State: **ASSAM**

Agriculture Contingency Plan for District: **Nalbari**

1.0 District Agriculture profile					
1.1	**Agro-Climatic/Ecological Zone**				
	Agro Ecological Sub Region (ICAR)	Assam And Bengal Plain, Hot Subhumid To Humid (Inclusion Of Perhumid) Eco-Region(15.2)			
	Agro-Climatic Zone (Planning Commission)	EASTERN HIMALAYAN REGION (II)			
	Agro Climatic Zone (NARP)	Lower Brahmaputra Valley Zone (AS-4)			
	List all the districts or part thereof falling under the NARP Zone	Kamrup, Nalbari, Barpeta, Bongaigaon, Dhubri,Goalpara, Baksa, Chirang, Kokrajhar			
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude	
		25°57´ N-26°34´ N	91°07 E-91° 47° E	89 m above mean sea level	
	Name and address of the concerned **ZRS/ ZARS/ RARS/ RRS/ RRTTS**	RARS, Gossaigaon			
	Mention the KVK located in the district	Sariahtoli, Mouza- Bataghila, P.O.-Milanpur, Nalbari, Assam			
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):	1203.7	125	1st Week of June	2nd week of August
	NE Monsoon(Oct-Dec):	141.5		3rd week of October	2nd Week of November
	Winter (Jan- March)	93.2			
	Summer (Apr-May)	461.8			
	Annual	1900			

1.3	**Land use pattern of the district** (latest statistics)	Geographical area (‘000 ha)	**Cultivable area (‘000 ha)**	**Forest area (‘000 ha)**	Land under non-agricultural use (‘000 ha)	Permanent Pastures (‘000 ha)	Cultivable wasteland (‘000 ha)	Land under Misc. tree crops and groves (‘000 ha)	Barren and uncultivable land (‘000 ha)	Current Fallows (‘000 ha)	Other fallows (‘000 ha)
	Area (‘000 ha)	100.957	64.955	18.940	12.336	0.424	2.252	0.957	-	0.723	0.370

1.4	**Major Soils (common names like red sandy loam deep soils (etc.,)***	**Area (‘000 ha)**	**Percent (%) of total geographical area**
	1. Sandy Loam	43.149	28.69
	2. Alluvial Soil	36.567	26.17
	3. Clay Loam	34.051	24.36
	4. Sandy Soil	21.602	15.45
	5. Clay	7.455	5.33

1.5	**Agricultural land use**	**Area (‘000 ha)**	**Cropping intensity %**
	Net sown area	71.07	141
	Area sown more than once	28.79	
	Gross cropped area	99.86	

1.6	**Irrigation**	**Area ('000 ha)**		
	Net irrigated area	10.962		
	Gross irrigated area	19.78		
	Rainfed area			
	Sources of Irrigation	Number	**Area ('000 ha)**	**% of total irrigated area**
	Canals		3.55	17.94
	Tanks	98	0.2	1.01
	Open wells			
	Bore wells	4250	15.21	76.90
	Lift irrigation schemes			
	Micro-irrigation			
	Other sources (please specify)		0.82	4.15
	Total Irrigated Area		19.78	
	Pump sets	7065		
	No. of Tractors	309		
	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	-		
	Critical	-		
	Semi- critical	-		
	Safe	7		
	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 (as per latest figures) (2009-10)

1.7	Major field crops cultivated	Area ('000 ha)									
		Kharif			*Rabi*			*Summer*			Grand total
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	
	Rice		65.00	65.00			6.083	14.95	-	14.95	86.033
	Rapeseed & Mustard					7.054	7.054				7.054
	Pea					2.225	2.225				2.225
	Lentil					1.358	1.358				1.358
	Black gram					0.966	0.966				0.966
	Horticulture crops - Fruits										
		Total								Irrigated	Rainfed ('000 ha)
	Banana	1.250								-	1.250
	Jackfruit	0.905								-	0.905
	Assam Lemon	0.418								-	0.418
	Papaya	0.229								-	0.229
	Litchi	0.222								-	0.222

	Horticulture crops - Vegetables	Total area ('000 ha)	Irrigated area ('000 ha)	Rainfed area ('000 ha)
	Kharif	2.632	2.632	-

	Rabi	5.563	5.563	-
	Potato	4.14	-	4.14
	Medicinal and Aromatic crops	**Total area ('000 ha)**	**Irrigated area ('000 ha)**	**Rainfed area ('000 ha)**
	Citronella	50	-	50
	Lemongrass	50	-	50
	Neem	30	-	30
	Patchouli	20	-	20
	Amla	10	-	10
	Spices			
	Coriander	1.969	-	1.969
	Turmaric	0.390	-	0.390
	Chilli	0.309	-	0.309
	Ginger	0.190	-	0.190
	Plantation crops	**Total area ('000 ha)**	**Irrigated area ('000 ha)**	**Rainfed area ('000 ha)**
1	Coconut	1.380	**-**	1.380
2	Arecanut	1.960	-	1.960

Others (Specify)	Eg., industrial pulpwood crops etc.			
1.7	**Fodder crops**	**Total area ('000 ha)**	**Irrigated area ('000 ha)**	**Rainfed area ('000 ha)**
	-	**-**	**-**	**-**
	Grazing land	**-**	**-**	**-**
	Sericulture etc			
	Eri seeds (DFLS)	1850	-	1850
	Muga silk			
	Others (specify)			

1.8	Livestock (in number)	Male ('000)	Female ('000)	Total ('000)
	Cattle	-	-	33050
	Buffaloes total	-	-	1290
	Commercial dairy farms	-	-	-
	Goat	-	-	101900
	Sheep	-	-	7820
	Others (Camel, Pig, Yak etc.)	-	-	Pig-5246
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**	
	Commercial	-	142.48	
	Backyard	-	-	
	Duck	-	68.22	
1.10	**Fisheries (Data source: Chief Planning Officer of district)**			
	A. Capture			

Inland (Data Source: Fisheries Department)	**No. Farmer owned ponds**	**No. of Reservoirs**	**No. of village tanks**
	-	**-**	**-**

B. Culture			
	Water Spread Area (ha)	**Yield (t/ha)**	**Production ('000 tons)**
i) Brackish water (Data Source: MPEDA/ Fisheries Department)			
ii) Fresh Water	49765.11	0.198	9873
iii) Others	43212		

1.11 Production and Productivity of major crops

1.11	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder ('000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
Major Field crops (Crops to be identified based on total acreage)										
	Rice	195.250	3003	10.949	1800	42.325	3206	248.524	2670	-
	Rapeseed & Mustard			3.826	542			3.826	542	-
	LentilPea			1.845	826			1.845	826	-
	Lentil			1.585	645			1.585	645	-
	Blackgram			0.538	557			0.538	557	-
Major Horticultural crops (Crops to be identified based on total acreage)										
	Potato			9.310	4104			9.310	4104	-
	Rabi vegetables			79.161	14230			79.161	14230	-
	Kharif vegetables	40.527	15398					40.527	15398	-
	Arecanut							6.500	4288	-
	Coconut							100 nut/plant	100 nut/plant	-
	Banana							190 nut/plant	190 nut/plant	-

1.12	**Sowing window for 5 major field crops (start and end of normal sowing period)**	**Rice**	**Rapeseed**	**Lentil**	**Pea**	**Blackgram**
	Kharif- Rainfed	June-November	-	-	-	-
	Kharif-Irrigated	June-November	-	-		-
	Rabi- Rainfed	November-May	November-February	November-February	November-February	Mid October-February March-April
	Rabi-Irrigated	November-May	November-February	-	-	-

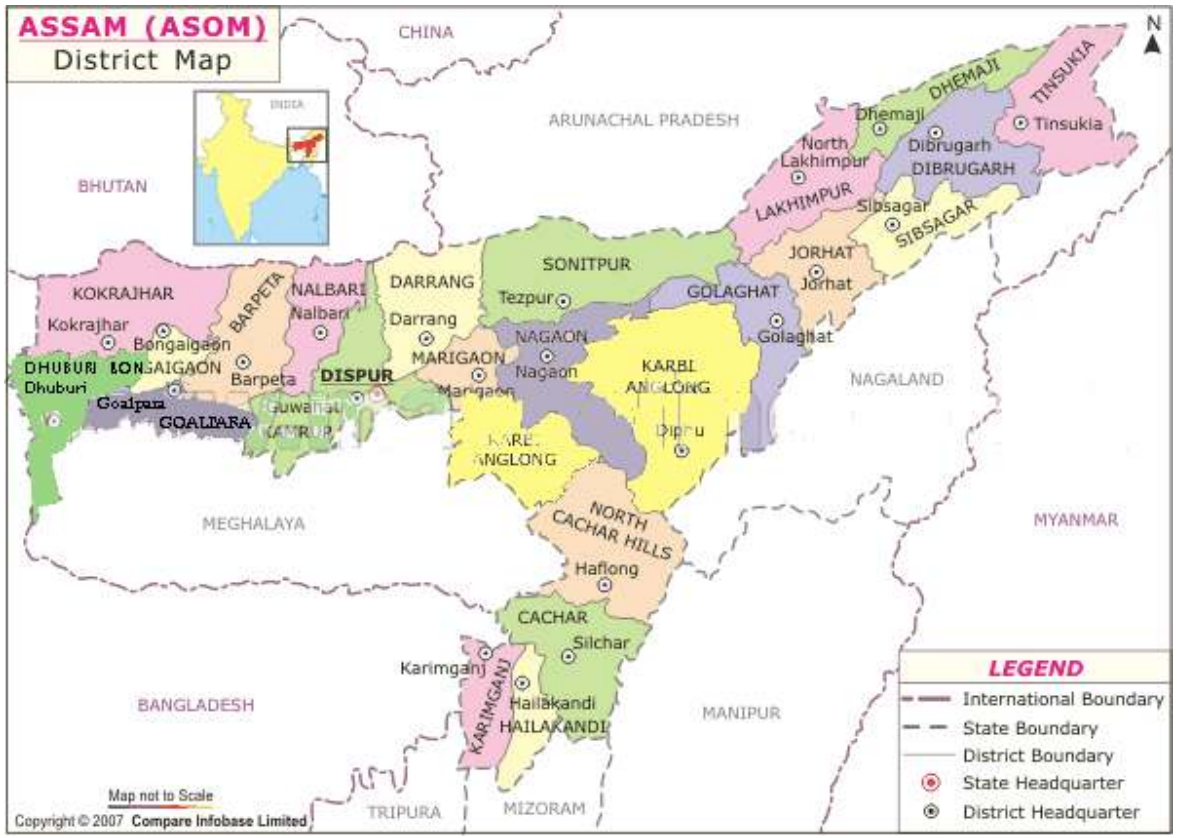
√**1.13**	**What is the major contingency the district is prone to?** (Tick mark)	**Regular**	**Occasional**	**None**
	Drought		√	
	Flood	√		
	Cyclone		√	
	Hail storm	√		
	Heat wave			√
	Cold wave			√
	Frost			√
	Sea water intrusion			√
	Pests and disease outbreak (specify)	√		
	Others (specify)			

6 out of 10 years = Regular

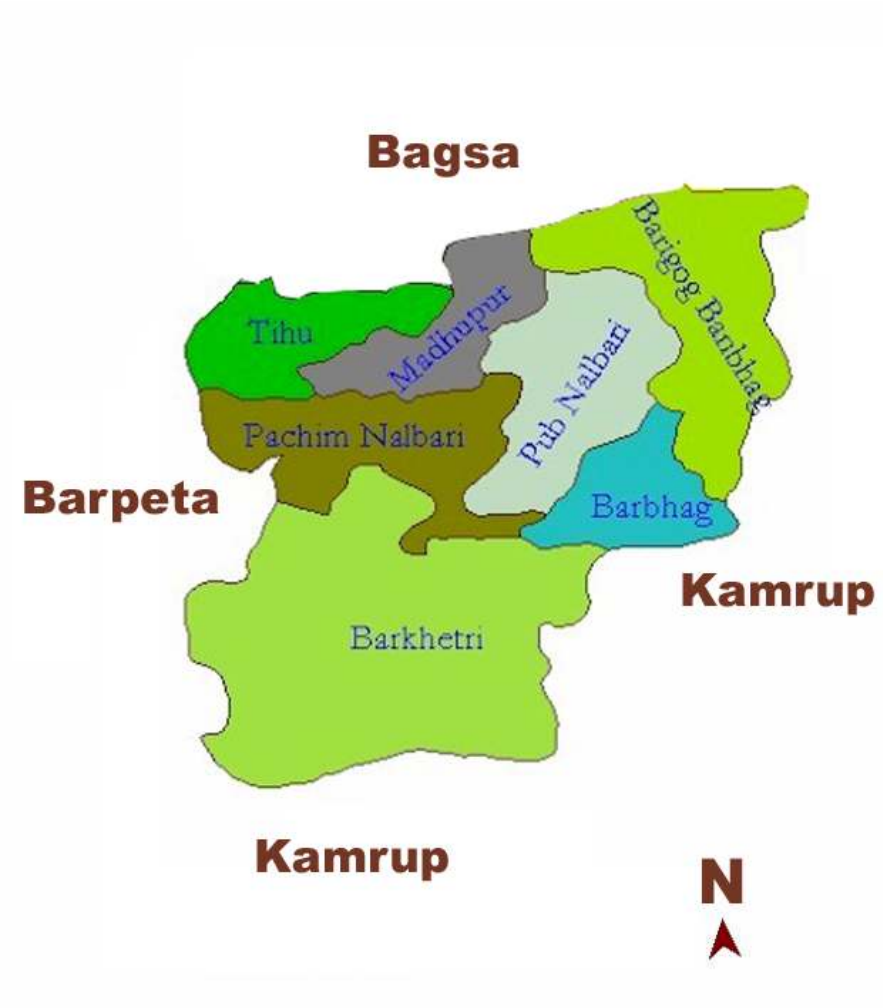
1.14	**Include Digital maps of the district for**	Location map of district within State as Annexure I	Enclosed: Yes
		Revenue Block Map ofNalbarI District of Assam Annexure 2	Enclosed: Yes

		Mean Annual RainfallofNalbariI District Annexure 3	Enclosed: Yes
		Soil Map Annexure	Enclosed: Yes

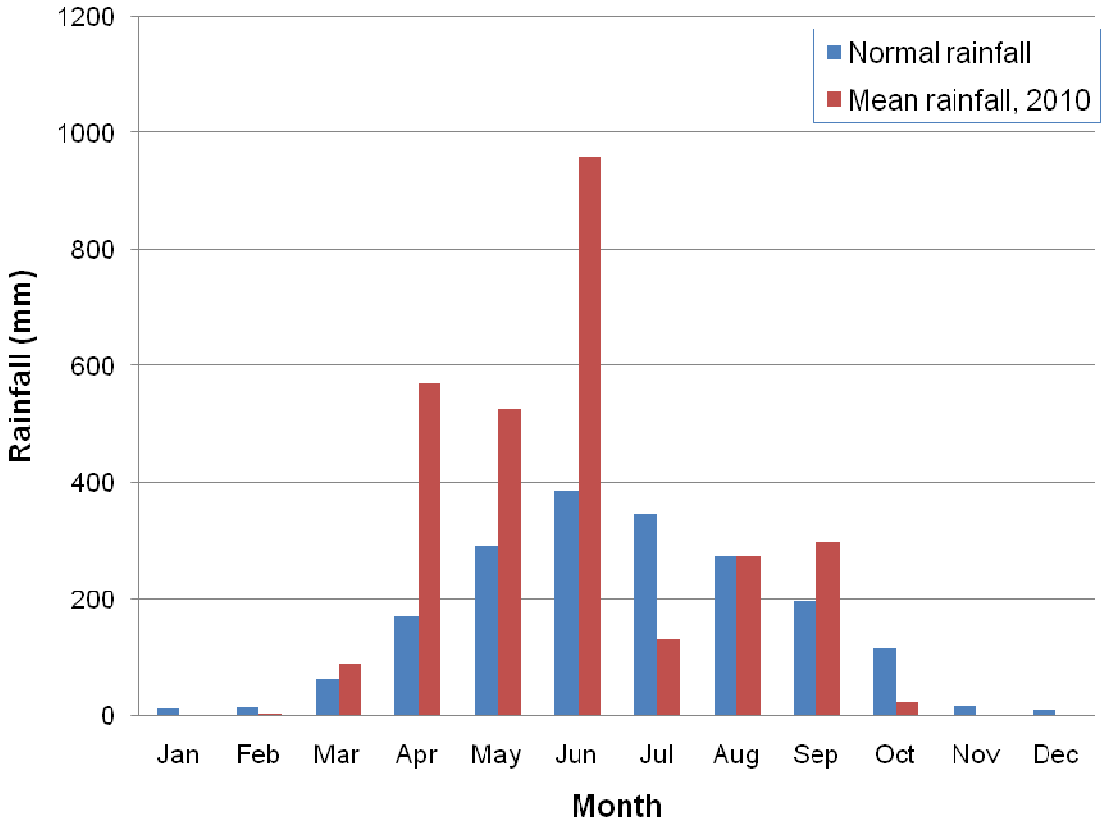
Annexure – 1: LOCATION MAP OF NALBARI IN ASSAM



Annexure – 1: REVENUE BLOCK MAP OF NALBARI DISTRICT OF ASSAM



Annexure – 3: MEAN ANNUAL RAINFALL OF NALBARI DISTRICT



Average Rainfall map of the district

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay **by 2 weeks June 3rd week**	**1) Farming Situation: Highrainfall medium land soils**	**Paddy+Rapeseed** **Paddy :** Mahsuri, Ranjit, Basanti,Local varieties **Rapeseed :**TS-36. M-27	**Paddy :** Satyranjan, Basundhar, **Rapeseed :**TS-36. M-27 **Vegetable:** Cabbage, Cauliflower, Knolkhol, Tomato, Potato **Pulse:** Pea, Lentil, Blackgram	Decrease spacing in paddy	1.Supply of seeds of changed paddy variety through NFSM and other such scheme. 2.Supply of weeder under RKVY
		Paddy+Vegetables **Paddy:** Mahsuri, Ranjit, Basanti and other local Sali variety **Vegetable:** Cabbage, Cauliflower, Knolkhol, Tomato, potato			
		Paddy+ Pulse **Paddy:** Mahsuri, Ranjit, Basanti and other local Sali variety **Pulse:** Lentil, Pea, Blackgram			

	2) Farming Situation: **High rainfall low land soils**	**Paddy+ Paddy** **AutomnPaddy :**Luit, Local varieties **Winter Paddy :** Ranjit, Mahsuri, Basanti and local varieties	**Winter Paddy :** Ranjit, Mahsuri**,** Satyranjan, Basundhar,		1.Supply of seeds of changed paddy variety through NFSM and other such scheme. 2.Supply of weeder under RKVY

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by **4 weeks** (Specify month) **July 1st week**	**High rainfall medium land soils**	**Paddy+Rapeseed** **Paddy :** Mahsuri, Ranjit, Basanti,Local varieties **Rapeseed :**TS-36. M-27	**Paddy :** Satyranjan, Basundhar, **Rapeseed :**TS-36. M-27 **Vegetable:** Cabbage, Cauliflower, Knolkhol, Tomato, Potato **Pulse:** Pea, lentil.	1. Decrease spacing in Winter Paddy.	1. Supply of weeder under RKVY 2.Supply of seeds of changed paddy variety through NFSM
		Paddy+Vegetables **Paddy:** Mahsuri, Ranjit, Basanti and other local Sali variety **Vegetable:** Cabbage, Cauliflower, Knolkhol, Tomato, potato			
		Cropping System:3 **Paddy+ Pulse** **Paddy:** Mahsuri, Ranjit, Basanti and other local Sali variety **Pulse:** Lentil, Pea, Blackgram			

	high rainfall low land soils	**Paddy+ Paddy** **Automn Paddy :**Luit, Local varieties **Winter Paddy :** Ranjit, Mahsuri, Basanti and local varieties			

Condition			**Suggested Contingency measures**		
Early season drought(delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by **6 weeks** (Specify month) **July 3rd week**	**High rainfall medium land soils**	**Paddy+Rapeseed** **Paddy :** Mahsuri, Ranjit, Basanti,Local varieties **Rapeseed :**TS-36. M-27	**Paddy** i) Satyaranjan, Basundhara **il)**Luit, Kapili, Dikhow **Rapeseed :**TS-36. M-27 **Vegetable:** Cabbage, Cauliflower, Knolkhol, Tomato, Potato **Pulse:** Pea, lentil, green gram	1.Dapog method of seed showing to cultivate paddy varieties such as Satyaranjan, Basundhara etc. 2. Decrease spacing in winter rice.	1.Supply of seeds of changed paddy variety through NFSM
		Paddy+Vegetables **Paddy:** Mahsuri, Ranjit, Basanti and other local Sali variety **Vegetable:** Cabbage, Cauliflower, Knolkhol, Tomato, potato			
		Paddy+ Pulse **Paddy:** Mahsuri, Ranjit, Basanti and other local Sali variety **Pulse:** Lentil, Pea, Blackgram			
	high rainfall low land soils	**Cropping System** **Paddy+ Paddy** **Automn Paddy :**Luit, Local varieties **Winter Paddy :** Ranjit, Mahsuri, Basanti and local varieties	**Paddy :**Luit, Kapili, Dikhow	1. Decrease spacing in winter rice.	

Condition			Suggested Contingency measures		
Early season drought(delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8 weeks (Specify month) **August 1st week**	**High rainfall medium land soils**	**Rice+Rapeseed** **Rice :** Mahsuri, Ranjit, Basanti,Local varieties **Rapeseed :**TS-36. M-27	**Paddy** i) Satyaranjan, Basundhara **il)**Luit, Kapili, Dikhow **Rapeseed :**TS-36. M-27 **Vegetable:** Cabbage, Cauliflower, Knolkhol, Tomato, Potato **Pulse:** Pea, lentil, green gram	1. Direct seeding of germinated seeds of short duration rice varieties such as Luit, Kapili and Disang in puddle field. 2. Transplanting of aged seedlings of long duration rice varieties suitable for delayed planting such as Prafulla and Gitesh. 3.	1.Seed drills under RKVY 2. 3.Supply of seeds through NFSM
		Rice+Vegetables **Rice:** Mahsuri, Ranjit, Basanti and other local Sali variety **Vegetable:** Cabbage, Cauliflower, Knolkhol, Tomato, potato			
		Paddy+ Pulse **Rice:** Mahsuri, Ranjit, Basanti and other local Sali variety **Pulse:** Lentil, Pea, Blackgram			
	high rainfall low land soils	**Paddy+ Paddy** **Automn Paddy :**Luit, Local varieties **Winter Paddy :** Ranjit, Mahsuri, Basanti and local varieties	**Paddy :**Luit, Kapili, Dikhow	1. Decrease spacing in winter rice.	1.Seed drills under RKVY 2. 3.Supply of seeds through NFSM

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

onset)				**measures**	
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	**High rainfall medium land soils**	**Rice+Rapeseed** **Rice :** Mahsuri, Ranjit, Basanti,Local varieties **Rapeseed :**TS-36. M-27 **Rice+Vegetables** **Rice:** Mahsuri, Ranjit, Basanti and other local Sali variety **Vegetable:** Cabbage, Cauliflower, Knolkhol, Tomato, potato **Paddy+ Pulse** **Rice:** Mahsuri, Ranjit, Basanti and other local Sali variety **Pulse:** Lentil, Pea, Blackgram	1. Re sowing **Rice :** Mahsuri, Ranjit, Basanti,Local varieties, **Rapeseed :**TS-36. M-27 **Vegetable:** Cabbage, Cauliflower, Knolkhol, Tomato **Pulse:** Pea, Lentil, Blackgram	1. Split application of N fertilizer 2. Application of more organic manure.	1.Seed drills under RKVY 2. 3.Supply of seeds through NFSM
	High rainfall low land soils	**Rice+ Rice** **AutomnRice :**Luit, Local varieties **Winter Rice :** Ranjit, Mahsuri, Basanti and local varieties			1.Seed drills under RKVY .

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At vegetative stage	**High rainfall medium land soils**	**Rice+Rapeseed** **Rice :** Mahsuri, Ranjit, Basanti,Local varieties **Rapeseed :**TS-36. M-27	1. Running weeder rice crop when soil loosens 2. If standing rice crop demages growing varieties	1. Life saving irrigation 2 Application of KCl	1. Irrigation under the scheme NREGS/ IWMP/ RKVY/NFSM 2.Supply of seeds

		Rice+Vegetables **Rice:** Mahsuri, Ranjit, Basanti and other local Sali variety **Vegetable:** Cabbage, Cauliflower, Knolkhol, Tomato, potato **Paddy+ Pulse** **Rice:** Mahsuri, Ranjit, Basanti and other local Sali variety **Pulse:** Lentil, Pea, Blackgram	such as Basanti, Luit, Kopili **Rapeseed:** M-27, TS-38 **Vegetable:** Cabbage, Cauliflower, Knolkhol, Tomato.		through AAU 3.Supply of seeds through NFSM. 4.. Seed drills under RKVY. **Rapeseed:** 1. Arragement of proven seeds of variety TS-36. **Potato** : 1.Supply of seeds through ASC **Vegetable:** 1. Supply of seeds through National Horticultural Mission
	High rainfall low land soils	**Rice+ Rice** **AutomnRice :**Luit, Local varieties **Winter Rice :** Ranjit, Mahsuri, Basanti and local varieties	1. Running weeder rice crop when soil loosens 2. If standing rice crop demages growing varieties such as Luit, Kopili and local varieties.	1. Life saving irrigation 2 Application of KCl	1. Irrigation under the scheme NREGS/ IWMP/ RKVY/NFSM 2.Supply of seeds through AAU 3.Supply of seeds through NFSM. 4.. Seed drills under RKVY

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At flowering/ fruiting stage	**High rainfall medium land soils**	**Rice+Rapeseed** **Rice :** Mahsuri, Ranjit, Basanti,Local varieties **Rapeseed :**TS-36. M-27	1. Running weeder rice crop when soil loosens	1. Life saving irrigation 2 Application of KCl	1. Irrigation under the scheme NREGS/ IWMP/ RKVY/NFSM 2.Supply of seeds

		Rice+Vegetables **Rice:** Mahsuri, Ranjit, Basanti and other local Sali variety **Vegetable:** Cabbage, Cauliflower, Knolkhol, Tomato, potato **Paddy+ Pulse** **Rice:** Mahsuri, Ranjit, Basanti and other local Sali variety **Pulse:** Lentil, Pea, Blackgram			through AAU 3.Supply of seeds through NFSM. 4.. Seed drills under RKVY. **Rapeseed:** 1. Arragement of proven seeds of variety TS-36. **Potato** : 1.Supply of seeds through ASC **Vegetable:** 1. Supply of seeds through National Horticultural Mission
	High rainfall low land soils	**Rice+ Rice** **AutomnRice :**Luit, Local varieties **Winter Rice :** Ranjit, Mahsuri, Basanti and local varieties	1. Running weeder rice crop when soil loosens	1. Life saving irrigation 2 Application of KCl	1. Irrigation under the scheme NREGS/ IWMP/ RKVY/NFSM 2.Supply of seeds through AAU 3.Supply of seeds through NFSM. 4.. Seed drills under RKVY.

Condition			**Suggested Contingency measures**		
Terminal drought (Early withdrawal of monsoon)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At flowering/ fruiting stage	**High rainfall medium land soils**	**Rice+Rapeseed** **Rice :** Mahsuri, Ranjit, Basanti,Local varieties **Rapeseed :**TS-36. M-27	Running weeder rice crop when soil loosens **Rapeseed:** M-27, TS-38 **Potato:** KufriJyoti, Kufri,	1. Life saving irrigation 2 Application of KCl	1. Irrigation under the scheme NREGS/ IWMP/ RKVY/NFSM 2.Supply of seeds

		Rice+Vegetables **Rice:** Mahsuri, Ranjit, Basanti and other local Sali variety **Vegetable:** Cabbage, Cauliflower, Knolkhol, Tomato, potato	Chandramukhi KufriMegha **Vegetable:** Cabbage, Cauliflower, Knolkhol, Tomato.		through AAU 3.Supply of seeds through NFSM. 4.. Seed drills under RKVY. **Rapeseed:** 1. Arragement of proven seeds of variety TS-36. **Potato** : 1.Supply of seeds through ASC **Vegetable:** 1. Supply of seeds through National Horticultural Mission
		Paddy+ Pulse **Rice:** Mahsuri, Ranjit, Basanti and other local Sali variety **Pulse:** Lentil, Pea, Blackgram			
	High rainfall low land soils	**Rice+ Rice** **AutomnRice :**Luit, Local varieties **Winter Rice :** Ranjit, Mahsuri, Basanti and local varieties			

2.1.2 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	Not applicable				

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					
Non release of water in canals under delayed onset of monsoon in catchment					
Insufficient groundwater recharge due to low rainfall	Tube well alluvial soil	Paddy	Aerobic Rice, Maize and vegetables (Tomato, Chilli and Brinjal)	1.Limited irrigation 2. Alternate Furrow irrigation	1.Seeds through ASC, NFSM, NHM etc.

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

Condition	Suggested contingency measure			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage[k]**	**Flowering stage[l]**	**Crop maturity stage[m]**	**Post harvest[n]**
Rice	Provide drainage	Provide drainage	Drain out Harvesting at physiological maturity stage	Stock the harvest under shed, threshing should be done as quickly as possible.
Rapeseed	Provide drainage	Provide drainage	Drain out Harvesting at physiological maturity stage and Harvest of pigeon pea for vegetable Purpose	Immediately bring the harvested rapeseed to safe place under the shed. Threshing and storing of the grain should be done quickly.
Lentil	Provide drainage	Provide drainage	Drain out Harvest at physiological maturity stage.	Immediately bring the harvested rapeseed to safe place under the shed. Threshing and storing of

				the grain should be done quickly.
Pea	Provide drainage	Provide drainage	Drain out Harvesting at physiological maturity stage.	Immediately bring the harvested rapeseed to safe place under the shed. Threshing and storing of the grain should be done quickly.
Horticulture				
Potato	1. Provide drainage 2. Spray chemicals against disease like blight as needed	1. Provide drainage 2. Spray chemicals against disease like blight as needed	Immediate harvesting , washing of tuber to free from soil and drying in well aerated place.	Washing of tuber to free from soil and drying in well aerated and dry place.
Rabi vegetables	Provide drainage	Provide drainage	Drain out Harvest at physiological maturity stage.	Sell out immediately
Kharif vegetables	Provide drainage	Provide drainage	Drain out Harvest at physiological maturity stage.	Sell out immediately
Arecanut	Provide drainage	Provide drainage	Harvest as when ready to do so.	1. Sell out the stock immediately 2. Bury in upland soil to cure.
Coconut	Provide drainage	Provide drainage	Harvest as when ready to do so.	1. Sell out the stock
Heavy rainfall with high speed winds in a short span[2]				
Rice	Provide drainage	Provide drainage	Drain out Harvesting at physiological maturity stage	Stock the harvest under shed, threshing should be done as quickly as possible.
Horticulture				
Kharif vegetables	Provide drainage	Provide drainage	Drain out Harvest at physiological maturity stage.	Sell out immediately
Arecanut	Provide drainage	Provide drainage	Harvest as when ready to do so.	1. Sell out the stock immediately 2. Bury in upland soil to cure.
Coconut	Provide drainage	Provide drainage	Harvest as when ready to do so.	1. Sell out the stock

Outbreak of pests and diseases due to unseasonal rains				
Rice	**Rice caseworm** 1. Removal of water 2. Alternate floodin& drying 3. Application of pesticides **Hispa** Stem bore 1. Periodical removal of water from field. 2. Application of pesticides **Whorl Maggot** 1. Release of Azolla 2. Application of pesticides **Stem Borer** 1. Alternate removal of water & flooding. 2. Use of shelter for bird in field 3. Application of N fertilizer 4. Application of pesticides **Rodent-**Poison baiting	**Stem borer**- 1. Use of shelter for bird in field 2.Application of pesticides **Gandhi bug** 1. Use light trap 2. Use of bait 3. Application of pesticides **Rodent-**Poison baiting	**Stem borer**- 1. Use of shelter for bird in field 2.Application of pesticides **Rodent-**Poison baiting	1. Fumigation of store 2. Application of pesticides as necessary **Rodent-**Poison baiting
Rapeseed	**Aphid &Mustard Sawfly -** Use of pesticides	**Aphid &Mustard Sawfly -** Use of pesticides		1. Fumigation of store 2. Application of pesticides as necessary **Rodent-**Poison baiting
Lentil	**Wet rot-**drainage and application of pesticides **Wilt-**Drainage, chemical application **Pod borer-** Use light trap, Hand picking and Use of insecticides. **Pulse bug-** Application of pesticides	**Wet rot-**drainage and application of pesticides **Wilt-**Drainage, chemical application **Pod borer-** Use light trap, Hand picking and Use of insecticides. **Pulse bug-** Application of pesticides	**Wet rot-**drainage and application of pesticides **Wilt-**Drainage, chemical application **Pod borer-** Use light trap, Hand picking and Use of insecticides.	Seed mix with black piper powder against bruchids

Pea	**Wilt-**Drainage, chemical application **Pod borer-** Use light trap, Hand picking and Use of insecticides. **Pulse bug-** Application of pesticides	**Wilt-**Drainage, chemical application **Pod borer-** Use light trap, Hand picking and Use of insecticides. **Pulse bug-** Application of pesticides	**Wilt-**Drainage, chemical application **Pod borer-** Use light trap, Hand picking and Use of insecticides.	Seed mix with black piper powder against bruchids
Horticulture				
Potato	**Late blight-** Application of pesticides regularly since Dec., 10. **Wilt-** drainage of excess water, chemical treatment **Aphid &epilachna beetle-** Application of pesticides	**Late blight-** Application of pesticides regularly since Dec., 10. **Wilt-** drainage of excess water, chemical treatment **Aphid &epilachna beetle-** Application of pesticides	**Late blight-** Application of pesticides regularly since Dec., 10. **Wilt-** drainage of excess water, chemical treatment **Aphid &epilachna beetle-** Application of pesticides	Chemical treatment with boric acid, mancozeb and also with malathion dust; netting with mosquito net in PTM endemic area
Rabi vegetables	**Wilt**-drainage, biocontrol, chemical control **Late blight of tomato-** Chemical control	**Wilt**-drainage, biocontrol, chemical control **Late blight of tomato-** Chemical control	**Wilt**-drainage, biocontrol, chemical control **Late blight of tomato-** Chemical control	
Kharif vegetables	**Wilt-** drainage, chemical treatment	**Wilt-** drainage, chemical treatment	**Wilt-** drainage, chemical treatment	
Arecanut	**Yellowing of leave-**Drainage & Chemical treatment **Nut splitting-** Drainage& borax treatment. **Ganoderma**- Cultural practices , Chemical control **Spindle rot, bud rot, stem bleeding-** chemical control	**Yellowing of leave-**Drainage & Chemical treatment **Nut splitting-** Drainage & borax treatment **Ganoderma**- Cultural practices , Chemical control **Spindle rot, bud rot, stem bleeding-** chemical control	**Yellowing of leave-**Drainage & Chemical treatment **Nut splitting-** Drainage & borax treatment **Ganoderma**- Cultural practices , Chemical control **Spindle rot, bud rot, stem bleeding-** chemical control	
Coconut	**Ganoderma**- Cultural practices , Chemical control **Spindle rot, bud rot, stem bleeding-** chemical control	**Ganoderma**- Cultural practices , Chemical control **Spindle rot, bud rot, stem bleeding-** chemical control	**Ganoderma**- Cultural practices , Chemical control **Spindle rot, bud rot, stem bleeding-** chemical control	

2.3 Floods

Condition	Suggested contingency measure[o]			
Transient water logging/ partial inundation[1]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Rice	1. Drainage of water 2. Resowing of seeds if necessary	1.Drainage of excess water	1. Drainage of excess water	1. Harvesting of crop at physiiiological maturity.
Horticulture				
Gourds	1. Drainage of water 2. Resowing of seeds if necessary	1.Drainage of excess water 2. Loosening of soil following drainage.	1. Drainage of excess water 2. Loosening of soil following drainage.	1. Harvesting of crop at physiiiological maturity. 2. Loosening of soil at physiologicall maturity
Other vegetables	1. Drainage of water 2. Resowing of seeds if necessary	1.Drainage of excess water 2. Loosening of soil following drainage.	1. Drainage of excess water 2. Loosening of soil following drainage.	1. Harvesting of crop at physiiiological maturity. 2. Loosening of soil at physiologicall maturity
Continuous submergence for more than 2 days[2]				
Rice	Resowing of seeds	1.Resowing of sprouted seedlings of short duration variety 2. Replantin with seedlings of staggered rice varieties.		1. Immediate harvesting and drying on raised platform or bar.
Horticulture				
Gourds	1. Drainage of water 2. Resowing of seeds if necessary	1.Drainage of excess water 2. Loosening of soil following drainage.	1. Drainage of excess water 2. Loosening of soil following drainage.	1. Harvesting of crop at physiiiological maturity. 2. Loosening of soil at physiologicall maturity
Other vegetables	1. Drainage of water 2. Resowing of seeds if	1.Drainage of excess water 2. Loosening of soil following	1. Drainage of excess water	1. Harvesting of crop at physiiiological maturity.

	necessary	drainage.	2. Loosening of soil following drainage.	2. Loosening of soil at physiologicall maturity
Gourds	1. Drainage of water 2. Resowing of seeds if necessary	1.Drainage of excess water 2. Loosening of soil following drainage.	1. Drainage of excess water 2. Loosening of soil following drainage.	1. Harvesting of crop at physiiiological maturity. 2. Loosening of soil at physiologicall maturity
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[p]	Not Encountered			
Cold wave[q]	Not Encountered			
Frost	Not Encountered			
Hailstorm				
Tomato				Provision for plastic roof
Banana		Replanting as necessary		
Horticulture				
Tomato				
Beans				
Banana		Replanting		

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event[s]	**During the event**	**After the event**
Drought			
Feed and fodder	1. Extensive fodder cultivation	1. Supply of fodder from already	1. Supply of feed and fodder to

availability	2. Conservation of fodder by silage and hay making. 3. Stocking of concentrate feed in sufficient quantities. 4. Database and contact information of private fodder grower in the district and outside. 5. Awareness on nutritional management of livestock during drought.	cultivated field or from conserved unit. 2. Supply of concentrate feed to the animal growers in sufficient quantities.	continue. 2. Fodder regeneration programme. 3. Cultivation of quick growing fodder species.
Drinking Water	1. Installation of deep tube wells at suitable location and interval 2. Contact water tanker service in case of emergencies.	1. Supply of water from deep tube well 2. Supply of clean water through tanker service.	Supply of clean water based on need.
Health and disease management	1. Storage of sufficient medicines specially for rehydration therapy. 2. Preparedness for veterinary mobile team. 3. Awareness on livestock management during drought. 4. Linkage/liasoning for insurance of animal	1. Supply of 27ehydration medicines 2. Regular health check up 3. Mobile veterinary team service for heat stroke, dehydration etc.	1. Regular health check up

Floods			
Feed and fodder availability	1. Fodder cultivation at extensive scale. 2. Conservation of fodder by silage and hey. 3. Stocking of concentrate feed in sufficient quantity in feed bank. 4. Establishing community fodder bank. 5. Animal insurance.	1. Distribution of feed concentrate and fodder by speed boat.	1. Distribution of feed concentrate and fodder. 2. Programme for fodder regeneration and cultivation.
Drinking water	1. Arrangement for clean drinking water by tube well in high shelter areas.	1. Supply of clean drinking water.	1. Supply of clean drinking water 2. Renovation of damaged tube wells.
Health and disease management	1. Awareness generation programme for proper health management of animals during flood. 2. Prophylactic vaccination against HS, BQ, FMD, Anthrax, swine fever, Enterotoxaemia, etc. 3. Stocking of sufficient medicines specially antidiarrhoeal, antipyretic, ruminotoric, antibiotics, vitamins, minerals and I. V. fluid. 4. Formation of mobile veterinary team 5. Preparedness for mobile veterinary team equipped motor boat faciltities along with necessary testing kit, medicines etc. 6. Linkage/liasoning for insurance of animal	1. Regular health check up. 2. Mobile veterinary teams pressed into service. 3. Conducting mass animal health camp.	1. Disinfection operation throughout the area. 2. Provide treatment facility against post flood disease like diarrhea, fever, debility, jaundice etc. 3. Regular health check up. 4. Culling of sick animals 5. Insurance payment.
Cyclone	-	-	-

Feed and fodder availability			
Drinking water			
Health and disease management			
Heat wave and cold wave	-	-	-
Shelter/environment management			
Health and disease management			

2.5.2 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	1. Storage of concentrate feed in sufficient quantity in feed bank	1. Supply of concentrate feedfrom the feed bank.	1. Uninterrupted supply of concentrate feed 2. Analysis of merits and demerits of prevailing system and modifications for future eventuality.	Shortage of feed ingredients
Drinking Water	1. Installation of deep tube well. 2. Awareness generation.	2. Supply of good quality drinking water.	Evaluation of adequacy of drinking water and action for future event,	Drinking Water

Health and disease management	1. Preparedness for veterinary dispensaries and mobile team. 2. Storage of veterinary medicine specially for rehydration therapy in sufficient quantity 3. Awareness generation about the health and hygiene management of poultry. 4. Insurance of animals	1. Regular health check up through dispensaries and mobile expert team. 2. Supply of dehydration medicine	1. Regular health check up 2. Financial assistance to the losing poultry bird 3. Evaluation of adequacy of drinking water and action for future event.	Health and disease management

Floods				
Shortage of feed ingredients	1. Storage of concentrate feed in sufficient quantity	Distribution of concentrate feed at war footing.	Supply of concentrate feed	
Drinking water	Installation of tube well	Supply of pure drinking water.	Disinfections of contaminated drinking water facility	
Health and disease management	1. Awareness generation for proper health management of poultry. 2. 3. Stocking of sufficient medicine 4. Prophylactic vaccination against Ranikhet disease, IBD, Fowl cholera etc.	1. Regular health check up mainly by mobile veterinary team with motor boat 2. Making medicine available at the poultry units.	1. Disinfection operation throughout the flood affected areas. 2. Regular health check up.	
Cyclone	-	-	-	-
Heat wave and cold wave	-	-	-	-

[a] based on forewarning wherever available

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
1) Drought			
A. Capture			
Inland			
(i) Shallow water depth due to insufficient rains/inflow	Closing of Out let.	Disease control measures. Partial Harvesting.	Construction of water retaining structure. Removal of sediments.
(ii) Changes in water quality	Removal of aquatic weeds. Closing of inlets.	Application of lime.	Control of excess aquatic vegetation.
(iii) Any other			
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	1. Seepage control. 2. Outlet control if any.	1. Disease control measure. 2. Partial Harvesting. 3.pumping of water from nearby sources, if any.	1. Removal of dead fish. 2. Stocking of fingerling.
(ii) Impact of silt load build up in ponds / change in water quality	1. Removal of silt. 2. Liming adequately. 3. Water quality management.	1.Application of lime and KmnO4.	1. Checking of the stock. 2.Removal of silt.
(iii) Any other			
2) Floods			
A. Capture	-	-	-
Inland			
(i) Average compensation paid due to loss of human life			
(ii) No. of boats / nets/damaged			
(iii) No.of houses damaged			

(iv) Loss of stock			
(v) Changes in water quality			
(vi) Health and diseases			
B. Aquaculture			
(i) Inundation with flood water	1. Raising of embankment. 2. closing of inlets.	Provision nets/ bana to stop escaping of fishes.	Checking of fish stock. Water quality management: application of lime, KMnO4.
(ii) Water contamination and changes in water quality.	1. Removal of silt, weed, jungles etc. 2. Liming adequately.	1. Partial harvesting.	Clearance/ control of aquatic weeds. Removal of silt.
(iii) Health and diseases	1. Proper management of stocking density. 2. Regular liming.	1. Application of $KMnO_4$ and lime. 2. Separation of infected fishes 3. Treatment of infected fishes.	1. Dewatering the pond/tanks. 2.Removal of bottom muds.
(iv) Loss of stock and inputs (feed, chemicals etc)	1. Stocking of feed, chemicals etc. at high lands. 2. Arrangement of carriage for transporting feed, chemicals etc. during emergency.	1. Transporting feed, chemicals from the godown of high land.	Construction of proper storage facility.
(v) Infrastructure damage (pumps, aerators, hutsetc)	1. Protection of pump, aerators etc.	1. Dismantling of pump for safety.	1. Harvesting and renovation of pond.
(vi) Any other			
3. Cyclone / Tsunami	-	-	-
A.Capture			
Marine			
(i) Average compensation paid due to loss of fishermen lives			
(ii) Avg. no. of boats / nets/damaged			
(iii) Avg. no. of houses damaged			
Inland			

B. Aquaculture			
(i) Overflow / flooding of ponds	1. collection of net, *banas* etc. for protection over embankment.		
(ii) Changes in water quality (fresh water / brackish water ratio)		Application of $KMnO_4$ and lime	
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)	1.		
(v) Infrastructure damage (pumps, aerators, shelters/hutsetc)	1. Protection of pump, aerators etc.		
(vi) Any other			
4. Heat wave and cold wave	-	-	-
A. Capture			
Marine			
Inland			
B. Aquaculture			
(i) Changes in pond environment (water quality)			
(ii) Health and Disease management			
(iii) Any other			