State: Assam

Agriculture Contingency Plan for District: Morigaon

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	Region: 15 Bengal And Assam Plains, Eco-Region: Hot Sub humid (Moist) To Humid (Inclusion of Perhumid)		
	Agro-Climatic Zone (Planning Commission)			
	Agro Climatic Zone (NARP)	Central Brahmaputra Valley Zone (CBVZ)		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Nagaon and Morigaon		
	Geographic coordinates of district headquarters	**Latitude**	**Longitude**	**Altitude**
		District: 26.15 to 26.5 degree N	District :92.00 to 95.5 degree E	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	RARS Shillongani, Assam Agricultural University, Nagaon, District: Nagaon		
	Mention the KVK located in the district with address	KVK, Morigaon, AAU, Jhargaon, District - Morigaon,Assam, PIN: 728411		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	RARS Shillongani, Assam Agricultural University, Nagaon, District: Nagaon		

1.2	**Rainfall**	**Normal RF (mm)**	**Normal Rainy days (number)**	**Normal Onset (specify week and month)**	**Normal Cessation (specify week and month)**
	SW monsoon (June-Sep):	859.29		1st week of June	Last week of September
	Post Monsoon/ NE Monsoon (Oct-Dec):	79.26		2nd week of October	2nd Week of November
	Winter (Jan- March)	10.97		-	-
	Summer (Apr-May)	279.94		-	-
	Annual	1245.75		-	-

(Source: Department of Agriculture, Morigaon, Assam. Based on rainfall data from 2008 to 2014)

1.3	**Land use pattern of the district** (Statistical hand book 2015)	Geographical Area (ha)	Forest area (ha)	Land under non-agricultural use (ha)	Permanent Pastures (ha)	Cultivable wasteland (ha)	Land under Misc. tree crops and groves (ha)	Barren and uncultivable land (ha)	Fallows land (ha)
	Area (ha)	155100	6611	53262	4278	15792	10853	3569	5881

(Source: Statistical Handbook of Assam 2015)

1. 4	**Major Soils (common names like red sandy loam deep soils (etc.,)***	**Area ('000 ha)**	**Percent (%) of total**
	1. Clay	NA	NA
	2. Clay loam	NA	NA
	3. Sandy loam	NA	NA
	4. Sandy	NA	NA
	Others (specify):	NA	NA

* mention colour, depth and texture (heavy, light, sandy, loamy, clayey etc) and give vernacular name, if any, in brackets

1.5	**Agricultural land use** (Source Statistical hand book 2015)	Area (ha)	Cropping intensity %
	Net sown area	73554	161
	Area sown more than once	47421	
	Total cropped area	120975	

1.6	**Irrigation** (Source Statistical hand book 2015)	Area (ha)		
	Net irrigated area	832		
	Gross irrigated area	1255		
	Irrigation potential created through Govt. Irrigation Schemes (Major & Medium+Minor)	16953		
	Rainfed area	-		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals	NA	NA	NA
	Tanks	NA	NA	NA
	Open wells	NA	NA	NA
	Bore wells	NA	NA	NA
	Lift irrigation schemes	NA	NA	NA

	Micro-irrigation	NA	NA	NA
	Other sources (please specify)	NA	NA	NA
	Pump sets	NA	NA	NA
	No. of Tractors	NA	NA	NA
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited	NA	NA	NA
	Critical	NA	NA	NA
	Semi- critical	NA	NA	NA
	Safe	NA	NA	NA
	Wastewater availability and use	NA	NA	NA
	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 (as per latest figures of Directorate of Statistics and Economics, Govt of Assam, 2014-15)

1.7	S.No.	**Major field crops cultivated**	**Area (ha)**							
			Kharif			***Rabi***				
			Irrigated	**Rainfed**	**Total**	**Irrigated**	**Rainfed**	**Total**	**Summer**	**Grand total**
	1	*Kharif* Paddy	-	-	44115	-	-	-	-	-
	2	Autumn Paddy	-	-	-	-	-	42535		-
	3	Summer Paddy	-	-	-	-	-	-	3272	-
	4	Rapeseed & Mustard	-	-	-	-	-	8250	-	-
	5	Wheat	-	-	-	-	-	2050	-	-
	6	Black gram	-	-	670	-	-	-	-	-
	7	Maize	-	-	200	-	-	-	-	-
	8	Seasamum	-	-	249	-	-	-	-	-
	9	Lentil	-	-	-	-	-	597	-	-
	10	Green gram	-	-	514	-	-	-	-	-
	11	Arahar	-	-	87	-	-	-	-	-
	12	Sugarcane	--	-	789	-	-	-	-	-
	13	Jute	-	-	6805	-	-	-	-	-
	14	Tur dal	-	-	-	-	-	111	-	-

	15	Groundnut	-	-	-	-	-	1375	-	-
	16	Linseed	-	-	-	-	-	206	-	-
	17	Niger	-	-	-	-	-	174	-	-
	18	Gram	-	-	-	-	-	37	-	-
	19	Pea	-	-	-	-	-	761	-	-
	20	Small millets	-	-	-	-	-	167	-	-
	Others (specify)	-	-	-	-	-	-	-	-	-

	S.No.	**Horticulture crops - Fruits**	**Area (ha)**		
			Total	**Irrigated**	**Rainfed**
	1	Banana	2603	-	-
	2	Guava	480	-	-
	3	Jackfruit	270	-	-
	4	Litchi	250	-	-
	5	Pineapple	45	-	-
	6	Orange	25	-	-
	7	Papaya	55	-	-
	8	Assam Lemon	875	-	-
	9	Mango	475	-	-
	10	Other fruits (Olive, Pear, peach, Jujube, Jambulan, melon etc)	206	-	-
	Others (specify)	-	-	-	-
		Horticulture crops - Vegetables	**Total**	**Irrigated**	**Rainfed**
	1	Potato	2165	-	-
	2	Sweet potato	450	-	-
	3	Tapioca	7	-	-
	4	Chilli	511	-	-
	5	Turmeric	431	-	-
	6	Onion	316	-	-
	7	Ginger	338	-	-
	8	Coriander	410	-	-
	9	Garlic	207	-	-

	10	*Rabi* Vegetable	4816	-	-
	Others (specify)	*Kharif* Vegetable	3108	-	-
		Plantation crops	**Total**	**Irrigated**	**Rainfed**
	1	Coconut	927	-	-
	2	Arecanut	1711	-	-
	3	Black pepper	122	-	-
	Others (Specify)	Eg., industrial pulpwood crops etc.	-	-	-

1.8	Livestock Statistical handbook 2015)	Male	Female	Total (nos)
	Indigenous cattle	-	-	280285
	Improved / Crossbred cattle	-	-	24420
	Buffaloes (local low yielding)	-	-	13683
	Improved Buffaloes	-	-	NA
	Goat	-	-	133422
	Sheep	-	-	12035
	Pig	-	-	23287
	Mithun			NA
	Yak			NA
	Others (Horse, mule, donkey etc., specify) Horse	-	-	376
	Commercial dairy farms (Number)	-	-	NA

1.9	Poultry	No. of farms	Total No. of birds (nos)
	Commercial	-	420093
	Backyard	-	

1.10	Fisheries (Data source: Chief Planning Officer)						
	A. Capture						
	i) Marine	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)	
		NA					
	ii)Inland (Data Source:SHB 2015)	No. Farmer owned ponds & tank		No. of Reservoirs			
		10818 Nos		-			
	B. Culture						
	Data source(District Fishery Development office,Morigaon)			Water Spread Area (ha)		Yield (t/ha)	Production(‘000tons)
	i) Brackish water						
	ii) Fresh water (Data Source SHB 2015)						
	Ponds & Tanks			3029.65			
	Beels			2824.90			
	Rivers			327.01			
	Swamp/ low-lying area			203.52			
	Paddy fields			2039.98			
	Others			12170.3			

1.11 Production and Productivity of major crops as per figures of Directorate of Statistics and Economics, Govt of Assam, 2014-15;)

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)										

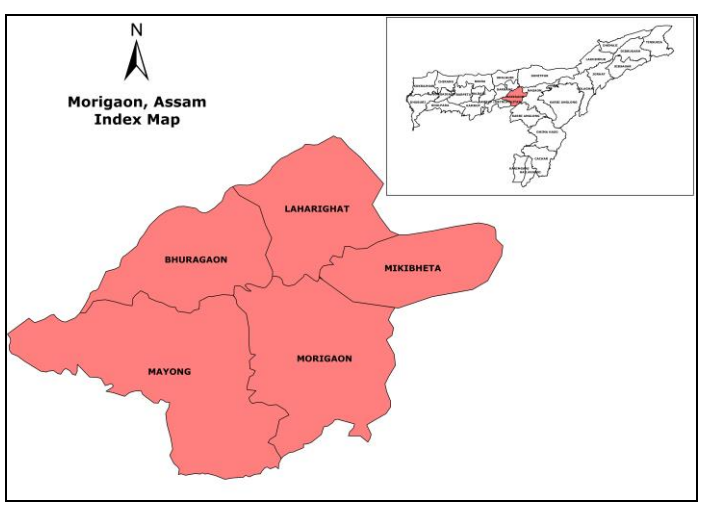
Crop 1	Summer Paddy	-	-	122160	2930	-	-	-	-	-
Crop 2	Winter Paddy	84363	1980	-	-	-	-	-	-	-
Crop 3	Autumn Paddy	-	-	4455	1375	-	-	-	-	-
Crop 4	Rapeseed & Mustard	-	-	3372	496	-	-	-	-	-
Crop 5	Wheat	-	-	4455	1136	-	-	-	-	-
Crop 6	Black gram	455	581	-	-	-	-	-	-	-
Crop 7	Maize	258.8	1454	-	-	-	-	-	-	-
Crop 8	Seas mum	147	628	-	-	-	-	-	-	-
Crop 9	Lentil	-	-	489	776	-	-	-	-	-
Crop 10	Arahar	89	823	-	-	-	-	-	-	-
Crop 11	Green gram	155	310	-	-	-	-	-	-	-
Crop 12	Sugarcane	31523	36969	-	-	-	-	-	-	-
Crop 13	Jute	46030	1545	-	-	-	-	-	-	-
Crop 14	Linseed	179	543	-	-	-	-	-	-	-
Crop 15	Niger	106	513	-	-	-	-	-	-	-
Crop 16	Gram	25	433	-	-	-	-	-	-	-
Crop 17	Pea	722	900	-	-	-	-	-	-	-
Crop 18	Small millets	191	473	-	-	-	-	-	-	-
Others	-	-	-	-	-	-	-	-	-	-
Major Horticultural crops (Crops to be identified based on total acreage)										
Crop 1	Banana	-	-	-	-	-	-	31766	16788	-
Crop 2	Guava	-	-	-	-	-	-	2400	5000	-
Crop 3	Jackfruit	-	-	-	-	-	-	2700	10000	-
Crop 4	Litchi	-	-	-	-	-	-	750	3000	-
Crop 5	Pineapple	-	-	-	-	-	-	1067	15604	-
Crop 6	Orange	-	-	-	-	-	-	25	10000	-
Crop 7	Papaya	-	-	-	-	-	-	2024	16368	-
Crop 8	Assam lemon	-	-	-	-	-	-	4375	5000	-
Crop 9	Mango	-	-	-	-	-	-	3800	8000	-
Crop 10	Arecanut	-	-	-	-	-	-	1091	144 (2013-2014)	-
Crop 11	Coconut	-	-	-	-	-	-	7053	48 (2013-2014)	-
Crop 12	Black pepper	-	-	-	-	-	-	154	1797	-

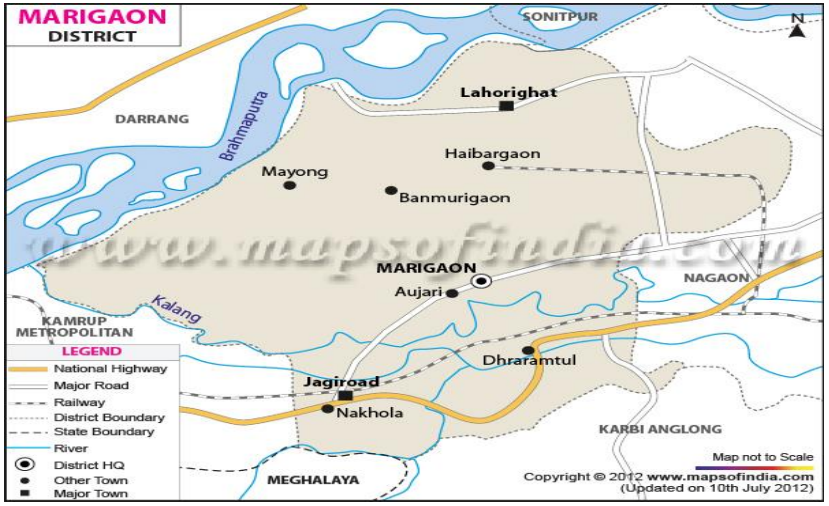
Crop 13	Potato	-	-	-	-	-	-	9105	5942	-
Crop 14	Sweet potato	-	-	-	-	-	-	640	3309	-
Crop15	Tapioca	-	-	-	-	-	-	59	7161	-
Crop 16	Chilli	-	-	-	-	-	-	292	675	-
Crop 17	Turmeric	-	-	-	-	-	-	305	1170	-
Crop 18	Onion	-	-	-	-	-	-	768	2406	-
Crop 19	Ginger	-	-	-	-	-	-	2356	8914	-
Crop 20	Garlic	-	-	-	-	-	-	2356	8914	-

1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	Crop 1: Paddy	2: Blackgram	3: Rapeseed	4:Jute	5:Sugarcane
	Kharif- Rainfed	June-July	Mid Aug-Mid Sept	-	March- April	March- April
	Kharif-Irrigated	-	-	-	-	-
	Autumn paddy	Sep-Oct	-	15th Oct-15th Nov	-	-
	Summer paddy (Boro rice)	March- April		-	-	-
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)			-	-	

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: No

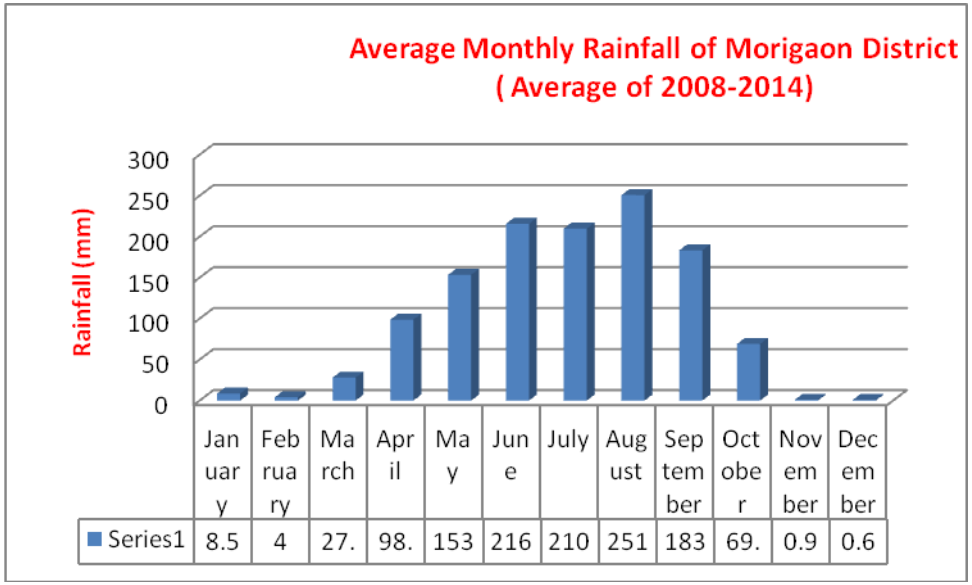
Annexure – 1: LOCATION MAP OF MORIGAON DISTRICT IN ASSAM





(Source: mapsofindia.com)

Annexure – 2: MEAN ANNUAL RAINFALL OF MORIGAON DISTRICT



Source: - Department of Agriculture, Morigaon, Assam

2.0 Strategies for weather related contingencies

2.1.Drought

A. Drought-Pre-Monsoon (Last week of March to First week of April) Normal

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**
Delayed by 2 weeks (2nd to 3rd week of April)	**1)Farming situation:** Rainfed upland	**<u>Cropping system 1</u>:** Summer vegetables /Summer Pulse (Greengram/ Blackgram)/Summer,Oilseed (Sesamum), Maize	No Change Growing high yielding varieties **Greengram**- SGC-16, SGC 20, Sonai (SG 21-5) T44,K 851,IPM-1-2, Pratap **Blackgram**- Sonkush (SB 23-5) SBC 40, SBC 47 Pant U 19, T-9, KU-301 etc Lentil-M **Sesamum** - Kaliabor local,SG 25-1,AST-1 Maize- NMH 803,Ganga 5,Hi-starch,Diara NLD etc	Follow recommended package of practices for different crops i) Weeding at critical stages of growth. ii) Addition of sufficient organic matter in the soil at the time of land preparation .	Provision supply of seeds/inputs through RKVY and other Central/State schemes

Normal onset of Pre-monsoon

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.	**2)Farming situation:** Rainfed Medium land/ Medium lowland	**Cropping system 1:** Rice (Early ahu and,normal ahu) monocropping	No Change in crops Use HYV of short duration rice Luit, Kolong,Kapilee,Dishang,Dikhow ,IR 36,Culture 1 etc	1.Weeding at critical stages of growth 2 Irrigation as per requirement 3.Proper plant protection measures as and when required 4.Foliar application of 1% MOP	Provision for supply of seeds/inputs through RKVY and various Central/State schemes
		Cropping system 2: Boro Rice	No Change Grow high yielding varieties like – Joymoti, Swarnabh, Kanaklata, Dinanath	1.Weeding at critical stages of growth 2 Irrigation as per requirement 3.Proper plant protection measures as and when required 4.Foliar application of 1% MOP	
		Cropping system 3. Jute	No Change Grow high yielding varieties like – Sonali, Reshma, Shyamali,Navin,Bahagi,Tarun, Apeswaree etc	1.Weeding at critical stages of growth 2 Irrigation as per requirement 3. Proper plant protection measures as and when required 4.Foliar application of 1% MOP	
		Maize	Maize-,Ganga 5,NetcMH 803,Diara	1.Weeding 2.Interculture 3.Foliar application of 1% MOP 4.provide irrigation from available source	

2.2 Rainfed situation

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation[a]**	**Normal Crop / Cropping system[b]**	**Change in crop / cropping system[c] including variety**	**Agronomic measures[d]**	**Remarks on Implementation**
Delay by 2 weeks **i.e. June 3rd Week**	**1)Farming situation:** Rainfed upland	**<u>Cropping system 1</u>**: Summer vegetables /Summer Pulse (Greengram/ Blackgram)/ Summer, Oilseed (Sesamum)	No Change in crops Growing high yielding varieties **Greengram**-SGC-16, SGC 20, Sonai (SG 21-5) T44,K 851,IPM-1-2, Pratap **Blackgram**- Sonkush (SB 23-5) SBC 40, SBC 47 Pant U 19, T-9, KU-301 etc Lentil-M **Sesamum** -Kaliabor local,SG 25-1,AST-1	Allow recommended package of practices for different crops i) Weeding at critical stages of growth. ii) Addition of sufficient organic matter in the soil at the time of land preparation iii) INM including use of biofertilizers like PSB Azotobacter iv)Seed Treatment of pulses with Rhizobium culture -Recommended package of practices for normal sowing.	Provision for supply of seeds/inputs National food security mission, RKVY and any other Central/State schemes
		<u>Cropping system 2</u>: Toria *Rabi* Veg /*Rabi* pulse(Lentil) /Maize/Groundnut	Grow high yielding varieties like - **Blackgram**- Sonkush (SB 23-5) SBC 40, SBC 47 Pant U 19, T-9, KU-301 etc, **Greengram**-SGC-16,SGC 20, Sonai (SG 21-5) T44,K 851,IPM-1-2, Pratap **Toria**- TS-36, TS-38, TS-67, TS-46, JT90-1(Jeuti) **Lentil**- Moitree, HUL 57, Azad Mosur 1		

	2)Farming situation: Rainfed Medium land/ Medium lowland	**<u>Cropping system 1:</u>** Rice(*Kharif*) monocropping	No Change Use HYV of rice like Ranjit, Bahadur, Piolee Maniram, Kushal etc	Recommended package of practices for normal crop – 1. Apply Organic manures. 2. Use INM practices in rice including use of Azospirillum and PSB as seedling treatment or recommended doses of fertilizers. 3.Weeding at critical stages of growth 4. Proper plant protection measures as and when required	
		<u>Cropping system 2</u>: Sali rice-Boro Rice / Potato/ Toria /*Rabi* vegetables/ Linseed/Niger/ Groundnut	No Change Grow high yielding varieties like – **Rice-** Joymoti, Swarnabh, Kanaklata, Dinanath **Toria**-TS-36, TS-38, TS-67, TS-46, JT 90-1(Jeuti) **Potato-** Kufri Chandramukhi, Kufri Jyoti, Kufri Pokhraj	Follow recommended package of practices for different crops- i) Weeding at critical stages of growth. ii) Addition of sufficient organic matter in the soil at the time of land preparation iii)Use INM practices including use of biofertilizers like PSB Azotobacter,	
		<u>Cropping system 3</u>. Jute-Toria / *Rabi* vegetables	No Change Grow high yielding varieties like – **Jute –** Sonali, Reshma, Shyamali,Navin,Bahagi,Tarun , Apeswaree etc **Toria**- TS-36, TS-38, TS-67, TS-46, JT-90	-Recommended package of practices for normal sowing.	

		<u>Cropping system 4:</u> Jute-Late Sali	No Change Grow high yielding varieties like – **Jute-** Sonali, Reshma, Shyamali, Navin, Bahagi, Tarun, Apeswaree etc Grow high yielding varieties like – **Late Sali-** Prafulla, Gitesh, Short duration varieties like Luit, Kolong,Kapili Dishang	-Recommended package of practices for normal sowing. 60 days old seedlings can be transplanted for Prafulla and Gitesh and transplanted upto last part of August About 60 kg seed/ha is required with closer spacing (15 cm x15 cm) and 6-8 seedlings/hill.Short duration varieties can be transplanted upto last part of August. 20-25 days old seedling should be transplanted at 15x15 cm spacing with 4-5 seedlings/hill.	
		<u>Cropping system 5:</u> Relay cropping of Lentil, Lathyrus and Field pea	Grow high yielding varieties like – **Lentil-** Moitree, HUL 57, Azad Mosur 1,Axom Mosur 1,Axom Masur 2 **Lathyrus -**Ratan, Prateek, Madhuri JL **Field pea-** Aman, Prakash, Vikash, Adarsh		
	3. Flood prone	**<u>Cropping system 1:</u>** Summer vegetables/Jute Toria/Lentil/Wheat /Potato/*Rabi* vegetables/ Chilli	No Change Varieties as mentioned above	-Recommended package of practices for normal sowing. Sowing time should be properly maintained	

		Kharif Rice (*Kharif*) -Wheat/Potato/*Rabi* vegetables/ Chilli	i)Growing of submergence tolerant rice varieties such as Jalashree, Jalkuwari, Swarna Sub 1, Ranjit Sub 1 ii) If flood water recedes early then medium duration rice varieties likeTTB-404,IR-36, Jaya Satyaranjan, Basundhara, etc iii) If transplanting is possible during last part of August, etc. Short duration varieties such as Luit, Kolong, Dishang. iv) For chronically flood affected areas, traditional photo sensitive coarse grain rice varieties with up to 60 days old seedlings can be grown up to last part of August Prafulla, Gitesh,Manohar Sali, Andrew Sali, Salpona etc. v) Community nursery may be raised in non- flood prone or high land for raising of rice seedlings	i) Transplanting within July. Seedlings should be raised in non flood prone or high land area. ii) Transplanting can be done by mid -August. Seedlings should be raised in non -flood prone or high land area. iii) Transplanting- last part of August 20-25 days old seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/hill. iv). About 60 kg seed/ha is required with closer spacing (15 cm x15 cm) and 6-8 seedlings/hill. Select delayed/staggered planting rice varieties like Prafulla and Gitesh with up to 60 days old seedlings (Sowing in the nursery bed within June). Seedlings should be raised in non flood prone or high land area.	
	Char areas	Groundnut/Niger/ *Rabi*Maize/ vegetables		Normal package	

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Change in crop/cropping system[c]**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
Delay beyond 4 weeks **July 1st week**	**1)Farming situation:** **Upland**	**<u>Cropping system 1:</u>** Summer vegetables/ Summer Pulse (Green gram and blackgram), Summer oilseed (Sesamum)	No Change in crops High yielding varieties **Blackgram**- Sonkush (SB 23-5) SBC 40, SBC 47 Pant U 19, T-9, KU-301 etc, **Greengram**-SGC-16,SGC 20, Sonai (SG 21-5) T44,K 851,IPM-1-2, Pratap **Sesamum** -Kaliabor local, SG 25-1,AST-1	Recommended package of practices for normal crop – 1. Apply Organic manures. 2. Use INM practices in rice including use of Azospirillum and PSB as seedling treatment or recommended doses of fertilizers. 3. Weeding at critical stages of growth 4. Proper plant protection measures as and when required	Provision for supply of seeds/inputs National food security mission, RKVY and any other Central/State schemes
		<u>Cropping system 2</u>: Toria/*Rabi* Veg /*Rabi* pulse (Lentil)/Groundnut	Grow high yielding varieties like - **Toria**- TS-36, TS-38, TS-67, TS-46, JT90-1(Jeuti) **Lentil**- Moitree, HUL 57, Azad Mosur 1	Recommended package of practices for normal crop – 1.Apply Organic manures. 2. Use INM practices in rice including use of Azospirillum and PSB as seedling treatment or recommended doses of fertilizers. 3. Weeding at critical stages of growth 4. Proper plant protection measures as and when required	

	2)Farming situation: **Medium land/ Medium low land**	**<u>Cropping system 1:</u>** Rice (*Kharif*) monocropping	No Change Use HYV of rice like Ranjit, Bahadur, Maniram, Piolee, Kushal etc	Growing of medium duration rice varieties such as Satyaranjan, Basundhara, TTB 404 (Shraboni), IR-36, Jaya,Swarna etc (transplanting up to 1st week August). - Short duration rice varieties such as Luit, Kolong, Dishang etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/hill. -Rice varieties that can be grown as late Sali up to last part of August are Manohar Sali, Andrew Sali, Salpona,Prafulla and Gitesh etc. and traditional photosensitive coarse grain varieties with up to 60 days old seedlings. About 60 kg seed/ha is required with closer spacing (15 cm x 15 cm) and 6-8 seedlings/hill.	

		<u>Cropping system 2</u>: Jute/Rice(*Kharif*)- Toria /Lentil /Potato / short duration *Rabi* vegetables/*Chilli*	No change Growing high yielding varieties **Jute- –** Sonali, Reshma, Shyamali, Navin, Bahagi ,Tarun etc **Toria**- TS-36, TS-38, TS-67, TS-46, JT90-1(Jeuti) **Lentil**- Moitree, HU L 57, Azad, Mosur 1 **Potato**-Kufri Chandramukhi, Kufri Jyoti, Kufri Pokhraj	-Growing of medium duration rice varieties such as Satyaranjan, Basundhara, TTB 404, IR-36, Jaya etc (transplanting up to 1st week August). -Short duration rice varieties such as Luit, Kolong, Dishang etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/ hill. --Rice varieties that can be grown as late Sali up to last part of August are Manohar Sali, Andrew Sali, Salpona, Prafulla, Gitesh etc. and traditional photosensitive coarse grain varieties with up to 60 days old seedlings. About 60 kg seed/ha is required with closer spacing (15 cm x 15 cm) and 6-8 seedlings/hill. Short duration *rabi* vegetables- beans, garden pea (relay),leafy vegetables, coriander	

		<u>Cropping system 3</u>: Rice (*kharif*) – Rice (summer)	No change Use HYV of rice likeRanjit,Bahadur, Maniram,Piolee, Kushal etc Summer rice (Boro rice)varieties- Joymoti,Kanaklata, Swarnav	-Growing of medium duration rice varieties such as Satyaranjan, Basundhara, TTB 404, IR-36, Jaya etc (transplanting up to mid August). - Short duration rice varieties such as Luit, Kolong, Dishang etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/ hill. - Rice varieties such as Pankaj, Kushal, Lakhimi can be grown up to August 15 with 45-50 days old seedlings. --Rice varieties that can be grown as late Sali up to last part of August are Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse grain varieties with up to 60 days old seedlings. About 60 kg seed/ha is required with closer spacing (15 cm x 15 cm) and 6-8 seedlings/hill.	
	Flood prone	**<u>Cropping system</u>** <u>1</u>: Summer vegetables/Jute – Toria/Lentil/ Wheat/Potato/*Rabi* vegetables/Chilli	No Change Growing high yielding varieties **Jute- –** Sonali, Reshma, Shyamali, Navin, Bahagi ,Tarun etc **Toria**- TS-36, TS-38, TS-67, TS-46, JT90-1(Jeuti) **Lentil**- Moitree, HU L 57, Azad, Mosur 1 **Potato**-Kufri Chandramukhi, Kufri Jyoti, Kufri Pokhraj	-Recommended package of practices for normal sowing.	Provision for supply of seeds/inputs National food security mission, RKVY and any other Central/State schemes

		<u>Cropping system 2</u>: Rice(Late *Kharif*) –Wheat/Potato/*Rabi* vegetables/Chilli	No change Grow high yielding varieties like ii) If flood water recedes early then medium duration rice varieties like TTB404,SatyaranjanBasundhara,Mulagabharu,IR -36, Jaya etc iii) If transplanting is possible during last part of August, etc. Short duration varieties such as Luit,Kolong,Dishang.	Transplanting within July.Seedlings should be raised in non flood prone or high land area. ii) Transplanting can be done by mid -August. Seedlings should be raised in non -flood prone or high land area. iii) Transplanting- last part of August 20-25 days old seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/hill. iv) About 60 kg seed/ha is required with closer spacing (15 cm x15 cm) and 6-8 seedlings/hill.	

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Change in crop/cropping system[c]**	**Agronomic measures[d]**	**Remarks on Implementation**
Delay by 6 weeks (Specify month)	1)**Farming situation: Upland**	**<u>Cropping system 1</u>:** Summer vegetables/ Summer Pulse (Green gram), Summer oilseed (Sesamum)- *Kharif* pulses- vegetables. Toria, /*Rabi* Veg /*Rabi* pulse/ Lentil	No Change Growing high yielding varieties **Blackgram**- Sonkush (SB 23-5) SBC 40, SBC 47 Pant U 19, T-9, KU-301 etc, **Greengram**-SGC-16,SGC 20, Sonai (SG 21-5) T44,K 851,IPM-1-2, Pratap **Lentil-** Moitree, HU L 57, Azad, Mosur 1 **Sesamum** -Kaliabor local, SG 25-1,AST-1 **Toria**- TS-36, TS-38, TS-67, TS-46, JT90-1(Jeuti)	i) Life saving supplemental irrigation ii) Weeding at critical stages of growth. iii) Thinning in Toria to maintain optimum population iii)Supplemental irrigation in the nursery bed of *Rabi* vegetables	Provision for supply of seeds/inputs National food security mission, RKVY and any other Central/State schemes

	2)**Farming situation:** Medium land/ Medium lowland	**<u>Cropping system 1:</u>** Rice (*Kharif*) monocropping Relay cropping with lathyrus, field pea, lentil,linseed and niger Summer pulses (greengram/ blackgram) and oilseed (Sesamum)	No change Use HYV of rice like Ranjit, Bahadur, Maniram, Piolee, Kushal etc	- Short duration rice varieties such as Luit, Kolong, Dishang etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/hill. --Rice varieties that can be grown as late Sali up to last part of August are Manohar Sali, Andrew Sali, Salpona,Prafulla and Gitesh etc. and traditional photo-period sensitive coarse grain varieties with up to 60 days old seedlings. About 62 kg seed/ha is required with closer spacing (15 cm x 15 cm) and 6-8 seedlings/hill.	

		<u>Cropping system 2</u>: Jute/Rice(*Kharif*)-Toria/Lentil/Wheat / Potato/Chilli/*Rabi* vegetables	No change Growing high yielding varieties **Jute- –** Sonali, Reshma, Shyamali, Navin, Bahagi ,Tarun etc **Toria**- TS-36, TS-38, TS-67, TS-46, JT90-1(Jeuti) **Lentil**- Moitree, HU L 57, Azad, Mosur 1 **Potato**-Kufri Chandramukhi, Kufri Jyoti, Kufri Pokhraj	- Short duration rice varieties such as Luit, Kolong, Dishang etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/hill. --Rice varieties that can be grown as late Sali up to last part of August are Manohar Sali, Andrew Sali, Salpona etc. and traditional photo-period sensitive coarse grain varieties with up to 60 days old seedlings. About 60 kg seed/ha is required with closer spacing (15 cm x15 cm) and 6-8 seedlings/hill.	
		<u>Cropping system 1</u>: Rice (*kharif*) – Rice (summer)	No change Use HYV of rice like Ranjit, Bahadur, Maniram, Piolee, Kushal etc Summer rice (Boro rice) varieties- Joymoti, Kanaklata, Swarnav	- Short duration rice varieties such as Luit, Kolong, Dishang etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/ hill. --Rice varieties that can be grown as late Sali up to last part of August are Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse grain varieties with up to 60 days old seedlings. About 60 kg seed/ha is required with closer spacing (15 cm x 15 cm) and 6-8 seedlings/hill.	

	3.Flood prone	**<u>Cropping system</u>** **<u>1:</u>**Summer vegetables/Jute – Toria/Lentil/ Wheat/ Potato/*Rabi* vegetables/Chilli	No Change Growing high yielding varieties **Jute- –** Sonali, Reshma, Shyamali, Navin, Bahagi ,Tarun etc **Toria**- TS-36, TS-38, TS-67, TS-46, JT90-1(Jeuti) **Lentil-** Moitree, HU L 57, Azad, Mosur 1 **Potato**-Kufri Chandramukhi, Kufri Jyoti, Kufri Pokhraj	-Recommended package of practices for normal sowing.	

Condition			**Suggested Contingency measures**		
Early season drought **(Normal onset)**	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
Normal onset followed by 15-20 days dry spell on standing crop.	1)**Farming situation:** upland	Summer vegetables/ Summer Pulse (Greengram) *Kharif* pulses and oilseed Toria/ *Rabi* Veg /*Rabi* pulse(Black .Gram)/ Lentil	No Change	-Life saving supplemental irrigation (STW) -Weeding at critical stages of growth. -Mulching -2% urea spray at branching	
	2)**Farming situation:** Medium land	Rice(*Kharif*)mono-cropping	No change	-Supplemental irrigation through STW /farm pond in the	Use of Raised bed planter

				nursery bed of rice. -Application of sufficient quantity of FYM or compost in the nursery bed and main field. -Where germination is severely affected, re-sowing of rice seed may also be recommended. Varieties suitable for normal sowing should be selected. -Spraying of Mancozeb @ 2.5g/l or Edifenphos 2 1ml/l or Carbendazim @ 1g/l against brown spot disease in rice.	
		Jute -Rice(*Kharif*)-Toria / Lentil/ Potato / *Rabi* vegetables/Chilli	No change Varieties of chilli- Micro Suryamukhi, Balijuri, Krishna	PSB as soil application Lime application as per recommendation based soil test data for pulse crop at 15-21 days prior to sowing	
		Rice (*kharif*) – Rice (summer)	No change		
	3.Flood prone	Summer vegetables/Jute – Toria/Lentil// Potato/*Rabi* vegetables/Chilli	No Change	-Supplementary life saving irrigation at critical crop stages	

		Rice (Late *Kharif*) –/Potato/*Rabi* vegetables/Chilli	No change	-In chronically flood affected areas, where rice nursery is raised in upland/ non flood prone areas to grow recommended rice varieties as late Sali Prafulla,Gitesh, Manohar Sali, Andrew Sali, Salpona, with higher seedling age, re-sowing of rice seed may also be recommended where germination is severely affected. - Seed treatment with 4% MOP for 24 hrs, dry it in shade for 24 hrs and sowing -Supplemental irrigation in the nursery bed of rice. -Application of sufficient quantity of FYM or compost in the nursery bed and main field.	

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell, consecutive 2 weeks rainless (< 2.5 mm)	**Major Farming situation**	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measures[d]**	**Remarks on Implementation[e]**
At vegetative stage June 3rd wk	1)**Farming situation:**. upland	Summer vegetables/ Summer Pulse(Greengram/Blackgram) / *Kharif* Pulses-Toria/ *Rabi* Veg /*Rabi* pulse(Black Gram)/ Lentil	No Change	-Life saving supplemental irrigation(STW, Farm pond, Low lift pump, LLP) -Weeding at critical stages of growth. -Application of post emergrnce herbicides (Imazethapyr, quazalofop-p-ethyl (60 g/ha) - Thinning to maintain optimum plant population. -Mulching in horticultural crops	Provision for water harvesting structures under PMKSY

	2)Farming situation: Medium land/ medium low land	Rice(*Kharif*) monocropping	No Change	-Life saving supplemental irrigation at critical stages of crop growth -Top dressing of additional quantities of MOP @ 37.5 kg/ha and incorporation is recommended in rice -Spraying of 2% KCl solution on leaves of rice if and when drought appears. -Top dressing of urea may be delayed upto heading stage of rice if drought prevails at tillering stage. -Spraying of Mancozeb @ 2.5g/l or Edinofenphos 2 ml/l or Carbendazim @ 1g/l against brown spot disease in rice. -Weeding at critical stages of growth.	
		Jute / Rice(*Kharif*)- Toria / Lentil/ / Potato / *Rabi* vegetables/Chilli	No Change		
		Rice (*kharif*)– Rice (summer)	No Change		
	3.Flood prone	Summer vegetables/Jute – Toria/Lentil/ Potato/*Rabi* vegetables/Chilli	No Change	-Supplementary life saving irrigation at critical crop stages	Provision for water harvesting structures under PMKSY
		Rice (Late *Kharif*) -Potato/ *Rabi* vegetables/ Chilli	No change	-Supplementary life saving irrigation at critical crop stages -Top dressing of additional quantities of MOP @ 37.5 kg/ha and incorporation is recommended in rice -Spraying of 2% KCl solution on leaves of rice if and when drought appears. -Top dressing of urea may be delayed upto heading stage of rice if drought prevails at the stages of top dressing	

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
At flowering/ fruiting stage	1. upland	Summer vegetables/ Summer Pulse (Greengram)-Toria/Linseed/ *Rabi* Veg /*Rabi* pulse (Lentil, pea, lathyrus, Rajmah)	No change	-Life saving supplemental irrigation through STW/LLP -Spraying of 1% KCl solution at flowering stage and 2% urea spray at pod initiation stage of pulses	
	2.Medium land	Rice (*Kharif*) monocropping	No change	Top dressing of additional quantities of MOP @ 37.5 kg/ha and incorporation is recommended in rice before flowering. -Spraying of 2% KCL solution on leaves of rice if and when drought appears before flowering. -Top dressing of urea may be delayed up to heading stage of rice if drought prevails at the stages of top dressing -Life saving supplemental irrigation at critical stages of crop growth -If crop fails, plan for *rabi* vegetables, oilseeds, pulses etc.	-Development of water harvesting structure under NREGS/PMKSY for life saving irrigation -Arrangements of pump sets under NFSM and RKVY/PMKSY
		Jute/Rice (*Kharif*)- Toria/ Linseed/Niger/Lentil/Potato / *Rabi* vegetables/Chilli	No change		
		Rice(*kharif*)–Rice (summer)	No change		
	3.Flood prone	Summer vegetables/Jute – Toria/Lentil/ Wheat/Potato/*Rabi* vegetables/Chilli	No Change		

		Rice (Late *Kharif*) –Wheat/Potato/*Rabi* vegetables/Chilli	No change	-Supplementary life saving irrigation at critical crop stages --Top dressing of additional quantities of MOP @ 37.5 kg/ha and incorporation is recommended in rice -Spraying of 2% KCL solution on leaves of rice if and when drought appears. -Top dressing of urea may be delayed upto heading stage of rice if drought prevails at the stages of top dressing - If crop fails, plan for *rabi* vegetables, oilseeds, pulses etc.	Rice (Late *Kharif*) –Wheat/Potato/*Rabi* vegetables/ Chilli
		Rice (Late *Kharif*) –Wheat/Potato/*Rabi* vegetables/Chilli	No change	-Supplementary life saving irrigation at critical crop stages --Top dressing of additional quantities of MOP @ 37.5 kg/ha and incorporation is recommended in rice -Spraying of 2% KCL solution on leaves of rice if and when drought appears. -Top dressing of urea may be delayed upto heading stage of rice if drought prevails at the stages of top dressing - If crop fails, plan for *rabi* vegetables, oilseeds, pulses etc.	Rice (Late *Kharif*) –Wheat/Potato/*Rabi* vegetables/ Chilli

Condition			**Suggested Contingency measures**		
Terminal drought (Early withdrawal of monsoon)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management[c]**	***Rabi* Crop planning[d]**	**Remarks on Implementation[e]**
September-October	1)**Farming situation:** Upland	Summer vegetables/ Summer Pulse (Greengra m) Toria/*Rabi* Veg /*Rabi* pulse (Lentil, lathyrus, pea, rajmah)	-Life saving supplemental irrigation -Harvesting of *kharif* crops at physiological maturity stage. Spraying of 1% KCl solution at flowering stage and 2% urea spray at pod initiation stage of pulses	-*Rabi* cropping with cole crops such as Cauliflower (mid season varieties). Growing of Tomato, Brinjal, pea, potato and Leafy vegetables like Spinach, Radish etc. with recommended varieties and package of practices. -Growing of *rabi* field crops like toria, lentil, wheat etc. in time with pre-sowing irrigation if required with recommended varieties and package of practices.	Provision for water harvesting structures under PMKSY
	2)**Farming situation:** Medium land	Rice (*Kharif*) monocropping	-Life saving supplemental -irrigation	-*Rabi* cropping with cole crops such as Cauliflower (mid season varieties). -Growing of Tomato, Brinjal, pea, potato and Leafy vegetables like Spinach, Radish etc. with recommended varieties and package of practices. -Growing of *rabi* field crops like toria, lentil, wheat etc. in time with pre-sowing irrigation if required with recommended varieties and package of practices.	Provision for water harvesting structures under PMKSY
		Jute / Rice(*Kharif*)- Toria / Lentil/ Wheat / Potato / *Rabi* vegetables/Chilli			
		Rice (*kharif*) – Rice (summer)			

	3.Flood prone	Summer vegetables/Jute – Toria/Lentil/Wheat/ Potato/*Rabi* vegetables/Chilli Rice (Late *Kharif*) –Toria/Lentil/Wheat/ Potato/*Rabi* vegetables/ Chilli	-Life saving supplemental irrigation -Application of Organic matter, Vermicompost etc	--Seed treatment with Bioveer,Biofor-PF *Rabi* cropping with cole crops such as Cauliflower (mid season varieties Growing of Tomato, Brinjal, pea, potato and Leafy vegetables like Spinach, Radish etc. with recommended varieties and package of practices. --Growing of *rabi* field crops like toria, lentil, wheat etc. in time with pre-sowing irrigation if required with recommended varieties and package of practices.	

2.3 Drought - Irrigated situation

Condition			**Suggested Contingency measures**		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Delayed release of water in canals due to low rainfall	1)**Farming situation**: Mention source of irrigation, topography (upland/lowland) and soil colour & depth Eg; canal irrigated shallow red soils; **tankfed medium deep black soils**	Cropping system 1:	NA		
		Cropping system 2:			
		Cropping system 3:			
	2)Farming situation:	Cropping system 1:			
		Cropping system 2:			
		Cropping system 3:			

Condition			**Suggested Contingency measures**		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Limited release of water in canals due to low rainfall	1)Farming situation: Mention source of irrigation, topography (upland/lowland) and soil colour & depth Eg; canal irrigated shallow red soils; **tank fed medium deep black soils**	Cropping system 1:			
		Cropping system 2:			
		Cropping system 3:			
	2)Farming situation:	Cropping system 1:			
		Cropping system 2:			
		Cropping system 3:			

Condition			**Suggested Contingency measures**		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Non release of water in canals under delayed onset of monsoon in catchment	1) Farming situation: Mention source of irrigation, topography (upland/lowland) and soil colour & depth Eg; canal irrigated shallow red soils; **tankfed medium deep black soils**	Cropping system 1:			
		Cropping system 2:			
		Cropping system 3:			
	2) Farming situation:	Cropping system 1:			
		Cropping system 2:			
		Cropping system 3:			

Condition			**Suggested Contingency measures**		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	1) Farming situation: Mention source of irrigation, topography (upland/lowland) and soil colour & depth Eg; canal irrigated shallow red soils; **Tube well irrigated medium red soils**	Cropping system 1:			
		Cropping system 2:			
		Cropping system 3:			
	2) Farming situation:	Cropping system 1:			
		Cropping system 2:			
		Cropping system 3:			

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Insufficient groundwater recharge due to low rainfall	1) Farming situation: Mention source of irrigation, topography (upland/lowland) and soil colour & depth Eg; canal irrigated shallow red soils; **tankfed medium deep black soils**	Cropping system 1:	NA		
		Cropping system 2:			
		Cropping system 3:			
	2) Farming situation:	Cropping system 1:			
		Cropping system 2:			
		Cropping system 3:			
Any other condition (specify)					

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

Condition	Suggested Contingency Measures			
Continuous high rainfall in a short span leading to water logging	Vegetative stage[k]	Flowering stage[l]	Crop maturity stage[m]	Post harvest[n]
Crop1 Summer rice	-Sow rice seed in raised nursery bed with 30cm gap between two beds which can be utilized to drain out excess water. - Excess rain water to be drained out through surface drainage channel to avoid submergence in the main field. -Light hoeing and weeding	Excess rain water to be drained out through surface drainage channel to avoid submergence	-Excess rain water to be drained out through surface drainage channel to avoid submergence -Crop to be harvested at physiological maturity stage.	-Proper drying of grains to maintain optimum moisture percentage (12-14%) for storage
Crop2 Winter rice	-Sow rice seed in raised nursery bed with 30cm gap between two beds which can be utilized to drain out excess water.		Crop to be harvested at physiological maturity stage	-Proper drying of grains to maintain optimum moisture percentage (12-14%) for storage
Crop 3 Sesame	-Excess rain water to be drained out through surface drainage channel of 25cm wide, 15cm deep spaced at 6 m -Light hoeing and weeding	Excess rain water to be drained out through surface drainage channel of 25cm wide, 15cm deep spaced at 6 m	-Excess rain water to be drained out through surface drainage channel of 25cm wide, 15cm deep spaced at 6 m. -Crop to be harvested at physiological maturity stage.	-Proper drying of grains to maintain optimum moisture percentage for storage
Crop4 Jute	- Drainage -If top dressing of N fertilizer is not possible, foliar spray of **3%** urea (11.5 kgN/ha i.e. 30 g urea/l of water) at 40-45 days and 55-60 days after sowing.,			Proper drying of fibre

Crop5 Sugarcane	-First & second earthing up at 45-60 and 90-120 days after planting, respectively. -Make trenches/furrows in between ridges to facilitate drainage of excess water during high rainfall.	Drainage - Make trenches/furrows in between ridges to facilitate drainage of excess water during high rainfall.	Drainage- Make trenches/furrows in between ridges to facilitate drainage of excess water during high rainfall.	Drainage

Horticulture				
Crop1 Chilli	-Drainage -Plant protection measures against anthracnose and bacterial/fungal wilt	-Drainage - Application of hormones, nutrient, sprays to prevent flower drop.	-Drainage -Plant protection measures against fruit rot -Crop to be harvested at physiological maturity stage.	-Shifting of the produce to drier place. - sell the produce immediately.
Crop2 Potato	-Drainage -Proper plant protection measure against late blight -Earthing up at 25 and 60 days after planting.	-Drainage -Proper plant protection measure against late blight	-Drainage -Harvesting of tuber	-proper drying of the produce. -Keep drier place before storage
Crop3 Vegetables	-Drainage - Application of hormones, nutrient, sprays to prevent flower drop.	-Drainage - Application of hormones, nutrient, sprays to prevent flower drop.	Drainage	Shifting of the produce to drier place, cold storage.
Crop 4 Watermelon	Drainage	Drainage, Application of hormones, nutrient, sprays to prevent flower drop.	Drainage	Shifting of the produce to drier place, Cold storage.
Heavy rainfall with high speed winds				

in a short span				
Crop1 Summer rice	-Sow rice seed in raised nursery bed with 30cm gap between two beds which can be utilized to drain out excess water.		-Crop to be harvested at physiological maturity stage.	-Proper drying of grains to maintain optimum moisture percentage (12-14%) for storage Drying the harvested product on bamboo
Crop2 Jute	- If top dressing of N fertilizer is not possible, foliar spray of urea (11.5 kgN/ha i.e. 30 g urea/l of water) at 40-45 days and 55-60 days after sowing., -Propping: crop should be provided mechanical support to prevent lodging - Growing of green manure crops like Dhaincha along the border as wind barrier.	-Propping: crop should be provided mechanical support to prevent lodging - Growing of green manure crops like Dhaincha along the border as wind barrier.	-Propping: crop should be provided mechanical support to prevent lodging - Growing of green manure crops like Dhaincha along the border as wind barrier.	-Proper drying of fibre
Crop3 Maize	-Proper drainage -Provision for wind breaks	Proper drainage Provision for wind breaks	-Crop to be harvested at physiological maturity stage. - Mechanical support to prevent lodging	-proper drying
Crop4 Sugarcane	-First & second earthing up at 45-60 and 90-120 days after planting, respectively. -Make trenches/furrows in between ridges to facilitate drainage of excess water during high rainfall.	-Drainage -Striping & propping	-Drainage -Striping & propping	Harvesting should be done before rain as far as possible Drying to remove excess moisture of canes
Crop5 Winter rice	-Sow rice seed in raised nursery bed with 30cm gap between two beds which can be utilized to drain out excess water.		-Crop to be harvested at physiological maturity stage.	-Proper drying of grains to maintain optimum moisture percentage (12-14%) for storage
Horticulture				

Crop1 Banana	Drainage, Make trenches/furrows in between ridges to facilitate drainage of excess water, propping.	Drainage, Make trenches/furrows in between ridges to facilitate drainage of excess water, propping.	Drainage, Make trenches/furrows in between ridges to facilitate drainage of excess water, propping.	Shifting of the produce to drier place
Crop2 Vegetable (climbers)	Drainage, make trenches/furrows in between ridges to facilitate drainage of excess water, propping.	Drainage, Application of hormones, nutrient, sprays to prevent flower drop.	Drainage	Shifting of the produce to drier place, Cold storage.
Crop3 Okra	Drainage	Drainage, Application of hormones, nutrient, sprays to prevent flower drop.	Drainage	Shifting of the produce to drier place ,Harvesting should be done before rain as far as possible, Drying to remove excess moisture of produce.
Crop 4 Watermelon	Drainage, make trenches/furrows in between ridges to facilitate drainage of excess water	Drainage, Application of hormones, nutrient, sprays to prevent flower drop.	Drainage	Shifting of the produce to drier place, Cold storage.
Crop 5 Dolichos bean	Drainage	Drainage, Application of hormones, nutrient, sprays to prevent flower drop.	Drainage	Shifting of the produce to drier place, Cold storage.
Crop 6. Bottle gourd	Drainage	Drainage, Application of hormones, nutrient, sprays to prevent flower drop.	Drainage	Shifting of the produce to drier place, Cold storage.
Crop 7. Bitter gourd Crop 8. Assam lemon Crop9. Guava	Drainage and earthing up	Drainage, Application of hormones, nutrient, sprays to prevent flower drop.	Drainage	Shifting of the produce to drier place, Cold storage, packing in transparent and nontransparent polythene bags.
Outbreak of pests and diseases due to unseasonal rains				
Crop1 summer rice	-Application of pesticides like chlorpyriphos or Monochrotophos @ 2	Adoption IPM module - Rouging of infected plant ,	-	-Insect pest and disease infested seed/grains should

	ml/lit against stem borer, leaf folder, case worm. -Adoption IPM module. -Alternate flooding and drying against case worm. -Application of carbendazim @ 1g/l against blast and sheath blight. Water from the sheath blight infested field should not be allowed to enter disease free field.	- Application of pesticides like chloropyriphos or Monochrotophos @ 2 ml/lit against stem borer -Adoption IPM module against stem borer -Spraying of pesticide should not coincide pollination time. -Application of carbendazim @ 1g/l against blast and sheath blight. Water from the sheath blight infested field should not be allowed to enter disease free field.		be discarded
Crop2 Winter rice	-Application of pesticides like chloropyriphos or Monochrotophos @ 2 ml/lit against stem borer, leaf folder, case worm. -Adoption IPM module. -Alternate flooding and drying against case worm. -Application of carbendazim @ 1g/l against blast and sheath blight. Water from the sheath blight infested field should not be allowed to enter disease free field.	-Rouging if infected plant , - Application of pesticides like chlorpyriphos or Monochrotophos @ 2 ml/lit against stem borer -Adoption IPM module against stem borer -Spraying of pesticide should not coincide pollination time. -Application of carbendazim @ 1g/l against blast and sheath blight. Water from the sheath blight infested field should not be allowed to enter disease free field.	-	Insect pest and disease infested seed/grains should be discarded
Crop3 Jute	- Jute hairy caterpillar, semi looper etc. are to be hand picked and destroyed by putting in kerosinazed water. - Alternatively, apply Fenitrothion 50 EC @ 1ml/l(3 sprayings) - In case of root rot, stem rot, seedling blight, apply carbendazim @ 1g/l of water. Application of potash should be increased up to 50 kg/ha	-	-	-Discard insect pest and disease infested plants to maintain the quality.

Crop4 Black gram	- Against YMV, spray Dimethoate @ 2ml/l (2 -3 spraying) - Against jassids, aphids, flee beetle, leaf folder, spray Malathion 50 EC @ 2 ml/l of water. - Against damping off, root rot and seedling blight, apply carbendazim @ 1g/l of water.	- Against YMV, spray Dimethoate @ 2ml/l (2 -3 spraying) - Against jassids, aphids, flee beetle, leaf folder, spray Malathion 50 EC @ 2 ml/l of water.	- Against pod borer & pod bug, spray Malathion 50 EC @ 2 ml/l of water.	Insect pest and disease infested seed/grains should be discarded
Horticulture				
Crop1 Potato	-Depending on the weather condition, Mancozeb @ 2.5 g/l should be sprayed as prophylactic measures against late blight. -Against late blight, 6 spraying with Mancozeb 2.5g/l of water at an interval of 12 days. -Use of sticker is essential in the spray solution for spraying during rainy weather. -Drainage of excess water			-Discard disease and insect infested tubers.
Crop2 Tomato	-Depending on the weather condition, Mancozeb @ 2.5 g/l should be sprayed as prophylactic measures against late blight. -Against late blight, 6 spraying with Mancozeb 2.5g/l or Ridomil 1g/lit of water at an interval of 12 days. -Use of sticker is essential in the spray solution for spraying during rainy weather. -Drainage of excess water			-Discard disease and insect infested fruits.

2.5 Floods

Condition	**Suggested Contingency Measures**			
Transient water logging /partial inundation[1]	Seeding/ nursery stage	Vegetative stage	Reproductive stage	At harvest
Crop1 Summer rice	-Raised nursery bed with 30 cm gap in between two beds so that excess water can be removed.			Harvesting at physiological maturity stage, tying the harvested head and transferred to dry place for drying
Crop2 Winter rice	-Raised nursery bed with 30 cm gap in between two beds so that excess water can be removed.			Harvesting at physiological maturity stage, tying the harvested head and transferred to dry place for drying
Crop3 Jute		-Foliar application of urea instead of top dressing is advocated		-Harvested plants should be made in bundles and to be kept in standing position for 2-4 days.
Crop4 Sesame	-Drainage of excess water -Hoeing in between lines for aeration in root zone after flood	-Drainage of excess water -Hoeing in between lines for aeration in root zone after flood.	-Drainage of excess water -Hoeing in between lines for aeration in root zone after flood.	-Harvesting at physiological maturity stage. -Proper drying of produce
Crop5 Black gram	-Drainage of excess water -Hoeing in between lines for aeration in root zone after flood	- Drainage of excess water -Hoeing in between lines for aeration in root zone after flood.	- Drainage of excess water -Hoeing in between lines for aeration in root zone after flood.	-Harvesting at physiological maturity stage. -Proper drying of produce
Horticulture				
Crop1 Banana	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water, propping.	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water, propping.	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water,	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water, propping.

			propping.	
Crop2 *Kharif* Vegetable	-Drainage of flood water -Hoeing in between lines for aeration in root zone after flood	-Drainage of flood water -Hoeing in between lines for aeration in root zone after flood	-Drainage of flood water -Hoeing in between lines for aeration in root zone after flood.	-Harvesting of produce as early as possible
Crop3 Arecanut	Drainage, Make trenches/furrows in between rows to facilitate drainage of excess water	Drainage, Make trenches/furrows in between rows to facilitate drainage of excess water	Drainage, Make trenches/furrows in between rows to facilitate drainage of excess water	-
Crop 4. Assam lemon	Making trenches/furrows in between ridges to drain out the excess water.	Earthing up	Earthing up	Shifting of the produce t Shifting of the produce to drier place o drier place.
Crop 5. Pineapple	Making trenches/furrows in between ridges to drain out the excess water.	Earthing up.	Drainage	Shifting of the produce to drier place
Continuous submergence for more than 2 days				
Crop1 Summer rice	-Raised nursery bed with 30 cm gap in between two beds so that excess water can be removed.		-	Harvesting at physiological maturity stage, tying the harvested head and transferred to dry place for drying
Crop2 Winter rice	-Raised nursery bed with 30 cm gap in between two beds so that excess water can be removed. -If seedlings are damaged by flood water, resowing may be done with the following varieties- -If transplanting can be done by mid August, select varieties like Satyaranjan, Basundhara, IR -36, Jaya etc. Seedlings should be raised in non flood prone or	If crop is damaged by flood, the nursery may be raised with the following very short duration varieties- Luit, Dishang, Kolong ,etc -		Harvesting at physiological maturity stage, tying the harvested head and transferred to dry place for drying

	high land area. - If transplanting is possible during last part of August, short duration varieties such as Luit, Kolong, Dishang etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/hill..			

Crop insurance through Fasal Bhima Yojana will be provided under Flood situations

2.6 Extreme events: Heat wave / Cold wave/Frost/ Hailstorm /Cyclone: NA

Extreme event type	**Suggested contingency measure[r]**			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave[p]	NA	NA	NA	NA
Horticulture	NA	NA	NA	NA
Cold wave[q]	NA	NA	NA	NA
Horticulture	NA	NA	NA	NA
Frost	NA	NA	NA	NA
Horticulture	NA	NA	NA	NA
Hailstorm	NA	NA	NA	NA
Horticulture	NA	NA	NA	NA
Cyclone	NA	NA	NA	NA
Horticulture	NA	NA	NA	NA

2.7. Contingent strategies for Livestock, Poultry & Fisheries

2.7.1. Livestock

	Suggested contingency measures		
	Before the event[s]	**During the event**	**After the event**
Drought			
Feed and fodder availability	• Increasing cultivation of perennial fodder and feed reserves in district • Establishment of fodder banks with inclusion of drought tolerant fodders • Training and preparation of hay and silage • Making facility for block feed and UMMB licks • Raising drought tolerant perennial grasses, trees, shrubs & bushes in field boundaries • Quality up-gradation of inferior quality roughages like paddy straw, wheat straw etc. with urea treatment. • Preventing the practice of burning paddy straw, maize stover and sugarcane tress. • Encouraging production of Azolla for animal feed. • Mass awareness on feeding the livestock with unconventional feeds and various byproducts. • Mass awareness on utilization of crop byproducts like sugarcane tops and bagasse for animal feeding with method demonstration on urea treatment of straw.	• Feeding fodders from perennial trees. • Feeding already prepared silage, hay, UMMB lick • Providing feed blocks, unconventional feeds and various byproducts. • Providing urea treated straw. • Use of harvested tree/top of fodder as feed for livestock animals. • Feeding of grains damaged during processing, milling by products & use of all failed field crops during the drought period as animal feed.	• Culling of affected and unproductive animals. • Fodder rejuvenation and cultivation of fodder crops (Oat, Maize etc.)
Drinking water	• Storing water in tanks for the hard period • On farm /Roof top water harvesting/ • Identification of natural water resources and their use in a planned way.	• Offering stored water to the livestock. • Preventing wastage of water • Animals not to be exposed outside	• Culling of affected and unproductive animals.

Health and disease management	• Popularizing the concept of animal insurance and its implementation. • Creation of repositories to store a sizeable stock of veterinary medicines for emergencies • Prompt recognition of endemic animal diseases and timely vaccination against them. • Mass awareness programme on management of livestock during drought. • Regular de-worming of animals to minimize the parasitic burden and improve the productivity of farm livestock. • Constituting efficient team of workers to act as a Rapid Action Force during emergencies • Collaboration with local and district veterinary officials to handle endemic animal diseases.	• Immediate treatment of the sick animals. • Organizing mass animal health check up camps wherever necessary. • Providing anthelmentics and mineral mixtures to productive animals. • Segregation of suspicious and disease animals from the herd and their early treatment.	• Availing insurance • Culling of unproductive livestock to improve economic status of livestock owners. • Organizing need based animal health check up camps • Minimizing cases of anestrous and repeat breeding in productive animals by organizing mass animal fertility camps.
Floods			
Feed and fodder availability	• Increasing cultivation of perennial fodder and feed reserves in district • Establishment of community fodder banks with inclusion of flood tolerant fodder variety. • Encouraging preparation of hay making and silage preparation • Making facility for block feed and UMMB licks • Preventing the practice of burning paddy straw, maize stover and sugarcane tress and quality up gradation of inferior quality roughages like paddy straw, wheat straw etc. with urea treatment. • Encouraging production of Azolla for animal feed. • Mass awareness on feeding the livestock with unconventional feeds and various	• Making fodders available from community fodder banks • Feeding already prepared silage, hay, UMMB lick feed blocks, unconventional feeds and various byproducts. • Providing urea treated straw. • Use of harvested tree/top of fodder as feed for livestock animals. • Keep animals in safe place like raised plate form/upland	• Availing insurance • Culling of affected and unproductive animals. • Fodder rejuvenation

	byproducts. • Mass awareness on utilization of crop byproducts like sugarcane tops and bagasse for animal feeding with method demonstration of urea treatment of straw. • Erection of raised platform for feed storage and animals		
Drinking water	• Storing water in tanks	• Offering stored water to the livestock.	• Treating of drinking water.
Health and disease management	• Popularizing the concept of animal insurance and its implementation • Prompt recognition of endemic animal diseases and timely vaccination against them. • Creation of repositories to store a sizeable stock of veterinary medicines for emergencies • Mass awareness programme on management of livestock during floods. • Regular de-worming of animals to minimize the parasitic burden and improve the productivity of farm livestock. • Constituting trained team of workers to act as a Rapid Action Force during emergencies • Involvement of the local veterinary officials to handle endemic animal diseases.	• Immediate treatment of the sick animals. • Conducting animal health camps during the period.	• Availing insurance • Organizing need based animal health check up camps and vaccination • Culling of unproductive livestock to improve economic status of livestock owners. • Minimizing cases of anestrous and repeat breeding in productive animals by organizing mass animal fertility camps.
Cyclone	NA	NA	NA
Feed and fodder availability	NA	NA	NA
Drinking water	NA	NA	NA
Health and disease management	NA	NA	NA

Heat wave and cold wave	NA	NA	NA
Shelter/environment management	NA	NA	NA
Health and disease management	NA	NA	NA
	NA	NA	NA

[s] based on forewarning wherever available

2.7.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event[a]	**During the event**	**After the event**	
Drought				
Shortage of feed ingredients	• Culling of unproductive poultry for efficient utilization of poultry feed. • Storage of household grains like broken rice, maize, pulses, oilseeds etc.	• Offering stored feed and use of non conventional source of feed like broken grains, brewery wastes, etc. • Supplementation of shell grit/ calcium to the laying birds • Immediate marketing of the meat type birds • Arrangement of good quality poultry feed	• Culling unproductive birds. • Providing of good quality poultry feed to obtain optimum growth	RKVY
Drinking water	• Preserving water in tank	• Judicious use of stored water	• Developing drinking water storage facilities.	
Health and disease management	• Culling of weak and diseased birds. • Timely de-worming. • Vaccination against endemic diseases especially Ranikhet disease. • Arrangement of brooding facilities for young chicks	• Immediate segregation of disease affected and suspicious birds from the flock. • Immediate treatment of the sick animals. • Conducting animal health camps during the period. • Maintenance of proper hygiene and	• Culling of unproductive birds • Availing insurance wherever required • Maintenance of proper hygiene and sanitation in the poultry sheds. • Disposal of dead birds	

	• Construction of good quality poultry houses or farms to minimize disease incidences and to avoid predation by carnivores. • Proper waste disposal system in poultry farms possessing large flocks. • Provision for balanced feeding of productive birds • Veterinary preparedness • Mass awareness programme on management of poultry during drought. • Popularizing poultry insurance and its implementation.	sanitation in the commercial poultry farms. • Regular cleaning of poultry houses to minimize disease incidence. • Restricting trade of poultry, poultry meat and eggs during outbreak of a disease having potential to take an epidemic form.e.g. Bird flu. • Restriction against needless movement of individuals in the farm premises	by burning or by deep burial with lime in pits of optimum sizes. • Timely vaccination of all the birds. • Timely marketing of meat type poultry and poultry eggs to minimize losses due to mortality. • Mass awareness programme on management of poultry during drought.	
Floods				
Shortage of feed ingredients	• Procurement and storage of sufficient good quality feed ingredients in flood prone areas	• Supply feed ingredient to the affected poultries	• Culling unproductive birds. • Use of good quality poultry feed to obtain optimum growth	
Drinking water	• Preserving water in tank	• Arrangement of safe drinking/ medicated water from outside	• Treating drinking water	
Shelter management	• Popularizing poultry sheds on raised bamboo/ pucca structures to protect birds/sheds from flood water, occurrence of diseases and storage of feed • Identification of sites/areas not prone to inundation during floods for erecting poultry sheds and feeds storage units	• Shifting of birds and feed to raised sheds and storage units respectively	• Sterilization of vacant poultry sheds before bringing back the batch of birds	• Insure poultry units and avail gov. programs for the same

Health and disease management	• Vaccination against endemic diseases especially Ranikhet disease. • Stocking of emergency medicine for prevalent diseases • Mass awareness programme on management of poultry and zoonotic diseases.	• Conducting animal health camps during the period • Immediate segregation of disease affected and suspicious birds from the flock and treatment of the sick birds • Maintenance of proper hygiene and sanitation in the commercial poultry farms • Restricting trade of poultry meat and eggs during outbreak of a disease having potential to take an epidemic form.e.g. Bird flu.	• Maintenance of proper hygiene and sanitation in the poultry sheds. • Disposal of dead birds by burning or by deep burial with lime in pits at proper depth • Timely marketing of meat type poultry and poultry eggs to minimize losses due to mortality	
Cyclone	-	-	-	-
Shortage of feed ingredients	-	-	-	-
Drinking water	-	-	-	-
Health and disease management	-	-	-	-
Heat wave and cold wave	-	-	-	-
Shelter/environment management	-	-	-	-
Health and disease management	-	-	-	-

[a] based on forewarning wherever available

2.7.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
1) Drought	-	-	-
A. Capture	-	-	-
Marine	-	-	-
Inland	-	-	-
(i) Shallow water depth due to insufficient rains/inflow	• Stop over-exploitation • Judicious or planned release of water from reservoir/tanks which are used for fisheries in drought prone areas • Water harvesting structure using polythene lining to supply water during the event • Harvesting and marketing of all large fish except brood stock	• Prioritize the ponds for rescuing from drought • Supplement water in the pond with ground water to maintain optimum depth in identified ponds • Drying of fish or production of value added fish products from the over harvested stock • Shift fish stock to deeper water, especially in case of pens • Restrict release of water from reservoir/tanks which are used for fisheries • Fingerlings and brood fishes, if catched, to be released back to safe waters • Stock water bodies with desirable species for culture	• Restocking, wherever possible. • Digging of pond to increase the depth. • Fertilization, manuring and rewatering of pond • Use feed supplement to increase the growth rate
(ii) Changes in water quality	• Thinning out of stock against reduced dissolved oxygen and space • Removal of aquatic weeds	• Provide aeration	• Remove aquatic vegetation
(iii) Any other	• As a long-term measure, deepening and regular de-silting of ponds and tanks in drought	-	-

	prone areas should be taken up		
B. Aquaculture	-	-	-
(i) Shallow water in ponds due to insufficient rains/inflow	• Capturing some amount of fishes and keeping few to minimize quantity of fishes in the pond • Digging of ponds to increase depth • Follow measures like addition of cow dung etc. to stop/minimize downward percolation of water • Enquiring alternative water sources to add to the pond • For pond construction select soils with sufficient clay for retention of water. • Apply sufficient organic manure during preparation to minimize water loss through seepage. • Educating for Insurance and apply • Excavation of bore wells • Reduce biomass and stocking density through partial harvesting. • Sell out the fishes attaining marketable size to minimize loss. • Stock fishes that can thrive low water depth, like air breathing fishes. • Maintenance of proper record for claiming compensation, especially in schemes assisted by Govt. or financial institutes. • Planning for rain water harvest.	• Digging of ponds/ middle of ponds to increase depth for saving life of the fishes • Minimizing quantity of fishes • Pump in water from other water source (nearby spring, stream, rivers etc) or ground water, if any. • Reduce food for minimum metabolism. • Restrict fertilizer for preventing algal bloom and minimum stress. • Dig deep trench in convenient part of the pond to save brood fishes. • Careful observation on daily basis. • Scare away birds and other animals (attracted by shallow water to catch fish) – may be vector for diseases.	• Cleaning and digging of ponds to increase depth • Use of clay material in pond beds to minimize water loss through percolation • Extended seed production • Restock the pond. • Promoting area specific Integrated fish farming • Short duration culture of species that are fast growing in initial stage and can be marketed at small size (minor and medium carps). • Air breathing fish culture • Claim compensation with support of record and documents.
(ii) Impact of salt load build up in	• Identify risks associated with the	-	• Partial water exchange to

ponds / change in water quality	suspected outbreak of pathogens and be ready with suitable remedial measures		optimize salinity
(iii) Any other	• Repairing/ arrangement of alternate safe place to keep pumps, aerators, etc • Store the feeds in a proper place	-	-
2) Floods	-	-	-
A. Capture	-	-	-
Marine	-	-	-
Inland	-	-	-
(i) No. of boats / nets/damaged	• Arrangement of boats, nests, etc in surplus	-	-
(ii) No.of houses damaged	-	-	-
(iii) Loss of stock	• Thin out population	• Use FAD, feed attractant	• Use of disinfectant
(iv) Changes in water quality			
(v) Health and diseases	• Use of disinfectant		
B. Aquaculture			
(i) Inundation with flood water	• Dyke should be strongly constructed/ renovated above the expected flood level. • Insurance • Repairing, turfing and compaction of peripheral embankments. • Growing horticultural crops on the embankment to prevent erosion. • Sufficient bamboo poles and nylon nets to be kept ready. • Construction of earthen nursery ponds in upland areas • 'High stocking multiple	• Encircling the fishery with fish net to prevent the escaping of fishes • Surround the pond with nets supported by bamboo poles to prevent escape of fish. • Supply sufficient food to fishes to reduce tendency of escaping from the pond. • Fixing nets with appropriate size to reduce the loss of stock • Turbidity need to be controlled • Collection of naturally bred	• Dyke should be renovated strongly above the maximum flood level. • Sampling of fishes and water for disease analysis • Desilting • Restock the pond if original stock escapes. • Promotion of suitable Integrated fish farming • Short duration culture of species that are fast growing and can be

	harvesting' can be taken up. • Sell out the fishes attaining marketable size to minimize loss. • Maintenance of proper record for claiming compensation, especially in schemes assisted by Govt. or financial institutes.	seeds (spawn/ fry/ fingerlings) from flooded water	marketed at small size. • Claim compensation with support of record and documents. • Removal of unwanted/ predatory fish from pond before stocking.
(ii) Water contamination and changes in water quality	• Dyke should be strongly constructed above the expected flood level. • Prevent entry of water from outside. • Precaution to prevent entry of pesticide/insecticide laden water from nearby agricultural land. • Apply lime regularly as per recommendation.	• Use disinfectant • Apply lime regularly as per recommendation.	• Use disinfectant, Remove all unwanted exotic fishes • Apply lime regularly as per recommendation. • Remove muck and debris, if entered with flood. • Apply preventive agents (eg. CIFAX) before on set of winter.
(iii) Health and diseases	• Provided vitamin, mineral with feed • Arrangement of medicines and chemical stocks	• Provided vitamin, mineral, protein with feed, use bactericide	• Use bactericide and disinfectant and feed with balance diets.
(iv) Loss of stock and inputs (feed, chemicals etc)	• Dyke should be strongly constructed above the maximum flood level.	• Catch the some amount of fishes to reduce the stock.	• Dyke should be strongly renovated and apply disinfectant and fish out the unwanted exotic fishes
(v) Infrastructure damage (pumps, aerators, huts, etc)	NA	NA	NA
(vi) Any other	NA	NA	NA
3. Cyclone / Tsunami	NA	NA	NA
A. Capture	NA	NA	NA
Marine	NA	NA	NA
(i) Average compensation paid due to loss of fishermen lives	NA	NA	NA
(ii) Avg. no. of boats / nets/damaged	NA	NA	NA

(iii) Avg. no. of houses damaged	NA	NA	NA
Inland	NA	NA	NA
B. Aquaculture	NA	NA	NA
(i) Overflow / flooding of ponds	NA	NA	NA
(ii) Changes in water quality (fresh water / brackish water ratio)	NA	NA	NA
(iii) Health and diseases	NA	NA	NA
(iv) Loss of stock and inputs (feed, chemicals etc)	NA	NA	NA
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)	NA	NA	NA
(vi) Any other	NA	NA	NA
4. Heat wave and cold wave	NA	NA	NA
A. Capture	NA	NA	NA
Marine	NA	NA	NA
Inland	NA	NA	NA
B. Aquaculture	NA	NA	NA
(i) Changes in pond environment (water quality)	• Reduction of biomass by partial harvest in the event of heat as the DO levels will be very low. • Apply lime regularly as per recommendation. • Apply preventive agents (eg. CIFAX) before onset of winter.	• Apply lime regularly as per recommendation. • Restrict application of fertilizer as per requirement. • Deep pool refuge based aquaculture to provide shelter and growth during summer and winter season	• Exchange water upto 2/3rd and take suggestion from expert • Apply lime regularly as per recommendation. •
(ii) Health and Disease management	-	-	-
(iii) Any other	-	-	---

[a] based on forewarning wherever available