

State: WEST BENGAL
Agriculture Contingency Plan for District: DARJEELING

1.0 District Agriculture profile				
1.1	Agro-Climatic/Ecological Zone			
	Agro Ecological Sub Region (ICAR)	Eastern Himalayas, Warm Perhumid Eco-Region (16.2)		
	Agro-Climatic Zone (Planning Commission)	Eastern Himalayan Region (II)		
	Agro Climatic Zone (NARP)	Hill Zone (WB-1)		
	List all the districts or part thereof falling under the NARP Zone	Jalpaiguri, Darjiling,		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		27°02'09.63 "N	88°15'45.63" E	2134 M
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Regional Research Station (Hill Zone), U.B.K.V, Kalimpong -734301		
	Mention the KVK located in the district	Darjeeling Krishi Vigyan Kendra Krishi Vigyan Kendra B.C.K.V. Kalimpong, Darjeeling 734 301, 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):	1220	32	Second week of June	First week of September
	NE Monsoon(October - December):	100	15	Second week of October	Third week of November
	Winter (January - February)	130	2		
	Summer (March - May)	225	-		
	Annual	1675	49		

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)	325.46	160.14	124.5	37.2	1.0	1.8	2.0	2.49	13.34	3.8

1.4	Major Soils (common names like red sandy loam deep soils (etc.,))*	Area ('000 ha)	Percent (%) of total geographical area
	Medium deep to very deep fine loamy soils (hill- brown forest soils)	110.48	35.0
	Sandy loam soils (Medium lands to foot hills)	109.31	34.7
	Shallow to medium deep Loamy soils(plains)	95.10	30.0
	Others (specify):	-	-

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	143.86	122.48
	Area sown more than once	32.34	
	Gross cropped area	176.20	

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	8.94		
	Gross irrigated area	3.67		
	Rainfed area	46.000		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals			
	Tanks	-	-	-
	Open wells	48	0.17	-
	Bore wells	588	2.23	-
	Lift irrigation schemes	128	4.16	-
	Micro-irrigation	16	4.15	-
	Other sources (please specify)	780	10.72	-
	Total Irrigated Area			
	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	Not available	-	Not available

	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) (2008-09)

1.7	Major field crops cultivated	Area ('000 ha)							Summer	Grand total
		<i>Kharif</i>			<i>Rabi</i>					
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total			
	Rice	-	31.4	31.4	-	2.41	2.41	0.67	34.48	
	Maize	-	14.6	14.6	-	-	-	-	14.6	
	Wheat	-	-	-	-	1.5	1.5	-	1.5	
	Oilseed (Mustard, Linseed)	-	-	-	-	14.3	14.3	-	14.3	
	-	-	-	-	-	-	-	-	-	

Horticulture crops - Fruits	Area ('000 ha)
	Total
Pineapple	124.9
Mandarin	0.5
Other citrus	5.7
Banana	3.3
Litchi	3.0
Horticulture crops - Vegetables	Total
Cucumbers	65.0
Brinjal	46.4
Cabbage	29.2
Cauliflower	26.2
Radish	13.6
Medicinal and Aromatic crops	-
Plantation crops	-
Tea	21.3
Ginger	2.2

	Chillies (dry)	0.5
	Potato	6.7
	Large cardamom	4.8

1.8	Livestock (2007-08)	Male ('000)	Female ('000)	Total ('000)		
	Non descriptive Cattle (local low yielding)	76.4	127.0	203.4		
	Crossbred cattle	20.4	64.5	84.9		
	Non descriptive Buffaloes (local low yielding)	2.0	4.4	6.4		
	Goat	-	-	248.4		
	Sheep	-	-	0.9		
	Others (Camel, Pig, Yak etc.)	-	-	-		
	Commercial dairy farms (Number)			09 (number)		
1.9	Poultry	No. of farms	Total No. of birds ('000)			
	Commercial	-	357.8			
	Backyard	-	162.8			
1.10	Fisheries (Data source: Chief Planning Officer) : Not applicable					
	A. Capture					
	i) Marine (Data Source: Fisheries Department)	No. of fishermen	Boats		Nets	Storage facilities (Ice plants etc.)
			Mechanized	Non-mechanized		
		-	-	-	-	-
	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)	1817.0	-		159.5		
Others	1817.0	-		159.5		

1.11 Production and Productivity of major crops (Average of last 5 years: 2004, 05, 06, 07, 08, 09)

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)
	Rice	48.7	1673	9.3	1576	2.6	1625	60.7	4874
	Maize	29.2	2300	-	-	-	-	29.2	2300
	Wheat	-	-	4.7	1700	-	-	4.7	1700
	Millet (Kodo millet)	0.8	1600	-	-	-	-	0.8	1600
	Rapeseed	-	-	0.5	600	-	-	0.5	600
	Vegetable (Cabbage, Cauliflower, Radish etc.)	2.0	7500	1.012	1000	1.40	7200	4.43	15700
	Chilli	0.3	750	-	-	-	-	0.30	750
	Ginger	0.6	3100	-	-	-	-	0.62	3100
	Turmeric	0.2	1500	-	-	-	-	0.15	1500
	Cardamum	-	245	-	-	-	-	-	245
	Potato	-	-	113.10	15700	-	-	113.10	15700

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Rice	Maize	Turmeric and Ginger (sole & intercrop)	Wheat	Kodo Millet	Mustard
	Pre-Kharif	-	4 th week of Feb to March 4 th week	March 2 nd week to April 2 nd week	-	-	-
	Kharif- Rainfed	Aman rice transplanted: July 1 st week to 4 th week	-		-	June 1 st week to July 1 st week	-
	Kharif-Irrigated	-	-		-	-	-
	Rabi- Rainfed	-	-		Nov 2 nd week to Dec 2 nd week	-	Sept 1 st week to Oct 4 th week
	Rabi-Irrigated	-	-		-	-	-

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

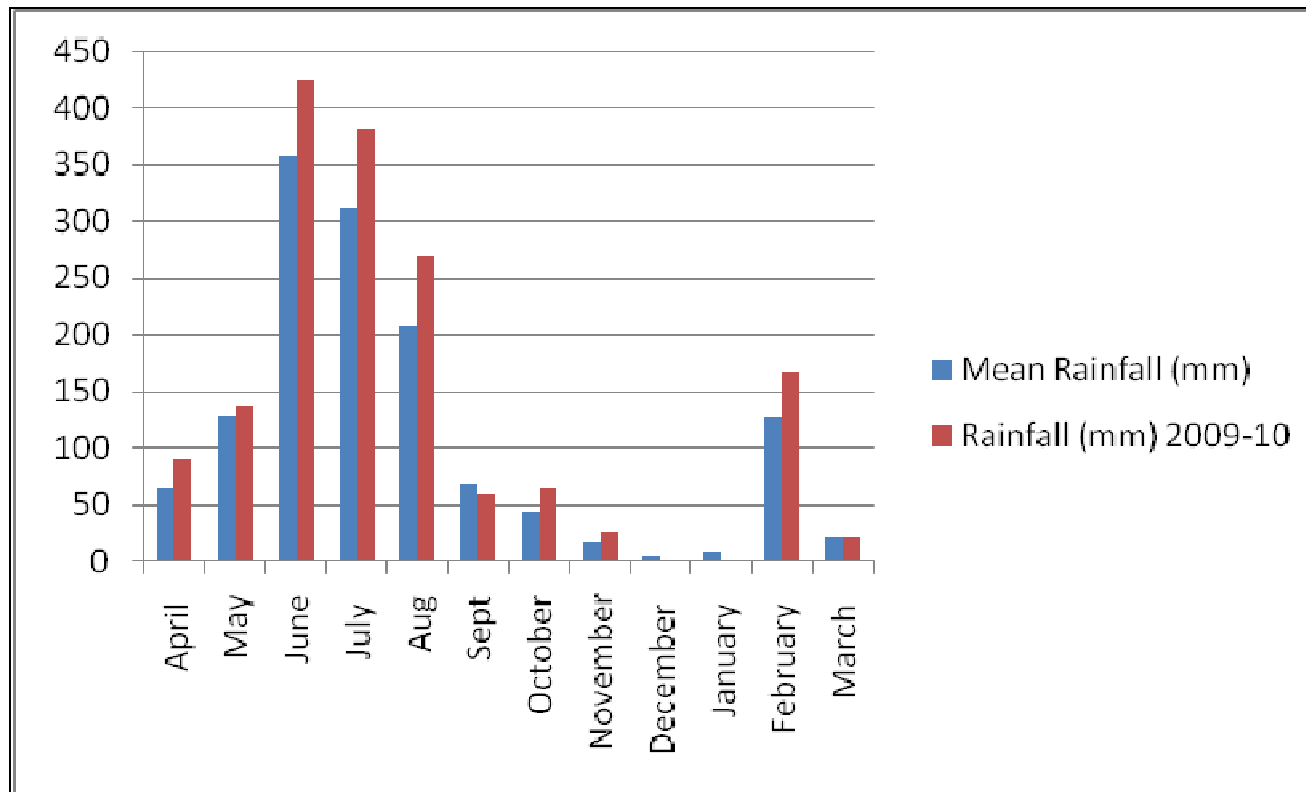
1.14	Include Digital maps of the district for	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

Annexure I

Location map of Darjeeling district



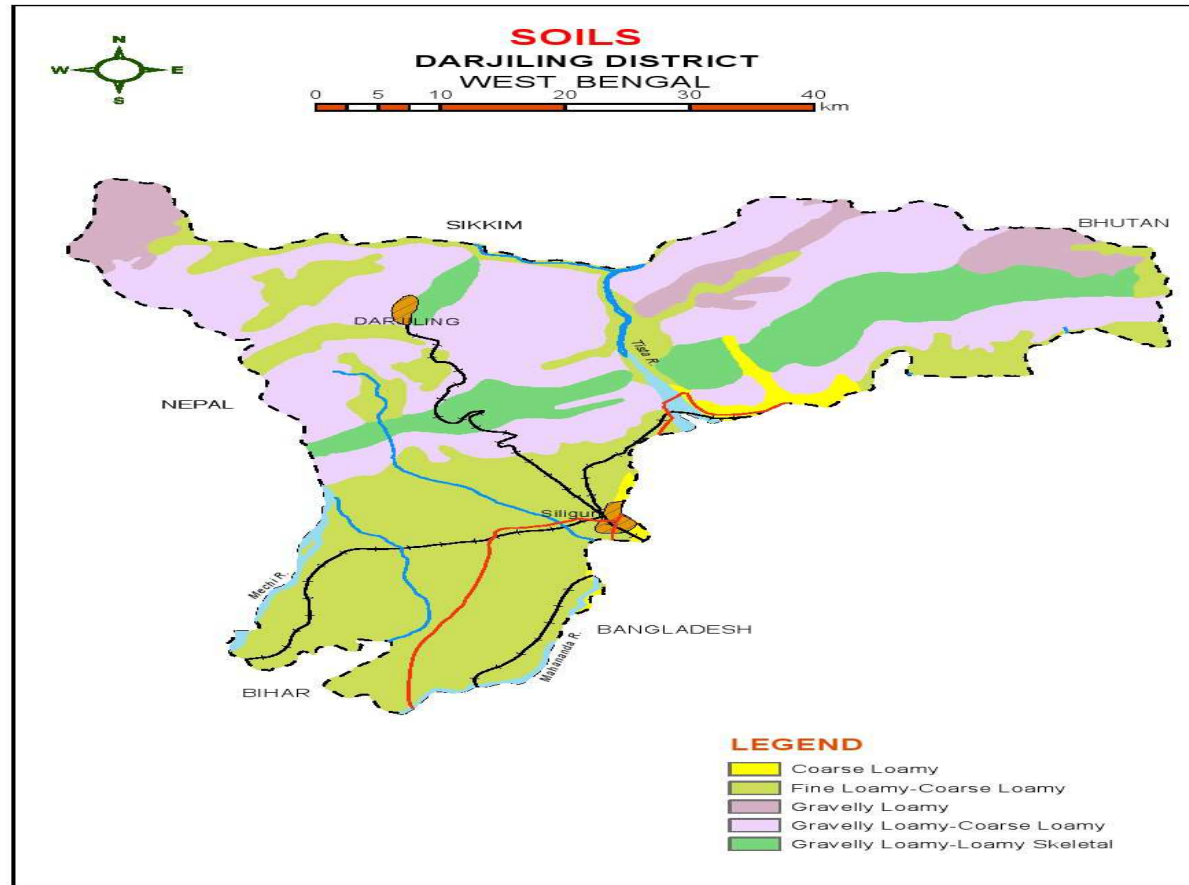
Annexure – II



Mean monthly rainfall of Darjeeling district

Annexure – III

Soil map of darjeeling district



Source: NBSS & LUP Regional Centre, Kolkata

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 2 weeks 4 th week of June	Medium deep to very deep fine loamy soils (hill-brown forest soils)	Maize -Wheat /Mustard / Vegetable (cole crop)	No change	Normal package of practices given by UBKV	Linkage with seed farms, Department of agriculture, WBSC, NSC, UBKV for supply of seed
		Aman rice transplanted – Vegetable (cole crops) / Mustard	No change. Prefer short duration varieties like Annada or Satabdi	Transplanting with 2-3 seedlings / hill	
		Kodo millet	No change	-	
	Sandy loam soils (Medium lands & terai land)	Maize (pre-kharif) - Mustard	No change	Normal package of practices given by UBKV	
		Aman rice transplanted – Vegetable / Mustard	No change	Normal transplanting of 2-3 seedlings/ hill	

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 4 weeks	Medium deep to very deep fine loamy soils (hill-	Maize -Wheat /Mustard / Vegetable (cole	No change	Normal package of practices given by UBKV	Linkage with seed farms, Department of agriculture, WBSC, NSC,

2 nd week of July	brown forest soils)	crop)			UBKV for supply of seed
		Aman rice transplanted – Vegetable (cole crops) / Mustard	No change. Prefer short duration varieties like Annada or Satabdi	Transplanting with 2-3 seedlings / hill	
		Kodo millet	No change	-	
	Sandy loam soils (Medium lands & terai land)	Maize (pre-kharif) - Mustard	No change	Normal package of practices given by UBKV	
		Aman rice transplanted – Vegetable / Mustard	No change	Normal transplanting of 2-3 seedlings/ hill	

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	Medium deep to very deep fine loamy soils (hill-brown forest soils)	Maize -Wheat /Mustard / Vegetable (cole crop)	No change	Normal package of practices given by UBKV	Linkage with seed farms, Department of agriculture, WBSC, NSC, UBKV for supply of seed
		Aman rice transplanted – Vegetable (cole crops) / Mustard	No change. Prefer short duration varieties like Annada or Satabdi	Transplanting with 2-3 seedlings / hill	
		Kodo millet	No change	-	
	Sandy loam soils (Medium lands & terai land)	Maize (pre-kharif) - Mustard	No change	Normal package of practices given by UBKV	
		Aman rice transplanted – Vegetable / Mustard	No change	Normal transplanting of 2-3 seedlings/ hill	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Agonomic measures	Remarks on Implementation
Delay by 8 weeks 2 nd week of August	Medium deep to very deep fine loamy soils (hill-brown forest soils)	Maize -Wheat /Mustard / Vegetable (cole crop)	No change	Normal package of practices given by UBKV	Linkage with seed farms, Department of agriculture, WBSC, NSC, UBKV for supply of seed
		Aman rice transplanted – Vegetable (cole crops) / Mustard	No change. Prefer short duration varieties like Annada or Satabdi	Transplanting with 2-3 seedlings / hill	
		Kodo millet	No change	-	
	Sandy loam soils (Medium lands & terai land)	Maize (pre-kharif) - Mustard	No change	Normal package of practices given by UBKV	
		Aman rice transplanted – Vegetable / Mustard	No change	Normal transplanting of 2-3 seedlings/ hill	

Condition			Suggested contingency measures	
Early season drought (Normal onset)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measues
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Medium deep to very deep fine loamy soils (hill- brown forest soils)	Maize -Wheat /Mustard / Vegetable (cole crop)	Gap filling with improved varieties if the population is less than 50% of optimum	Spray 2% urea during the dry spell
		Aman rice transplanted – Vegetable (cole crops) / Mustard	<ul style="list-style-type: none"> Staggered nursery with short duration variety like Annada or Satabdi. Transplanting with 2-3 seedlings / hill Timely weed control (mechanical or herbicides) 	-
		Kodo millet	Intercultivation to control weeds	-

	Sandy loam soils (Medium lands & terai land)	Maize (pre-kharif) - Mustard	Gap filling with improved varieties if the population is less than 50% of optimum Timely weed control (mechanical or herbicides)	<ul style="list-style-type: none"> • Intercultivation to control weeds and conserve moisture • Spray 2% urea during the dry spell
		Aman rice transplanted – Vegetable / Mustard	<ul style="list-style-type: none"> • Staggered nursery with short duration variety like Annada or Satabdi to fill up the gaps • Transplanting with 2-3 seedlings / hill • Weed control 	-

Condition			Suggested contingency measures	
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures
At vegetative stage	Medium deep to very deep fine loamy soils (hill-brown forest soils)	Tea	<ul style="list-style-type: none"> • By pruning/skiffing plants transpiration loss can be reduced. • Shade tree provides resistant to excessive radiation & heat. 	<ul style="list-style-type: none"> • Mulching with pruned litters • Foliar application of Potassium in the form of Muriate of potash @ 1-2% at the interval of 15-21 days during drought. • Irrigation by sprinkler & surface irrigation
		Cardamom	Provide shade	<ul style="list-style-type: none"> • Apply life saving irrigation • Mulching with coir mat, tree twigs etc • Apply well decomposed forest litter or Neem cake for moisture retention.

Condition			Suggested contingency measures	
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures
At flowering/ fruiting stage	Medium deep to very deep fine loamy soils (hill-brown forest soils)	Tea	Watering followed by mulching is recommended for survival of tea plants as well as to reduce the excessive dropping of flower buds and fruits	-
		Cardamom	Aeration should be provide	<ul style="list-style-type: none"> • Mulching with leaves of shade tree • Earthing up

Condition			Suggested contingency measures
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Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning
	Medium deep to very deep fine loamy soils (hill-brown forest soils)	Tea		Delay the crop maturity and harvesting. Foliar application of Potash 1% and MgSO ₄ 1% followed by micro nutrient spraying thrice at 15 days interval
		Cardamom	No effect	-

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	Medium deep to very deep fine loamy soils (hill-brown forest soils)	Rice - Potato-/ Mustard/Wheat/Late Vegetable	No change	<ul style="list-style-type: none"> Adopt SRI method for rice cultivation Irrigation at critical crop growth stages Alternate wetting and drying upto primordial initiation stage to save water Efficient weed management practices Adopt alternate furrow irrigation for potato / Vegetable 	-
	Sandy loam soils (Medium lands to foot hills)	Potato – Maize-Fallow	No change	Adopt alternate furrow irrigation for potato Mulching for maize	

	Shallow to medium deep Loamy soils(plains)	Rice- early potato/ Mustard/ Wheat/Vegetable	No change	<ul style="list-style-type: none"> • Adopt SRI method for rice cultivation • Irrigation at critical crop growth stages • Alternate wetting and drying upto primordial initiation stage to save water • Efficient weed management practices • Adopt alternate furrow irrigation for potato / Vegetable 	
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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	NA				

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	NA				

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 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 	<ul style="list-style-type: none"> • Drain excess water • Top dressing of N after removal of excess water 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Shift produced to safer place • Dry the grain to proper moisture content before bagging and storage
Wheat	<ul style="list-style-type: none"> • Drain excess water • Postpone topdressing N fertilizers till water recedes 	Drain excess water	Immediate harvesting & kept under shade with airy place	Transfer the produce to safe place
Mustard	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Drain excess water • Allow the crop to dry completely before harvesting 	<ul style="list-style-type: none"> • Drain excess water • Dry the grain to proper moisture content before bagging and storage
Maize	<ul style="list-style-type: none"> • Drain the excess water • Avoid the topdressing and spraying schedule until the water recedes • Spray Dimethoate 30 EC (2ml per litre of water) and Dicofol 1805 EC (3ml per litre of water) against the insect pest attack. 	<ul style="list-style-type: none"> • Drain the excess water • Avoid the topdressing and spraying schedule until the water recedes • Spray Mancozeb (2 gm per litre of water) fungicide against the damping off disease. • Spray Dimethoate 30 EC (2ml per litre of water) and Dicofol 1805 EC (3ml per litre of water) against the insect 	<ul style="list-style-type: none"> • Drain the excess water. • Harvesting process should be completed at the earliest and they should be carried out to the safer places quickly to dry out the produce. 	Earliest arrangement should be done to dry out and sale out the post harvest product

Horticulture				
Vegetables	<ul style="list-style-type: none"> • Drain the excess water. • Spray Mancozeb (2 gm per litre of water) and Copper oxychloride (4 gm per litre of water) alternately as fungicide against the damping off disease. • Spray Dimethoate 30 EC (2ml per litre of water) and Dicofol 1805 EC (3ml per litre of water) against the insect pest attack. 	<ul style="list-style-type: none"> • Drain the excess water. • Spray Mancozeb (2 gm per litre of water) and Copper oxychloride (4 gm per litre of water) alternately as fungicide against the damping off disease. • Spray Dimethoate 30 EC (2ml per litre of water) and Dicofol 1805 EC (3ml per litre of water) against the insect pest attack. 	Drain the excess water.	Earliest arrangement should be done to dry out and sale out the post harvest product
Tea	<ul style="list-style-type: none"> • A good drainage practice is to be adopted as early as possible. • Silt deposition on leaves and branches should be removed by spraying ordinary water. 	Provide drainage to promote vegetative growth thereby inhibiting reproductive phase	Hormonal spray (e.g Planofix) can be sprayed to bring the crop maturity in proper time	
Cardamom	No effect	<ul style="list-style-type: none"> • Staggered trenches may be taken across the slope • Earthing up • Proper drainage • Repair of breached bunds 	Good drainage facility	
Ginger	<ul style="list-style-type: none"> • Proper drainage • Mulching with green leaves 	<ul style="list-style-type: none"> • Proper drainage • Mulching 	-	-
Turmeric	<ul style="list-style-type: none"> • Proper drainage • Soil drenching • Use Bordeaux mixture (1%) 	<ul style="list-style-type: none"> • Proper drainage • Use Ridomil@ 1g/lit water to reduce flower set 		
Condition-Heavy rainfall with high speed winds in a short span				
Rice	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Drain excess water • Top dressing of N after removal of excess water 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Shift produced to safer place • Dry the grain to proper moisture content before bagging and storage

	from surviving hills			
Wheat	<ul style="list-style-type: none"> • Drain excess water • Postpone topdressing N fertilizers till water recedes 	Drain excess water	Immediate harvesting & kept under shade with airy place	Transfer the produce to safe place
Mustard	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Drain excess water • Allow the crop to dry completely before harvesting 	<ul style="list-style-type: none"> • Drain excess water • Dry the grain to proper moisture content before bagging and storage
Maize	<ul style="list-style-type: none"> • Drain the excess water • Avoid the topdressing and spraying schedule until the water recedes • Spray Dimethoate 30 EC (2ml per litre of water) and Dicofol 1805 EC (3ml per litre of water) against the insect pest attack. 	<ul style="list-style-type: none"> • Drain the excess water • Avoid the topdressing and spraying schedule until the water recedes • Spray Mancozeb (2 gm per litre of water) fungicide against the damping off disease. • Spray Dimethoate 30 EC (2ml per litre of water) and Dicofol 1805 EC (3ml per litre of water) against the insect 	Drain the excess water.	Earliest arrangement should be done to dry out and sale out the post harvest product
Horticulture				
Vegetables	<ul style="list-style-type: none"> • Drain the excess water. • Spray Mancozeb (2 gm per litre of water) and Copper oxychloride (4 gm per litre of water) alternately as fungicide against the damping off disease. • Spray Dimethoate 30 EC (2ml per litre of water) and Dicofol 1805 EC (3ml per litre of water) against the insect pest attack. 	<ul style="list-style-type: none"> • Drain the excess water. • Spray Mancozeb (2 gm per litre of water) and Copper oxychloride (4 gm per litre of water) alternately as fungicide against the damping off disease. • Spray Dimethoate 30 EC (2ml per litre of water) and Dicofol 1805 EC (3ml per litre of water) against the insect pest attack. 	Drain the excess water	Earliest arrangement should be done to dry out and sale out the post harvest product

Condition-Outbreak of pests and diseases due to unseasonal rains				
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	Dehauling of affected parts and destroy Severely infested produce is unfit for seed purpose
Paddy	Protection against leaf blast with tricyclazole @ 1ml/l	Protect against bacterial leaf blight with hexaconazole @ 1 ml/l	<ul style="list-style-type: none"> Protect against bacterial leaf blight with hexaconazole @1ml/l Spray carbendazim 0.1% to prevent seed discolouration / grain spot 	-
Horticulture				
Tea	-	<ul style="list-style-type: none"> Phassus borer (<i>Sahydrassus malabricus</i>): affected stems are cut and Aldrin/heptachlor is poured in the hole using ink filler and plugged with clay paste Blister Blight (<i>Exobasidium vexans</i>): Infest tender leaves and stem and develops translucent spot. Copper oxychloride 350 g in 67 lit water with powder sprayer for pruned field at 3-4days interval. In plucking field 210 g copper oxychlorie +210 Nickel chlorides in 45 lit of water/ha at 7 days interval. 	Shot-hole borer (<i>Xyleborus fornicates</i>): Badly affected branches are pruned off. Heptachlor 20 EC is sprayed @8.5 l in 675 lit. of water /ha on the pruned frames	Red Spider mite (<i>Oligonychus coffeae</i>) : Infest upper surface of mature leaves. Tetradiofon (8 EC) 1 to 1.25 lit/ha. Black root disease (<i>Rosellinia arcuata</i>): Infested roots show black mycelium on the root, white star shaped mycelium between bark and wood and black lead shot like perithecia seen on collar region. The soil may be drenched with Dithane M 45 @30g/10 lit water.
Ginger		<ul style="list-style-type: none"> Shoot borer: Malathion @ 0.1% dusting in July-October at monthly intervals Control of Rhizome rot by by seed treatment with 0.3 % Dithane M-45) 	Control of Rhizome rot by by seed treatment with 0.3 % Dithane M-45)	Control of Fusarium dry rot, Bacterial wilt by seed treatment with 200 ppm streptocycline for 2 days
Turmeric		To control Shoot borer apply Malathion @0.1% at monthly intervals from July to October	To control Rhizome and Root rot drench the soil with 0.1 % wet cersan	-

Cardamom		<ul style="list-style-type: none"> • Thrips: Spraying monocrotophos @ 0.025 % • Katte disease: use healthy seedling, rough the infested plant to control the disease • Chirke and Furke disease: Uprooting the infested plant 	Aphids: spray 0.05 % dimethoate	Damping or Rhizome rot: Protect the nursery with 1:50 formaldehyde, drench the soil after germination with 0.2% Copper oxychloride.
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2.3 Floods

Condition - Transient water logging/ partial inundation				
Crop	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Aman Rice	<ul style="list-style-type: none"> • Drain the excess water after recession of flood • Preserve extra amount of seed for raising second seedbed • Gap filling with seedlings from upland nursery • Grow the variety like IET 5656 and NC 490 which can withstand submergence to some extent and suitable for late transplanting 	<ul style="list-style-type: none"> • Drain the excess water after recession of flood • Double transplanting with aged seedling maybe done from upland to medium and low land • May go for alternate crop like black gram or green gram • Apply booster dose of 50 kg N/ha after draining excess water • Spray ZnSo₄ 0.2% if it is less than 45 days after transplanting 	<p>Plan for alternate crops like Kalai, Mustard, Wheat, Lentil, Potato, Gram, Maize and Rice</p> <p>For early flood, supply of seed/fertilizer minikit as follows: Paddy seed@5 kg/kit, Urea @ 10 kg/kit</p> <p>Kalai @ 4 kg/kit</p> <p>For late flood:</p> <p>Boro paddy @6 kg/kit Mustard @ 1kh/kit Wheat @ 15kg/kit Potato@ 15 kg/kit Lentil @ 2kg/kit Gram @ 4 kg/kit</p>	Early harvest
Horticulture				
Cabbage/ cauliflower	Raised and poly covered seed bed	Quick drainage and need based plant protection measure to be adopted	Draining water / Harvest the crop	Immediate harvest
Brinjal	Protect against damping off with	Quick drainage and need based plant	-do-	-do-

	dithane M 45@ 2g/l spray	protection measure to be adopted		
Condition-Continuous submergence for more than 2 days				
Aman Rice	<ul style="list-style-type: none"> • Drain the excess water after recession of flood • Preserve extra amount of seed for raising second seedbed • Gap filling with seedlings from upland nursery • Grow the variety like IET 5656 and NC 490 which can withstand submergence to some extent and suitable for late transplanting 	<ul style="list-style-type: none"> • Drain the excess water after recession of flood • Double transplanting with aged seedling maybe done from upland to medium and low land • May go for alternate crop like black gram or green gram • Apply booster dose of 50 kg N/ha after draining excess water • Spray ZnSo₄ 0.2% if it is less than 45 days after transplanting 	<p>Plan for alternate crops like Kalai, Mustard, Wheat, Lentil, Potato, Gram, Maize and Rice</p> <p>For early flood, supply of seed/fertilizer minikit as follows: Paddy seed@5 kg/kit, Urea @ 10 kg/kit</p> <p>Kalai @ 4 kg/kit</p> <p>For late flood:</p> <p>Boro paddy @6 kg/kit Mustard @ 1kh/kit Wheat @ 15kg/kit Potato@15 kg/kit Lentil @ 2kg/kit Gram @ 4 kg/kit</p>	Early harvest
Horticulture				
Cabbage/ cauliflower	Raised and poly covered seed bed	Quick drainage and need based plant protection measure to be adopted	Draining water / Harvest the crop	Immediate harvest
Brinjal	Protect against damping off with dithane M 45@ 2g/l spray	Quick drainage and need based plant protection measure to be adopted	-do-	-do-
Sea water intrusion	NA			

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

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave	NA			
Cold wave				
Wheat	Resowing under polished with good water management	Apply irrigation in evening & draining water in morning	Apply irrigation in evening & draining water in morning	Immediate harvesting
Mustard	Resowing under polished with good water management	-	-	-
Potato	Re-planting	-	-	-
Ginger	No effect	No effect	No effect	Harvest early and keep rhizomes in heap form
Tea	-	<ul style="list-style-type: none"> Wind break trees at the periphery of the garden Shade tree planting to be done at 30-40 cm apart to maintain optimum soil and leaf temperatures 	Foliar application of N, P, K 2:1:3 at the interval of 15 days twice	Provide extra shade and mulching to raise the soil temperature
Cardamom	-	<ul style="list-style-type: none"> Mulching Manuring with well decomposed forest litters 	<ul style="list-style-type: none"> Mulching Manuring with well decomposed forest litters 	No effect
Frost				
Wheat	Resowing under polished with good water management	Apply irrigation in evening & draining water in morning	Collect affected plants and burn them	-
Tea	-	Spraying of growth hormones (planofix) on the foliage of tea plants followed by spraying NPK mixture @ 2:1:2 twice at 15 days interval	Hormonal spray (planofix) twice at 15 days interval	Provide burnt fire in a suitable place without providing harm to the plant for timely crop maturity
Cardamom	No effect	No effect	No effect	Early harvesting of ripen capsule
Hailstorm				
Rice	Preserve extra amount of seed for raising second	Gap filling in early vegetative stage	-	-

	seedbed			
Mustard	<ul style="list-style-type: none"> If the field is completely affected by hail storm plough down the field and go for any late variety Use the unaffected plants as leafy vegetable 			
Wheat	-	-	Harvest the crop quickly	-
Maize	-	Gap filling	-	-
Horticulture				
Pineapple	-	-	Spray of fungicide incase of rotting	Harvest quickly and sale out
Tea	-	<ul style="list-style-type: none"> Provide shade tree planting (permanent and temporary shade) Spray one round of contact fungicide on the affected portion of plants to avoid any fungal infection One round of zinc sulphate@1% to be sprayed to heal up faster 	<ul style="list-style-type: none"> Provide temporary shade Spray 1% zinc sulphate to avoid secondary infection to flowers and fruits 	Crop sanitation, cleaning of affected flower buds and fruits is recommended to restore crop maturity
Cardamom	-	Remove affected shoots of the plants (trashing)	No effect	No effect
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	-		
Floods	-		
Cyclone	-		
Heat wave and cold wave			
Shelter/environment management	<ul style="list-style-type: none"> • Provide shelter (wooden house preferable) • Simple windbreak, shelter or shade are essential • Plant , tree as wind break or build a solid fence for wind break • Wind break should be located to the north west of the farm shed 	<ul style="list-style-type: none"> • More stock, especially young into the shelter area. • Wind break, properly oriented and laid out or timber covered lowland were better protection for range cattle than most over heat cattle, causing suggested respiratory disorder. • Never close indoor shelter tightly because stock can suffocate from lack of oxygen. • Protect male reproductive organ from frostable and freezing as it can impair the animals fertility or ability to breed. • Animal need extra feed to provide body heat and to maintain production wt gain. • Make arrangement for pelleted cake or cake concentrate for emergency purpose • Use heater in water tank to provide livestock enough water 	<ul style="list-style-type: none"> • Feedlot livestock that have gone through a severe storm or stress period should be put back on feed carefully. • Change the ration gradually from a low to high concentration proportion • Cattle which have not been fed for several days or one in accustomed to grains should be limited to 2 to 4 lb per head of whole grain in one feeding, or a total of 5 provide per head the first day. Insure the amount of feed by 2 lb/head/day for lays watch cattle for sign of acute indigestion. • Isolate livestock showing sign of scowing or labored breathing. Keep these animals in a dry, draft free place and contact a veterinarian.
Health and disease management	Seasonal vaccination scheduled to be followed.	<ul style="list-style-type: none"> • Precautionary measure to protect from severe cold effect. This will leads to Pnumonia. • Use Heater, lamp etc, to keep weather hot and dry. Avoid heater use directly, better to hot air by blower 	Damp free floor, wall to avoid pneumonia, flue etc.

2.5.2

Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	During the event	After the event	
	-			
Drought	-			
Floods	-			
Cyclone	-			
Heat wave and cold wave				
Shelter/environment management	<ul style="list-style-type: none"> Built the house in North-south direction to receive more sunlight. Make arrange for proper ventilation into the shed. Make the wall with appropriate insolation to chek cod transmission. Better to use cage system than deep litter system as these is a change of damping the litter incold wave and this increases the chance of <i>Aspergillosis</i>, <i>Candiasis</i> etc. It is to be noted that during cold weather, the chance of incidence of disese is increased. 	<ul style="list-style-type: none"> Drop the curtain but assure sufficient ventilation. Provide heat – heater, Lamp, Stoves etc. Hot water pipe. Provide feed – need extra energy for body heat during severe or prolonged cold weather, especially if they are outside without shelter. 	If any bird shows any sign of symptoms of Pneumonia or any other disease, then isolate it immediately make appropriate arrangement for treatment and prevention.	Darjeeling Krishi Vigyan Kendra doing good work in this aspect in this district
Health and disease management	Deep litter (staw) should be avoiding, so free from damping problem.	<ul style="list-style-type: none"> Insulated wall to avoid Aspergellosis. Use Protectin measure such as Enrofloxacin, Oxytetracyclin, Tetracyclin etc. 	<ul style="list-style-type: none"> Ensure that sufficient sunlight should be received in house. Use green feed if available. 	-

2.5.3

Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event	During the event	After the event
1) Drought	-	-	-
2) Floods	-	-	-
A. Capture	-	-	-
B. Aquaculture	-	-	-
3. Cyclone / Tsunami	-	-	-
4. Heat wave and cold wave	-	-	-