

State: WEST BENGAL

Agriculture Contingency Plan for District: MURSHIDABAD

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. (15.1)		
	Agro-Climatic Zone (Planning Commission)	Lower Gangetic Plain Region (III)		
	Agro Climatic Zone (NARP)	New Alluvial Zone (WB-4) Old Alluvial Zone (WB-3)		
	List all the districts or part thereof falling under the NARP Zone	Nadia, Murshidabad, 24-Parganas (N), Hooghly, Burdwan, Malda, Howrah, Dinajpur (N), Birbhum, Cooch_behar, Darjiling, jalpaiguri, Midnapur(west), Uttar dinajpur		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		24° 10' 03.20" N	88° 16' 14.95" E	19m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Regional Research Station, New Alluvial zone, BCKV, P.O.Gayeshpur, Dist.Nadia, West Bengal - 741234		
Mention the KVK located in the district	Krishi Vigyan Kendra, Milebasa(Digha), PO.Kalukhali, P.S.Bhagwangola, Murshidabad Dist., Pin-742 135			

1.2	Rainfall Ten year' average (1998-2007)	Normal RF(mm)	Normal Onset	Normal Cessation
	SW monsoon (June-Sep):	1100.1	1 st week of June	4 th week of September
	NE Monsoon(Oct-Dec):	165.7		
	Winter (Jan- March)	55.4	-	-
	Summer (Apr-May)	170.9	-	-
	Annual	1492.1	-	-

1.3	Land use pattern of the district (latest statistics) 2007-08	Geographical area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area ('000 ha)	532.5	399.01	0.77	127.8	0.01	0.8	1.9	2.0	0.3	0.01

1.4	Major Soils (common names like red sandy loam deep soils (etc.,))*	Area ('000 ha)	Percent (%) of total
	Clayey-loamy soils	100.4	25%
	Loamy soils	297.3	74%
	Loamy-sandy soils	4.0	1%

1.5	Agricultural land use (2007-08)	Area ('000 ha)	Cropping intensity %
	Net sown area	398.7	245
	Area sown more than once	577.5	
	Gross cropped area	976.2	

1.6	Irrigation (2006-07)	Area ('000 ha)		
	Net irrigated area	204.3		
	Gross irrigated area	567.6		
	Rainfed area	408.6		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals	-	32.8	-
	Tanks	11024	7.8	-
	Open wells	-	-	-
	Bore wells	-	-	-
	Lift irrigation schemes	917	22.3	-
	Micro-irrigation		-	-
	Other sources (please specify)	72724	141.4	-
	Total Irrigated Area	-	204.3	-
	Pump sets	-	-	-
	No. of Tractors	-	-	-
	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	-	-	-
	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)

1.7	Major field crops cultivated	Area ('000 ha)							Grand total
		<i>Kharif</i>			<i>Rabi</i>			Summer	
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
	Rice	-	32.7	32.7	-	223.8	223.8	141.9	398.4
	Wheat	-	-	-	-	-	-	122.6	122.6
	Pulses	-	-	-	51.5	-	-	-	-
	Oilseeds	-	-	-	93.7	-	-	-	-
	Jute	-	153.2	-	-	-	-	-	153.2
	Potato	-	-	-	14.7	-	-	-	14.7

	Horticulture crops – Fruits	Area ('000 ha)		
		Total	Irrigated	Rainfed
	Mango	16.1	-	16.1
	Banana	2.1	2.1	-
	Jackfruit	1.3	-	1.3
	Litchi	2.8	-	2.8
	Guava	0.5	-	0.5
	Horticulture crops – Vegetables	Total	Irrigated	Rainfed
	Brinjal	16.7	16.7	-
	Cucurbits	11.3	11.3	-
	Cabbage	12.1	12.1	-
	Tomato	4.3	4.3	-
	Ladies finger	4.7	4.7	-
	Cauliflower	3.7	3.7	-
	Fodder crops	Total	Irrigated	Rainfed

	Total fodder crop area	-	-	-
	Grazing land	-	-	-
	Sericulture etc Mulberry Production	1065144 M.T.	-	-

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)	
	Non descriptive Cattle (local low yielding)	-	-	264049	
	Crossbred cattle	-	-	46645	
	Non descriptive Buffaloes (local low yielding)	-	-	1120	
	Graded Buffaloes	-	-	9494	
	Goat	-	-	187852	
	Sheep	-	-	593	
	Others (Camel, Pig, Yak etc.)	-	-	Horse-8, Pig-978, Rabbit-2859	
	Commercial dairy farms (Number)			-	
1.9	Poultry	No. of farms	Total No. of birds ('000)		
	Commercial	Broiler-1182, Improved Layer-25	In Farm: Broiler-560392, Layer-6779, Duck-60 [District Total of Improved strains Fowl-672006, Duck-1814452633, Turkey-214, Quail-264, Other-4232]		
	Backyard	Fowl-3, Duck (commercial + backyard) -1	In Farm: Deshi Total Fowl-145, Duck-60 [District Total of Deshi Fowl-474613, Duck-222642]		
1.10	Fisheries (Data source: District Fisheries Department)				
	A. Capture				
	i) Marine (Data Source: Fisheries Department)	No. of fishermen	Boats		Nets
			Mechanized	Non-mechanized	
		-	-	-	-
ii) Inland (Data Source: Fisheries Department)	No. Farmer owned ponds (Under FFDA Scheme up to 08-09)		No. of Reservoirs	No. of village tanks	
	No. of Farmer: 14300 Area of Pond (ha.) : 4803.75		Nil	Record not available	

B. Culture			
	Water Spread Area (ha)	Yield (t/ha)	Production
i) Brackish water (Data Source: MPEDA/ Fisheries Department)	Nil		78 ton prawn (Freshwater) (2008-09)
ii) Fresh water (Data Source: Fisheries Department)	Culturable area: 4240.45 ha. Semi-Derelict area: 415.70 ha. Derelict area: 898.45 ha. Total area: 5554.60 ha.	From Ponds under FFDA Scheme= 4.4 t/ ha.	42208 ton Fish (2008-09) Fish Seed Production (08-09)= million
Others (Impounded Water Area)	(River) 1007.36 ha. (Canal) 2019.82 ha. (Beel/Baor) 118.28 ha.		

1.11 Production and Productivity of major crops (Average of last 4 years: 2004-05,05-06,06-07,07-08; specify years)

1.11	Name of crop	Kharif		Rabi		Summer		Total	
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)
Major Field crops									
	Rice	68.68	2024	568.7	2510	483.4	3478	1120.9	2678
	Wheat	-	-	285.6	2295	-	-	285.6	2295
	Pulses	-	-	41.6	705	-	-	41.6	705
	Oilseeds	-	-	91.4	983	-	-	91.4	983
	Jute	1939.8	3048	-	-	-	-	1939.8	3048
	Potato			185.0	15225	-	-	185.0	15225
Major Horticultural crops									
	Brinjal	-	-	-	-	-	-	284.0	16956
	Cucurbits	-	-	-	-	-	-	360.3	29632
	Cabbage	-	-	-	-	-	-	131.3	11592
	Tomato	-	-	-	-	-	-	45.8	9642
	Ladies finger	-	-	-	-	-	-	58.8	13521
	Cauliflower	-	-	-	-	-	-	278.9	24742

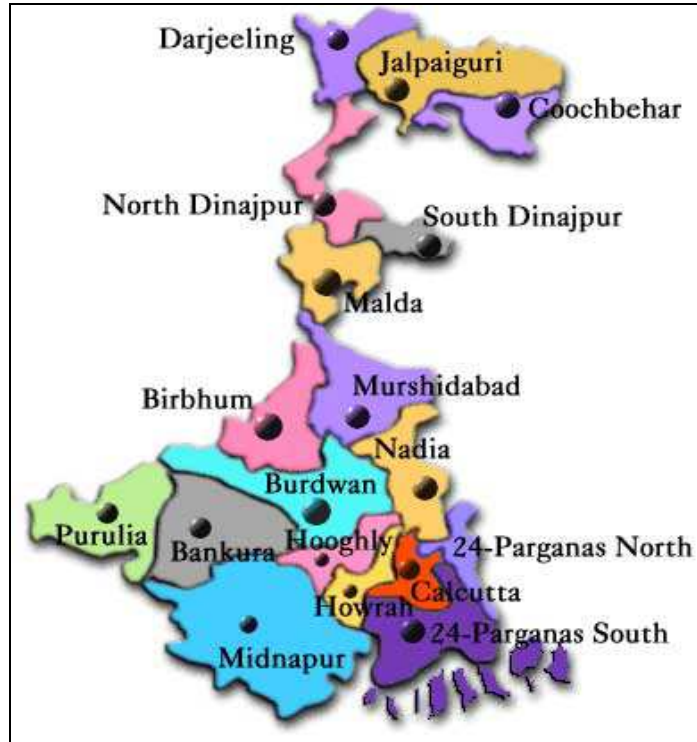
1.12	Sowing window for 5 major field crops	Rice	Jute	Wheat	Oilseeds	Pulses
	Kharif- Rainfed	July 1 st to 4 th week of July	Mid March to Mid April	-	-	-
	Kharif-Irrigated	July 1 st to 4 th week of July	Mid March to Mid April	-	-	-
	Rabi- Rainfed	-	-	2 nd week of November to 4 th week of November	November. 1 st to 3 rd week of November	2 nd week of November. to 4 th week of November

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

1.14	Include Digital maps of the district for	Location map of district within State as Annexure I	Enclosed: Yes
		Agro Climatic Zones of West Bengal Annexure II	Enclosed: Yes
		Mean annual rainfall as Annexure III	Enclosed: Yes
		Soil map as Annexure IV	Enclosed: Yes

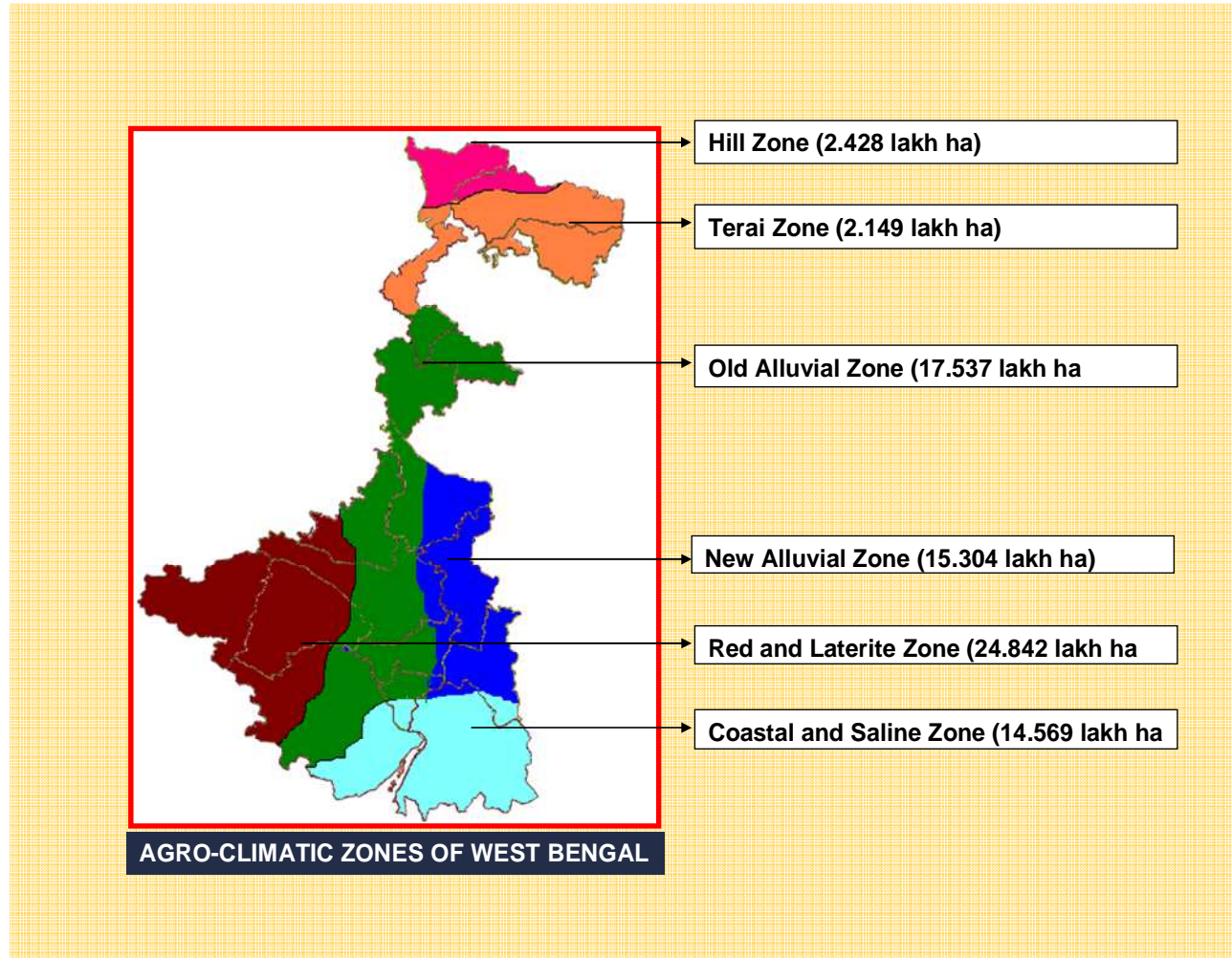
Annexure -I

Location map of Murshidabad district

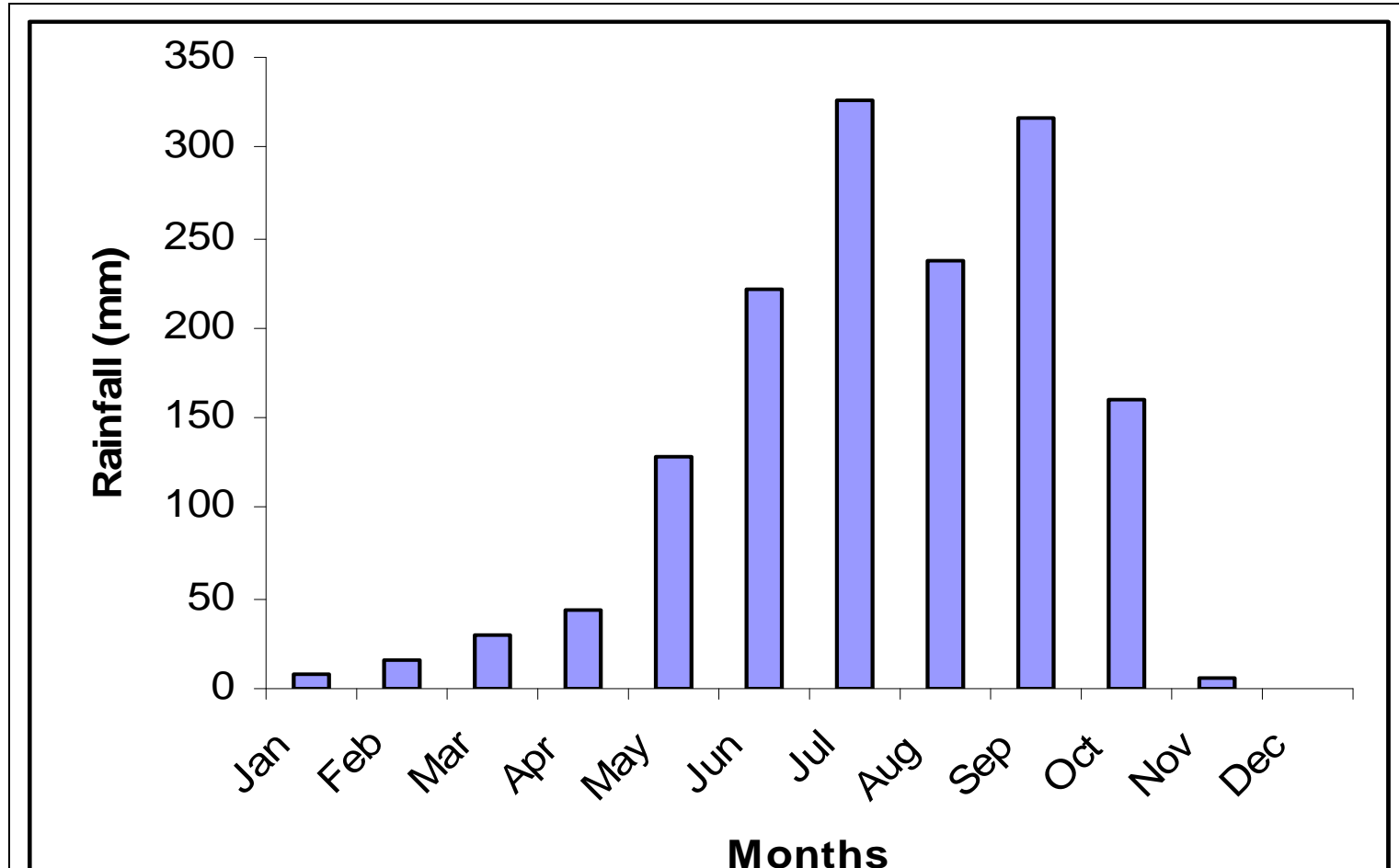


Annexure-II

Agro Climatic Zones of West Bengal



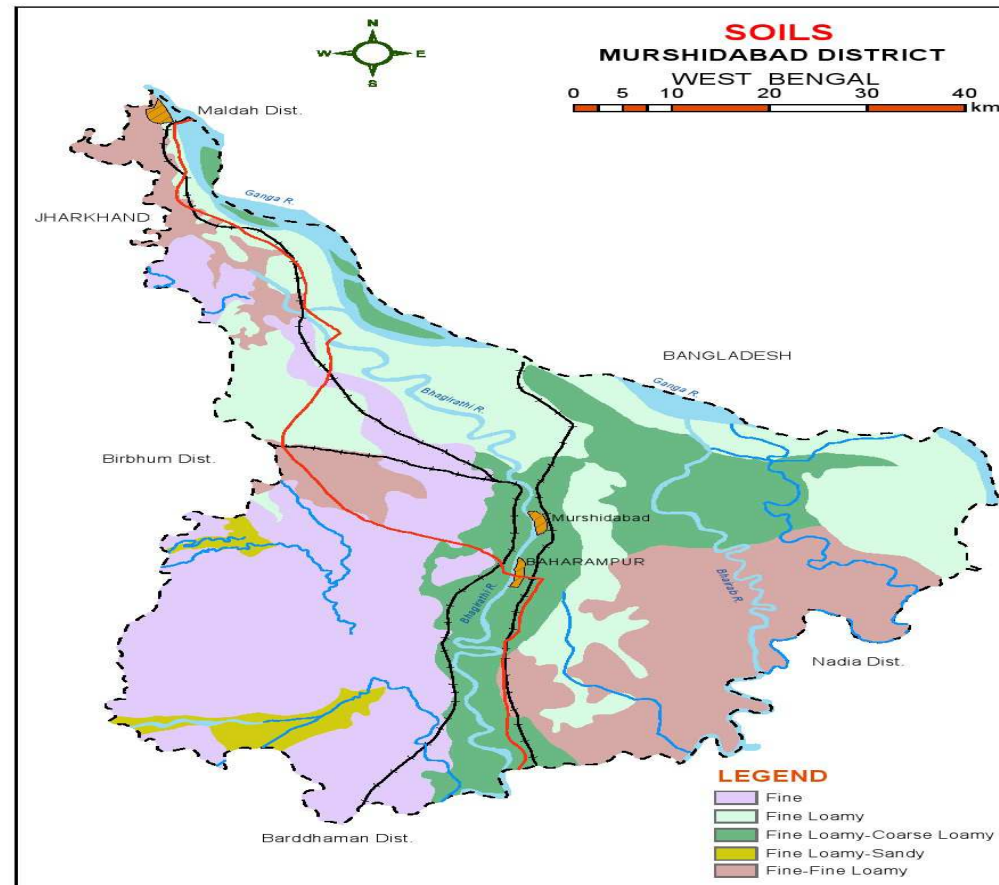
Annexure-III



Mean monthly rainfall of Murshidabad district

Annexure-IV

Soil map of Murshidabad district



Source: NBSS & LUP Regional Centre, Kolkata

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 3 rd week of June	Deep loamy soils Gangetic New Alluvial Plains High Rainfall (>1500 mm)	Rice-Pulse (Lentil/Lathyrus)	No change. Prefer short duration varieties (Shatabdi, Khitish, Swarna Mahsuri, Sada Swarna)	Transplant 2-3 seedlings/hill	Link seed farms, Department of Agriculture, NSC, WBSC, and BCKVV, Kalyani for supply of seed
		Rice-Jute	No change. Adopt short duration HYV of Rice – Shatabdi, Khitish	-do-	
		Rice-Mustard	No change. Prefer short duration varieties (Shatabdi, Khitish, Swarna Mahsuri, Sada Swarna)	-do-	
		Rice-Vegetables-Sesame	No change. Prefer short duration varieties (Shatabdi, Khitish, Swarna Mahsuri, Sada Swarna)	-do-	

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 4 weeks 2 nd week of July	Deep loamy soils Gangetic New Alluvial Plains	Rice-Pulse (Lentil/Lathyrus)	No change. Prefer short duration varieties (Shatabdi, Khitish, Swarna Mahsuri, Sada Swarna)	Transplant 2-3 seedlings/hill	Link seed farms, Department of Agriculture, NSC, WBSC, and BCKVV, Kalyani for supply of seed
		Rice-Jute	No change. Adopt short duration HYV of Rice – Shatabdi, Khitish	-do-	
		Rice-Mustard	No change. Prefer short duration varieties (Shatabdi, Khitish, Swarna Mahsuri, Sada Swarna)	-do-	
		Rice-Vegetables-Sesame	No change. Prefer short duration varieties (Shatabdi, Khitish, Swarna Mahsuri, Sada Swarna)	-do-	

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 6 weeks 4 th week of July	Deep loamy soils Gangetic New Alluvial Plains	Rice-Pulse (Lentil/Lathyrus)	No change (Shatabdi, Khitish, Swarna Mahsuri, Sada Swarna) Alternatively prefer vegetables like brinjal (Muktakeshi, Makra) / Chillies (Surya mukhi, Jwala, BCCH SL-4)	Transplant 4-5 seedlings/hill	Link NSC, WBSC, and BCKVV, Kalyani for supply of seed
		Rice-Jute	No change. Adopt short duration HYV of Rice – Shatabdi, Khitish	Transplant 4-5 seedlings/hill	
		Rice-Mustard	No change	-do-	
		Rice-Vegetables-Sesame	No change	-do-	

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 8 weeks 2 nd week of Aug	Deep loamy soils Gangetic New Alluvial Plains	Rice-Pulse (Lentil/Lathyrus)	Vegetables(brinjal (Muktakeshi, Makra) / Chillies (Surya mukhi, Jwala, BCCH SL-4) /Greengram (Samrat -PDM 84-139; IPM-02-03, Bireswar, Sukumar) /Blackgram (Pant U-31, 19, WBU-108 - Sharada, WBU-109 Sulota)/ kharif Maize	Transplant 4-5 weeks old seedlings (4-5 seedlings/ hill)	Link seed farms, Department of Agriculture, NSC, WBSC, and BCKVV, Kalyani for supply of seed
		Rice-Jute	-do-	-do-	
		Rice-Mustard	-do-	-do-	
		Rice-Vegetables-Sesame	-do-	-do-	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested contingency measures	
			Crop management	Soil nutrient & moisture conservation measures
Early season drought (Normal onset)				
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Deep loamy soils	Rice - Pulse (Lentil/Lathyrus) /Jute / Mustard / Vegetables	<ul style="list-style-type: none"> • Take up gap filling with available nursery or by splitting the tillers from the surviving hills • Weeding 	<ul style="list-style-type: none"> • Apply foliar spray with 2% Urea • Postpone top dressing with N • Life saving irrigation (fertigation)

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested contingency measures	
			Crop management	Soil nutrient & moisture conservation measures
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Deep loamy soils	Rice - Pulse (Lentil/Lathyrus) /Jute / Mustard / Vegetables	<ul style="list-style-type: none"> • Gap filling with the seedlings from available community nursery • Weeding 	<ul style="list-style-type: none"> • Apply foliar spray with 2% Urea • Postpone top dressing with N • Life saving irrigation (fertigation)
At vegetative stage				

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested contingency measures	
			Crop management	Soil nutrient & moisture conservation measures
Mid season drought (long dry spell)	Deep loamy soils	Rice - Pulse (Lentil/Lathyrus) /Jute / Mustard / Vegetables	<ul style="list-style-type: none"> • Weeding • Life saving irrigation (fertigation) • In case of failure of rice, broadcast pulses (blackgram) or plan for rabi mustard after harvesting fodder if damage is severe 	<ul style="list-style-type: none"> • Apply foliar spray with 2% Urea • Life saving irrigation (fertigation)
At flowering/ fruiting stage				

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested contingency measures	
			Crop management	Rabi crop planning
Terminal drought (Early withdrawal of monsoon)	Deep loamy soils	Rice - Pulse (Lentil/Lathyrus) /Jute / Mustard / Vegetables	Life saving irrigation	Plan for early rabi crops like oilseeds, pulses, vegetables

2.1.2 Drought - Irrigated situation

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall	Not applicable				
Limited release of water in canals due to low rainfall	Not applicable				
Non release of water in canals under delayed onset of monsoon in catchment	Not applicable				
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Tube-well irrigated lowland alluvial soil	Rice-rice-rice	No change Alternatively: Rice + Lathyrus as paira cropping	<ul style="list-style-type: none"> • Starter dose of 2% DAP to Lathyrus • Dapog method of nursery for rice and adopt SRI method of cultivation 	<ul style="list-style-type: none"> • Linkage with Agricultural Farms under Department of Agriculture, Govt. of WB, Regional Research Station, UBKV, Majhian and KVK at Chopra for supply of seed • Machine for Zero tillage under NFSM
	Tube-well irrigated medium land alluvial soil	Rice-potato-sesame	Rice-lentil (Asha, Ranjan) groundnut (TAG-51, Tag-24)/sesame (Kanke white, Rama) /Greengram (Samrat)	<ul style="list-style-type: none"> • Dapog method of nursery for rice • Adopt SRI method of cultivation • Prefer ridge and furrow system for groundnut 	

		Rice-rapeseed-rice	Rice-rapeseed (B-9)sesame (Rama)	Dapog method of nursery for rice Adopt SRI method of cultivation	
		Rice-Wheat	No change	Zero till for wheat	
Insufficient groundwater recharge due to low rainfall	Not applicable				

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

Condition - Continuous high rainfall in a short span leading to water logging				
Crop	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Rice	<ul style="list-style-type: none"> Drain excess water Postpone topdressing N fertilizers till water recedes Take up gap filling either with available nursery or by splitting the tillers from the surviving hills 	<ul style="list-style-type: none"> Drain excess water Apply the recommended nutrients after draining excess water 	<ul style="list-style-type: none"> Drain excess water Spray 2% brine solution to prevent premature germination in field Allow the crop to dry completely before harvesting 	<ul style="list-style-type: none"> Drain excess water and spread sheaves loosely in the fields or field bunds where there is no stagnation or Dry the grain to proper moisture content before bagging and storage
Potato	Drain excess water	Drain excess water	<ul style="list-style-type: none"> Drain excess water Harvest the produce on a clear sunny day after the water recedes 	Keep the harvested produce in shed for aeration
Mustard	<ul style="list-style-type: none"> Drain excess water Inter cultivation at optimum moisture condition to loosen and aerate the soil and to control weeds 	<ul style="list-style-type: none"> Drain excess water Inter cultivation at optimum moisture condition to loosen and aerate the soil and to control weeds 	<ul style="list-style-type: none"> Drain excess water Allow the crop to dry completely before harvesting 	Dry the produce to proper moisture content before bagging and storage
Sesame	-do-	-do-	-do-	-do-
Jute	-do-	-do-	-do-	Immediately after harvesting, go

				for retting
Wheat	-do-	-do-	-do-	-do-
Pulses	-do-	-do-	-do-	-do-
Horticulture				
Cauliflower	<ul style="list-style-type: none"> Drain excess water Three sprays of 0.1% Ammonium molybdate 15, 30 and 45 days after transplanting 	<ul style="list-style-type: none"> Drain excess water Blanching i.e. covering the curd through tying the outer leaves up over the curd improves curd colour and quality 	<ul style="list-style-type: none"> Drain excess water Harvest on clear sunny day 	Large leaves are trimmed away leaving only sufficient jacket leaves to protect the curd from bruising and other mechanical injury in transport.
Cabbage	-do-	-do-	-do-	-do-
Brinjal	Drain excess water	Drain excess water	Drain excess water	Immediate marketing of the produce
Condition-Heavy rainfall with high speed winds in a short span				
Boro rice	Drain excess water	Drain excess water	Spray brine (2%) solution to prevent field germination	Dry the grain to proper moisture content before bagging and storing
Cauliflower	Drain excess water	Spraying the crop with Copper-oxychloride (0.4%) or Mancozeb (0.25 %)/ Chlorothalonil (0.2%) or Difenconazole (0.5g/l) with sticker at 10 days interval to prevent curd blight.	-	-
Cabbage	-do-	Spraying the crop with Cypermethrin @ 0.1% with sticker to control Cabbage borer	-	-
Okra	-do-	Spraying the crop with Cypermethrin @ 0.1% to control fruit borer	-	-
Condition- Outbreak of pests and diseases due to unseasonal rains				
Rice	Protection against blast and sheath blight with Hexaconazole or Propiconazole @ 1ml/l	Protect against bacterial leaf blight with Hexaconazole @ 1ml/l	Protect against bacterial leaf blight with Hexaconazole @ 1ml/l	Prevent grain discolouration by spraying Carbendazim 0.1%
Potato	Spray Metalaxyl+Mancozeb mixture @ 2.5g/l twice at 7days interval to protect against late	Spray Metalaxyl+Mancozeb mixture @ 1.5g/l twice at 10days interval to	Protection against late blight with Carbendazim spray 0.1% immediately after cessation of	<ul style="list-style-type: none"> Dehauling of affected parts and destroy

	blight disease	protect against late blight disease	rain	<ul style="list-style-type: none"> Severely infected produce is unfit for seed purpose
Mustard	Spray application of Carbaryl 0.1 % or Endosulfan 0.07 % or Phosalone 0.05% or Profenofos 0.05% or Metasystox 0.05% or Imidacloprid 0.01% or Acetamiprid @ 0.01% for the control of mustard saw fly	Spray application of Carbaryl 0.1 % or Endosulfan 0.07 % or Phosalone 0.05% or Profenofos 0.05% or Metasystox 0.05% or Imidacloprid 0.01% or Acetamiprid @ 0.01% for the control of mustard saw fly	-	-
Horticulture				
Cauliflower	Spraying of Prophenophos @ 0.1% or Cypermethrin @ 0.1% to Control cabbage borer or diamond back moth with sticker	Spraying the crop with Copper-oxychloride (0.4%) or Mancozeb (0.25 %)/ Chlorothalonil (0.2%) or Difenconazole (0.5g/lit) with sticker at 10 days interval to prevent curd blight.	-	-
Okra	Four sprayings of systemic insecticides starting from 20 days after sowing at 10 days interval	Spraying the crop with Cypermethrin @ 0.1% to control fruit borer	-	-
Cucurbits	Two sprays of 0.25% Fosetyl Al or Cyamoxanil- Mancozeb or Metalaxyl- Mancozeb at 10 days interval effectively control downy mildew disease.	-	-	-
Chilli	Spraying of Prophenophos @ 1ml/litre/ Diafenthiuron @ 1 g/litre for the control of thrips and mites at 15-20 days interval	-	-	-

2.2

Floods

Condition - Transient water logging/ partial inundation				
Crop	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Rice (Aman)	<ul style="list-style-type: none"> • Drain excess water • Delayed sowing of seed • Growing variety like IET5656 and Nc490(withstans submergence and late transplanting • Maintain weed free condition 	<ul style="list-style-type: none"> • Drain excess water • Take up gap filling with available seedlings from community nursery • Spray zinc sulphate 0.2% if the crop is affected by floods within 45 days after transplanting 	Early rabi crop planning with vegetables, oilseeds etc	<ul style="list-style-type: none"> • Drain excess water and spread sheaves loosely in the fields or field bunds where there is no stagnation or • Spray 2% brine solution to prevent premature germination in field. • Dry the grain to proper moisture content before bagging and storage
Jute (Olitorius)	<ul style="list-style-type: none"> • Drain excess water • Intercultivation at optimum soil moisture condition to loosen and aerate the soil and to control weeds 	<ul style="list-style-type: none"> • Drain excess water • Intercultivation at optimum soil moisture condition to loosen and aerate the soil and to control weeds 	<ul style="list-style-type: none"> • Drain excess water • Allow the crop to dry completely before harvesting 	Immediately after harvesting, go for retting
Horticulture				
Cabbage	Raised and poly covered seed bed	Quick drainage and need based plant protection measure to be adopted	-	-
Cauliflower	-do-	-do-	-	-
Brinjal	Protect against damping off with Dithane M 45 @ 2g/l spray	Quick drainage and need based plant protection measure to be adopted	-	
Condition-Continuous submergence for more than 2 days				
Rice	Re-transplanting / double transplanting		Early rabi crop planning	
Horticulture	More than 2 to 3 days submergence will damage all the horticultural crops			
Sea water intrusion	NA			

2.4 Extreme events: Heat wave / Cold wave/Frost/ Hailstorm /Cyclone – Not applicable

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
Floods	<p>In case of early forewarning (EFW), harvest all the crops that can be useful as feed/fodder in future (store properly)</p> <p>Store sufficient dry fodder for the transportation to the flood affected villages</p> <p>Don't allow the animals for grazing if severe floods are forewarned</p> <p>Keep stock of bleaching powder and lime</p> <p>Carry out Butax spray for control of external parasites</p> <p>Identify the Clinical staff and trained paravets and indent for their services as per schedules</p> <p>Identify the volunteers who can serve in need of emergency</p> <p>Arrangement for transportation of animals from low lying area to safer places and also for rescue animal health workers to get involve in rescue operations</p> <p>Preparation of hay & silage of excess left over fodder for use in natural disadvantageous situation,</p> <p>Insurance of livestock</p>	<p>Supply fodder from nearby Govt. fodder farms, private parties, prepared hay or silage, community fodder bank etc.</p> <p>Establish Control Room at the Block, Sub-division & District level for prompt management action</p> <p>Transportation of animals to elevated areas</p> <p>Proper hygiene and sanitation of the animal shed</p> <p>In severe storms, un-tether or let loose the animals</p> <p>Use of unconventional and locally available cheap feed ingredients for feeding of livestock.</p> <p>Avoid soaked and mould infected feeds / foddors to livestock</p> <p>Emergency outlet establishment for required medicines or feed in each village</p> <p>Spraying of fly repellants in animal sheds</p>	<p>Repair of animal shed</p> <p>Bring back the animals to the shed</p> <p>Cleaning and disinfection of the shed</p> <p>Bleach (0.1%) drinking water / water sources</p> <p>Encouraging farmers to cultivate short-term fodder crops like sunhemp.</p> <p>Deworming with broad spectrum dewormers</p> <p>Proper disposable of the dead animals / carcasses by burning / deep burying (4-8 feet) with lime powder (1kg for small ruminants and 5kg for large ruminants) in pit</p> <p>Drying the harvested crop material and proper storage for use as fodder.</p> <p>Claim insurance</p>
Drought			
Feed and fodder	Cultivation of perennial fodder (Pusagaint, NB-21,	Harvest and use biomass of dried up crops material as	Encourage progressive farmers to grow multi cut fodder crops

availability	<p>IGFRI-3, IGFRI-6, 7, 10, BN-1, 2, 4, 6 and Co-1, paragrass)on the bank of the rivers</p> <p>Sowing of cereals (Sorghum/ Maize/Bajra) and leguminous crops Lucerne (Anand-2, T-9, Chetak)/Berseem (Mescavi, wardan etc)/ Rice bean (DagoreRani, S-8, S-9, K-1)/ Cowpea (Russian Giant, UPC-287, UPC 5286, C-30) during North-East monsoon for fodder production.</p> <p>Cultivation of JOB'S TEAR OR COIX (Bidhan Coixno. 1, PC-9, PC-23) with summer rains</p> <p>Establishment of village level fodder banks with surplus material</p> <p>Encourage cultivate short-term fodder crops like sunhemp</p> <p>Promote Azola cultivation at backyard</p> <p>Formation of village Disaster Management Committee</p> <p>Capacity building and preparedness of the stakeholders and official staff for the drought/floods</p>	<p>fodder</p> <p>Harvest all the top fodder available (Subabul, Glyricidia, Pipol, Prosopis etc) and feed the LS during drought</p> <p>Judicious use of available fodder from fodder banks</p> <p>Concentrate ingredients such as Grains, brans, chunnies & oilseed cakes, low grade grains etc. unfit for human consumption should be procured from Govt. Godowns for feeding as supplement for high productive animals during drought</p> <p>Promotion of cultivation of Horse gram as contingent crop and harvesting it at vegetative stage as fodder</p>	<p>of sorghum (Meethi Sudan, Raj Chari, PC-6, PC-9, PC-23)/maize (African Tall, J 1006, Vijay, Moti, Jawahar)/ Oats (OS-6, Kent, UPO 212, UPO 94, PO 3)</p> <p>Flushing the stock to recoup</p> <p>Replenish the feed and fodder banks</p>
Drinking water	<p>Establish water reservoir from the ground water or river on community basis</p> <p>Adopt various water conservation methods at village level to improve the ground water level for adequate water supply.</p> <p>Identification of water resources</p> <p>Desilting of ponds</p> <p>Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals)</p> <p>Construction of drinking water tanks in herding places/village junctions/relief camp locations</p> <p>Community drinking water trough can be arranged in shandies /community grazing areas</p>	<p>Adequate supply of drinking water.</p> <p>Restrict wallowing of animals in water bodies/resources</p> <p>Add alum in stagnated water bodies</p>	<p>Watershed management practices shall be promoted to conserve the rainwater. Bleach (0.1%) drinking water / water sources</p> <p>Provide clean drinking water</p>
Health and disease	Procure and stock emergency medicines and	Carryout deworming to all animals entering into relief	Keep close surveillance on

management	vaccines for important endemic diseases of the area All the stock must be immunized for endemic diseases of the area Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district Adequate refreshment training on draught management to be given to VAS, Jr.VAS, LI with regard to health & management measures Procure and stock multivitamins & area specific mineral mixture	camps Identification and quarantine of sick animals Constitution of Rapid Action Veterinary Force Performing ring vaccination (8 km radius) in case of any outbreak Restricting movement of livestock in case of any epidemic Tick control measures be undertaken to prevent tick borne diseases in animals Rescue of sick and injured animals and their treatment Organize with community, daily lifting of dung from relief camps	disease outbreak. Undertake the vaccination depending on need Keep the animal houses and milking sheds clean and spray disinfectants Farmers should be advised to breed their milch animals during July-September so that the peak milk production does not coincide with mid summer
Cyclone	NA		
Heat wave and cold wave	NA		

based on forewarning wherever available

2.5.2 Poultry

	Suggested contingency measures		
	Before the event ^a	During the event	After the event
Floods			
Shortage of feed ingredients	In case of early forewarning of floods, shift the birds to safer place Storing of house hold grain like maize, broken rice, bajra etc,	Use stored feed as supplement Don't allow for scavenging Culling of weak birds	Routine practices are followed Deworming and vaccination against RD
Drinking water	Adopt various water conservation methods at village level to improve the ground water level for adequate water supply.	Use water sanitizers or offer cool hygienic drinking water	Sanitation of drinking water
Health and disease management	In case of EFW, add antibiotic		

	powder (Terramycin/Ampicilline/ Ampiclox etc., 10g in one litre) in drinking water to prevent any disease outbreak	Prevent water logging surrounding the sheds through proper drainage facility Assure supply of electricity by generator or solar energy or biogas Sprinkle lime powder to prevent ammonia accumulation due to dampness	Sanitation of poultry house Treatment of affected birds Disposal of dead birds by burning / burying with lime powder in pit Disposal of poultry manure to prevent protozoal problem Supplementation of coccidiostats in feed Vaccination against RD
Drought			
Shortage of feed ingredients	Storing of house hold grain like maize, broken rice etc, in to use as feed in case of severe drought	Supplementation only for productive birds with house hold grain Supplementation of shell grit (calcium) for laying birds Culling of weak birds	Supplementation to all survived birds
Drinking water	Adopt various water conservation methods at village level to improve the ground water level for adequate water supply.	Use water sanitizers or offer cool hygienic drinking water	Sanitation of drinking water
Health and disease management	Culling of sick birds. Deworming and vaccination against RD and IBD	Mixing of Vit. A,D,E, K and B-complex including vit C in drinking water (5ml in one litre water)	Hygienic and sanitation of poultry house Disposal of dead birds by burning / burying with lime powder in pit
Cyclone	NA		
Heat wave & cold wave	NA		

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			
Marine	Not applicable	Not applicable	Not applicable

Inland			
(i) Shallow water depth due to insufficient rains/inflow	Proposed for excavation of earth from periphery areas so that water can retain in the deep pockets and building of high embankment	Supply of water into the water body from tube well, nearby river etc. and observe mortality of fish and proper management of the said water body.	Proper post-event management, retention of water, disinfecting water (if possible) to prevent disease out-breaks.
(ii) Changes in water quality	Water and soil quality tests suggested from time to time.	Proper management in ponds for soil and water as per the test report.	Proper disinfection of water and maintenance of water temperature and plankton quantity.
(iii) Any other	Nil	Nil	Nil
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	Proposed for excavation of earth from the pond so that water can retain during drought and supply of water in to the pond from tube well / river etc.	Control of pond water quality parameters and maintenance of optimum level of planktons (fish food) in the pond through proper fertilization (if required)	Suggested for disinfection of pond water through liming and periodic netting to assess the biomass.
(ii) Impact of salt load build up in ponds / change in water quality	Not applicable (No saline water nearby)	Not applicable (No saline water nearby)	Not applicable (No saline water nearby)
(iii) Any other	Nil	Nil	Nil
2) Floods			
A. Capture			
Marine	Not applicable (No marine fishery resource)	Not applicable (No marine fishery resource)	Not applicable (No marine fishery resource)
Inland			
(i) Average compensation paid due to loss of human life	Creating awareness among the fishermen on emergency strategies to be adopted in the case of flood.	Advise to shift to high land / flood shelter camps to save life.	Monetary compensation to the affected family for loss of life.
(ii) No. of boats / nets/damaged	Training fishermen on protection of boats, nets etc. in case of occurrence of flood.	Keeping the boat / net in dry / high places during flood situation.	Damage reports are to be sent to higher authority for compensation.
(iii) No. of houses damaged	Nil	Nil	Damage reports are to be sent to higher authority for compensation.
(iv) Loss of stock	Advise to strengthen protection dyke so that during flood dyke remains safe and	Advise to protect fish stock from escaping by putting nets in the areas	Assessing the residual fish stock after the flood and taking proper

	fish stock are not affected. Placing fish aggregation devices in the deeper zones so that fish are accumulated there.	where dyke is damaged.	management strategies as per the advice of Fishery Department.
(v) Changes in water quality	Nil	Nil	Application of lime / other disinfectants in the water body
(vi) Health and diseases	Nil	Nil	Monitoring and taking preventive measures against out-break of disease
B. Aquaculture			
(i) Inundation with flood water	Raising the height of the pond dyke in the flood prone areas, Harvesting the stock before onset of monsoon.	Placing nets to prevent escape of fish from the culture ponds.	Repair of pond dyke.
(ii) Water contamination and changes in water quality	Nil	Nil	Suggested for water testing and advice for corrective measures.
(iii) Health and diseases	Nil	Nil	Suggested for water treatment through liming and other disinfectants and monitoring of health of fish stock..
(iv) Loss of stock and inputs (feed, chemicals etc)	Arrangement for keeping feeds / chemicals in dry & safe place.	Immediately shift the inputs to high / safe place. Sundry (if possible) the wet inputs.	Recommending to higher authority for supplying mini kit (fingerlings, lime & other critical inputs)
(v) Infrastructure damage (pumps, aerators, huts etc)	Keeping them in safe place after use.	Immediately shift the pump / aerator from the pond to safe place. Remove the other valuable items from the hut in case possibilities of flood water entering to the hut	Recommending to higher authority for compensation against the loss.
(vi) Any other	Insurance for aquaculture activities. Constitute Departmental Disaster Management Committee at the Block, Sub-division & District level for planning management action.	Establish Control Room at the Block, Sub-division & District level for prompt management action. Cancel leaves for the employees	Claim insurance
3. Cyclone / Tsunami			
4. Heat wave and cold wave			
	NA		

^a based on forewarning wherever available

