State: WEST BENGAL

Agriculture Contingency Plan for District: PURBA MEDINIPUR

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	Bengal and Assam plains, hot sub humid (moist) to humid (inclusion of per humid) eco-sub region (15.1) Eastern plateau (chhotanagpur) And Eastern Ghats, Hot Subhumid Eco-Region (12.3) Eastern Coastal Plain, Hot Subhumid To Semi-Arid Eco-Region (18.5)		
	Agro-Climatic Zone (Planning Commission)	Lower Gangetic Plain Region (III)		
	Agro Climatic Zone (NARP)	Coastal Saline Zone (WB-6) Red and laterite soil zone (wb-5) Old aluuvial zone (wb-3)		
	List all the districts or part there of falling under the NARP Zone	24 Paraganas (North), Calcutta, Howrah and South 24 Paraganas, Bankura, Birbhum, Burdwan, Dakshin Dinajpur, Hooghly, Malda, Midnapur(west), Murshidabad, Nadia, Purulia, Uttar Dinajpur.		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		21º 56' 14.24" N	87º 46'34.80" E	6 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	RRS (Red &laterite zone), Jhargram, Medinipur (W) -721 507		
	Mention the KVK located in the district	No KVK in the district		

1.2	**Rainfall**	Normal RF(mm)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	1238.6	1st week of June	4th week of September
	NE Monsoon(Oct-Dec):	288.2	-	-
	Winter (Jan- March)	73.9	-	-
	Summer (Apr-May)	145.9	-	-
	Annual	1746.6	-	-

1.3	**Land use pattern of the district** (latest statistics)	Geographical area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area ('000 ha)	396.59	295.67	0.90	96.69	0.04	0.14	2.78	0.37	2.75	0.19

1. 4	**Major Soils (common names like red sandy loam deep soils (etc.,)***	**Area (‘000 ha)**	**Percent (%) of total**
	1. Clayey	32.78	11
	2. Clayey – loamy	259.26	87
	3. Loamy sandy	5.96	2

1.5	**Agricultural land use**	Area (‘000 ha)	Cropping intensity %
	Net sown area	292.73	178
	Area sown more than once	229.75	
	Gross cropped area	522.48	

1.6	**Irrigation**	Area (‘000 ha)		
	Net irrigated area	169.26		
	Gross irrigated area	398.74		
	Rainfed area	123.74		
	Sources of Irrigation	Number	Area (‘000 ha)	Percentage of total irrigated area
	Canals	-	63.58	37.56
	Tanks	-	26.25	15.50
	Open wells	-	-	-
	Bore wells	-	-	-
	Lift irrigation schemes		79.43	41.01
	Micro-irrigation	-	-	-
	Total Irrigated Area	-	169.26	56.80
	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	-	-	Salinity CI-111 &above
	Critical	-	-	-
	Semi- critical	1	-	-
	Safe	9	-	-

	Wastewater availability and use	-	-	-
	Ground water quality	Ground Water Saline in 7 blocks		
*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) (year 2008-09)

1.7	Major field crops cultivated	Area ('000 ha)							
		Kharif			*Rabi*				
		Irrigated	**Rainfed**	**Total**	**Irrigated**	**Rainfed**	**Total**	**Summer (Irrigated)**	**Grand total**
	Rice	-	15.5	15.5	-	223.8	223.8	157.1	396.4
	Pulses	-	-	-	-	11.0	-	-	11.0
	Oilseeds	-	-	-	-	22.6	-	-	22.6
	Dry Chilli	-	3.5	-	-	-	-	-	3.5
	Potato	-	-	-	-	4.6	-	-	4.6
	Horticulture crops - Fruits	**Total Area ('000 ha)**							
	Mango	1.99							
	Banana	1.93							
	Papaya	0.79							
	Citrus	0.89							
	Sapota	0.86							
	Horticulture crops - Vegetables	**Total**							
	Brijal	9.47							
	Cucurbits	10.55							
	Ladiesfinger	4.65							
	Cauliflower	1.28							
	Cabbage	1.27							
	Tomato	1.00							

1.8	Livestock (2007-08)	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)	279.1	1,033.6	1265094
	Crossbred cattle	19.3	74.1	93496
	Non descriptive Buffaloes (local low yielding)	0.3	0.5	697
	Graded Buffaloes	-	-	103
	Goat	-	-	489676
	Sheep	-	-	18844

	Others (Camel, Pig, Yak etc.)	-	-	Horse-54, Pig-2623, Rabbit-3214
	Commercial dairy farms (Number)	-	-	-
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**	
	Commercial	Broiler-1700, Improved Layer-112	In Farm: Broiler-1293731, Layer-65367, Duck-19604 [District Total of Improved strains Fowl-1741687, Duck-49064, Turkey-104, Quail-803, Others-2589]	
	Backyard	Fowl-64, Duck (commercial + backyard)- 25	In Farm: Deshi Total Fowl-45415 [District Total of Deshi Fowl-767655, Duck-268419]	

1.10 Fisheries (Data source: Chief Planning Officer)

A. Capture

i) Marine (Data Source: Fisheries Department)	**No. of fishermen**	**Boats**		**Nets**		**Storage facilities (Ice plants etc.)**
		Mechanized (Registered between 1998-2009)	Non-mechanized (Registered between 1998-2009)	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
	-	3141	1507	-	-	-

ii) Inland (Data Source: Fisheries Department)	**No. Farmer owned ponds**	**No. of Reservoirs**	**No. of village tanks**
	No. of FFDA Farmer: 50284 Area of FFDA Pond (ha.):10442 No. of BFDA Farmer: 3999	Nil	Record not available

B. Culture

	Water Spread Area (ha)	**Yield (t/ha)**	**Production ('000 tons)**
i) **Brackish water** (Data Source: MPEDA/ Fisheries Department)	-	-	- 14615 ton prawn (2008-09)
ii) **Fresh water** (Data Source: Fisheries Department)	Culturable area: 17854.80 ha. Semi-Derelict area: 5282.31 ha. Derelict area: 1350.27 ha. Total area: 24487.38 ha.	From Ponds under FFDA Scheme = 4.9 t/ ha.	112573 ton Inland Fish + 135221 ton Marine fish (2008-09) Fish Seed Production (08-09)= 918 million
	2451.60 ha. (River) 2451.60 ha. (Canal)	-	-

1.11 Production and Productivity of major crops (Average of last 4 years: 2004 -08)

1.11	Name of crop	**Kharif**		**Rabi**		**Summer**		**Total**		**Crop residue as fodder** (‘000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
	Major Field crops (Crops to be identified based on total acreage)									
	Rice	118.0	1937	439.45	1709	461.86	3161	1019.31	6807	-
	Wheat	-	-	-	-	1.2	2314	1.2	2314	-
	Pulses	-	-	-	-	-	-	11.00	1074	-
	Oilseeds	-	-	-	-	-	-	33.9	1669	-
	Jute	16.93	-	-	-	-	-	16.93	2798	-
	Potato	-	-	59.45	-	-	-	59.45	152.73	-
	Major Horticultural crops (Crops to be identified based on total acreage)									
	Cucurbits	-	-	107.68	10206	-	-	-	107.68	10206
	Brinjal	-	-	129.12	13634	-	-	-	129.12	13634
	Okra	-	-	45.71	9830	-	-	-	45.71	9830
	Cauliflower	-	-	23.29	1895	-	-	-	23.29	1895
	Cabbage	-	-	28.08	22110	-	-	-	28.08	22110

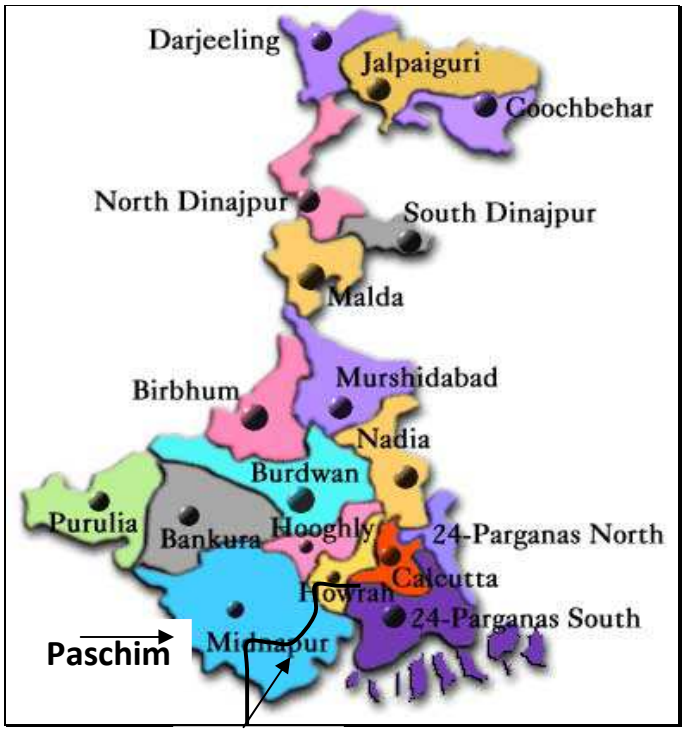
1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	Rice	Oilseeds	Potato	Pulses	Jute
	Kharif- Rainfed	July 1st to 4th week	-	-	-	March 4th week. to April 3rd week
	Kharif-Irrigated	-	-	-	-	March 4th week. to April 3rd week
	Rabi- Rainfed	-	-	-	-	-
	Rabi-Irrigated	Jan. 1st to 4th week	Oct. 4th to Nov 2nd week	Nov. 1st to 4th week	Oct. 4th to Nov. 3rd week.	-

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
		Agroclimatic zones of West Bengal Annexure 2	Enclosed: Yes
		Mean annual rainfall as Annexure 3	Enclosed: Yes
		Soil map as Annexure 4	Enclosed: Yes

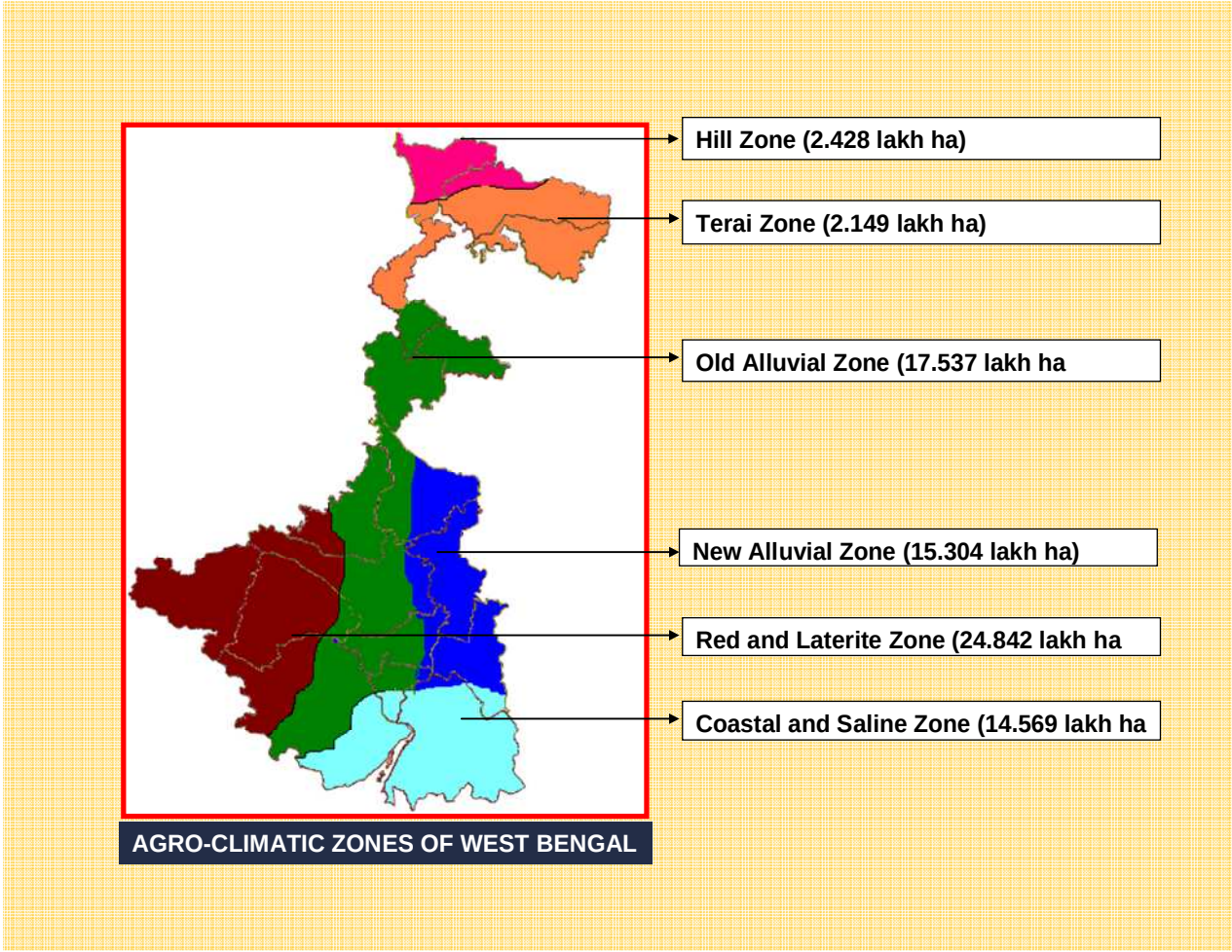
Annexure –I

Location map of Purba Medinipur district

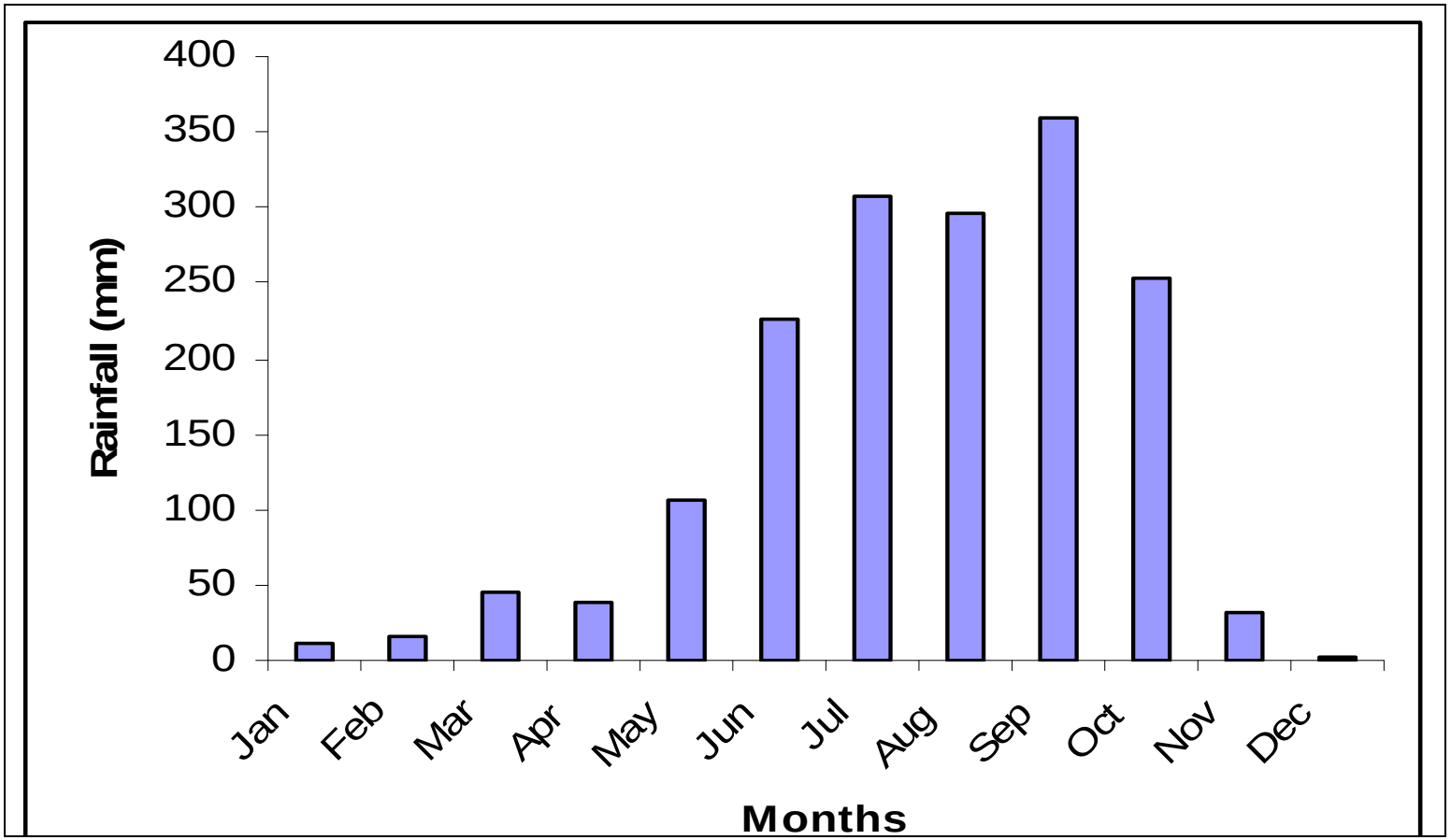


Annexure-II

Agroclimatic zones of West Bengal



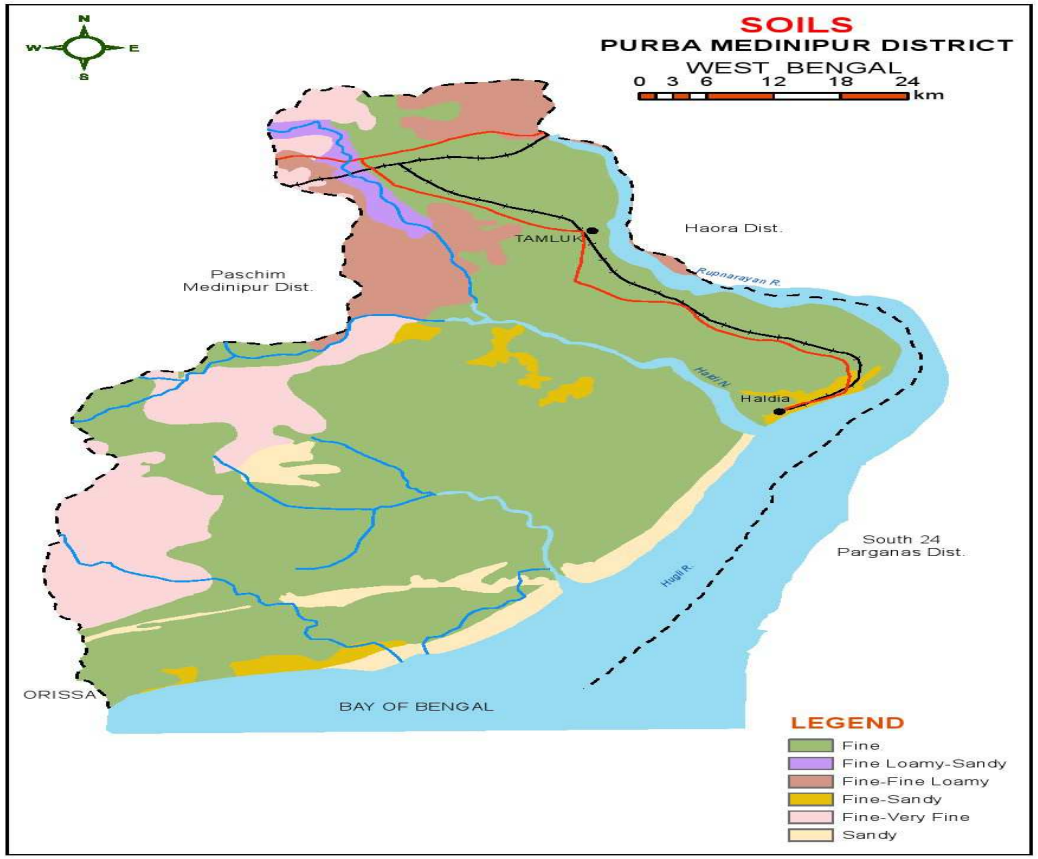
Annexure – III



Mean monthly rainfall of Purba Medinipur district

Annexure-IV

Soil map of Purba Medinipur



Source: NBSS&LUP Regional Centre, Kolkata

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition **Early season drought (delayed onset)**	**Major Farming Situation**	**Normal crop / cropping system**	**Suggested Contingency Measures**		
			Change in crop / cropping system including variety	**Agronomic measures**	**Remarks on implementation**
Delay by 2 Weeks June 3rd week	Lower Indo-Gangetic alluvial plains clay / clay loams / loamy soils	Rice – Fallow	No change. Adopt salt tolerant varieties (Lunishri) and other popular varieties like Sabita, Dudeswar, Swarna Mahsuri, Lalat	• Transplant 2-3 seedlings/hill	Linkage with NSC,WBSC, and BCKVV, Kalyani for supply of seed
		Rice- Pulse / Oilseed / Vegetable	-do-	-do-	
Delay by 4 Weeks 1st week of July	Lower Indo-Gangetic alluvial plains clay / clay loams / loamy soils	Rice – Fallow	Prefer short duration rice varieties (Shatabdi, Khitish, Ranjit) and paira (relay) cropping with lathyrus, lentil	-do-	
		Rice- Pulse / Oilseed / Vegetable	Prefer short duration rice varieties (Shatabdi, Khitish, Ranjit) and paira (relay) cropping with lathyrus, lentil	-do-	
Delay by 6 Weeks 3rd week of July	Lower Indo-Gangetic alluvial plains clay / clay loams / loamy soils	Rice-fallow	Prefer short duration rice varieties (Shatabdi, Khitish, Ranjit) and paira (relay) cropping with lathyrus, lentil	• Transplant 2-3 seedlings/hill	
		Rice-- Pulse / Oilseed / Vegetable	Alternate crops dry chillies (bullet sundari) Water melon (Sugar baby) Sunflower (Nov) (hybrids) Pulses (Lathyrus, Blackgram)	• Raised bed planting method for Chillies • Land preparation for *rabi* crops (conservation tillage	
Delay by 8 Weeks 1st week of August	Lower Indo-Gangetic alluvial plains clay / clay loams / loamy soils	Rice-fallow	Prefer short duration rice varieties (Shatabdi, Khitish, Ranjit) and paira (relay) cropping with lathyrus, lentil	Supplemental irrigation for rice through farm ponds.	
		Rice-- Pulse / Oilseed / Vegetable	Alternate crops dry chillies (bullet sundari) Water melon (Sugar baby) Sunflower (Nov) (hybrids) Pulses (Lathyrus, Blackgram)	• Raised bed planting method for Chillies • Land preparation for *rabi* crops (conservation tillage)	

Condition			**Suggested Contingency measures**		
Early season drought (Normal onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Lower Indo-Gangetic alluvial plains clay / clay loams / loamy soils	Rice – Fallow	• Take up gap filling with available nursery or by splitting the tillers from the surviving hills • Weeding	• Apply foliar spray with 2% Urea • Postpone top dressing with N • Life saving irrigation (fertigation)	• Linkage with Agricultural Farms under Department of Agriculture, Govt. of WB, Regional Research Station, BCKVV for supply of seed • Link farm pond technology with watersheds NREGS.
		Rice- Pulse / Oilseed / Vegetable	-do-	-do-	

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 measues**	**Remarks on Implementation**
At vegetative stage	Lower Indo-Gangetic alluvial plains clay / clay loams / loamy soils	Rice – Fallow	• Gap filling with the seedlings from available community nursery • Weeding	• Apply foliar spray with 2% Urea • Postpone top dressing with N • Life saving irrigation (fertigation)	• Linkage with Agricultural Farms under Department of Agriculture, Govt. of WB, Regional Research Station, BCKVV for supply of seed • Link farm pond technology with watersheds NREGS
		Rice- Pulse / Oilseed / Vegetable	-do-	-do-	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measues**	**Remarks on Implementation**
At flowering/ fruiting stage	Lower Indo-Gangetic alluvial plains clay / clay loams / loamy soils	Rice – Fallow	• Weeding • In case of failure of rice, broadcast pulses (blackgram)	• Apply foliar spray with 2% Urea • Life saving irrigation (fertigation)	Link farm pond technology with watersheds NREGS
		Rice- Pulse / Oilseed / Vegetable	• 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	-do-	

Condition			Suggested Contingency measures		
Terminal drought	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
(Early withdrawal of monsoon)	Lower Indo-Gangetic alluvial plains clay / clay loams / loamy soils	Rice – Fallow	Life saving irrigation	-	Link farm pond technology with watersheds NREGS
		Rice- Pulse / Oilseed / Vegetable	Life saving irrigation	Plan for early rabi crops like oilseeds, pulses, vegetables	

2.1.2 Drought - Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**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 rainfall in catchments	**Not applicable**
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	• Drain out excess water • Postpone topdressing N fertilizers till water recedes • Take up gapfilling either with available nursery or by splitting the tillers from the surviving hills	• Drain out excess water • Apply the recommended nutrients after draining excess water.	• Drain out excess water • Spray 2% brine solution to prevent premature germination in field • Allow the crop to dry completely before harvesting	• Drain out 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
Horticulture				
Betel vine	Drain out excess water Stake the crop to provide support Drenching the crop with COC (0.3%) to control the rot diseases	Drain out excess water Stake the crop to provide support Drenching the crop with COC (0.3%) to control the rot diseases	Drain out excess water Harvest the leaves on a clear sunny day after water recedes	Grade the leaves before packing and marketing
Condition-Heavy rainfall with high speed winds in a short span				
Rice	• Drain out excess water • Postpone topdressing N fertilizers till water recedes	• Drain out excess water • Postpone topdressing N fertilizers till water recedes	• Drain out excess water • Spray 2% brine solution to prevent premature	• Spray 2% brine solution to prevent premature germination in field

			germination in field • Allow the crop to dry completely before harvesting	• Dry the grain to proper moisture content before bagging and storage
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%
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/lt) with sticker at 10 days interval to prevent curd blight.	-	-
Okra	Four spraying 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.	-	-	-
Chillies	Drench nursery beds with COC 3g/l to prevent damping off Spraying of Profenophos @ 1ml/litre/ Diafenthiuron @ 1 g/litre/ Prlopergite @1 g/litre for the control of thrips and mites at 15-20 days interval	Spray COC 30 g + 1 g streptocycline in 10 litres of water, 2-3 times against the bacterial leaf spot and blight	Spray carbendazim 0.1% to control fruit rot	Quick drying of produce to prevent fruit rot and development of afflatoxins

2.3 Floods

Transient water logging/ partial inundation[1]				
Crop	**Suggested contingency measure**			
	Seedling / nursery stage	**Vegetative stage**	**Crop maturity**	**Post harvest**
Rice (Aman)	• Release of water after recession of flood • Keep extra paddy seeds for raising second seedbed • Raising of seed nursery in upland position • Growing of variety like IET 5656 and NC 490, swarnasub (withstand submergence, late transplanting) • Maintain weed free condition	• Drain out excess water • Take up gap filling with available nursery or by splitting the tillers from the surviving hills • Apply booster dose of 50 kgN/ha • Spray zinc sulphate o.2% if it is less than 45 days after tranplanting	• Drain out excess water at the earliest • Take up need based plant protection measures • If the damage is severe take up alternate crops like Kalai, Mustard, Wheat, Lentil, Potato, Gram, Maize and Boro paddy.	• Drain out excess water and spread sheves loosely in the fields or field bunds where ther is no stagnation or • Spray 2% brine solution to prevent premature germination in field . • Allow the crop to dry completely before harvesting • Dry the grain to proper moisture content before bagging and storage
Horticulture				
Condition-Continuous submergence for more than 2 days				
Rice	Drain out excess water	Drain out excess water	• Plan for alternate crops like Kalai, mustard, wheat, lentil, potato, Gram, maize and boro paddy if damage is severe • Allow the crop to dry completely before harvesting	• Early harvest • Drain out excess water • Spray 2% brine solution to prevent premature germination in field. • Dry the grain to proper moisture content before bagging and storage

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

Extreme event type	**Suggested contingency measure**				
	Seedling / nursery stage	**Vegetative**	**Flowering**	**Crop maturity**	**Post harvest**
Heat Wave	Not applicable				
Cold wave	-do-				
Frost	-do-				
Heat Wave	-do-				
Cold wave	-do-				
Cyclone					
Rice	• Gap filling with the seedlings from raised community nurseries • Prefer salt tolerant and submergence tolerant (IET 5656 and NC 490, swarnasub) crops	-	Rabi crop planning	Rabi crop planning	Shift produce to safer place
Horticulture					
Betel vine	Replanting	• Propping and staking • Harvesting and marketing			
Sea Water intrusion					
Rice	• Prefer salt tolerant varieties • Reclaim saline soil by raise green manure crops (Sesbania) in summer • Strengthening of embankments	Ponding fresh water for leaching of salts wherever available			

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 availability	Cultivation of perennial fodder in waste lands and on the bank of the rivers/ponds/tanks; preparation of hay & silage of excess left over fodder,, Motivation for community/Group for fodder cultivation Insurance of livestock Alert nearby Govt. fodder farms to stock straw	Feed fodder from nearby Govt. fodder farms, perennial fodder, prepared hay or silage etc. Collect fodder from nearby less affected areas Feed region specific concentrated feed supplements	Claim insurance Feed supplements Cull the unproductive stock
Drinking water	Dig bore well & establish water reservoir from the ground water or river on community basis	Use water from dig well, river or other water reservoirs	
Health and disease management	Make alert for the Govt. & Non-Govt departments for adequate storage of medicines, vaccines, saline/dextrose. Organize awareness camp	Organize health camp, treatment of animals, Use stress relieving medicines & protect animal houses from extreme hot air	Treat sick animals Cull permanently unproductive animals
Floods			
Feed and fodder availability	Stock dry straw in the nearby Govt. fodder farms, ask the private parties to stock straw, Preparation of hay & silage of excess left over fodder for use in natural disadvantageous situation, Insurance of livestock Alert nearby Govt. fodder farms to stock straw Constitute Departmental Disaster Management Committee at the Block, Sub-division & District level for planning management action Cancel leaves for the employees	Supply fodder from nearby Govt. fodder farms, private parties, prepared hay or silage, community fodder bank etc. Feed region specific concentrated feed supplements Establish Control Room at the Block, Sub-division & District level for prompt management action	Claim insurance Feed supplements Cull the unproductive stock
Drinking water	Establish water reservoir from the ground water	Use water from dig well, river or other	Ground water disinfection

	or river on community basis Digging shallow tube wells in the vincinity of farms	water reservoirs, In devastating areas use ground water after local people	Use disinfection of nearby water sources
Health and disease management	Make alert for the Govt. & Non-Govt departments for adequate storage of medicines, vaccines, saline/dextrose Organize awareness camp Utilize Departmental Disaster Management Committee at different levels for prevention & therapy of animals	Organize health camp, treatment of animals, Mass use of protective and curing medicines for gut sterilization Use Departmental Disaster Management Committee at different levels for prompt therapy Cancel all sorts of leaves for the departmental employees	Treat sick animals Cull permanently unproductive animals
Cyclone			
Feed and fodder availability	Stocking of green and dry fodder in Govt. & Private farms. Insurance of livestock Better forecasting for fodder farms Constitute Departmental Disaster Management Committee	Supply fodder from nearby Govt. fodder farms, private parties, prepared hay or silage, community fodder bank etc. Feed region specific concentrated feed supplements Establish Control Room at the Block, Sub-division & District level for prompt management action	Claim insurance Feed supplements Cull the unproductive stock Introduce new stock from the unaffected areas
Drinking water	Establish water reservoir on community basis	Use water from safe source	Ground water disinfection Use disinfection of nearby water sources
Health and disease management	Make alert for the Govt. & Non-Govt. departments for adequate storage of medicines, vaccines, saline/dextrose Organize awareness camp Utilize Departmental Disaster Management Committee at different levels for prevention & therapy of animals	Organize health camp, treatment of animals, Mass use of protective and curing medicines for gut sterilization Use Departmental Disaster Management Committee at different levels for prompt therapy	Treat sick animals Cull permanently unproductive animals
Heat wave and cold wave			
Shelter/environment management	Preparation of animal houses on scientific manner Plant the trees giving shed to the houses	Use window curtains made up of locally available materials	Creation of awareness for scientific management practices and construction of animal shelter on community basis

	Use protection of curtains over the windows		
Health and disease management	Store medicine, saline etc.	Administer stress removing medicaments	Awareness on Scientific management practices & disease control

[s] based on forewarning wherever available

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	Insurance Bank linkage Instruct Govt. feed supplies to stock feed for urgency	Feed from stocked feed	Avail insurance	ASCAD
Drinking water	Install bore well In city area seek drinking water supply	Use drinking water from different kind of water reservoirs	Use disinfection and sterilization of drinking water	
Health and disease management	Emergency preparedness of Govt. department Organise awareness camp Formulate Departmental Disaster Management Committee at Block, Sub-division & District levels for proper planning & give requisition of medicine, vaccines, biologicals beforehand for the Govt. supplies Bio-security measurers must be in action for prevention of emerging diseases to obstacle in the transmission of disease	Organise mass health camp & treat birds Utilize Departmental Disaster Management Committee for prompt therapy & control of diseases	Culling of affected birds & subsequent disposal	
Floods				
Shortage of feed ingredients	Emergency preparedness for Govt. feed plants and also for non-Govt. companies	Supply from nearby Private or Govt. feed plants	Cull dead and affected birds and subsequently to be buried in isolated place	
Drinking water	Sterilization of drinking water.	Use water from dig well after	Awareness on hygienic	

	Dig deep tube wells.	disinfection & supply it in affected areas	water conservation	
Health and disease management	Emergency preparedness of Govt. department Organise awareness cap	Organise mass health camp & treat birds Cancel all sorts of leaves for the departmental employees	Culling of affected birds & subsequent disposal	
Cyclone				
Shortage of feed ingredients	Arrangement of poultry feed ingredients and more production of poultry feed for future usage	Ample supply of poultry feed in the affected areas	Awareness on preparation of poultry feed using unconventional feed ingredients and	
Drinking water	Arrangements of hygienic potable water and conservation of water	Ample supply of safe water	Awareness of water conservation	
Health and disease management	Group Insurance or Community Insurancing for affected animals against diseases of birds . Mass vaccination.	Adopt scientific rearing practices. Supply of medicines and vaccines	Awareness on poultry disease prevention & control in natural disaster	
Heat wave and cold wave				
Shelter/environment management	Construct houses at safe place for emergency housing of poultry birds at district level atleast	Avoid further spread of disease by housing the birds in the safe location outside the infected zone	Re-introduce birds from unaffected areas	
Health and disease management	Preparedness for timely supply of medicines/vaccines/biologicals is essential	Ample supply of medicines & vaccines	Awareness	

[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			
Marine	Negligible impact	Negligible impact	Negligible impact
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	Negligible impact	Negligible impact	Negligible impact
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 fish stock are not affected. Placing fish aggregation devices in the deeper zones so that fish are accumulated there.	Advise to protect fish stock from escaping by putting nets in the areas where dyke is damaged.	Assessing the residual fish stock after the flood and taking proper 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			
A. Capture			
Marine	Develop better forecasting system on cyclone / tsunami	Advising fishermen not to venture in to the sea	Arranging relief for the affected fisherman
Inland			
(i) Average compensation paid due to loss of fishermen lives	Creating awareness among the fishermen on emergency strategies to	Advise to shift to high land / flood shelter camps to save life.	Monetary compensation to the affected family for loss of life.

	be adopted in the case of cyclone.		
(ii) Avg. no. of boats / nets/damaged	Training fishermen on protection of boats, nets etc. in case of occurrence of cyclone.	Keeping the boat / net in dry / high places during flood situation.	Damage reports are to be sent to higher authority for compensation.
(iii) Avg. no. of houses damaged	Nil	Nil	Damage reports are to be sent to higher authority for compensation.
B. Aquaculture			
(i) Overflow / flooding of ponds	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) Changes in water quality (fresh water / brackish water ratio)	Not applicable (No brackish water source nearby)	Not applicable (No brackish water source nearby)	Not applicable (No brackish water source nearby)
(iii) Health and diseases	Nil	Nil	Monitoring and taking preventive measures against out-break of disease
(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, shelters/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

4. Heat wave and cold wave			
A. Capture			
Marine	Not applicable	Not applicable	Not applicable
Inland	Harvesting of fish stock to minimize the loss due to heat / cold wave.	Placing the tree branches, old pipes etc. in the deeper zone so that fish can take shelter in the cool places.	Nil

B. Aquaculture			
(i) Changes in pond environment (water quality)	Increase pond water depth by pumping water in to the pond during summer months.	During heat wave, place the tree branches, old pipes etc. in the deeper zone so that fish can take shelter in the cool places. If pond water depth reduces, partially harvest stock, reduce / stop supplementary feeding, reduce / stop fertilization, watch out for Dissolve oxygen (DO) depletion.	Try to increase the pond water depth, take necessary measure for improving pond water quality parameters.
(ii) Health and Disease management	Be vigilant for fish disease	Do not go for additional stocking. Take appropriate treatment for the diseased fish after consulting fishery expert / Fishery Extension Officer.	Watch out for health status of fish stock through netting.
(iii) Any other	Nil	Nil	Nil

[a] based on forewarning wherever available