State: WEST BENGAL
Agriculture Contingency Plan for District: MALDA

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	Bengal and Assam plains, hot subhumid (moist) to humid (inclusion of perhumid) eco-subregion (15.1)		
	Agro-Climatic Zone (PlanningCommission)	Lower Gangetic Plain Region (III)		
	Agro Climatic Zone (NARP)	New Alluvial Zone (WB-4) Old Aluuvial Zone (WB-3)		
	List all the districts falling under the NARP Zone*(*>50% area falling in the zone)	Cooch behar, Murshidabad, Jalpaiguri, Nadia, Uttar Dinajpur, Malda, Burdwan, Dakshin dinajpur, Hooghly, Malda		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		$25^0$00'39.03" N	$88^0$08'27.95" E	25M
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Regional Research Sub-Station (Old Alluvial Zone), UBKV, Manikchak, Malda- 732 203. West Bengal		
	Mention the KVK located in the district with address	Krishi Vigyan Kendra, PO.Ratua, Malda, Pin-732 205		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	AgroMet Field Unit, Regional Research Station(Old Alluvial Zone), UBKV, Majhian, Patiram – 733 133, Dakshin Dinajpur, West Bengal		

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-September):	1163.8	57	1st week of June	2nd week of October
	NE Monsoon(October-December):	167.0	6	-	-
	Winter (January- February)	214.7	13		
	Summer (March-May)	-	-		
	Annual	1545.5	76		

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 ('000ha)	370.8	295.9	1.6	64.3	0.4	0.6	7.7	0.3	21.5	14.4

1. 4	**Major Soils (common names like red sandy loam deep soils (etc.,)***	**Area ('000 ha)**	**Percent (%) of total**
	Deep clay to clay loam Low Land (Tal)	114.099	30
	Medium sandy loam to loam Medium Land (Diara)	112.188	30
	Deep Clay loam High Land (Barind)	133.851	40 including other land use

1.5	**Agricultural land use**	Area ('000 ha)	Cropping intensity %
	Net sown area	260	182.57
	Area sown more than once	214.7	
	Gross cropped area	474.7	

1.6	**Irrigation**	Area ('000 ha)		
	Net irrigated area	125.13		
	Gross irrigated area	459.83		
	Rainfed area	134.87		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals		-	-
	Tanks /Surface flow irrigation	701	26.2	61.5
	Deep tube well	326	6.4	15.0
	Bore wells-MDTW	18	0.3	0.7
	Lift irrigation schemes	424	9.1	21.3
	Micro-irrigation		-	-
	Other sources (Light DTW)	108	0.6	
	Total Irrigated Area STW	33194	42.6	
	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	-	-	Few blocks are having water quality problems such as arsenic and fluoride
	Critical	4	-	
	Semi- critical	-	-	
	Safe	11	-	
	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) (Specify year 2010-11)

1.7	**Major field crops cultivated**	**Area ('000 ha)**							
		Kharif			***Rabi***				
		Irrigated	**Rainfed**	**Total**	**Irrigated**	**Rainfed**	**Total**	**Summer**	**Grand total**
	Rice	-	135.210	135.210	-	59.980	59.980	3.102 Aus	198.292
	Mustard	-	-	-	-	27.025	27.025	-	27.025
	Wheat	-	-	-	-	41.130	41.130	-	41.130
	Jute	-	-	-	-	-	-	20.387	20.387
	Blackgram	-	-	14.2	-	-	-	-	14.2
	Sugarcane	-	-	-	-	63.697	63.697	-	63.697
	Maize	-	-	4.525	-	-	-	4.525	4.525
	Horticulture crops - Fruits	**Area ('000 ha)**							
		Total							
	Mango	25.0							
	Litchi	1.0							
	Banana	0.7							
	Papaya	0.2							
	Guava	0.3							
	Jackfruit	0.3							
	Horticulture crops - Vegetables	**Total**							

	Potato	12.9
	Cabbage	3.9
	Cauliflower	3.2
	Tomato	2.4
	Peas	0.7
	Medicinal and Aromatic crops	**Total**
	Tulsi	0.4
	Sarpagandha	1.6
	Aswagandha	1.4
	Kalomegh	1.2
	Alovera	0.6

1.8	**Livestock (2007-08)**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Non descriptive Cattle (local low yielding)	273.4	391.8	665.3
	Crossbred cattle	11.6	54.8	66.4
	Non descriptive Buffaloes (local low yielding)	39.5	11.3	50.8
	Descript Buffaloes	-	-	-
	Goat	-	-	975.5
	Sheep	-	-	56.2
	Others (Camel, Pig, Yak etc.)	-	-	-
	Commercial dairy farms (Number)			
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**	
	Commercial Fowl	-	1993.5	
	Backyard Duck	-	418.4	

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	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
		88674	-	-	-	-	-
	ii) 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** (Data Source: Fisheries Department)			-	-	-	
	Others			-	-	-	

1.11 Production and Productivity of major crops (Average of last 5 years: 2004, 05, 06, 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 (Crops to be identified based on total acreage)								
	Paddy	338.025	2500	179.94	3000	9.306	2000	527.271	2660
	Mustard	-	-	24.32	900	-	-	24.32	900
	Wheat	-	-	82.26	2000	-	-	82.26	2000
	Jute	48.928	2400	-	-	-	-	48.928	2400
	Blackgram	10.224	720	-	-	-	-	10.224	720
	Sugarcane	-	-	4458.79	70000	-	-	4458.79	70000
	Maize	-	-	11.31	2500	-	-	11.31	2500
	Major Horticultural crops (Crops to be identified based on total acreage)								
	Mango	-	-			145.00	12500	145.00	12500
	Potato	-	-	283.8	22000	-	-	283.8	22000

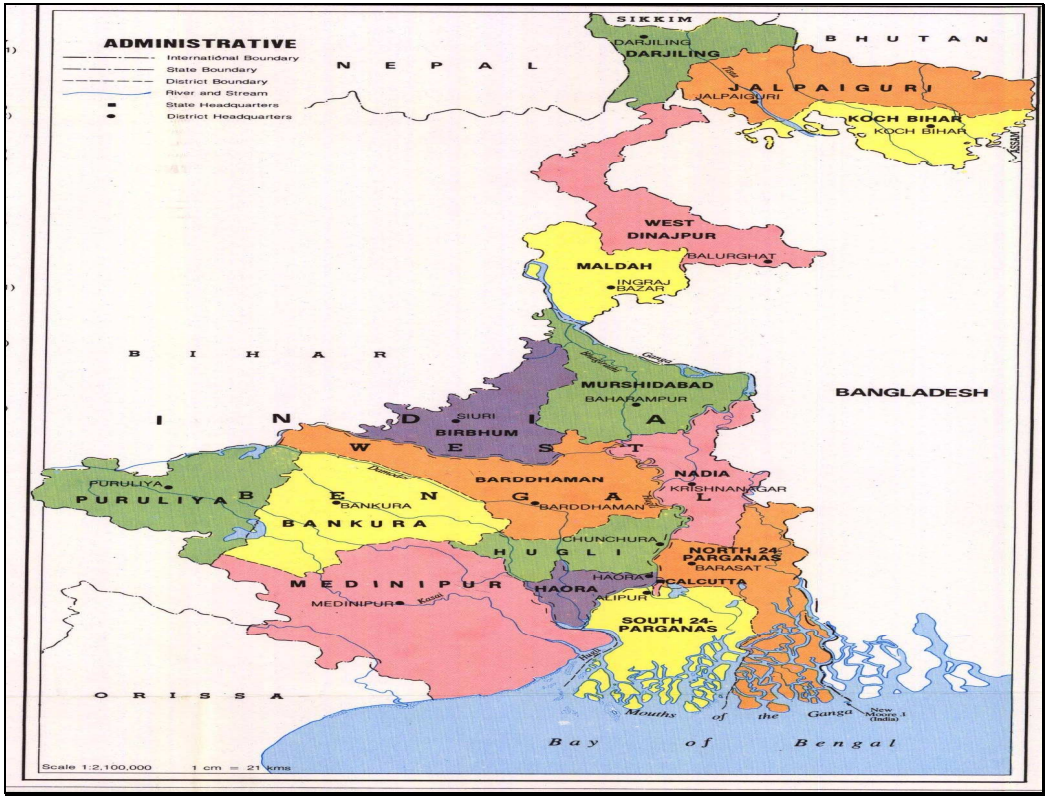
1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	**Rice**	**Mustard**	**Wheat**	**Jute**	**Black gram**	**Potato**
	Kharif- Rainfed	July 1st week to Aug 2nd week	-	-	-	Aug 2nd - 4th week	-
	Kharif-Irrigated	-	-	-	-	-	-
	Rabi- Rainfed	-	-	Nov 1st week to Dec 2nd week	-	-	-
	Rabi-Irrigated	-	Oct 4th week to Nov 2nd week	-	-	-	Nov 1st week to Dec 4th week
	Summer / Pre-kharif	Boro rice – Jan 3rd week to Feb 2nd week	-	-	March 4th week to April 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)	√ Potato late blight .Kharif rice- Stem borer, Leaf folder, Sheath blight, rice blast, stem rot Jute-Stem rot, Bihar Hairy Caterpillar, Mite Mustard_ Aphid, Club root, Leaf spot Wheat – Stem borer	-	-

1.14	**Include Digital maps of the district for**	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

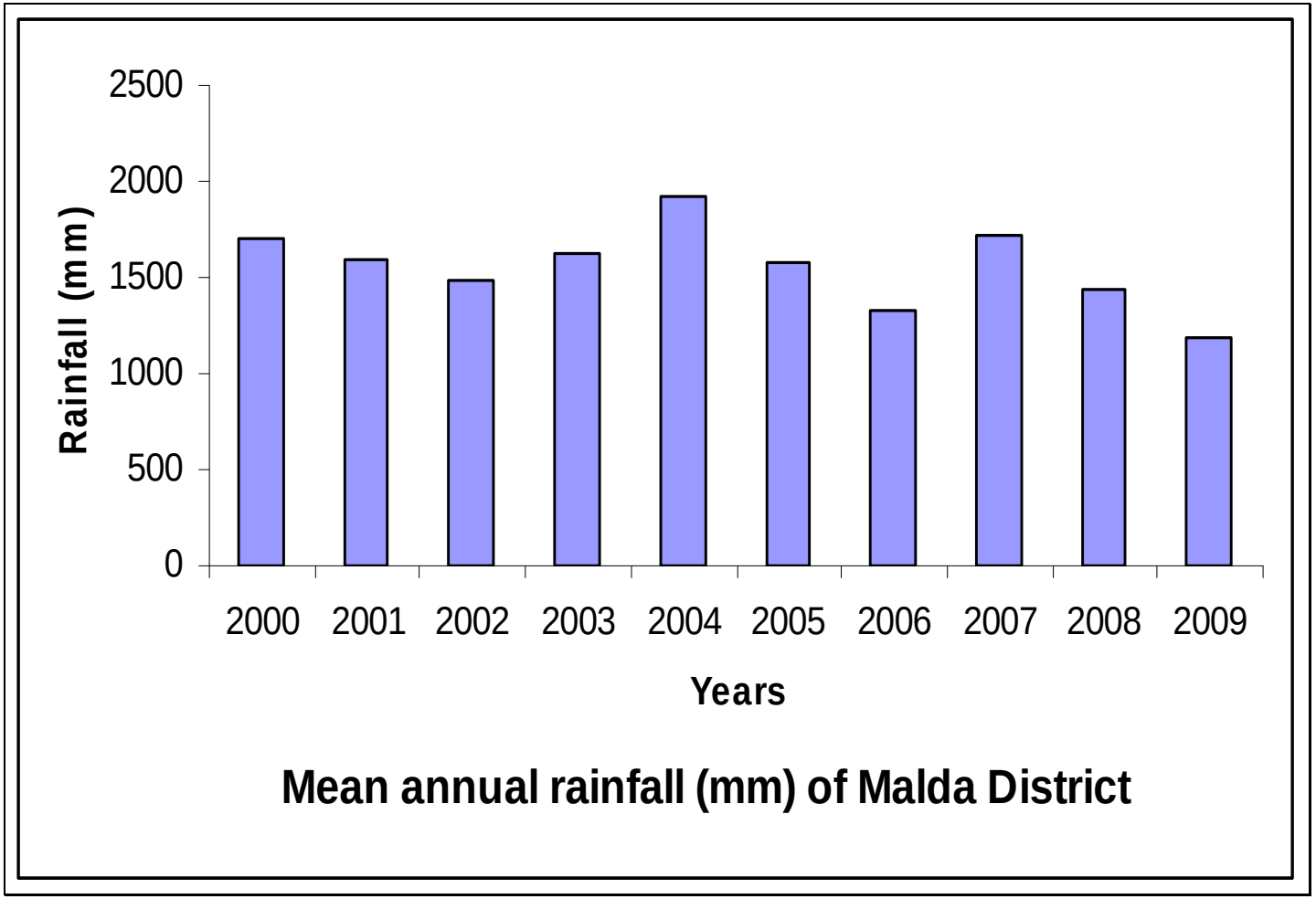
Annexure-1

Location map of Malda district



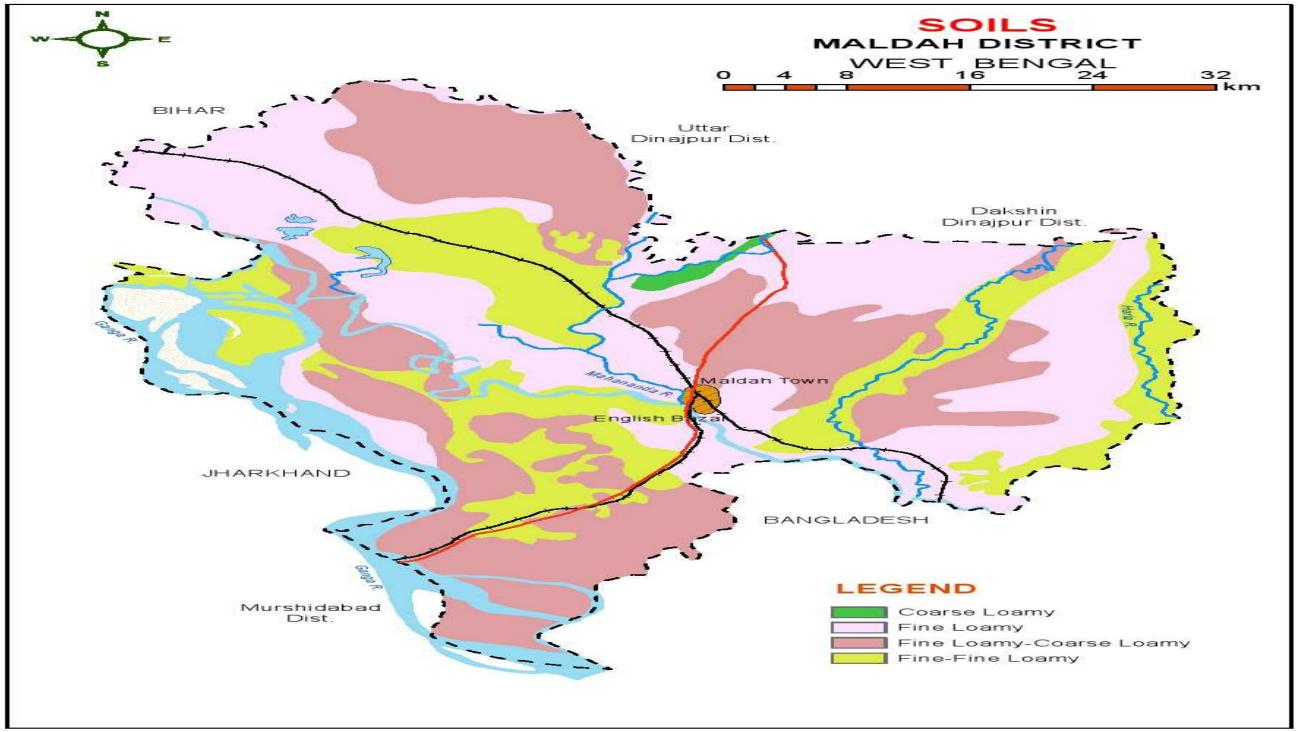
Annexure-2

Mean annual rainfall of Malda district



Annexure-2

Soil map of Malda 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 3rd week of June	Deep clay to clay loam Low Land (Tal)	Maize-Rice	No change	Increase the seed rate by 10% and close spacing of 45 cm	Linkage with seed farms of Department of Agriculture, NSC, WBSC, UBKV for supply of seed
		Rice (aus)-Fallow-Mustard	- do -	Normal Transplanting of 2-3 seedlings/ hill	
		Jute-Rice	- do -	Increase the seed rate by 10% and close spacing of 30 cm	
	Medium sandy loam to loam Medium Land (Diara)	Jute – Rice	- do -	- do -	
		Maize-Blackgram	- do -	-do-	
		Sugarcane	- do -	• Planting 2-3 budded setts • Sett treatment with 0.2% Carbendazim to prevent rot disease	
	Deep Clay loam High Land (Barind)	Jute - Rice	- do -	Increase the seed rate by 10% and close spacing of 30 cm	
		Sugarcane	- do -	• Planting 2-3 budded setts Sett treatment with 0.2% Carbendazim to prevent rot disease	

Conditions			**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	Deep clay to clay loam Low Land	Maize-Rice	No change	Increase seed rate by 20% and closer spacing of 45 cm	Linkage with seed farms of Department of Agriculture, NSC, WBSC, UBKV for
		Rice (aus)-fallow-Mustard	No change	Transplanting with 4-5 seedling / hill	

1st week of July	(Tal)	Jute-Rice	No change	Increase the seed rate by 10% and close spacing of 30 cm	supply of seed
	Medium sandy loam to loam Medium Land (Diara)	Jute - Rice	No change	-do-	
		Maize-Blackgram	No change	Increase seed rate by 20% and closer spacing of 45 cm	
		Sugarcane	No change	• Mulching with sugarcane trash • Ridge and furrow planting • Furrow / sprinkler irrigation	
	Deep Clay loam High Land (Barind)	Jute - Rice	No change	Increase seed rate by 20% and closer spacing of 45 cm	
		Sugarcane	No change	• Mulching with sugarcane trash • Ridge and furrow planting • Furrow / sprinkler irrigation	

Conditions			**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 3rd week of July	Deep clay to clay loam Low Land (Tal)	Maize-Rice	No change	Increase seed rate by 20% and closer spacing of 45 cm	Linkage with seed farms of Department of Agriculture, NSC, WBSC, UBKV for supply of seed
		Rice (aus)-Fallow-Mustard	- do -	Transplanting with 4-5 seedling / hill in case of long duration variety (Lalat, Sabita, swarna masuri)	
		Jute-Rice	- do -	Increase seed rate by 20% and closer spacing of 30 cm	
	Medium sandy loam to loam Medium Land (Diara)	Jute - Rice	No change	-do-	
		Maize-Blackgram	- do -	Increase seed rate by 20% and closer spacing of 45 cm	
		Sugarcane	- do -	• Mulching with sugarcane trash • Furrow / sprinkler irrigation	
	Deep Clay loam High Land (Barind)	Jute - Rice	No change	Increase seed rate by 20% and closer spacing of 30 cm	
		Sugarcane	-do-	• Mulching with sugarcane trash • Furrow / sprinkler irrigation	

Conditions			**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 1st week of August	Deep clay to clay loam Low Land (Tal)	Maize-Rice	No change	Increase seed rate by 20% and closer spacing of 45 cm	Linkage with seed firms of department of Agriculture, NSC, WBSC, UBKV for supply of seed
		Rice (aus)-Fallow-Mustard	- do -	Transplanting with 4-5 seedling / hill in case of long duration variety (Lalat, Sabita, swarna masuri)	
		Jute-Rice	- do -	Increase seed rate by 20% and closer spacing of 30 cm	
	Medium sandy loam to loam Medium Land (Diara)	Jute - Rice	No change	-do-	
		Maize-Blackgram	- do -	Increase seed rate by 20% and closer spacing of 45 cm	
		Sugarcane	- do -	• Mulching with sugarcane trash • Furrow / sprinkler irrigation	
	Deep Clay loam High Land (Barind)	Jute - Rice	No change	Increase seed rate by 20% and closer spacing of 30 cm	
		Sugarcane	- do -	• Mulching with sugarcane trash • Furrow / sprinkler irrigation	

Conditions			**Suggested contingency measures**	
Early season drought (Normal onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc	Deep clay to clay loam Low Land (Tal)	Maize-Rice	Gap filling with improved cultivars if the population is less than 75% of optimum	-
		Rice (aus)-fallow-Mustard	Normal transplanting of 2-3 seedlings/ hill	-
		Jute-Rice	Gap filling with improved cultivars if the population is less than 75% of optimum	-
	Medium sandy loam to loam Medium Land	Jute - Rice	- do -	-
		Maize-Blackgram	-do-	-

	(Diara)	Sugarcane	Gap filling with 2 to 3 budded setts if the population is less than 75% of optimum	• Mulching with sugarcane trash • Furrow/sprinkler irrigation
	Deep Clay loam High Land (Barind)	Jute - Rice	Gap filling with improved cultivars if the population is less than 75% of optimum	-
		Sugarcane	Gap filling with 2 to 3 budded setts if the population is less than 75% of optimum	• Mulching with sugarcane trash • Furrow/sprinkler irrigation

Conditions			**Suggested contingency measures**	
	Major Farming situation	**Normal Crop / Cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period) **At vegetative stage**	Deep clay to clay loam Low Land (Tal)	Maize-Rice	Intercultivation by harrowing	• Spray 2% urea during dry spell • Supplemental irrigation by alternate furrows • Top dressing with 10-20 kg N/ha after relief of dry spell
		Rice (aus)-fallow /Mustard	• Transplanting with 4-5 seedling / hill • Weed control either mechanical or herbicidal	• Supplemental irrigation • Top dressing with 10-20 kg N/ha after relief of dry spell
		Jute-Rice	Intercultivation by harrowing	• Spray 2% urea during dry spell • Supplemental irrigation
	Medium sandy loam to loam Medium Land (Diara)	Jute - Rice	Intercultivation by harrowing	• Spray 2% urea during dry spell • Top dressing of 20-30 kgN/ha after relief of dry spell • Supplemental irrigation
		Maize-Blackgram	Intercultivation by harrowing	• Spray 2% urea during dry spell • Supplemental irrigation by alternate furrows • Conservation furrows for every 3 rows if feasible
		Sugarcane	• Gap filling with 2-3 budded setts if population is less than 75% • Weed control either mechanical or herbicidal	• Mulching with sugarcane trash • Supplemental irrigation by sprinkler • Top dressing of 20-30 kgN/ha after relief of dry spell
	Deep Clay loam High Land	Jute - Rice	Intercultivation by harrowing	• Spray 2% urea during dry spell • Supplemental irrigation

	(Barind)			• Conservation furrows for every 3 rows if feasible
		Sugarcane	• Gap filling with 2-3 budded setts if population is less than 75% • Weed control either mechanical or herbicidal	• Mulching with sugarcane trash • Supplemental irrigation by sprinkler • Top dressing of 20-30 kgN/ha after relief of dry spell

Conditions			**Suggested contingency measures**	
	Major Farming situation	**Normal Crop / Cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**
Mid season drought (long dry spell) At flowering/ fruiting stage	Deep clay to clay loam Low Land (Tal)	Maize-Rice	-	• Spray 2% urea during dry spell • Supplemental irrigation by alternate furrow or micro irrigation system if feasible
		Rice (aus)-Fallow/Mustard	-	-do-
		Jute-Rice	-	Supplemental irrigation by alternate furrow or micro irrigation system if feasible
	Medium sandy loam to loam Medium Land (Diara)	Jute - Rice	-	-do-
		Maize-Blackgram	-	• Spray 2% urea during dry spell • Supplemental irrigation by alternate furrow or micro irrigation system if feasible
		Sugarcane	-	Supplemental irrigation by alternate furrow or micro irrigation system if feasible
	Deep Clay loam High Land (Barind)	Jute - Rice	-	-do-
		Sugarcane	-	Supplemental irrigation by alternate furrow or micro irrigation system if feasible

Conditions			**Suggested contingency measures**	
	Major Farming situation	**Normal Crop / Cropping system**	**Crop management**	**Rabi crop planning**
Terminal drought (Early withdrawal of	Deep clay to clay loam Low Land	Maize-Rice	Supplemental irrigation	Harvest as fodder crop if damage is severe and plan for *rabi* rice

monsoon)	(Tal)	Rice (aus)-Fallow-Mustard	-do-	Plan for *rabi* mustard if damage is very severe
		Jute-Rice	-do-	Plan for early rabi if damage is severe
	Medium sandy loam to loam Medium Land (Diara)	Jute - Rice	-do-	-do-
		Maize-Blackgram	-do-	Harvest as fodder crop if damage is severe plan for *rabi* blackgram
		Sugarcane	• Apply 40-50 kg N/ha after relief of dry spell • Spray 2% urea	Ratoon the crop if the damage is severe and plan for ratoon crop cultivation
	Deep Clay loam High Land (Barind)	Jute - Rice	-do-	Plan for *rabi* rice if damage is severe
		Sugarcane	-do-	Ratoon the crop if the damage is severe and plan for ratoon crop cultivation

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	NA				

Condition			**Suggested Contingency measures**		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Limited release of water in canals due to low rainfall	NA				

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Non release of water in canals under delayed onset of monsoon in catchment	NA				

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Medium sandy loam to loam Medium Land (Diara)	Maize-Rice/Wheat/Mustard	No Change	• Alternate furrow irrigation • Irrigation at critical crop growth stages	• Linkage with NFSM, ISOPOM for seed • Link watersheds, NRGES farm pond technology
		Jute-Rice/Wheat/Mustard	-do-	-do-	
		Maize-Blackgram/Potato	-do-	-do-	
		Sugarcane	-do-	-do-	
	Deep Clay loam High Land (Barind)	Maize-Rice/Wheat/Mustard	Maize-Wheat/ Mustard	• Alternate furrow irrigation • Irrigation at critical crop growth stages • Mulching	
		Jute-Rice/Wheat/Mustard	Jute-Wheat/Mustard	-do-	
		Maize-Blackgram/Potato/Cole crops	No change	-do-	
		Sugarcane	-do-	• Alternate furrow irrigation • Irrigation at critical crop growth stages • Mulching with sugarcane trash	

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Insufficient groundwater recharge due to low rainfall	Medium sandy loam to loam Medium Land (Diara)	Maize-Rice/Wheat/Mustard	Maize-Wheat/Mustard	• Alternate furrow irrigation • Timely interculture operation for weed control • Irrigation at critical crop growth stages	• Linkage with NFSM, ISOPOM for seed • Link watersheds, NRGES farm pond technology
		Jute-Rice/Wheat/Mustard	Jute- Wheat/Mustard	-do-	
		Maize-Blackgram-Potato	No change	-do-	
		Sugarcane	-do-	• Mulching with sugarcane trash • Sprinkler method of irrigation	
	Deep Clay loam High Land (Barind)	Maize-Rice-Wheat/Mustard	Maize-Wheat/Mustard	• Alternate furrow irrigation • Timely interculture operation for weed control • Irrigation at critical crop growth stages through farm pond water/ other sources • Mulching in between crop rows after top dressing of N	
		Jute-Rice-Wheat/Mustard	Jute- Wheat/Mustard	-do-	
		Maize-Blackgram-Potato	No change	-do-	
		Sugarcane	-do-	• Mulching with sugarcane trash • Sprinkler method of irrigation	

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 excess water as early as possible • Postpone topdressing N fertilizers till water recedes	• Drain excess water • Top dressing of N after removal of excess water	• Drain excess water • Spray 2% brine solution to prevent premature germination in field	• Shift produced to safer place • Dry the grain to proper moisture content before

	• Take up gap filling with available seedlings from nursery or by splitting tillers from surviving hills		• Harvest the crop after drying and keep the produce under shed with airy places	bagging and storage
Mustard	• Drain excess water • Take interculture operation at optimum soil moisture condition to loosen and aerate the soil and to control weeds • Spray mancozeb 0.25% to control fungal diseases	• Drain excess water • Take interculture operation at optimum soil moisture condition to loosen and aerate the soil and to control weeds • Spray mancozeb 0.25% to control fungal diseases	• Drain excess water • Allow the crop to dry completely before harvesting	• Drain excess water • Dry the grain to proper moisture content before bagging and storage
Wheat	-do-	-do-	-do-	-do-
Jute	• Drain excess water • Gap filling with improved variety if the population is less than 50% of optimum • Take interculture operation at optimum soil moisture condition to loosen and aerate the soil and to control weeds	• Drain excess water • Take interculture operation at optimum soil moisture condition to loosen and aerate the soil and to control weeds	• Drain excess water • Harvest the crop on clear sunny day	-
Blackgram	• Drain excess water • Take interculture operation at optimum soil moisture condition to loosen and aerate the soil and to control weeds	• Drain excess water • Take interculture operation at optimum soil moisture condition to loosen and aerate the soil and to control weeds	• Drain excess water • Allow the crop to dry completely • Spray carbendezim@ 1 g/l of watre	• Quick drying followed by threshing • Maintain optimum moisture content before bagging and storage
Sugarcane	• Drain excess water • Propping of fallen plants for support	• Drain excess water • Propping of fallen plants for support	Drain excess water	-
Horticulture				
Mango	Drain excess water	Drain excess water	• Drain excess water • Harvest mature produce on a clear sunny day • Fallen fruit may be collected,	• Store fruits in well ventilated temporary structures before marketing • Market the fruits as soon as

			graded and marketed if feasible	possible
Potato	• Drain excess water • Postpone topdressing N fertilizers till water recedes	Drain excess water	Drain excess water	
Cabbage/ Cauliflower	• Drain excess water • Three sprays of 0.1% Ammonium molybdate 15, 30 and 45 days after transplanting	• Drain excess water • Blanching i.e covering the curd through tying the outer leaves up over the curd to improve curd colour and quality	Early harvesting	Large leaves are trimmed away leaving only sufficient jacket leaves to protect the curd from bruising and other mechanical injury in transport
Tomato	• Drain excess water • Gap filling with the seedlings raised from the community nursery	• Drain excess water • Staking of fallen plants to provide support • Remove wilt affected plants	• Drain excess water • Staking of fallen plants to provide support Harvest the produce on a clear sunny day	Market the produce as early as possible
Condition-Heavy rainfall with high speed winds in a short span				
Rice	• Drain excess water as early as possible • Postpone topdressing N fertilizers till water recedes • Take up gap filling with available seedlings from nursery or by splitting tillers from surviving hills	• Drain excess water • Top dressing of N after removal of excess water	• Drain excess water • Spray 2% brine solution to prevent premature germination in field • Harvest the crop after drying and keep the produce under shed with airy places • Tie the fallen plants in groups with the help of leaves to protect the panicles	• Shift produced to safer place • Dry the grain to proper moisture content before bagging and storage
Mustard	• Drain excess water • Take up inter cultivation at optimum moisture content to aerate the soil and to control the weeds	• Drain excess water • Take up inter cultivation at optimum moisture content to aerate the soil and to control the weeds	• Drain excess water • Harvest the crop on clear sunny day	• Drain excess water • Dry the grain to proper moisture content before bagging and storage
Wheat	Drain excess water Take up intercultivation at optimum moisture content to aerate the soil	Drain excess water Take up inter cultivation at optimum moisture content to aerate the soil	Drain excess water Harvest the crop on clear sunny day ear sunny day	-do-

	and to control the weeds	and to control the weeds		
Jute	-do-	-do-	-do-	-do-
Blackgram	-do-	-do-	-do-	-do-
Sugarcane	• Drain excess water as soon as possible • Gap fill with 2-3 budded sets if gaps are more	• Drain excess water as soon as possible • Gap fill with 2-3 budded sets if gaps are more • Propping the fallen plants to get support	• Drain excess water as soon as possible • Propping the fallen plants to get support	-
Horticulture				
Mango	Drain excess water	Drain excess water	• Drain excess water • Harvest mature produce on a clear sunny day • Fallen fruit may be collected, graded and marketed if feasible	• Store fruits in well ventilated temporary structures before marketing • Market the fruits as soon as possible
Potato	• Drain excess water • Postpone topdressing N fertilizers till water recedes	Drain excess water	Drain excess water	
Cabbage/ Cauliflower	• Drain excess water • Three sprays of 0.1% Ammonium molybdate 15, 30 and 45 days after transplanting	• Drain excess water • Blanching i.e covering the curd through tying the outer leaves up over the curd to improve curd colour and quality	Early harvesting	Large leaves are trimmed away leaving only sufficient jacket leaves to protect the curd from bruising and other mechanical injury in transport
Tomato	• Drain excess water • Gap filling with the seedlings raised from the community nursery	• Drain excess water • Staking of fallen plants to provide support • Remove wilt affected plants	• Drain excess water • Staking of fallen plants to provide support • Harvest the produce on a clear sunny day	Market the produce as early as possible
Condition-Outbreak of pests and diseases due to unseasonal rains				
Rice	Protection against leaf blast with Tricyclazole@ 1 ml/l	Protect against bacterial leaf blight with Hexaconazole @1 ml/l	• Protect against bacterial leaf blight with Hexaconazole@ 1 ml/l	Protection against leaf blast with Tricyclazole@ 1ml/l

			• Spray Carbendazim 0.1% to prevent seed disculouration / grain spot	
Horticulture				
Mango	• Spray Imadacloprid 0.3 ml or Dimethoate 1 ml/l to control leaf hopper • Drench the seedlings with COC 0.3% against root rot	Spray Imadacloprid 0.3 ml or Dimethoate 1 ml/l to control leaf hopper	• Spray Dithane M-45 3gm/l or Carbendazim 1gm/l against anthracnose • Spray sulphur 0.5% to control powdery mildew	Maintain aeration in storage to prevent fungal infection and blackening of fruits
Potato	-	Spray metalaxyl + mancozeb mixture @ 1.5 g/l twice at 10 days interval to protect against late blight disease	Spray metalaxyl + mancozeb mixture @ 1.5 g/l twice at 10 days interval to protect against late blight disease	Dehaulming of affected parts and destroy Severely infested produce is unfit for seed purpose
Cabbage/ Cauliflower	Spraying of Profenophos @ 0.1% or Cypermethrin @ 0.1% with sticker to control cabbage borer or diamond back moth	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.	-	-
Tomato	Drench the seedlings with COC 0.3% against damping off	Spray sulphur 0.5% to control powdery mildew	Spray mancozeb 1.5g/l to control alternaria blight on fruits	-

2.3 Floods

Condition- Transient water logging/ partial inundation				
Crop		**Suggested contingency measures**		
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Rice	• Drain water, after recession of flood • Gap fill with the seedlings raised either from community nurseries or split the tillers from	• Drain excess water • Gap fill with the seedlings raised either from community nursiries or split the tillers from surviving hills • Apply booster dose of	Alternate crops like kalai, mustard, wheat, lentil, potato, gram, maize and boro paddy can be taken up if the damage is very severe	Early harvest

	surviving hills • Apply booster dose of nutrients(30-50 kgN/ha) • Micronutrient deficiency corrections for Zn and Fe with foliar application of 0.2% $ZnSo_4$ and $FeSo_4$ 2-3 times at 4-5 days interval	nutrients(30-50 kgN/ha) • Spray zinc sulphate 0.2% if it is less than 45 days after transplanting		
Condition-Continuous submergence for more than 2 days				
Rice	• Drain excess water • Transplant seedlings raised from community nursery / staggered nursery or by splitting the tillers from surviving hills	• Drain excess water • Transplant seedlings raised from community nursery / staggered nursery or by splitting the tillers from surviving hills	Plan for alternate crops like Kalai, Mustard, Wheat, Lentil, Potato, Gram, Maize and Boro paddy For early flood, supply of seed/fertilizer minikit as follows: Paddy seed@5 kg/kit, Urea @10 kg/kit Kalai @ 4 kg/kit For late flood: Boro paddy @6 kg/kit Mustard @ 1kh/kit Wheat @15kg/kit Potato@15 kg/kit Lentil @ 2kh/kit Gram @ 4 kg/kit	
Sea water intrusion	NA			

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

Extreme event type	Suggested contingency measures			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave	NA			
Cold wave	NA			
Frost	NA			
Hailstorm	NA			
Cyclone	NA			

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Drought			
Feed and fodder availability	Preserve the surplus feeds and fodder through hay and silage making	Provide , hay, silage and urea straw treated feed to dairy animals	Grow drought tolerant fodder variety in barren land to meet crisis
Drinking water	Store hygienic drinking water and make silage of fodder to retain water	Provide fresh water and green fodder as silage to reduce the water intake	Supply adequate fresh water to avoid heat strokes
Health and disease management	Vaccination of dairy animals against infectious diseases.	Keep animal in cool place to avoid heat stress and strokes.	Give antistress drug and preventive medicinal supplement to dairy animals.
Floods			
Feed and fodder availability	Store the feed and fodder in upland through silage	Avoid damp and moldy feed and fodder to dairy animals.	Dry the stored dampy feeds and fodder before feeding to dairy animals.
Drinking water	Store hygienic drinking water for dairy animals	Provide hygienic and chlorinated water to dairy animals.	Supply chlorinated fresh water to avoid dihorea and dysentery to dairy animals.
Health and disease management	Vaccination of dairy animals against infectious diseases.	Keep the animals in upland areas to avoid drowning.	Provide preventive anti diahorea vitamin supplement.
Cyclone	NA		
Heat wave and cold wave	NA		

2.5.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	**During the event**	**After the event**	
Drought				
Shortage of feed ingredients	Preserve the surplus feed ingredient of concentrate feed	Provide the low cost CF with locally available resources	-	-
Drinking water	Store plenty of fresh water	Supply stored fresh and chlorinated water	-	-
Health and disease management	Vaccination of poultry against infectious diseases	Keep birds in cool and shady place to avoid heat strokes and stress.	Give anti stress drug and medicinal supplement	-
Floods				
Shortage of feed ingredients	- do -	- do -	- do -	-
Drinking water	- do -	- do -	- do -	-
Health and disease management	- do -	-do-	- do -	-
Cyclone	-			
Heat wave and cold wave	-			

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
1) Drought			
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	Reduce stocking density & harvesting fish	Apply KMNO4	Supply water from other ponds and water sources.
2) Floods			
B. Aquaculture			

(i) Inundation with flood water	Harvesting fish or reduce stocking density & pen erected	Netting and keep in cage	Application of lime
(ii) Water contamination and changes in water quality	Application of lime@200kg/hawater body	Netting and keep in cage	Application of lime@200kg/hawater body
(iii) Health and diseases	Application of CIFAX@1 lit/ha-m of water	-	Application of CIFAX@1 lit/ha-m of water
(iv) Loss of stock and inputs (feed, chemicals etc)	Feed and chemicals should be stocked in room with care.	-	Purchase low cost input
(v) Infrastructure damage (pumps, aerators, huts etc)	Keep in concrete house or protected area.	-	Repair infrastructure
(vi) Any other	-	-	-
3. Cyclone / Tsunami			
B. Aquaculture			
(i) Overflow / flooding of ponds	Harvesting or reducing stocking density, dyke may be constructed.	-	Application of lime
(ii) Changes in water quality (fresh water / brackish water ratio)		-	
(iii) Health and diseases	Application of CIFAX or lime	-	Application of CIFAX or lime
4. Heat wave and cold wave			
B. Aquaculture			
(i) Changes in pond environment (water quality)	Application of lime, stop manuring	-	Application of lime, harvesting fish
(ii) Health and Disease management	Provide shade	Provide shade	Application of CIFAX & Lime
(iii) Any other			