

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	1 st Week of June	2nd week of August
	NE Monsoon(Oct-Dec):	141.5		3rd week of October	2 nd 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	-	-	-

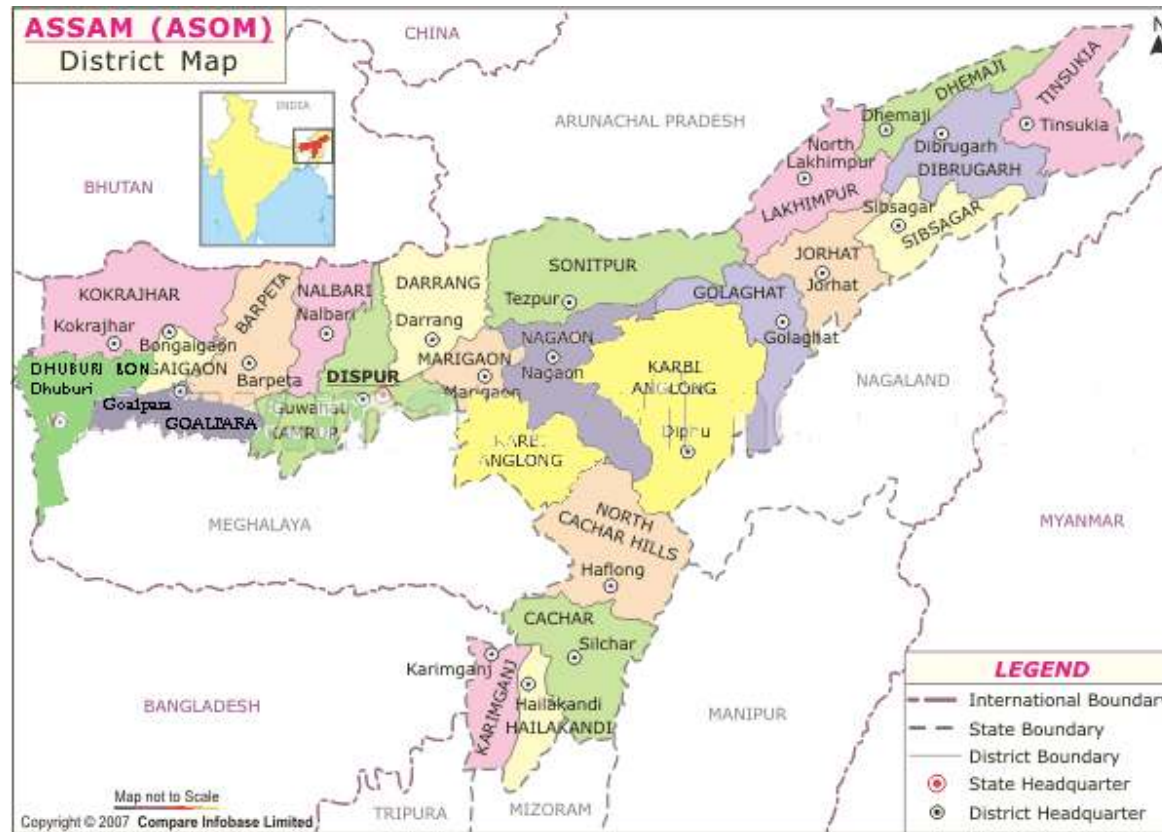
√1.13	What is the major contingency the district is prone to? (Tick mark)	Regular	Occasional	None
	Drought		√	
	Flood	√		
	Cyclone		√	
	Hail storm	√		
	Heat wave			√
	Cold wave			√
	Frost			√
	Sea water intrusion			√
	Pests and disease outbreak (specify)	√		
	Others (specify)			

6 out of 10 years = Regular

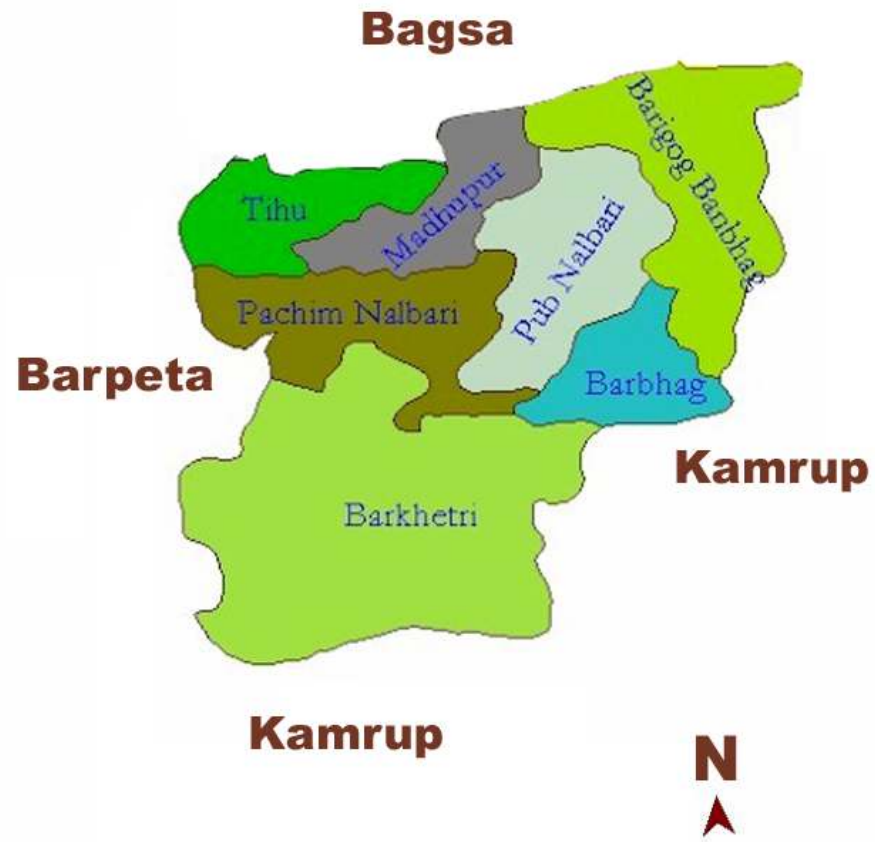
1.14	Include Digital maps of the district for	Location map of district within State as Annexure I	Enclosed: Yes
		Revenue Block Map of Nalbari District of Assam Annexure 2	Enclosed: Yes

		Mean Annual Rainfall of Nalbari District Annexure 3	Enclosed: Yes
		Soil Map Annexure	Enclosed: Yes

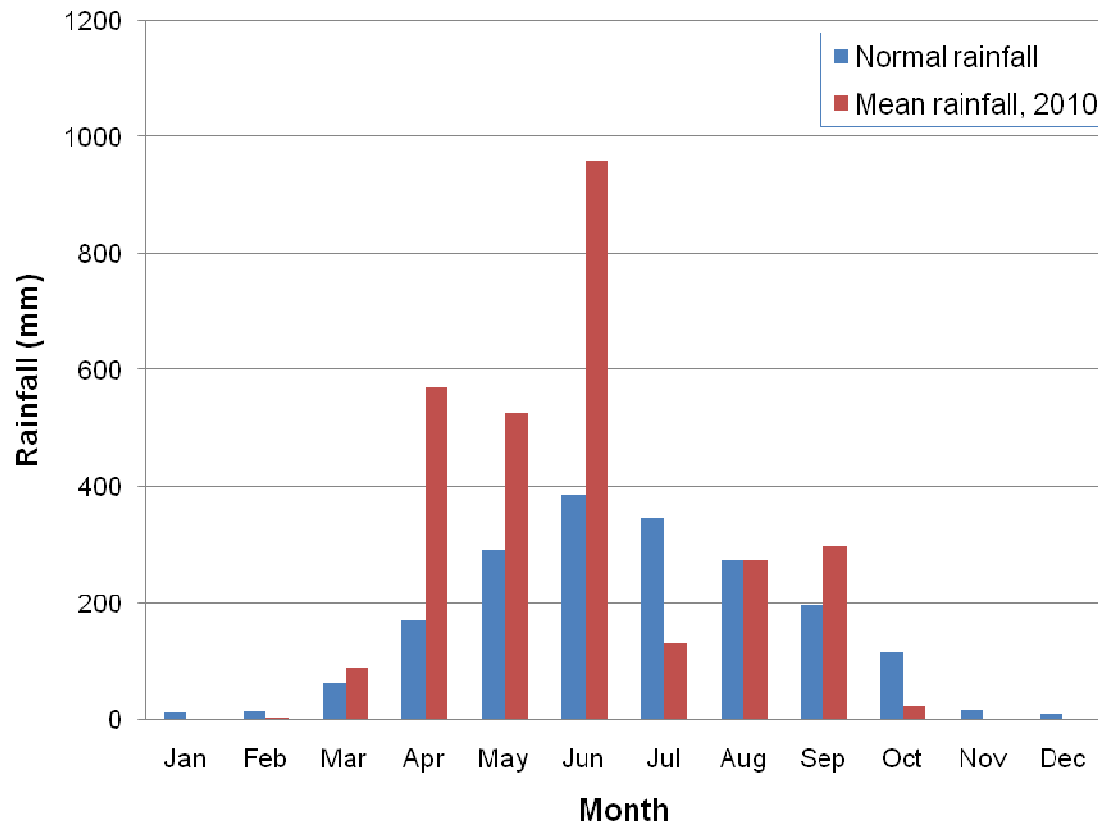
Annexure – 1: LOCATION MAP OF NALBARI IN ASSAM



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	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)					
Delay by 2 weeks June 3 rd 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 AutumnPaddy :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
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Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)					
Delay by 4 weeks (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 Autumn Paddy :Luit, Local varieties Winter Paddy : Ranjit, Mahsuri, Basanti and local varieties			
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Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 6 weeks (Specify month) July 3 rd week	High rainfall medium land soils	Paddy+Rapeseed Paddy : Mahsuri, Ranjit, Basanti, Local varieties Rapeseed : TS-36. M-27	Paddy i) Satyaranjan, Basundhara ii) 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 Autumn Paddy :Luit, Local varieties Winter Paddy : Ranjit, Mahsuri, Basanti and local varieties	Paddy :Luit, Kapili, Dikhow	1. Decrease spacing in winter rice.	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought(delayed onset) Delay by 8 weeks (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 ii)Luit, Kapili, Dikhow Rapeseed :TS-36. M-27 Vegetable: Cabbage, Cauliflower, Knolkhol, Tomato, 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	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation	Remarks on Implementat ion
Early season drought (Normal					

onset)				measures	
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/c rop stand etc.	High rainfall medium land soils	Rice+Rapeseed Rice : Mahsuri, Ranjit, Basanti,Local varieties Rapeseed :TS-36. M-27	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
		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	Rice+ Rice AutumnRice :Luit, Local varieties Winter Rice : Ranjit, Mahsuri, Basanti and local varieties			1. Seed drills under RKVY .

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)					
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 damages growing varieties	1. Life saving irrigation 2 Application of KCI	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	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. Arrangement 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 AutumnRice : Luit, Local varieties Winter Rice : Ranjit, Mahsuri, Basanti and local varieties	1. Running weeder rice crop when soil loosens 2. If standing rice crop damages growing varieties such as Luit, Kopili and local varieties.	1. Life saving irrigation 2 Application of KCI	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	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Mid season drought (long dry spell)					
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 KCI	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			through AAU 3. Supply of seeds through NFSM. 4.. Seed drills under RKVY. Rapeseed: 1. Arrangement 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 Autumn Rice : 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 KCI	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	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Terminal drought (Early withdrawal of monsoon)					
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 KCI	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. Arrangement 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 AutumnRice : Luit, Local varieties Winter Rice : Ranjit, Mahsuri, Basanti and local varieties			

2.1.2 Drought - Irrigated situation

Condition	Major Farming situation ^f	Normal Crop/cropping system ^g	Suggested Contingency measures		
			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			
	Vegetative stage ^k	Flowering stage ^l	Crop maturity stage ^m	Post harvest ⁿ
Continuous high rainfall in a short span leading to water logging				
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 span²				
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	<p>Rice caseworm</p> <ol style="list-style-type: none"> 1. Removal of water 2. Alternate floodin& drying 3. Application of pesticides <p>Hispa</p> <p>Stem bore</p> <ol style="list-style-type: none"> 1. Periodical removal of water from field. 2. Application of pesticides <p>Whorl Maggot</p> <ol style="list-style-type: none"> 1. Release of Azolla 2. Application of pesticides <p>Stem Borer</p> <ol style="list-style-type: none"> 1. Alternate removal of water & flooding. 2. Use of shelter for bird in field 3. Application of N fertilizer 4. Application of pesticides <p>Rodent-Poison baiting</p>	<p>Stem borer-</p> <ol style="list-style-type: none"> 1. Use of shelter for bird in field 2. Application of pesticides <p>Gandhi bug</p> <ol style="list-style-type: none"> 1. Use light trap 2. Use of bait 3. Application of pesticides <p>Rodent-Poison baiting</p>	<p>Stem borer-</p> <ol style="list-style-type: none"> 1. Use of shelter for bird in field 2. Application of pesticides <p>Rodent-Poison baiting</p>	<ol style="list-style-type: none"> 1. Fumigation of store 2. Application of pesticides as necessary <p>Rodent-Poison baiting</p>
Rapeseed	<p>Aphid & Mustard Sawfly -</p> <p>Use of pesticides</p>	<p>Aphid & Mustard Sawfly -</p> <p>Use of pesticides</p>		<ol style="list-style-type: none"> 1. Fumigation of store 2. Application of pesticides as necessary <p>Rodent-Poison baiting</p>
Lentil	<p>Wet rot-drainage and application of pesticides</p> <p>Wilt-Drainage, chemical application</p> <p>Pod borer- Use light trap, Hand picking and Use of insecticides.</p> <p>Pulse bug- Application of pesticides</p>	<p>Wet rot-drainage and application of pesticides</p> <p>Wilt-Drainage, chemical application</p> <p>Pod borer- Use light trap, Hand picking and Use of insecticides.</p> <p>Pulse bug- Application of pesticides</p>	<p>Wet rot-drainage and application of pesticides</p> <p>Wilt-Drainage, chemical application</p> <p>Pod borer- Use light trap, Hand picking and Use of insecticides.</p>	<p>Seed mix with black piper powder against bruchids</p>

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

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2.3 Floods

Condition	Suggested contingency measure ^o			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation¹				
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 physiological 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 physiological maturity. 2. Loosening of soil at physiological 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 physiological maturity. 2. Loosening of soil at physiological maturity
Continuous submergence for more than 2 days²				
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 physiological maturity. 2. Loosening of soil at physiological maturity
Other vegetables	1. Drainage of water 2. Resowing of seeds if necessary	1. Drainage of excess water 2. Loosening of soil following	1. Drainage of excess water	1. Harvesting of crop at physiological maturity.

	necessary	drainage.	2. Loosening of soil following drainage.	2. Loosening of soil at physiological 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 physiological maturity. 2. Loosening of soil at physiological maturity
Sea water intrusion³	-	-	-	-

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

Extreme event type	Suggested contingency measure ^f			
	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	<ol style="list-style-type: none"> 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. 	<p>cultivated field or from conserved unit.</p> <ol style="list-style-type: none"> 2. Supply of concentrate feed to the animal growers in sufficient quantities. 	<p>continue.</p> <ol style="list-style-type: none"> 2. Fodder regeneration programme. 3. Cultivation of quick growing fodder species.
Drinking Water	<ol style="list-style-type: none"> 1. Installation of deep tube wells at suitable location and interval 2. Contact water tanker service in case of emergencies. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Fodder cultivation at extensive scale. 2. Conservation of fodder by silage and hay. 3. Stocking of concentrate feed in sufficient quantity in feed bank. 4. Establishing community fodder bank. 5. Animal insurance. 	<ol style="list-style-type: none"> 1. Distribution of feed concentrate and fodder by speed boat. 	<ol style="list-style-type: none"> 1. Distribution of feed concentrate and fodder. 2. Programme for fodder regeneration and cultivation.
Drinking water	<ol style="list-style-type: none"> 1. Arrangement for clean drinking water by tube well in high shelter areas. 	<ol style="list-style-type: none"> 1. Supply of clean drinking water. 	<ol style="list-style-type: none"> 1. Supply of clean drinking water 2. Renovation of damaged tube wells.
Health and disease management	<ol style="list-style-type: none"> 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 facilities along with necessary testing kit, medicines etc. 6. Linkage/liasoning for insurance of animal 	<ol style="list-style-type: none"> 1. Regular health check up. 2. Mobile veterinary teams pressed into service. 3. Conducting mass animal health camp. 	<ol style="list-style-type: none"> 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 feed from 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	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 1. Regular health check up through dispensaries and mobile expert team. 2. Supply of dehydration medicine 	<ol style="list-style-type: none"> 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
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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, KMnO ₄ .
(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, <i>banas</i> 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			