State: ASSAM

Agriculture Contingency Plan for District:TINSUKIA

1.0 District Agriculture profile*				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)			
	Agro-Climatic Zone (Planning Commission)	Eastern Himalayan Region		
	Agro Climatic Zone (NARP)	Upper Brahmaputra Valley Zone		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Tinsukia, Dibrugarh , Sibsagar, Jorhat, Golaghat		
	Geographic coordinates of district headquarters headquarters	**Latitude**	**Longitude**	**Altitude**
		$27^0 23^/$ to $27^0 48^/$ N	$93^0 22^/$ to $95^0 38^/$ E	147.83 – 184.3 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Regional Agricultural Research Station, Assam Agricultural University, Titabor		
	Mention the KVK located in the district with full address	KVK, Tinsukia Gellapukhuri road, Tinsukia 786125, Assam		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	AAS Unit, Dept of Agro-meteorology, Assam Agricultural University, Jorhat-785013		

***Indicate source of data while furnishing information at different places in the district profile**

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-Sep):	1342.4 mm	82	1st week of June	2nd week of September
	NE Monsoon(Oct-Dec):	110.1 mm	14		
	Winter (Jan- February)	91.2 mm	15	-	-
	Summer (March-May)	599.6 mm	48	-	-
	Annual	2143.3 mm	159	-	-

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)	379.000	200.054	34.552	74.180	3.560	1.586	20.616	36.807	6.486	1.159

1. 4	Major Soils (common names like red sandy loam deep soils (etc.,)*	Area ('000 ha)**	Percent (%) of total geographical area
	1. Red soil	23.264	
	2. Sandy soil	94.631	
	3.Sandy loam	102.662	
	4.Sandy clay	199.775	
	Others (specify)		

* mention colour, depth and texture (heavy, light, sandy, loamy, clayey etc) and give vernacular name, if any, in brackets (data source: Soil Resource Maps of NBSS & LUP); ** Pl. give the details of the major soils occupying more than 5% of total geographical area. Degree of soil acidity (pH) may also be indicated

1.5	**Agricultural land use**	Area ('000 ha)	Cropping intensity %
	Net sown area	99.9	145.3
	Area sown more than once	45.3	
	Gross cropped area	145.2	

1.6	**Irrigation**	Area ('000 ha)		
	Net irrigated area	2.7		
	Gross irrigated area	6.24		
	Rainfed area	97.2		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals			Area may be indicated
	Tanks	26	0.016	
	Open wells	19	0.046	
	Bore wells	2734	4.671	
	Lift irrigation schemes	566	1.233	
	Micro-irrigation			
	Other sources (please specify)	11	0.270	
	Total Irrigated Area		6.240	
	Pump sets			
	No. of Tractors			
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited			
	Critical			
	Semi- critical			
	Safe	7		
	Wastewater availability and use			
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

1.6. a.	Fertilizer and Pesticides use	Type	Total quantity (tonnes)
1	Fertilizers*	Urea DAP Potash SSP Other straight fertilizers (specify) Other complex fertilizers (specify)	6576 1814 1665
2	Chemical Pesticides*	Insecticides Fungicides Weedicides Others (specify)	

* If break up is not available, indicate total quantity used in the district for any recent year, mention here the year and source of statistic

1.7 Area under major field crops & horticulture (as per latest figures) (2008-09)

1.7	Major field crops cultivated	Area ('000 ha)							
		Kharif			*Rabi*				
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Summer	Grand total
	Paddy			68.424				0.01	68.434
	Maize			0.854					0.854
	Blackgram			0.700					0.700
	Sesamum			0.225					0.225
	Arhar			0.065					0.065
	Rapeseed and Mustard						4.315		4.315
	Potato						2.642		2.642
	Pea						1.300		1.300
	Wheat						0.306		0.306

	Horticulture crops - Fruits	Area (ha)		
		Total	Irrigated	Rainfed
	Banana	1.530		
	Khasi Mandarin	1.408		
	Pineapple	0.355		

	Horticulture crops - Vegetables	**Total**		
	Kharif vegetables	3.457		
	Rabi vegetables	5.914		
	Medicinal and Aromatic crops	**Total**		
	Ginger	1.12		
	Coriander	0.739		
	Turmeric	0.244		
	Black pepper	0.062		
	Plantation crops	**Total**		
	Tea	68.207		
	Arecanut			
	Eg., industrial pulpwood crops etc.			
	Fodder crops	**Total**		
	Total fodder crop area			
	Grazing land, reserve areas etc			
	Availability of unconventional feeds/by products eg., breweries waste, food processing, fermented feeds bamboo shoots, fish etc			
	Sericulture etc **Other agro enterprises (mushroom cultivation etc specify)**			
	Others (specify)			

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Indigenous cattle	201.041	267.029	468.070
	Improved / Crossbred cattle	4.019	9.863	13.882
	Buffaloes (local low yielding)			20.598
	Improved Buffaloes			-
	Goat			85.020
	Sheep			0.136
	Pig			60.539
	Mithun			-
	Yak			-
	Others (Horse, mule, donkey etc., specify)			0.201
	Commercial dairy farms (Number)			

1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**
	Commercial		744.883
	Backyard		

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)	

ii) Inland (Data *Source: Statistical Handbook Assam 2009)*	**No. Farmer owned ponds**	**No. of Reservoirs**	**No. of village tanks**
	7837 nos.	NIL	

B. Culture

	Water Spread Area (ha)	**Yield (t/ha)**	**Production ('000 tons) 2011-12**
i) **Brackish water** (Data Source: MPEDA/ Fisheries Department)	NIL		
ii) **Fresh water** (Data Source: Fisheries Department)	1896.0	2.5	6607.27
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		Crop residue as fodder ('000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
Major Field crops (Crops to be identified based on total acreage)										
	Paddy	124.4	1818			0.018	1820	124.42	1818	
	Maize	0.557	680					0.557	680	
	Blackgram	0.560	800					0.560	800	
	Sesamum	0.111	491					0.111	491	
	Arhar	0.033	500					0.033	500	
	Rapeseed & mustard			3.020	700			3.020	700	
	Potato			8.095	6300			8.095	6300	
	Pea			0.910	700			0.910	700	
	Wheat			0.406	1325			0.406	1325	
Major Horticultural crops (Crops to be identified based on total acreage)										
	Orange							19.760	16000	
	Banana							51.400	40000	
	Pineapple							8.325	45000	
	Ginger							2.673	3000	
	Black pepper							0.090	277	
	Kharif vegetables							33.832	8000	
	Rabi vegetables							46.476	9000	

1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	**Rice**	**Rapeseed and mustard**	**Pea**	**Potato**	**Maize**
	Kharif- Rainfed	June –July				March –April
	Kharif-Irrigated	April - May				

	Rabi- Rainfed		Mid.Oct - Mid. Nov.	Oct.-Dec.	Oct. – Nov.	Nov. - Dec
	Rabi-Irrigated	Dec.- Jan.				
	Summer-irrigated					
	Summer-rainfed					

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			✓
	Pests and disease outbreak (specify) Rice bug, Rice stem borer,		✓	
	Others (like fog, cloud bursting etc.)			✓

*When contingency occurs in six out of 10 years

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: No

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[a]**	**Normal Crop / Cropping system[b]**	**Change in crop / cropping system[c] including variety**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
Delay by 2 weeks **3rd week of June**	**High rainfall medium low land alluvial soil**	Rice-Rice a) Autumn rice+winter rice Autumn rice- Govind, IR-50, Lachit, Luit Winter rice- Ranjit, Bahadur, Kushal, Moniram, Rangelee	Rice based cropping system Continued up to July 15th	Weed management	1. Supply of seeds through KSSC 2. Supply of seeds through NFSM 3. Supply of pump set through NFSM, AACP,RKVY
		Rice + Toria a) Autumn rice + Toria b) Winter rice + Toria **Autumn rice-** Govind, IR-50, Lachit, Luit **Winter rice-** Ranjit, Bahadur, Kushal, Moniram, **Rapeseed**- TS-36, TS-38, M-27	Winter rice - Lakhimi, IR-36, Satyaranjan, Basundhara	i. Weed management, ii. Supply of minimum irrigation, Thinning	
		Rice- Potato/pea a) Winter rice + Potato b) Winter rice + Pea Winter rice- Ranjit, Bahadur, Kushal, Moniram Potato- Kufri Chandramukhi, K. Jyoti, K. Sindhuri, K. Megha	Winter rice - Lakhimi, IR-36, Satyaranjan, Basundhara	Weed management, Supply of minimum irrigation,	

		Pea – Boneville, Rachna, HUP-2, Pant-14			
	High rainfall low land alluvial soil	Rice Ranjit, Bahadur, Kushal, Moniram, Pankaj	Rice Rice based cropping system Continued up to July 15th		
	3**. High rainfall upland alluvial soil**	Kharif veg- Rabi veg	Kharif veg- Rabi veg	Weed management, Supply of minimum irrigation,	
		Kharif pulse – Toria – Summer Vegetables a) Blackgram + Toria b) Blackgram + Toria + Summer vegetables **Blackgram-** Pant U 19, T-9, Rangdoi mah **Toria-** TS-36, TS-38, M-27 **Summer vegetables** – Okra, Cucumber, Pumpkin, Ridge gourd etc.		Weed management, Supply of minimum irrigation	

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Change in crop/cropping system[c]**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
Delay by 4 weeks **July 1st week**	1) **Farming situation: .High rainfall medium low land alluvial soil**	Rice-Rice a) Autumn rice+winter rice **Autumn rice**- Govind, IR-50, Lachit, Luit **Winter rice-** Ranjit, Bahadur, Kushal, Moniram, Rangelee	Rice based cropping system Continued up to July 15th	Weed management	1. Supply of seeds through KSSC 2. Supply of seeds through NFSM 3. Supply of pump set through NFSM, AACP,RKVY

		Rice + Rapeseed & Mustard a) Autumn rice + Toria b) Winter rice + Toria **Autumn rice-** Govind, IR-50, Lachit, Luit **Winter rice-** Ranjit, Bahadur, Kushal, Moniram, **Toria-** TS-36, TS-38, M-27	**Winter rice** - Lakhimi, IR-36, Satyaranjan, Basundhara	i. Weed management, ii. Supply of minimum irrigation, i. Thining i. Thining	
		Rice- Potato/pea a) Winter rice + Potato b) Winter rice + Pea **Winter rice-** Ranjit, Bahadur, Kushal, Moniram **Potato-** Kufri Chandramukhi, K. Jyoti, K. Sindhuri, K. Megha **Pea –** Boneville, Rachna, HUP-2, Pant-14	**Winter rice** - Lakhimi, IR-36, Satyaranjan, Basundhara	i. Weed management, ii. Supply of minimum irrigation i. Seed hardening-(18 hrs. soaking in water followed by 24 hrs. shade drying	
	High rainfall low land alluvial soil	Rice Ranjit, Bahadur, Pankaj	Rice Rice based cropping system Continued up to July 15th		
	3. High rainfall upland alluvial soil	Kharif veg- Rabi veg	Kharif veg- Rabi veg	i. Weed management, ii. Supply of minimum irrigation,	
		Kharif pulse – Toria – Summer		i. Weed	

		Vegetables a) Blackgram + Toria b) Blackgram + Toria + Summer vegetables **Blackgram-** Pant U 19, T-9, Rangdoi mah **Toria-** TS-36, TS-38, M-27 **Summer vegetables –** Okra, Cucumber, Pumpkin, Ridge gourd etc.		management, ii.Supply of minimum irrigation	
		Cropping system 4 Maize-vegetables			

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Change in crop/cropping system[c]**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
Delay by 6 weeks **July 2nd week**	**High rainfall medium low land alluvial soil**	Rice-Rice a) Autumn rice+winter rice **Autumn rice-** Govind, IR-50, Lachit, Luit **Winter rice-** Ranjit, Bahadur, Kushal, Moniram, Rangelee	**Winter rice** - Pankaj, Kushal, Lakhimi, Tranplanting with 60 days old seedling upto the end of August with Monoharsali, Prafulla, Gitsh Direct seeding with Luit, Kapilee etc.	i. Weed management ii. Staggered planting, iii. Closer spacing	1. Supply of seeds through KSSC 2. Supply of seeds through NFSM 3. Supply of pump set through NFSM, AACP,RKVY
		Rice + Rapeseed & Mustard a) Autumn rice + Toria b) Winter rice + Toria **Autumn rice-** Govind, IR-50, Lachit, Luit	**Winter rice -** Luit, Kapilee, Disang, IR-36, Satyaranjan, Basundhara	**Rice**- i. Weed management, ii. Supply of Life saving irrigation,	

		Winter rice- Ranjit, Bahadur, Kushal, Moniram, **Toria-** TS-36, TS-38, M-27		Thinning	
		Rice- Potato a) Winter rice + Potato b) Winter rice + Pea **Winter rice**- Ranjit, Bahadur, Kushal, Moniram **Potato**- Kufri Chandramukhi, K. Jyoti, K. Sindhuri, K. Megha **Pea** – Boneville, Rachna, HUP-2, Pant-14	**Winter rice -** Luit, Kapilee, Disang,, IR-36, Satyaranjan, Basundhara	**Rice-** i. Weed management, ii. Supply of Life saving irrigation, ,	
	High rainfall low land alluvial soil	Rice Ranjit, Bahadur, Pankaj	Pankaj, Kushal, Lakhimi, Tranplanting with 60 days old seedling upto the end of August with Monoharsali, Prafulla, Gitsh	i. Selection of drought tolerant varieties ii. Staggered planting, iii. Closer spacing	
	High rainfall upland alluvial soil	Kharif veg- Rabi veg	Oilseed crops like sesame- Rabi veg	i.Weed management, ii.Supply of Life saving irrigation,	
		Kharif pulse – Toria – Summer Vegetables a) Blackgram + Toria b) Blackgram + Toria + Summer vegetables **Blackgram**- Pant U 19, T-9, Rangdoi mah **Toria**- TS-36, TS-38, M-27 **Summer vegetables** – Okra, Cucumber, Pumpkin, Ridge gourd etc.		i. Weed management, ii. Supply of Life saving irrigation,	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Change in crop/cropping system[c]**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
Delay by 8 weeks August 1st week	**High rainfall medium low land alluvial soil**	Rice-Rice b) Autumn rice+winter rice **Autumn rice-** Govind, IR-50, Lachit, Luit **Winter rice-** Ranjit, Bahadur, Kushal, Moniram, Rangelee	**Winter rice** - Pankaj, Kushal, Lakhimi, Tranplanting with 60 days old seedling upto the end of August with Monoharsali, Prafulla, Gitsh Direct seeding with Luit, Kapilee etc.	i. Weed management ii. Staggered planting, iii. Closer spacing	1. Supply of seeds through KSSC 2. Supply of seeds through NFSM 3. Supply of pump set through NFSM, AACP,RKVY
		Rice + Rapeseed & Mustard c) Autumn rice + Toria d) Winter rice + Toria **Autumn rice-** Govind, IR-50, Lachit, Luit **Winter rice-** Ranjit, Bahadur, Kushal, Moniram, **Toria-** TS-36, TS-38, M-27	**Winter rice -** Luit, Kapilee, Disang, IR-36, Satyaranjan, Basundhara	**Rice**- i. Weed management, ii. Supply of Life saving irrigation, Thinning	
		Rice- Potato c) Winter rice + Potato d) Winter rice + Pea **Winter rice**- Ranjit, Bahadur, Kushal, Moniram **Potato**- Kufri Chandramukhi, K. Jyoti, K. Sindhuri, K. Megha **Pea** – Boneville, Rachna, HUP-2, Pant-14	**Winter rice -** Luit, Kapilee, Disang,, IR-36, Satyaranjan, Basundhara	**Rice-** i. Weed management, ii. Supply of Life saving irrigation, ,	

	High rainfall low land alluvial soil	Rice Ranjit, Bahadur, Pankaj	Pankaj, Kushal, Lakhimi, Tranplanting with 60 days old seedling upto the end of August with Monoharsali, Prafulla, Gitsh	i. Selection of drought tolerant varieties ii. Staggered planting, iii. Closer spacing	
	High rainfall upland alluvial soil	Kharif veg- Rabi veg	Oilseed crops like sesame-Rabi veg	i.Weed management, ii.Supply of Life saving irrigation,	
		Kharif pulse – Toria – Summer Vegetables c) Blackgram + Toria d) Blackgram + Toria + Summer vegetables **Blackgram**- Pant U 19, T-9, Rangdoi mah **Toria**- TS-36, TS-38, M-27 **Summer vegetables** – Okra, Cucumber, Pumpkin, Ridge gourd etc.		i. Weed management, ii. Supply of Life saving irrigation,	

Condition			**Suggested Contingency measures**		
Early season drought **(Normal onset)**	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop	1) **Farming situation: High rainfall medium low land alluvial soil**	Rice-Rice a) Autumn rice+winter rice **Autumn rice-** Govind, IR-50, Lachit, Luit **Winter rice-** Ranjit, Bahadur, Kushal,		**Rice-** i.Gap filling, ii.Weed management, iii. Supply of Life saving irrigation,	1. Supply of pump set through NFSM, AACP,RKVY

stand etc.		Moniram, Rangelee		iv.Top dressing additional quantities of MOP v.Spray 2% MOP solution.	
		Rice + Rapeseed & Mustard a) Autumn rice + Toria b) Winter rice + Toria **Autumn rice-** Govind, IR-50, Lachit, Luit **Winter rice-** Ranjit, Bahadur, Kushal, Moniram, **Toria-** TS-36, TS-38, M-27		**Rice**- i.Gap filling, ii.Weed management, iii.Supply of minimum irrigation, iv.Top dressing additional quantities of MOP v.Spray 2% MOP solution.	
		Rice- Potato a) Winter rice + Potato b) Winter rice + Pea **Winter rice**- Ranjit, Bahadur, Kushal, Moniram **Potato**- Kufri Chandramukhi, K. Jyoti, K. Sindhuri, K. Megha **Pea** – Boneville, Rachna, HUP-2, Pant-14		**Rice-** i.Gap filling, ii.Weed management, iii.Supply of minimum irrigation, iv.Top dressing additional quantities of MOP v.Spray 2% MOP solution.	
	2) Farming situation: **High rainfall low land alluvial soil**	Cropping system 1: Rice Ranjit, Bahadur, Pankaj		i.Gap filling, ii.Weed management, iii.Supply of minimum irrigation, iv.Top dressing additional quantities of MOP	

				v.Spray 2% MOP sol.	
	3. **High rainfall upland alluvial soil**	Kharif veg- Rabi veg	Kharif veg- Rabi veg		
		Kharif pulse – Toria – Summer Vegetables a) Blackgram + Toria b) Blackgram + Toria + Summer vegetables **Blackgram**- Pant U 19, T-9, Rangdoi mah **Toria**- TS-36, TS-38, M-27 **Summer vegetables** – Okra, Cucumber, Pumpkin, Ridge gourd etc.		i. Weed management, ii. Supply of minimum irrigation,	

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
At vegetative stage	**High rainfall medium low land alluvial soil**	Rice-Rice a) Autumn rice+winter rice **Autumn rice-** Govind, IR-50, Lachit, Luit **Winter rice-** Ranjit, Bahadur, Kushal, Moniram, Rangelee		i.Weed management, ii.Supply of minimum irrigation, iii.Top dressing additional quantities of MOP iv.Spray 2% MOP solution, v. Delay top dressing of urea up to heading	1. Supply of pump set through NFSM, AACP,RKVY
		Rice + Rapeseed & Mustard a) Autumn rice + Toria		**Rice-** i.Weed management,	

		b) Winter rice + Toria **Autumn rice-** Govind, IR-50, Lachit, Luit **Winter rice-** Ranjit, Bahadur, Kushal, Moniram, **Toria-** TS-36, TS-38, M-27		ii.Supply of minimum irrigation, iii.Top dressing additional quantities of MOP iv.Spray 2% MOP solution, v. Delay top dressing of urea up to heading	
		Rice- Potato a) Winter rice + Potato b) Winter rice + Pea **Winter rice**- Ranjit, Bahadur, Kushal, Moniram **Potato**- Kufri Chandramukhi, K. Jyoti, K. Sindhuri, K. Megha **Pea** – Boneville, Rachna, HUP-2, Pant-14		**Rice-** i.Weed management, ii.Supply of minimum irrigation, iii.Top dressing additional quantities of MOP iv.Spray 2% MOP solution, v. Delay top dressing of urea up to heading	
	High rainfall low land alluvial soil	Cropping system 1: Rice Ranjit, Bahadur, Pankaj		**Rice-** i.Weed management, ii.Supply of minimum irrigation, iii.Top dressing additional quantities of MOP iv.Spray 2% MOP solution, v. Delay top dressing of urea up to heading	
	High rainfall upland alluvial soil	Kharif veg- Rabi veg			
		Kharif pulse – Toria –			

		Summer Vegetables a) Blackgram + Toria b) Blackgram + Toria + Summer vegetables **Blackgram**- Pant U 19, T-9, Rangdoi mah **Toria**- TS-36, TS-38, M-27 **Summer vegetables** – Okra, Cucumber, Pumpkin, Ridge gourd etc.			

Condition			**Suggested contingency measures**		
Mid season drought(long dry spell)	**Major farming situation[a]**	**Crop/cropping system[b]**	**Change in crop/cropping system[c]**	**Agronomic measures[d]**	**Remarks on implementation[e]**
At flowering/ fruiting stage	**1. High rainfall medium low land alluvial soil**	Rice-Rice a) Autumn rice + winter rice **Autumn rice-** Govind, IR-50, Lachit, Luit **Winter rice-** Ranjit, Bahadur, Kushal, Moniram, Rangelee		**Rice-** i.Weed management, ii.Supply of minimum irrigation, iii.Top dressing additional quantities of MOP iv.Spray 2% MOP solution, v. Delay top dressing of urea up to headin	1. Supply of pump set through NFSM, AACP,RKVY
		Rice + Rapeseed & Mustard a) Autumn rice + Toria b) Winter rice + Toria **Autumn rice-** Govind, IR-50, Lachit, Luit **Winter rice-** Ranjit, Bahadur, Kushal, Moniram, **Toria-** TS-36, TS-38, M-27		**Rice-** i.Weed management, ii.Supply of minimum irrigation, iii.Top dressing additional quantities of MOP iv.Spray 2% MOP solution, v. Delay top dressing of urea up to headin	
		Rice- Potato a) Winter rice + Potato		**Rice-**	

		b) Winter rice + Pea **Winter rice**- Ranjit, Bahadur, Kushal, Moniram **Potato**- Kufri Chandramukhi, K. Jyoti, K. Sindhuri, K. Megha **Pea** – Boneville, Rachna, HUP-2, Pant-14		i.Weed management, ii.Supply of minimum irrigation, iii.Top dressing additional quantities of MOP iv.Spray 2% MOP solution, v. Delay top dressing of urea up to heading	
	High rainfall low land alluvial soil	Rice Ranjit, Bahadur, Pankaj		**Rice-** i.Weed management, ii.Supply of minimum irrigation, iii.Top dressing additional quantities of MOP iv.Spray 2% MOP solution, v. Delay top dressing of urea up to heading vi. Staggered planting	
	High rainfall upland alluvial soil	Kharif veg- Rabi veg	Oilseed crops like Sesame- Rabi vegetables		
		Kharif pulse – Toria – Summer Vegetables a) Blackgram + Toria b) Blackgram + Toria + Summer vegetables **Blackgram**- Pant U 19, T-9, Rangdoi mah **Toria**- TS-36, TS-38, M-27 **Summer vegetables** – Okra, Cucumber, Pumpkin, Ridge gourd etc.			

Condition			Suggested contingency measures		
Terminal drought	**Major farming situation[a]**	**Crop/cropping system[b]**	**Change in crop/cropping system[c]**	**Agronomic measures[d]**	**Remarks on implementation[e]**
	High rainfall medium low land alluvial soil	Rice-Rice a) Autumn rice+winter rice **Autumn rice-** Govind, IR-50, Lachit, Luit **Winter rice-** Ranjit, Bahadur, Kushal, Moniram, Rangelee		i.Supply of life saving irrigation, ii.Spray 2% MOP solution	1. Supply of pump set through NFSM, AACP,RKVY
		Rice + Rapeseed & Mustard a) Autumn rice + Toria b) Winter rice + Toria **Autumn rice-** Govind, IR-50, Lachit, Luit **Winter rice-** Ranjit, Bahadur, Kushal, Moniram, **Toria-** TS-36, TS-38, M-27		**Rice-** i.Supply of life saving irrigation, ii.Spray 2% MOP solution	
		Rice- Potato a) Winter rice + Potato b) Winter rice + Pea **Winter rice**- Ranjit, Bahadur, Kushal, Moniram **Potato**- Kufri Chandramukhi, K. Jyoti, K. Sindhuri, K. Megha **Pea** – Boneville, Rachna, HUP-2, Pant-14		**Rice-** i.Supply of life saving irrigation, ii.Spray 2% MOP solution	
	High rainfall low land alluvial soil	Rice		i.Supply of life saving irrigation, ii.Spray 2% MOP solution	

	3. High rainfall upland alluvial soil	Kharif veg- Rabi veg		Supply of life saving irrigation	
		Kharif pulse – Toria – Summer Vegetables a) Blackgram + Toria b) Blackgram + Toria + Summer vegetables **Blackgram**- Pant U 19, T-9, Rangdoi mah **Toria**- TS-36, TS-38, M-27 **Summer vegetables** – Okra, Cucumber, Pumpkin, Ridge gourd etc.		Supply of life saving irrigation	

2.1.2 Drought - Irrigated situation---Not applicable

Condition			**Suggested Contingency measures**		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Delayed release of water in canals due to low rainfall					
Limited release of water in canals due to low rainfall					
Non release of water in canals under delayed onset of monsoon in catchment					
Lack of inflows into tanks due to insufficient					

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
/delayed onset of monsoon					
Insufficiency of surface water for irrigation					
Insufficient groundwater recharge due to low rainfall					

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[k]**	**Flowering stage[l]**	**Crop maturity stage[m]**	**Post harvest[n]**
Rice	Provide drainage	Provide drainage	Drain out Harvesting at physiological maturity stage	Shift to safe place dry in shade and turn frequently
Rapeseed & mustard	Provide drainage	Drain out Harvest for vegetable purpose	Drain out Harvesting at physiological maturity stage	Shift to safer place
Pea	Provide drainage	Provide drainage	Drain out Harvest for vegetable purpose	Safe storage against storage pest and disease
Potato	Provide drainage	Provide drainage	Provide drainage	Safe storage against storage pest and disease
Maize	Provide drainage	Provide drainage	Drain out and Harvest at physiological	Shift to safer place

			maturity stage	
Horticulture				
Rabi vegetables	Provide drainage	Provide drainage	Drain out and Harvest the crop	
Khashi mandarin	Provide drainage	Provide drainage		
Heavy rainfall with high speed winds in a short span[2]				
Outbreak of pests and diseases due to unseasonal rains				
Rice	Need based plant protection IPDM for pluses	Need based plant protection IPDM for pluses in	Harvest the crop, clean and sell	
Rapeseed & mustard				
Pea				
Potato				
Maize				
Horticulture				
Rabi vegetables	Need based plant protection IPDM for pluses	Need based plant protection IPDM for pluses in	Harvest the crop, clean and sell	
Kharif vegetables				

2.3 Floods

Condition	**Suggested contingency measure[o]**			
Transient water logging/ partial inundation[1]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Crop 1 - Rice	Drain out water where ever possible, Raising community nursery at safe place	Drain out water where ever possible , Use of submergence tolerant varieties Jalashree, Plaban	Drain out water where possible	
Continuous submergence for more than 2 days[2]				
Crop 1 - Rice	Drain out water where	Drain out water where	Drain out water where	Harvest at Physiological

	possible, Raising community nursery at safe place, Resawing	possible , Use of submergence tolerant varieties Jalashree, Plaban Gap filling during early vegetative stage	possible	maturity , dried properly
Horticulture / Plantation crops				
Kharif vegetables	Drain out water where possible	Drain out water where possible	Drain out water where possible	Immediate harvest and sale
Sea water intrusion[3]				

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

Extreme event type	**Suggested contingency measure[r]**			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave[p]				
Cold wave[q]				
Frost				
Hailstorm				
Cyclone				
Sand deposition or heavy siltation				

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event[s]	**During the event**	**After the event**
Drought			
Feed and fodder availability	Encourage perennial fodder on bunds and waste land on community basis	Utilizing fodder from perennial trees and Fodder bank reserves, Transporting excess fodder from	Culling unproductive livestock

	Establishing fodder banks	adjoining districts, Use of feed mixtures	
Drinking water	Preserving water in the tank for drinking purpose	Using preserved water in the tanks for drinking	
Health and disease management	Veterinary preparedness with medicines and vaccines	Vaccination, deworming	Culling sick animals
Floods			
Feed and fodder availability	Encourage perennial fodder on bunds and waste land on community basis Preservation of fodder , Stock of raw material for concentrate.	Utilizing fodder from perennial trees and Fodder bank reserves Transporting excess fodder from adjoining districts Use of feed mixtures	Culling unproductive livestoc
Drinking water		Supply of clean/treated drinking water	
Health and disease management	Vaccination , deworming	Conducting mass animal Health Camps and treating the affected onc in Campaign Vaccination, deworming	Culling sick animals Ecofriendly disposal of carcasses
Cyclone			
Feed and fodder availability			
Drinking water			
Health and disease management			
Heat wave and cold wave			
Shelter/environment management			
Health and disease management			
Snowfall			

Earthquake			
Landslides			

[S] based on forewarning wherever available

2.5.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event[a]	**During the event**	**After the event**	
Drought				
Shortage of feed ingredients				
Drinking water				
Health and disease management				
Floods				
Shortage of feed ingredients	Stocking of essential feed ingredients	Utilization of stock feed Disposal at proper age	Disposal at proper age	
Drinking water	Provision for clean drinking water	Supply of disinfected drinking water	Supply of disinfected drinking water	
Health and disease management	Emergency Veterinary preparedness with medicines vaccination to birds	Campaign and Mass vaccination		
Cyclone				
Shortage of feed ingredients				
Drinking water				
Health and disease management				
Heat wave and cold wave				
Shelter/environment management				
Health and disease management				
Snowfall				

Earthquake, Landslides etc				

[a] based on forewarning wherever available

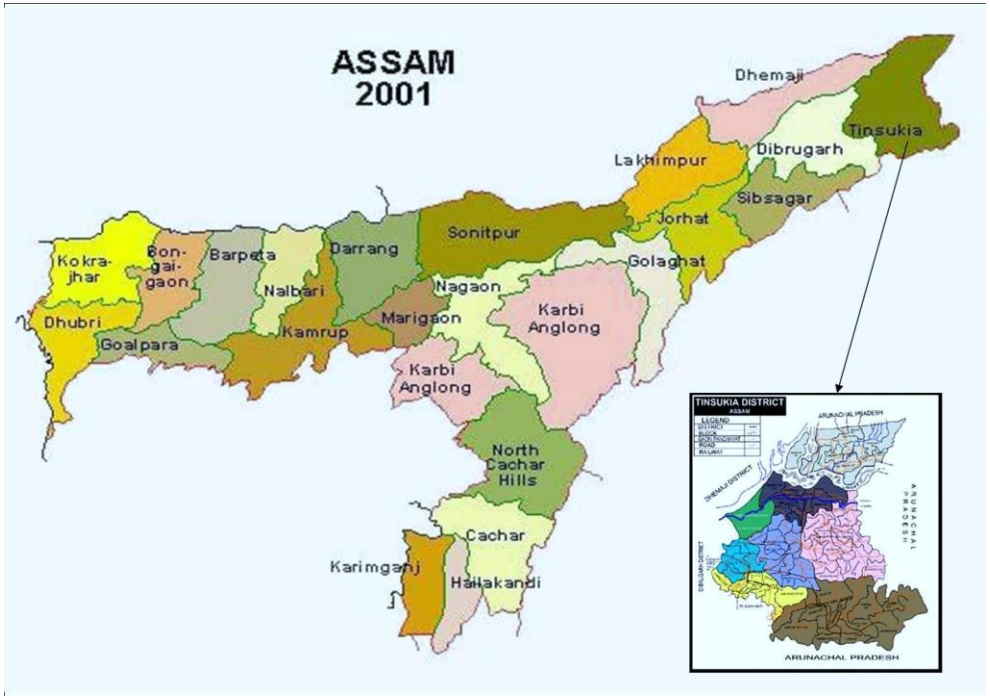
2.5.3 Fisheries/ Aquaculture

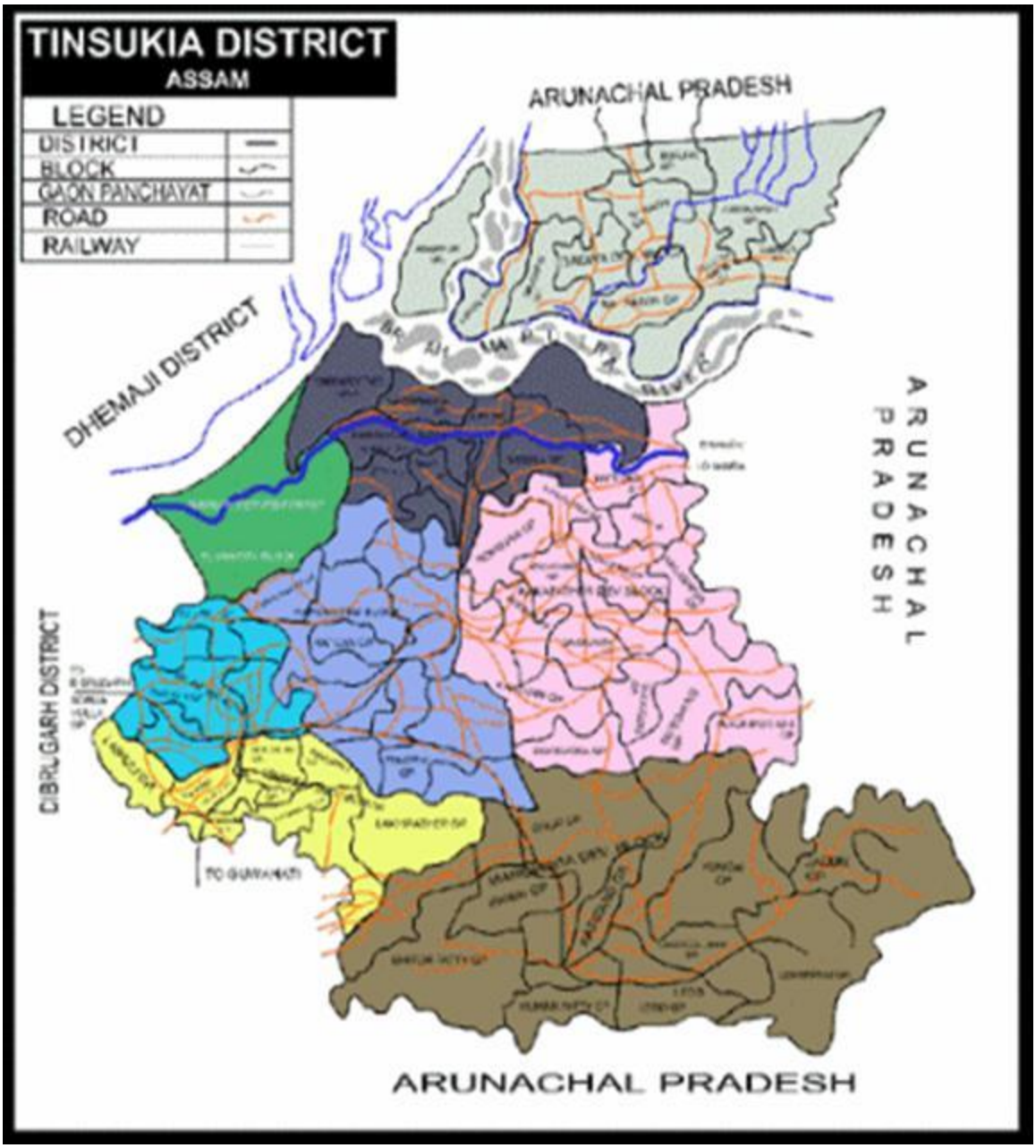
	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
1) Drought			
A. Capture			
Marine	-	-	-
Inland	Source of ground water		
(i) Shallow water depth due to insufficient rains/inflow	Arrangement of water pump Inclusion of species like minor	Supply of water by pumping	
(ii) Water contamination and changes in BOD	Agitation of water , application of $KMnO_4$		Water treatment with lime and $KMnO_4$
(iii) Any other- Health and disease management	Use of disinfectant water purifier		Use of disinfectant water purifier
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow		Supply of water by pumping	
(ii) Impact of salt load build up in ponds / change in water quality			
(iii) Any other			
2) Floods			
A. Capture			
Marine	-	-	-
Inland	Raising of embankment	Fitting of 'Bana', Nets etc	Preventive measure by liming application cifax
(i) Loss of stock			
(ii) Changes in water quality			
(iii) Health and diseases			
B. Aquaculture			
(i) Inundation with flood water	-	-	-
(ii) Water contamination and changes in water quality	Applied time	-	-

(iii) Health and diseases	Preventive measures taken by applying cifax, sakrena etc.	-	After through netting apply lime. If necessary dewatering the tank.
(iv) Loss of stock and inputs (feed, chemicals etc)			Restocking the fish seed
(v) Infrastructure damage (pumps, aerators, huts etc)	Pumps, aerators etc. should be kept ready		Repair the damage infrastructure
(vi) Any other			
3. Cyclone / Tsunami			
A. Capture			
Marine			
Inland			
B. Aquaculture			
(i) Overflow / flooding of ponds			
(ii) Changes in water quality (fresh water / brackish water ratio)			
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)			
(vi) Any other			
4. Heat wave and cold wave			
A. Capture			
Marine			
Inland			
B. Aquaculture			
(i) Changes in pond environment (water quality)			
(ii) Health and Disease management			
(iii) Any other			

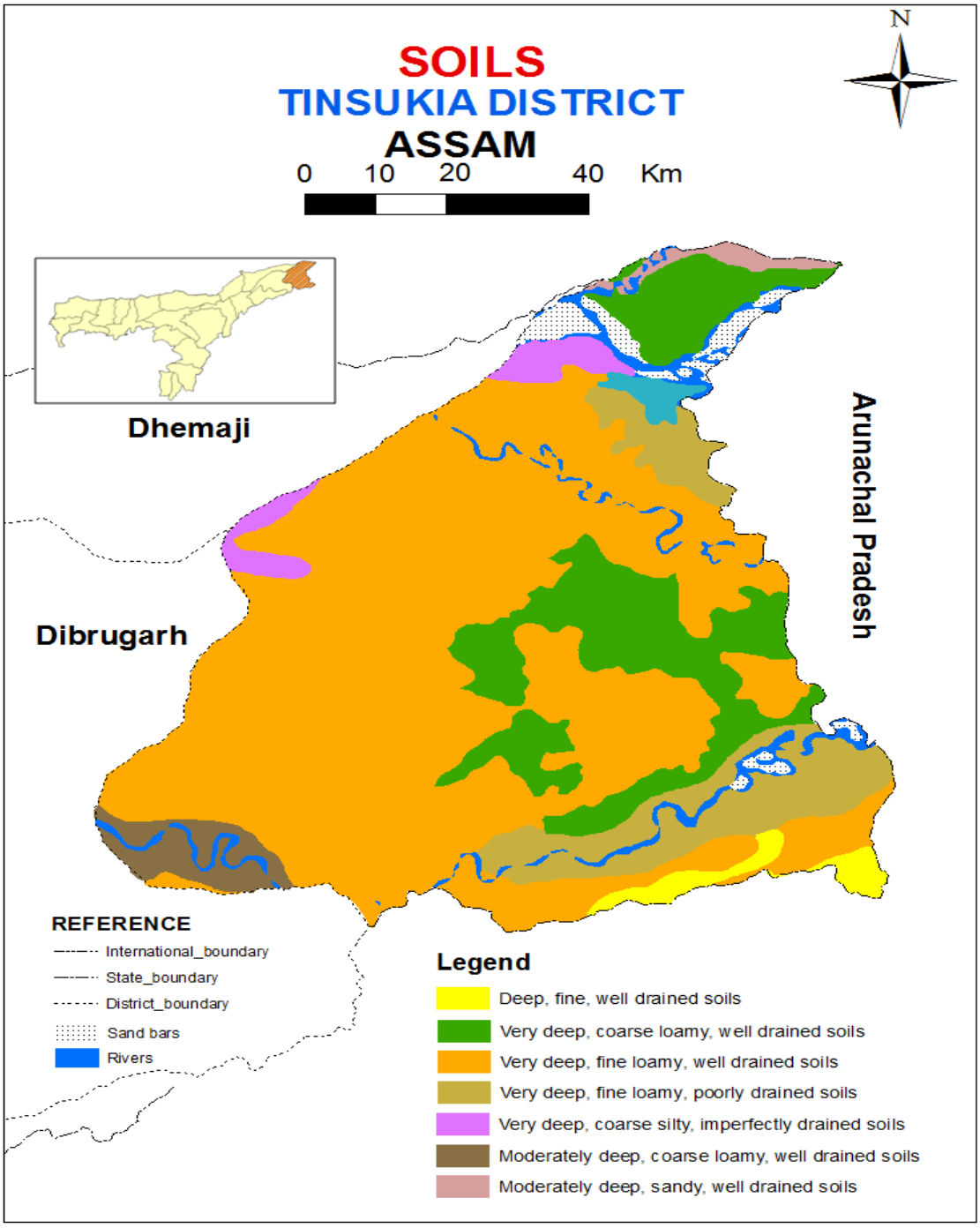
[a] based on forewarning wherever available

Location map in the state

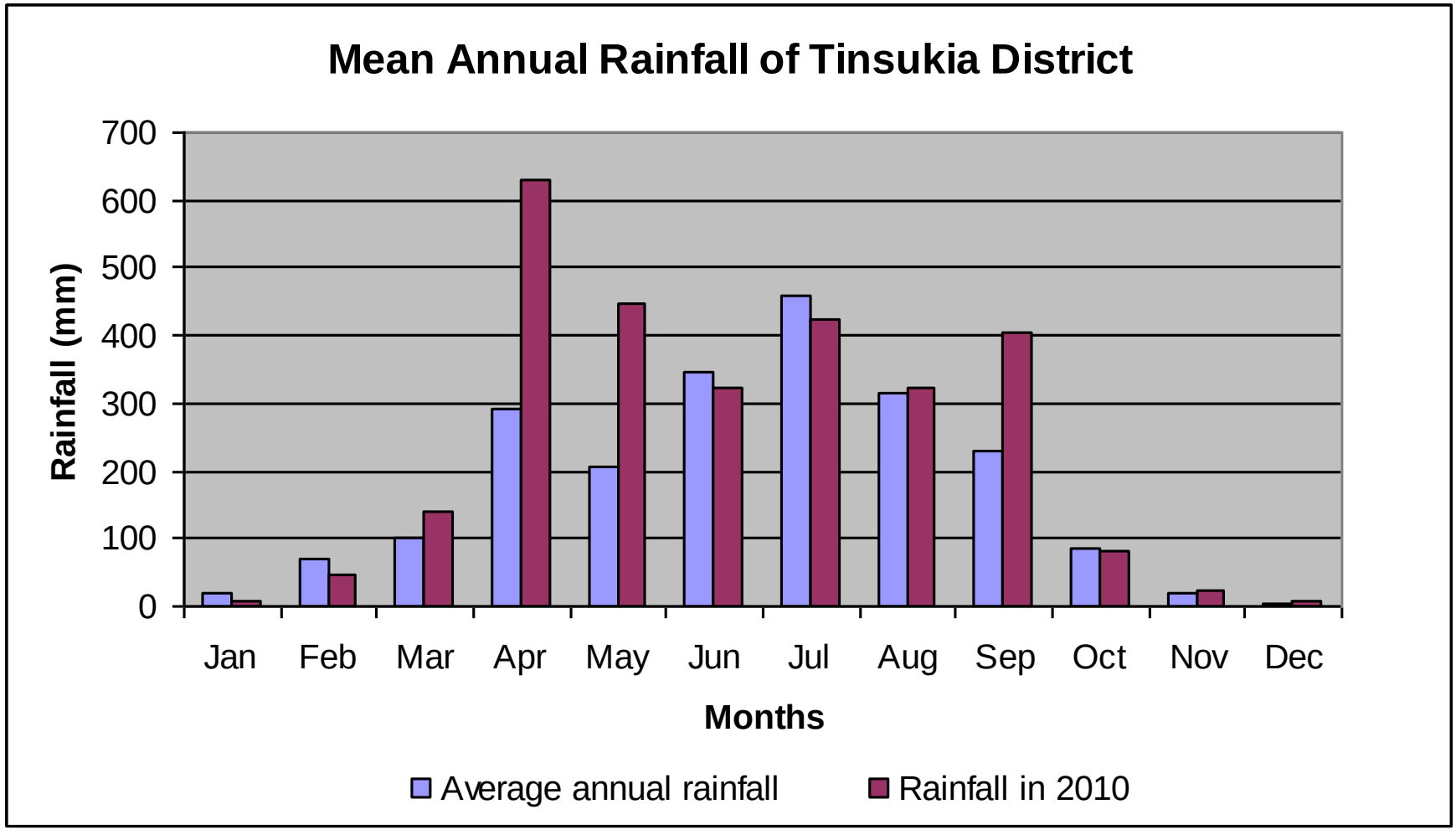




Location map **Annexure-I**


SOILS
TINSUKIA DISTRICT
ASSAM
0 10 20 40 Km
N
Dhemaji
Dibrugarh
Arunachal Pradesh
REFERENCE
International_boundary
State_boundary
District_boundary
Sand bars
Rivers
Legend
Deep, fine, well drained soils
Very deep, coarse loamy, well drained soils
Very deep, fine loamy, well drained soils
Very deep, fine loamy, poorly drained soils
Very deep, coarse silty, imperfectly drained soils
Moderately deep, coarse loamy, well drained soils
Moderately deep, sandy, well drained soils

Soil map


Mean Annual Rainfall of Tinsukia District
Rainfall (mm)
700
600
500
400
300
200
100
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Months
Average annual rainfall
Rainfall in 2010