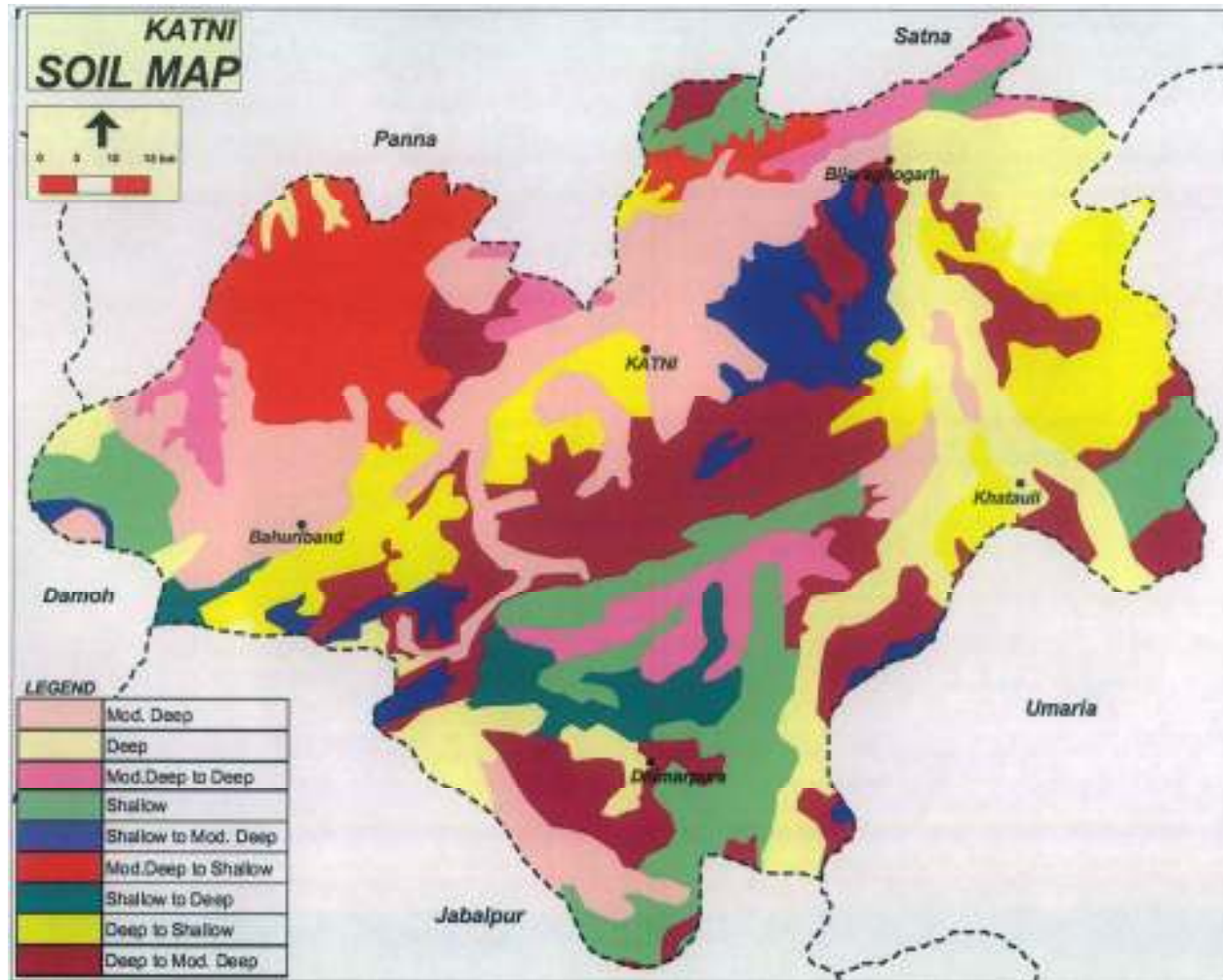
Annexure I



Annexure II



Annexure III



Source: NBSS & LUP, Nagpur

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 2 weeks 4 th week of June	Medium lands deep to medium deep black soils	Rice-Wheat	No Change Rice-Upland field: IR-36, JR-201, JR-503, Vandna, Poornima, 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, and 5 and Hybrid rice (PRH-10, PA6201, PHB71, Pro Agro 6444) Pigeonpea- Asha, No-148, JKM-7, JA-4, ICPL-85063(Laxmi), JKM-189	1. Under traditional system of planting of 3-4 seedlings of 18-21 day ages in 20x10 cm at one place for late mature rice under. For early mature varieties plating in 15x15 cm geometry but seedlings are not more than 18-21 day old1. 2. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers.	Seed Source Beej Nigam JNKVV, Dept. of Agril Mandi Local Market
		Soybean – Chickpea	Soybean- JS-335, JS 80-21, JS 97-42, JS 94-60, JS 9305 Pigeonpea- Asha, No-148, JKM-7, JA-4, ICPL-85063(Laxmi), JKM-189		
	Bunded uplands shallow soils (mixed red & black soils)	Rice-Wheat	No Change Rice-Upland field: IR-36, JR-201, JR-503, Vandna, Poornima, 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, and 5 and Hybrid rice (PRH-10, PA6201, PHB71, Pro Agro 6444) Pigeonpea- Asha, No-148, JKM-7, JA-4, ICPL-85063(Laxmi), JKM-189		
		Soybean – Chickpea	Soybean- JS-335, JS 80-21, JS 97-42, JS 94-60, JS 9305 Pigeonpea- Asha, No-148, JKM-7, JA-4, ICPL-85063(Laxmi), JKM-189		
	Haveli systems with medium deep soils	Rice-Wheat	No Change		

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 4 weeks 2nd week of July	Medium lands deep to medium deep black soils	Rice-Wheat	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-	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	Seed Source Beej Nigam JNKVV, Dept. of Agril Mandi Local Market

			11, PKTS-12, JT-1		
		Soybean – Chickpea	<p>Pigeonpea- Pragati ,Jagriti,,Asha ,Nmuber-148,JKM-7,JA-4, Type-21-Pusa-855, ICPL-85063 (Laxmi), JKM-189</p> <p>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</p> <p>Blackgram – JU-2,JU-3,JU-86,T-9,JBG-623,LBG684,TAU-1, Berkha,PU-30,35,19</p> <p>Sesame- TKG -306, TKG-35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1</p>		
	Bunded uplands shallow soils (mixed red & black soils)	Rice-Wheat	<p>Rice – IR-36 JR-201, Poornima , JR-503, Vandna</p> <p>Pigeonpea- Pragati ,Jagriti,,Asha ,Nmuber-148,JKM-7,JA-4, Type-21-Pusa-855, ICPL-85063 (Laxmi), JKM-189</p> <p>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</p> <p>Blackgram – JU-2,JU-3,JU-86,T-9,JBG-623,LBG684,TAU-1, Berkha,PU-30,35,19</p> <p>Sesame- TKG -306, TKG-35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1</p>		
		Soybean – Chickpea	<p>Pigeonpea- Pragati ,Jagriti,,Asha ,Nmuber-148,JKM-7,JA-4,</p>		

			<p>Type-21-Pusa-855, ICPL-85063 (Laxmi), JKM-189</p> <p>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</p> <p>Blackgram – JU-2,JU-3,JU-86,T-9,JBG-623,LBG684,TAU-1, Berkha,PU-30,35,19</p> <p>Sesame- TKG -306, TKG-35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1</p>	
	Haveli systems with medium deep soils	Rice-Wheat	No change	

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)					
Delay by 6 weeks 4 th week of July	Medium lands deep to medium deep black soils	Rice-Wheat	<p>Don't sown Rice – Upland field. sowing of alternate crops, Sesame, Niger, Castor, Kodo, Kutki</p> <p>Kodo-JK-41, JK-48</p>	<ol style="list-style-type: none"> 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 	Seed Source Beej Nigam JNKVV, Dept. of Agril Mandi Local Market
		Soybean – Chickpea	<p>Sesame- TKG -306, TKG-35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1</p> <p>Kodo-JK-41, JK-48</p>		
	Bunded uplands shallow soils (smixed red & black soils)	Rice-Wheat	<p>Sesame- TKG -306, TKG-35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1</p> <p>Kodo-JK-41, JK-48</p>		

		Soybean – Chickpea	Sesame- TKG -306, TKG-35, JGS-8, JT-21, JT-22, JT-55, PKTS-11, PKTS-12, JT-1		
	Haveli systems with medium deep soils	Rice-Wheat	No crop to be sown		

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)					
Delay by 8 weeks 2nd week of August	Medium lands deep to medium deep black soils	Rice-Wheat	Upland field : Don't sown the rice crop and sowing of alternate crops Sesame, Niger, Castor, Kodo, Kutki Lowland field : Transplanting of rice cv. JR-201, JR-503, Poornima, Vandna, Narendra-97, Govinda	1. Use of blade harrow (Bakhar) for moisture conservation and destroy of weed in late onset of monsoon 2. Don't sown soybean and maize 3. Intercropping of Sesame and Niger with Pigeonpea	Seed Source Beej Nigam JNKVV, Dept. of Agril Mandi Local Market
		Soybean – Chickpea	Niger/ Kodo-JK-41, JK-48		
	Bunded uplands shallow soils (mixed red & black soils)	Rice-Wheat	Niger/ Kodo-JK-41, JK-48		
		Soybean – Chickpea	Niger/ Kodo-JK-41, JK-48		
	Haveli systems with medium deep soils	Rice-Wheat	No crop to be sown		

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measure	Remarks on Implementation
Early season drought (Normal onset)					
Normal onset	Medium lands deep	Rice-Wheat	Resowing of crops.	1. Interculture with	Seed Source

followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	to medium deep black soils		Gapfilling of exsisting crop.	Dora/Kulpha/Hand hoe in between rows and use of removed weeds use as mulch for moisture conservation 2. Use of FYM and vermicompost at the time of resowing for increase of water holding capacity 3. Adopt moisture conservation practices.	Beej Nigam JNKVV, Dept. of Agril Mandi Local Market
	Bunded uplands shallow soils (smixed red & black soils)	Soybean – Chickpea			
	Haveli systems with medium deep soils	Rice-Wheat			

Mid season drought (long dry spell,consecutive 2 weeks rainless period)	Major Farming situation	Normal Crop / Cropping system	Crop management	Soil nutrient & moisture conservation measure	Remarks on Implementation
At vegetative stage	Medium lands deep to medium deep black soils	Rice-Wheat	Life saving irrigation. Timely weeding and use weeds as mulch between rows.	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 Adopt plant protection measures	-
		Soybean – Chickpea			
	Bunded uplands shallow soils (smixed red & black soils)	Rice-Wheat			
		Soybean – Chickpea			
	Haveli systems with medium deep soils	Rice-Wheat			

MID season drought(long dry spell,consecutive 2 weeks rainless period)	Major Farming situation	Normal Crop / Cropping system	Crop management	Soil nutrient & moisture conservation measure	Remarks on Implementation
At flowering and fruiting stage	Medium lands deep to medium deep black soils	Rice-Wheat	Life saving light irrigation. Timely weeding	1. Interculture with Dora/Kulpha/Hand hoe in between rows . 2. Use of uprooted weeds use	-
		Soybean – Chickpea			
	Bunded uplands	Rice-Wheat	Harvesting of crop at physiological		

	shallow soils (smixed red & black soils)	Soybean – Chickpea	maturity.	as mulch for moisture conservation. 3. Ridges are made after 15-20 lines of crops for the moisture conservation 4. Adopt plant protection measures	
	Haveli systems with medium deep soils	Rice-Wheat			

Condition	Major Farming situation		Suggested Contingency measures		
Terminal drought		Normal Crop/cropping system	Crop management	Rabi Crop planning	Remarks on Implementation ^e
(Early withdrawal of monsoon)	Medium lands deep to medium deep black soils	Rice-Wheat	Harvesting of crop at physiological maturity.	1. Adopt moisture conservation practice 2. Intercultivation 3. Preference will be given on sowing of Mustard,,Lentil, Linseed, Chickpea, 4. Line sowing of Lentil, Linseed, Chickpea in moist zone 5. Seed treatment with mixture of Thiram (1.5g)+ Carbendazim (1.5g) /kg seed followed by treated with biofertilizers 6. Sowing of small seeded grains mix with FYM and vermicompost	Seed Source Beej Nigam JNKVV, Dept. of Agril Mandi Local Market
		Soybean – Chickpea			
	Bunded uplands shallow soils (smixed red & black soils)	Rice-Wheat			
		Soybean – Chickpea			
Haveli systems with medium deep soils	Rice-Wheat				

2.1.2 Irrigated situation

Condition	Suggested Contingency measures			
	Major Farming situation	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall	Sandy clay to silt clay loam soils	Rice -Wheat/Chickpea	Sowing of Pigeonpea, Blackgram and Sesame.	RKVY, NFSM, ISOPAM, NREGS
		Pigeonpea--Wheat/Chickpea	Prefer early maturing Cultivars.	
Limited release of water in canals due to low rainfall	Sandy clay to silt clay loam soils	Rice-Wheat/Chickpea	Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice	
		Pigeonpea--Wheat/Chickpea	Irrigate at critical stage	
Non release of water in canals under delayed onset of monsoon	Sandy clay to silt clay loam soils	Rice -Wheat/Chickpea	Rice- Adopt water saving methods like direct seeded rice, SRI Cultivation, Aerobic rice	
		Pigeonpea-Wheat/Chickpea	Pigeonpea- Prefer early maturing varieties and sow on ridges	
Lack of inflow in to tanks due to insufficient/delaye	Sandy clay to silt clay loam soils	Rice -Wheat/Chickpea	Blackgram/ Greengram: Adopt <i>in-situ</i> moisture conservation practices at 30DAS	
		Pigeonpea--Wheat/Chickpea		

Condition	Suggested Contingency measures			
	Major Farming situation	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall.	Sandy clay to silt clay loam soils	Rice-Wheat/Chickpea Or Pigeonpea--Wheat/Chickpea Prefer short duration low water requirement varieties of wheat.	Sowing of Pigeonpea, Blackgram and Sesame. 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	RKVY, NFSM, ISOPAM, NREGS

Condition	Suggested Contingency measures			
	Major Farming situation	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
		Pigeonpea--Wheat/Chickpea	wheat. Adopt furrow irrigation and use of micro-irrigation system such as drip and sprinkler system. Adaptation of soil and water conservation practices.	

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 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
Maize, Soybean, Sesame. Blackgram	Provide drainage care should be taken that rain water does not stagnate in the field. Interculture operation.	Change care should be taken that rain water does not stagnate in the field. Interculture operation	Care should be taken that rain water does not stagnate in the field. Harvesting of crop in clear weather.	Produce should be placed under shade. or protect the produce by tarpaulin kept in T floor.

Wheat	Care should be taken that rain water does not stagnate in the field and not allow to top dressing of nitrogenous fertilizers.	Care should be taken that rain water does not stagnate in the field and not allow to top dressing of nitrogenous fertilizers. Interculture operation	Proper drainage should be provided and adopt all plant protection measures. Harvesting of crop in clear weather.	- Produce should be placed under shade. or protect the produce by tarpaulin kept in T floor
Chickpea	Care should be taken that rain water does not stagnate in the field and not allow to top dressing of nitrogenous fertilizers.	Care should be taken that rain water does not stagnate in the field. Interculture operation	Proper drainage should be provided and adopt all plant protection measures. Harvesting of crop in clear weather.	Produce should be placed under shade. or protect the produce by tarpaulin kept in T floor
Horticulture				
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
Tomato	Staking of plant be done	Staking of plant be done	Staking of plant be done	
Heavy rainfall with high speed wind in a short span	Not applicable			
Outbreak 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 % 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	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	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	-

	borer and for chemical control spraying of Quinalphos 25 EC or Chlorpyriphos 20 EC C or Methyle Parathiyan 50 EC @ 600 ml dissolve in 500 L of water should be used. Dusting of Fenvalerate 0.4% or Endosulphan 4% 15-20 kg or Quinalphos 1.5 WP 20-25 per hectare with duster.	and for chemical control spraying of Quinalphos 25 EC or Chlorpyriphos 20 EC C or Methyle Parathiyan 50 EC @ 600 ml dissolve in 500 L of water should be used. Dusting of Fenvalerate 0 0.4% or Endosulphan 4% 15-20 kg or Quinalphos 1.5 WP 20-25 per hectare with duster.		
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2.3 Floods – Not applicable

Condition	Suggested contingency measure ^o			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation ¹				
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
Maize, Soybean, Pigeonpea,	Protect the crop with the help of light irrigation, wind breaks are necessary	Protect the crop with the help of light irrigation; wind breaks are necessary where	Protect the crop with the help of light irrigation; wind breaks are necessary where cold	Protect the crop with the help of light irrigation

	where cold and heat wave in regular	cold and heat wave in regular	and heat wave in regular	
Horticulture				
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
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-	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	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,

	<p>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>during drought</p> <p>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</p> <p>Promotion of Horse gram as contingent crop and harvesting it at vegetative stage as fodder</p> <p>Continuous supplementation of minerals and vitamin to prevent infertility.</p> <p>Encourage mixing available kitchen waste with dry fodder while feeding to the milch animals</p>	<p>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>
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</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>

	arranged in sandies /community grazing areas		
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 & management measures</p> <p>Procure and stock multivitamins & 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 dung from relief camps</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>
Floods	NA		
Cyclone	NA		
Heat wave and cold wave			
Heat wave	<p>i) Plantation around the shed</p> <p>ii) H₂O sprinklers / foggers in the shed</p> <p>iii) Application of white reflector paint on the roof</p> <p>iv) Thatched sheds should be provided as a shelter to animal to minimize heat stress</p>	<p>Allow the animals early in the morning or late in the evening for grazing during heat waves</p> <p>Feed green fodder/silage / concentrates during day time and roughages / hay during night time in case of heat waves</p> <p>Put on the foggers / sprinklers /fans during heat waves in case of high yielders (Jersey/HF crosses)</p> <p>In severe cases, vitamin 'C' and electrolytes should be added in H₂O during heat waves.</p>	<p>Feed the animals as per routine schedule</p> <p>Allow the animals for grazing (normal timings)</p>
Cold wave	Covering all the wire meshed walls / open area	Allow for grazing between 10AM to 3PM	Feed the animals as per routine

	with gunny bags/ polyethylene sheets (with a mechanism for lifting during the day time and putting down during night time)	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	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