State: ASSAM
Agriculture Contingency Plan for District: CACHAR

1.0	**District Agriculture profile**			
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	Assam And Bengal Plain, Hot Subhumid To Humid (Inclusion Of Perhumid) Eco-Region. (15.3), North-Eastern Hills (Purvachal), Warm Perhumid Eco-Region (17.1)		
	Agro-Climatic Region (Planning Commission)	Eastern Himalayan Region (II)		
	Agro Climatic Zone (NARP) Zone	Barak Valley Zone (AS-5)		
	List all the districts falling under the NARP Zone	Cachar, Karimganj , Hailakandi		
	Geographic co-ordinates of district	Latitude	Longitude	Altitude
		24^0 22' N & $25^0$8' E	92^0 24' E & $93^0$15' E	36.5 MSL
	Name and address of the concerned *ZRS*/ZARS/RARS/RRS/RRTTS	Regional Agricultural Research Station (RARS), Karimganj, Assam		
	Mention the KVK located in the district	KVK, Cachar, PO Arunachal 788025, Cachar, Assam		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Regional Agricultural Research Station (RARS), Karimganj, Assam		

Source: KVK, Cachar

1.2	**Rainfall**	**Normal RF (mm)**	**Normal rainy days**	**Normal Onset**	**Normal Cessation**
	SW monsoon (June-Sep)	1900	90	2nd week of June	4th week of September
	NE Monsoon(Oct-Dec)	250	20	2nd week of October	4th week of December
	Winter (Jan- March)	200	12	2nd week of February	4th week of March
	Summer (Apr-May)	900	25	1st week of April	4th week of May
	Annual	3250	147		

1.3	**Land use pattern of the district**	**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**	**Land put or non-agricultural use**
	Area	377.610		143.270	40.838	-	2.637	13.075	41.701	2.354	9.000	40.838

	(‘000ha)											

Source: Department of Agriculture, Cachar, Assam

1.4	Major soils	Characteristics	Area in ‘000ha	Percent (%) of total
	Old riverine alluvium	Light textured (varies from sandy to fine silty loam), silt deposition is common feature, pH comparatively higher	26.432	7.00
	Old mountain alluvium	Deep and heavy textured varying from silty to clay loam with moderate organic matter content.	135.939	35.99
	Non laterized red soils	Confined to hilly areas, belonging chiefly to Tipam and Surma groups of soil. More acidic than alluvial tract.	192.582	51.00
	Laterized red soils	Texture is sandy loam, rich in Fe and Al content, high in acidity	15.105	4.00
	Peat soils	Heavy textured, dark grey in colour, pH around 7.0, rice in organic matter.	7.552	2.00

1.5	Agricultural land use	Area (‘000ha)	Cropping intensity %
	Net sown area	125.000	122.3
	Area sown more than once	70.980	
	Gross cropped area	152.826	

1.6	Irrigation	Area (‘000ha)	
	Net irrigated area	0.398	
	Gross irrigated area	1.180	
	Rainfed area	151.646	
	Sources of Irrigation	**Number**	**Area**
	Canals		
	Tanks		
	Open wells		
	Bore wells		
	Lift irrigation		
	Other sources	325	398 ha
	Total		
	Pumpsets		
	Micro-irrigation		
	Groundwater availability and use		

	Over exploited		
	Critical		
	Semi- critical		
	Safe		
	Wastewater availability and use		
*over-exploited: groundwater utilization> 100%; critical: 90-100%; semi-critical: 70~90%; safe: <70%			

1.7 Area under major field crops & horticulture etc

1.7	**Major field crops cultivated**	**Area ('000 ha)**									
		Kharif			***Rabi***			**Summer**			
		Irrigated	**Rainfed**	**Total**	**Irrigated**	**Rainfed**	**Total**	**Irrigated**	**Rainfed**	**Total**	**Grand total**
	Rice		87.53	87.53		10.61	10.61		14.70	14.70	112.84
	Maize					0.094	0.094				0.094
	Wheat								0.083	0.083	0.083
	Sugarcane								0.232	0.232	0.232
	Jute		0.075	0.075							0.075
	Blackgram		0.125	0.125							0.125
	Chickpea					0.052	0.052				0.052
	Pea					0.564	0.564				0.564
	Lentil					0.019	0.019				0.019
	Lathyrus					0.934	0.934				0.934
	Rapeseed & Mustard					1.98	1.98				1.98
	Sesame					0.184	0.184				0.184
	Linseed					0.043	0.084				0.084
	Niger					0.029	0.029				0.029

.7b	**Horticulture crops - Fruits**	**Area ('000 ha)**		
		Total	**Irrigated**	**Rainfed**
	Banana	2.80		2.80
	Pineapple	1.41		1.41
	Papaya	0.35		0.35

	Orange	0.052		0.052
	Assam lemon	0.626		0.626
	Guava	0.365		0.365
	Litchi	0.292		0.292
	Jackfruit	1.09		1.09
	Mango	1.25		1.25
	Other fruits	0.067		0.067

1.7c	**Horticulture crops – Vegetables and spice**	**Total**	**Irrigated**	**Rainfed**
	Kharif Vegetables	3.45		3.45
	Rabi Vegetables	7.96		7.96
	Potato	1.89		1.89
	Chillies	0.839		0.839
	Turmeric	0.265		0.265
	Onion	0.168		0.168
	Ginger	0.361		0.361
	Coriander	0.055		0.055
	Garlic	0.093		0.093
	Black pepper	0.169		0.169
	Other spices	0.072		0.072
1.7d	**Medicinal and Aromatic crops**	**Total**	**Irrigated**	**Rainfed**
1.7e	**Plantation crops**	**Total**	**Irrigated**	**Rainfed**
	Arecanut	4.46		4.46
	Coconut	1.40		1.40

1.8	**Livestock (in number)**	**Male (‘000)**	**Female (‘000)**	**Total (‘000)**
	Non descriptive Cattle (local low yielding)	172.01	211.66	383.67
	Crossbred cattle	9.44	135.68	145.12
	Non descriptive Buffaloes (local low yielding)	3.56	41.52	45.08
	Graded Buffaloes			26.40
	Goat	92.30	85.20	177.50
	Sheep	5.40	10.02	15.42
	Others (Camel, Pig, Yak etc.)			
	(i) Pig	10.54	15.81	26.35
	(ii) Mithun			
	Commercial dairy farms (Number)			10
1.9	**Poultry**	**No. of farms**	**Total No. of birds (‘000)**	
	Commercial	565	491.04	
	Backyard	11	256.00	

1.10	Fisheries (Data source: Chief Planning Officer of district)							
	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)		
		Not applicable						
	ii) Inland (Data Source: Fisheries Department)	**No. Farmer owned ponds**		**No. of Reservoirs**	**No. of village tanks**	**No of ponds& tanks**		
						6188.00		
	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)							
	GP pond and tank	7.88				18000		
	Revenue pond and tank	3.5						
	Private pond and tank	6038.0						
	Beels	13973.38						

1.11 Production and Productivity of major crops

1.11	**Name of crops**	**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)**
Field crops									
	Ahu rice					30.86	2100	30.86	2100
	Sali rice	192.56	2200					192.56	2200
	Boro rice			10.61	1800			10.61	1800
	Maize	0.047	500					0.047	500
	Wheat			0.088	1070			0.088	1070
	Sugarcane	0.986	4250					0.986	4250
	Jute	500 bale	1200					500 bale	1200
	Blackgram	0.089	705					0.089	705

	Greengram	0.017	533					0.017	533
	Chickpea			0.027	522			0.027	522
	Lentil			0.010	512			0.010	512
	Lathyrus			0.54	575			0.54	575
	Pea			0.34	600			0.34	600
	Rapeseed			1.14	573			1.14	573
	Sesame	0.094	512					0.094	512
	Linseed			0.020	462			0.020	462
	Niger			0.015	516			0.015	516
Horticultural crops									
	Banana	33.98	12139					33.98	12139
	Pineapple	29.91	16923					29.91	16923
	Popaya	4.24	12297					4.24	12297
	Orange	0.312	6000					0.312	6000
	Assam Lemon	3.47	5543					3.47	5543
	Guava	5.66	15512					5.66	15512
	Litchi	1.46	5000					1.46	5000
	Jackfruit	10.93	10012					10.93	10012
	Mango	8.55	6817					8.55	6817
	Other fruits	0.093	1388					0.093	1388
	Potato			10.41	5513			10.41	5513
	Sweet potato			0.956	5250			0.956	5250
	Tapioca			0.120	4300			0.120	4300
	Chillies			0.536	640 (dry)			0.536	640 (dry)
	Turmeric	0.562	2120					0.562	2120
	Onion			0.546	3250			0.546	3250
	Ginger	2.50	6930					2.50	6930
	Coriander	0.051	920					0.051	920
	Garlic	0.200	2150					0.200	2150
	Black pepper	0.228	1340					0.228	1340
	Other spices							56	770
	Kharif vegetables	42.50	12326					42.50	12326
	Rabi vegetables			126.79	15924			126.79	15924

1.12	Sowing window for 5 major crops	Sali Rice	Ahu rice	Boro rice	Rajmah	Potato
	Kharif-Rainfed	June to July	April to May			
	Kharif – Irrigated					
	Rabi-Rainfed			December to January	October to November	October to November
	Rabi-Irrigated					

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			√
	Snowfall			√
	Landslides			√
	Earthquake		√	

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 II	Enclosed: Yes
		Soil map as Annexure III	Enclosed: Yes

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rain fed situation

Condition			Suggested Contingency measures

Early season drought (Delayed onset)	Major Farming situation	Normal Crop /cropping system	Change in crop /cropping system	Agronomic measures	Remarks on Implementation
Delay by 2 weeks 3rd week of June	Rainfed low land situation	Sali rice Bao/deep water paddy	No change	➢ Preparation of seed bed just after rain ➢ Recommended practices of Sali rice cultivation ➢ Bund the field with mud plastering to keep rain water ➢ Decrease spacing	Linkage to
	Rainfed medium land situation	Sali rice Bao/deep water paddy	No change	➢ Preparation of seed bed just after rain ➢ Recommended practices of Sali rice cultivation ➢ Bund the field with mud plastering to keep rain water Decrease spacing	
	Rainfed upland situation	Summer and kharif vegetables like brinjal ,Snakegourd,okra, ridge gourd, bottle gourd, bittergourd Sweet gourd, cucumber followed by rabi vegetables, maize, rapeseed, pea potato, rajmah	No change	➢ Sufficient organic matter like compost , FYM should be applied ➢ Mulching with waste materials	

Condition			Suggested Contingency measures		
Early season drought (Delayed onset)	Major Farming situation	Normal Crop /cropping system	Change in crop /cropping system	Agronomic measures	Remarks on Implementation

Delay by 4 weeks 1st week of July	Rainfed low land situation	Sali rice Bao/deep water paddy	Medium duration Sali rice variety Basundhra, Satyaranjan and short duration variety like Disang, luit, Kolong, Kopilee	➢ Preparation of seed bed just after rain ➢ Recommended practices of Sali rice cultivation ➢ Bund the field with mud plastering to keep rain water ➢ Decrease spacing	
	Rainfed medium land situation	Sali rice Bao/deep water paddy	Medium duration Sali rice variety Basundhra, Satyaranjan and short duration variety like Disang, luit, Kolong, Kopilee	➢ Preparation of seed bed just after rain ➢ Recommended practices of Sali rice cultivation ➢ Bund the field with mud plastering to keep rain water ➢ Decrease spacing	
	Rainfed upland situation	Summer and kharif vegetables like brinjal ,Snakegourd,okra, ridge gourd, bottle gourd, bittergourd Sweet guard, cucumber , sesame followed by rabi vegetables, maize, rapeseed, pea potato, rajmah	Late kharif vegetables followed by normal rabi vegetables	➢ Sufficient organic matter like compost , FYM should be applied ➢ Mulching with waste materials	

Condition			**Suggested Contingency measures**		
Early season drought (Delayed onset)	**Major Farming situation**	**Crop /cropping system**	**Change in crop /cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 6 weeks 1st week of August	Rainfed low land situation	Sali rice Bao/deep water paddy	Sali rice variety Ranjit, Bahadurand local variety, Medium duration rice variety	• Staggered planting • Direct seeding	

			like Basundhra, Satyaranjan, Short duration rice variety like Disang, Luit, Kolong, Kopilee		
	Rainfed medium land situation	Sali rice Bao/deep water paddy	Sali rice variety Ranjit, Bahadurand local variety, Medium duration rice variety like Basundhra, Satyaranjan Short duration rice variety like Disang, Luit, Kolong, Kopilee	• Staggered planting • Direct seeding	
	Rainfed upland situation	Summer and kharif vegetables like brinjal ,Snakegourd,okra, ridge gourd, bottle gourd, bittergourd, Sweet gourd, cucumber, sesame followed by rabi vegetables, maize, rapeseed, pea potato, rajmah	Late kharif vegetables followed by normal rabi vegetables and rabi oilseeds and pulses	➢ Sufficient organic matter like compost , FYM should be applied ➢ Mulching with waste materials	

Condition			**Suggested Contingency measures**		
Early season drought (Delayed onset)	**Major Farming situation**	**Crop /cropping system**	**Change in crop /cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8weeks 3rd week of August	Rainfed low land situation	Sali rice Bao/deep water paddy Cropping system: rice mono crop either Sali or boro	Sali rice variety Ranjit, Bahadurand local variety, Medium duration rice variety like Basundhra, Satyaranjan, Short duration rice variety like Disang, Luit, Kolong, Kopilee	• Staggered planting • Direct seeding	
	Rainfed medium land	Sali rice	Sali rice variety Ranjit,	• Stagerred planting	

	situation	Bao/deep water paddy	Bahadurand local variety, Medium duration rice variety like Basundhra, Satyaranjan Short duration rice variety like Disang, Luit, Kolong, Kopilee	• Direct seeding	
	Rainfed upland situation	Summer and kharif vegetables like brinjal ,Snakegourd,okra, ridge gourd, bottle gourd, bittergourd, Sweet gourd, cucumber, sesame followed by rabi vegetables, maize, rapeseed, pea potato, rajmah	Late kharif vegetables followed by normal rabi vegetables and rabi oilseed and pulses	➢ Sufficient organic matter like compost , FYM should be applied ➢ Mulching with waste materials	

Condition			**Suggested contingency measures**		
Early season drought (Normal onset)	**Major Farming situation**	**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.	Rainfed low land situation	Sali rice Bao/deep water paddy Cropping system: rice mono crop either Sali or boro	Mannualy watering in the nursery bed Re sowing	Application of sufficient organic matter in the nursery bed	
	Rainfed medium land situation	Sali rice Bao/deep water paddy Cropping system: rice mono crop	Mannualy watering in the nursery bed Re sowing	Application of sufficient organic matter in the nursery bed	

	Rainfed upland situation	Summer and kharif vegetables like brinjal ,Snakegourd,okra, ridge gourd, bottle gourd, bitter gourd, Sweet gourd, cucumber, sesame followed by rabi vegetables, maize, rapeseed, pea potato, rajmah	Mannualy watering in the nursery bed Re sowing	Application of sufficient organic matter and balance fertilizer	

Condition			**Suggested contingency measures**		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm)period)	**Major Farming situation**	**Crop/Cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on implementation**
At vegetative stage.	Rainfed low land situation	Sali rice Bao/deep water paddy Cropping system: rice mono crop either Sali or boro	• Bunds should be kept in good condition in rice field • Spray of anti-transpirants • If crop is damaged short duration Sali rice variety can be grown	• Application of sufficient amount of organic manures in main fields before transplanting/ sowing • Stop top dressing of urea in case of rice	
	Rainfed medium land situation	Sali rice Bao/deep water paddy Cropping system: rice mono crop	• Bunds should be kept in good condition in rice field • Spray of anti-transpirants • If crop is damaged short duration Sali rice variety can be grown	• Application of sufficient amount of organic manures in main fields before transplanting/ sowing	
	Rainfed upland situation	Summer and kharif vegetables like brinjal ,Snakegourd,okra, ridge gourd, bottle gourd,	• Thinning the plant population & Mulching in case of other crops, re sowing of crops	• Application of sufficient amount of organic manures in main fields before	

		bittergourd Sweet gourd, cucumber, sesame followed by rabi vegetables, maize, rapeseed, pea potato, rajmah		transplanting/ sowing	

Condition			**Suggested contingency measures**		
Mid season drought (long dry spell)	**Major Farming situation**	**Crop/Cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on implementation**
At reproductive stage	Rainfed low land situation	Sali rice Bao/deep water paddy Cropping system: rice mono crop either Sali or boro	• Bunds should be kept in good condition in rice field • If crop is damaged early rabi oilseed pulses and vegetables should be grown	• Application of sufficient amount of organic manures in main fields before transplanting/ sowing	
	Rainfed medium land situation	Sali rice Bao/deep water paddy Cropping system: rice mono crop	• Bunds should be kept in good condition in rice field • If crop is damaged early rabi oilseed pulses and vegetables should be grown	• Application of sufficient amount of organic manures in main fields before transplanting/ sowing	
	Rainfed upland situation	Summer and kharif vegetables like brinjal ,Snakegourd,okra, ridge gourd, bottle gourd, bittergourd Sweet guard, cucumber, sesame followed by rabi vegetables, maize, rapeseed, pea potato,	• Bunds should be kept in good condition in rice field • If crop is damaged early rabi oilseed pulses and vegetables should be grown	• Application of sufficient amount of organic manures in main fields before transplanting/ sowing	

		rajmah			

Condition			**Suggested contingency measures**		
Terminal drought (Early withdrawal of monsoon)	**Major Farming situation**	**Crop/Cropping system**	**Crop management**	**Rabi crop pianning**	**Remarks on implementation**
	Rainfed low land situation	Sali rice Bao/deep water paddy Cropping system: rice mono crop either Sali or boro	High yielding variety of Boro rice is to grown	1.Toria and Niger can be sown up to Mid November 2. Buckwheat can be sown up to first December 3. Lentil and Buckwheat can be grown in moisture stress situation also	
	Rainfed medium land situation	Sali rice Bao/deep water paddy Cropping system: rice mono crop		Rabi vegetables, oilseeds and pulses are to be grown	
	Rainfed upland situation	Summer and kharif vegetables like brinjal ,Snakegourd,okra, ridge gourd, bottle gourd, bittergourd Sweet guard, cucumber, sesame followed by rabi vegetables, maize, rapeseed, pea potato, rajmah			

2.1.2 Irrigated situation:

Condition			**Suggested contingency measures**		
	Major Farming	**Crop/Cropping system**	**Change in Crop /**	**Agronomic measures**	**Remarks on**

	situation		**Cropping system**		**implementation**
Delayed /limited release of water in canals due to low rainfall	Not Applicable				
Not release of water in canals under delayed onset of monsoon in catchment	Not Applicable				
Lack of inflows into tanks due to	Not Applicable				
Insufficient / delayed onset of monsoon	Not Applicable				
Insufficient ground water recharge due to low rainfall	Not Applicable				

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

Condition	**Suggested Contingency measure**			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**
Sali rice	Provide drainage, Gap filling	Provide drainage	Provide drainage	• Harvesting should be done before rain as per as possible • Drying of produces before storage to optimum moisture level • Seed treatment with insecticide and fungicide against insects & diseases respectively during the period of storage
Ahu rice	Provide drainage	Provide drainage	Provide drainage	
Potato	Provide drainage	Provide drainage	Provide drainage	
Rajmah	Provide drainage	Provide drainage	Provide drainage	
Rapseed	Provide drainage	Provide drainage	Provide drainage	
Horticulture				• Harvesting should be done before rain as per as possible • Drying of produces before storage to optimum moisture level
Tomato	Provide drainage	Provide drainage	Provide drainage	
Capsicum	Provide drainage	Provide drainage	Provide drainage	

Vegetables	Provide drainage	Provide drainage	Provide drainage	• Sale the produces
French bean	Provide drainage	Provide drainage	Provide drainage	
Chilli	Provide drainage	Provide drainage	Provide drainage	
Heavy rainfall with high speed winds in a short span				
Rice	Provide drainage	Provide drainage	Provide drainage	• Harvesting should be done before rain as per as possible • Drying of produces before storage to optimum moisture level
Rajmah	Provide drainage &earthing up	Provide drainage &earthing up	Provide drainage &earthing up	
Toria	Provide drainage	Provide drainage	Provide drainage	
Potato	Provide drainage &earthling up	Provide drainage &earthling up	Provide drainage &earthling up	
Rabi pulse	Provide drainage Drainage	Provide drainage	Provide drainage	
Horticulture				
Tomato	Provide drainage & resowing	Provide drainage	Provide drainage	• Harvesting should be done before rain as per as possible
Rabi vegetable	Provide drainage e & resowing	Provide drainage	Provide drainage	
Kharif vegetable	Provide drainage & resowing	Provide drainage	Provide drainage	
Brinjal	Provide drainage & resowing	Provide drainage	Provide drainage	
Chilli	Provide drainage & resowing	Provide drainage	Provide drainage	
Outbreak of pests and diseases due to unseasonal rains				
Rice	Application of pesticides as prophylactic measures	Rouging if infected plant, Application of 2 per cent Potash solution by spraying, Micronutrient spray.	Apply pesticide and ITK measures	
Rajmah				
Toria				
Potato				
Rabi pulse				
Horticulture	Application of pesticides as prophylactic measures	Rouging if infected plant, Application of 2 per cent Potash solution by spraying, Micronutrient spray.	Apply pesticide and ITK measures	
Tomato				
Rabi vegetable				
Kharif vegetable				
Brinjal				

Chilli				

2.3 Floods

Condition	**Suggested Contingency measure [o]**			
Heat wave [p]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Sali rice	Drainage of nursery bed or re sowing	• Drainage of excess water. • Gap filling may be done by re distributing the tillers. • Management of pests & diseases	• Drainage of excess water.	
Ahu rice	Drainage of nursery bed or re sowing	• Drainage of excess water. • Gap filling may be done by redistributing the tillers. • Management of pests & diseases	• Drainage of excess water.	
Horticulture				
Summer vegetables	Re sowing	Provide Drainage or re sowing of late varieties	Drainage or pre rabi and rabi vegetables	Pre rabi and rabi vegetables
Continuous submergence for more than 2 days [2]				
Sali rice	Provide drainage Drainage or resowing	Drainage, gap filling, stagger planting, disease pest management	Drainage of excess water. Growing of vegetables after receding flood water	Drainage of excess water., emphasis should be given on rabi crops Growing of boro rice after receding flood water
Ahu rice	Provide drainage, re sowing	Drainage, gap filling, stagger planting, disease pest management	Drainage of excess water. Growing of rabi after receding flood water	Drainage of excess water., emphasis should be given on Sali rice
Rajmah	Provide drainage, re sowing			
Toria	Provide drainage, re sowing			
Potato	Provide drainage, re sowing			
Horticulture				

Summer vegetables	Provide drainage, re sowing	Provide drainage or Resowing of late varieties		Harvest and dry in shade as soon as possible Safe storage against storage pest and diseases
Rabi vegetables	Provide drainage, re sowing	Provide drainage or Re sowing of late varieties		Harvest and dry in shade as soon as possible Safe storage against storage pest and diseases
Sea water inundation [3]	Not Applicable			

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

Extreme event type	**Suggested Contingency measure [r]**			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave	Not Applicable			
Cold wave	Not Applicable			
Frost	Not Applicable			
Hailstorm				
Boro rice	Selection of lodging resistant varieties	Potash application at 25 and 45 DAT		
Horticulture				
Banana	Provision of nursery shed	Propping	Propping and bunch bagging	
Pumpkin			Bagging of fruits	
Mango			Covering of tree by net	
Litchi			Covering of tree by net	
Cyclone	Not Applicable			

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

Drought	**Suggested contingency measures**		
	Before the event	**During the event**	**After the event**
Feed and fodder availability	1.Fodder cultivation 2.Collection & storage of paddy straws 3. storage of sufficient feed/fodder 4. Processing of fodder 5. Preservation of fodder as silage and hay. 6. Awareness camp on drought	1. Utilization of fodder from fodder plant 2. Utilization of stored feed/fodder and transport it to affected areas.	1. Awareness /training of farmers for fodder cultivation /feed & fodder storage. 2. Training as preparation of urea treated paddy straw/hay & silage making.
Drinking water	1. Preserving water in own tanks/ponds 2. Preserving water in village tanks/ponds 3. Rain water harvesting 4. Excavation of bore wells	1. Using water from the preserved tanks/ponds or from bore well where available.	1. Maintenance of cleaning and strengthening of water reservoirs/tanks/ponds etc.
Health and disease management	1. Vaccination of animals. 2. Insurance of animals. 3. Deworming of all animals. 4. Storage of some medicines for first aid	1. Awareness camp on Animal health 2. Animal health camp	1. Vaccination of animals. 2. Dewornming of animals. 3. Treatment of sick animals.
Floods			
Feed and fodder availability	Collection and storage of paddy straw. Fodder cultivation in tillah land Storage of feed/fodder safely from floods. Preparation of urea treated paddy straw/hay & silage making. preparation of silage/hay & storage	Transportation of storage paddy straw /feed/fodders to flood affected areas.	Maintenance and strengthening of feed / fodder storage facilities Awareness/training of farmers for fodder cultivation /feed/fodder storage.
Drinking water	Excavation of bore wells.	Supply of clean and safe water to the animals.	Cleaning and disinfection of water reservoir/village ponds/tanks. Repair/maintenance of bore wells.
Health and disease management	1. Vaccination of animals. 2. Deworming of all animals. 3. Provision of community shelters at safe places. 4. Make availability of sufficient	Shifting animals from affected areas like tillah areas & community shelters. Providing veterinary aids to affected animals.	Mass Deworming of animals Animal health camp Treatment of sick animals Mass Vaccination Proper disposal of carcass of dead

	veterinarians and medicines	Regular monitoring of animals.	animals. Segregation /culling of sick animal.
Cyclone	Not Applicable		
Heat wave and cold wave	Not Applicable		

s. based on forewarning whenever available.

2.5.2 Poultry

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Drought			
Shortage of feed ingredients	Keeping sufficient stock by suppliers..	Utilizing feed from sufficient stock..	Strengthening of feed storage facilities.
Drinking water	Increased water supply sources.	Supply of sufficient clean and safe drinking water supplies	Strengthening of water supply sources
Health and disease management	Vaccination of birds. Proper medicinal/supplement schedule for day to day basis. Sufficient stocks of medicines.	Routine inspection of flock Segregation/treatment /culling of diseased bird.	Routine inspection of flock Segregation/treatment /culling of diseased bird.
Floods			
Shortage of feed ingredients	Storage of feed to meet requirements during floods atleast for 30 days. Keep the food in dry condition to avoid fungal growth.	Supply of fed to the affected areas from the storage.	Regular inspection of feed to prevent fungal growth. Cleaning & disinfection of feed stores Disposal of fungal contaminated feeds.
Drinking water	Excavation of deep bore wells. Increased water supply from the PHE	Use of clean and safe water from bore well or PHE only	Maintenance of water supply sources.
Health and disease management	Routine inspection of stocks. Vaccination of stocks Proper medicinal/supplement schedule for day to day basis Sufficient stocks of medicine	Routine inspection of flocks Segregation/treatment /culling of diseased bird. Proper disposal of died birds	Routine inspection of flocks Segregation/treatment /culling of diseased bird. Proper disposal of died birds
Cyclone	Not Applicable		
Heat wave and cold wave	Not Applicable		

	Suggested Contingency measures		
	Before the event	**During the event**	**After the event**
1. Drought			

A. Capture			
Marine	-	-	-
Inland			
(i) Shallow water depth due to insufficient rains/inflow	• Critical analysis of long range forecast data. • Storage of water • Conservation of rivers/reservoir/ponds. • Re-excavation of local canals and reservoirs.	Use stored water. Divert water from unutilized areas.	i) Need based monitoring through research plan. ii) Strengthening of water reservoirs. iii) Prepare vulnerability map and place it to management committee.
(ii) Changes in water quality	i) Prohibit dumping of solid, liquid and waste in water sources.	i) Use disinfectants and therapeutic drugs. ii) Adoption of bio-remedial measures	i)Need based research data should be generated on water quality. ii) Dumping of solid, liquid and waste in water bodies should be stopped through enactment of legislation.
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	i) Critical analysis of long range ii) Forecast data. iii) Conservation of rivers/reservoir/ponds. iv) Re-excavation of local canals and reservoirs.	i) Divert water from unutilized areas. ii) Utilize canal water. iii) Aeration of ponds.	i) Need based monitoring through research plan. ii) Construction of water reservoirs. iii) Adoption of rain harvesting methods. iv) Compensation claims . v) Prepare vulnerability map and place it to management committee.
(ii) Impact of salt load build up in ponds/Changes in water quality	i) Prohibit dumping of solid, liquid and waste in water sources. ii) Preparedness with stocks of chemicals, disinfectants and therapeutic drugs.	i) Use disinfectants and therapeutic drugs.i.e. Potash, bleaching powder ii) Adoption of bio-remedial measures	i)Need based research data should be generated on water quality. ii) Dumping of solid, liquid and waste should be stopped through enactment of legislation.
2. Flood			
A. Capture			
Marine		-	-
Inland			

(i) Average compensation paid due to loss of human life	i) Be prepared to evacuate at a short notice. ii) Preparation of flood control action plan. iii) Warning dissemination and precautionary response. iv) Formation of flood management committee. v) Enhancement in coping capabilities of common people. vi) Insurance for the life of people/fishermen.	i) Human evacuation from the area. ii) Coordination of assistance. iii) Damage and need assessment. iv) Immediate management of relief supplies. v) Immediate help delivery.	i) Arrangement for rescue and casualty care. ii) Arrangement for burial control room. iii) Restoration of essential services, security and protection of property. iv) Support to rehabilitation, logistics, training and awareness build up & testing and updating the plan. v) Insurance and compensation claim.
(ii) No. of boats/nets damaged	i) Annual repair of boats/nets and gears. ii) Insurance of boats/nets/gears.	i) Coordination of assistance iii) Immediate management of relief supplies. iv) Govt. support and compensation.	i) Education and training for the repair of boats/nets and gears. ii) Loss assessment & insurance claim.
(iii) No. of houses damaged	i) Education and training for the repair of houses. ii) Store raw material for emergency repair of houses. iii) House insurance.	i) Arrangement of temporary shelters for homeless people. i) Damaged house enumeration and need assessment. ii)Coordination of assistance. iii) Immediate management of relief supplies.	i)Loss assessment & insurance claim. ii) Govt. assistance claim.
(iv) Loss of stock	i) Keep boats, nets/gears ready for emergency use. ii) Store fuels, food/other item iii) Develop flood control management plans.	i) Search/locate the stock/input. ii) Mobilize local people for protection. iii) Hire stock/inputs from distant areas/company/ farmers who are not affected by flood.	i) Follow flood control management plan. ii) Notify utilities of the critical demand about loss of stock and inputs. iii) Loss assessment & insurance claim.
(v) Changes in water quality	i) Provision to stop/close the effluent/sewerage discharge point in water bodies ii) Store chemicals, disinfectants and therapeutic drugs.	i) Do not use contaminated water ii) Proper preparation and management through emergency aeration. iii) Use appropriate amount of disinfectants, chemicals and therapeutic drugs. iv) Need based bioremediation	i) Need based research data should be generated to maintain water quality, ii) Dumping of solid, liquid and waste should be stopped through enactment of legislation. iii) Regular water monitoring and bio-monitoring of water bodies for

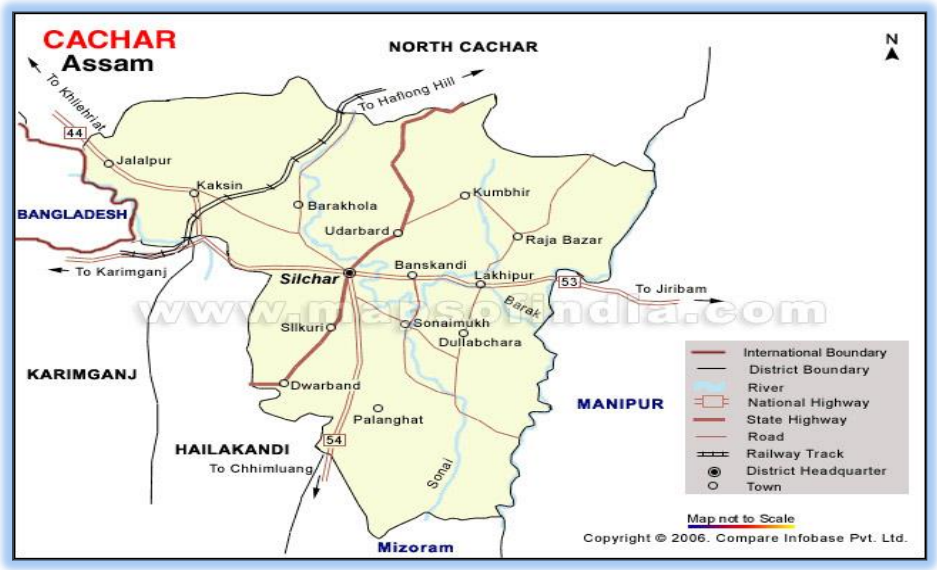
			formulation of management plan
(vi) Health and disease	i) Advance planning and preparedness. ii) Store chemicals, disinfectants and therapeutic drugs.	i) Prompt action or immediate removal of disease causing agents/ dead fish, followed by sterile or landfill disposal. ii) Use appropriate amount of disinfectants, chemicals and therapeutic drugs. iii) Emergency aeration or splashing in water bodies.	i) Laboratory diagnosis of diseased fish, generation of data about type or kind of disease spread. ii) Follow up surveillance and monitoring after disease outbreak. iii) Bio-monitoring and maintaining water quality. iv) Need based research data should be generated. v) Loss assessment & insurance claim.
B. Aquaculture			
(i) Inundation with flood water	i) Proper facility construction for ponds and its stock safety. ii)Preparedness with emergency backup equipment on site. iii) Stock insurance. iv) Preventive measures against entry of alien/wild organisms through flood water.	i) Arrangement for evacuation. ii) Arrangement for burial control room. iii) Restoration of essential services, security and protection of property. iv) Coordination of assistance. v) Damage and need assessment. vi) Immediate management of relief supplies. vii) Release excess water from height of T. viii) Lower the water level in culture facilities.	i) Support to rehabilitation, logistics, training and awareness build up & testing and updating the plan ii) Reallocate fish to maintain appropriate biomass so that waste assimilation capacity of pond is not exceeded. iii) Strengthening of water bodies/ponds. iv) Loss assessment & insurance claim.
(ii) Water contamination and changes in water quality	i) Store chemicals, disinfectants and therapeutic drugs ii) Develop flood control management plan	i) Do not use contaminated water. ii) Proper preparation and management through emergency aeration (paddle wheel aerator/circulating aerator), that may improve water quality in affected areas. iii) Use appropriate amount of disinfectants, chemicals and therapeutic drugs.	i) To maintain water quality, need based research data should be generated ii) Dumping of solid, liquid and waste should be stopped through enactment of legislation. iii) Immediate remedy and cleaning of water bodies. iv) Regular water monitoring and bio-monitoring of water bodies for

		iv) Maintaining the purity and quality of water bodies. iv) Need based bioremediation.	formulation of management plan.
(iii) Health and diseases	i) Stock sufficient emergency medicines. Ie. Potach , bleaching powder, lime, turmeric etc.	i)Identification of type of disease outbreak, immediate removal of disease causing agents/ dead fish. ii) Use appropriate amount of disinfectants, chemicals and therapeutic drugs.	i) Laboratory diagnosis of diseased fish, generation of data about type or kind of disease spread. ii) Proper disposal of dead fish. iii) Loss assessment & insurance claim.
(iv) Loss of stock and input (feed, chemicals)	i) Keep the stock/input at safe place for emergency purpose.	i) Search/locate the stock/input. ii) Purchase/hire valuable stock/inputs from distant areas not affected by flood.	i) Strengthening of stocks. ii) Assessment of total loss. iii) Insurance claims.
(v) Infrastructure damage (pumps, aerators, huts etc)	i) Educate and provide training for the repair of infrastructure. ii) Follow flood control management plan. iii) Infrastructure insurance.	i)Coordination of assistance. ii) Immediate management of relief supplies.	i) Locate backup equipment and verify its operation. ii) Loss assessment & insurance claim.
3. Cyclone / Tsunami	Not Applicable		
4. Heat wave and cold wave	Not Applicable		
A. Capture			
B. Aquaculture			
(i) Changes in pond environment (water quality)	i)Listen to local weather forecasts and stay aware of upcoming temperature changes. ii) Arrange the aerators. iii) Ensure sufficient water quantity in water bodies. iv)Formulate strategic fishing management for the heat /cold waves. v) Tree plantation around fish ponds	i) Monitor fishing sites frequently to ensure that they are not affected by heat or cold waves. ii) Use dark materials to cover the water bodies during excessive heat waves. iii) Stay hydrated by drinking plenty of fluids during fishing/field work. vi) Adopt proper care and management during the fishing period of cold/heat wave like keeping stock of drinking water and extra cloths. vi) Educating the farmers through electronic or print media	i) Intensive afforestation program for reducing heat waves. ii) Collect basic weather data and incidence of extreme and physical data of water bodies, water chemistry and seasonal changes, plankton profile and seasonal blooms, topography and soil composition. iii) Gather information about history of catch per unit effort as well as fish yield rate during heat wave and cold wave and accordingly simulate future plan for sustainable fishing.

			vi) Loss assessment & insurance claim.
(ii) Health and disease management	i) Advance planning and preparedness. ii) Store chemicals, disinfectants and therapeutic drugs. iii) Develop heat/ cold wave control management plan. iv) Stock sufficient emergency medicines.	i)Identification of type of disease outbreak, immediate removal of disease causing agents/ dead fish. ii) Use appropriate amount of disinfectants, chemicals and therapeutic drugs. iii) Determination of nature and speed of transmission of diseases. vi)Emergency aeration or splashing in water bodies	i) Laboratory diagnosis of diseased fish, generation of data about type or kind of disease spread. ii) Eradicating the disease. iii) Follow up surveillance and monitoring. iv) Proper disposal of dead fish. v) Loss assessment & insurance claim.

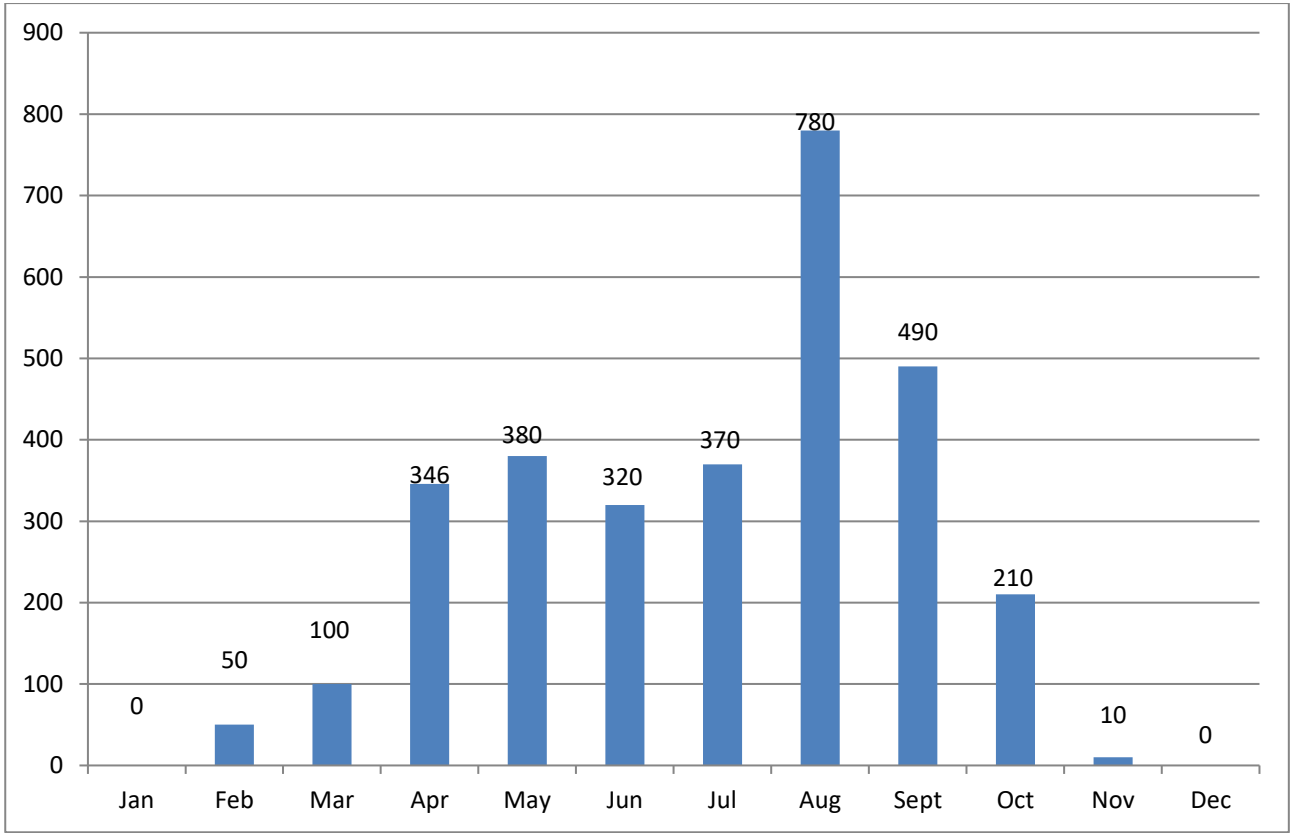
ANNEXURE-1

LOCATION MAP OF DISTRICT WITHIN STATE



ANNEXURE-2

MONTHLY RAINFALL FOR THE YEAR 2010



Month	Rainfall (mm)	Temperature ^{0} C		Relative Humidity (%)	
		Maximum	Minimum	Morning	Evening
January	0	27.3	11.0	71.25	55.45
February	50	30.1	15.3	64.25	47.85
March	100	35.2	21.8	66.90	47.90
April	346	32.4	18.2	72.09	68.40
May	380	39.1	18.0	85.23	75.46
June	320	39.2	19.0	82.12	78.65
July	370	38.4	21.0	84.28	78.10
August	780	35.3	24.0	93.88	97.60
September	490	35.2	20.0	90.00	80.00
October	210	37.3	18.6	98.90	65.90
November	10	30.5	15.2	75.20	60.70
December	0	28.3	12.0	73.60	62.30

ANNEXURE-III

Soil Map of Cachar District