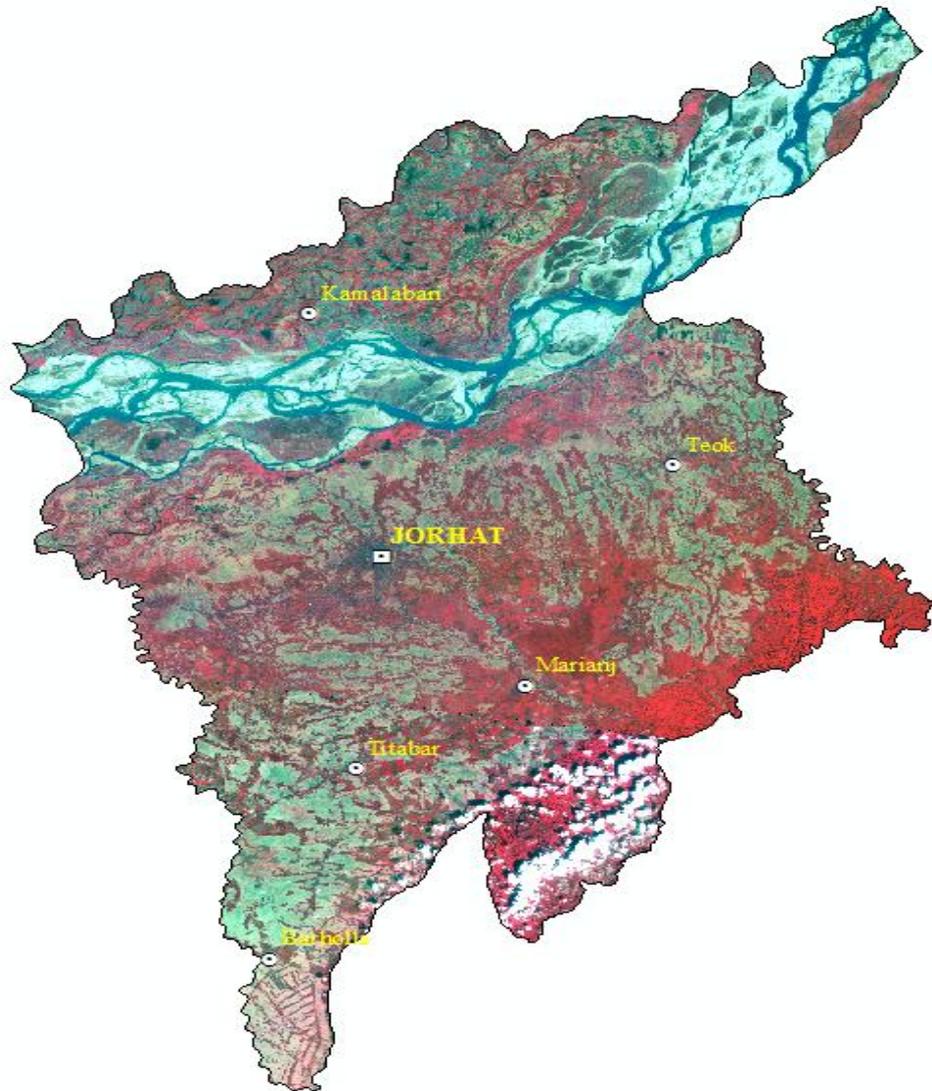


# SOILS OF JORHAT DISTRICT (ASSAM) FOR LAND USE PLANNING



NORTH EASTERN REGIONAL CENTRE  
JORHAT

National Bureau of Soil Survey & Land Use Planning

(Indian Council of Agricultural Research)

Nagpur - 440 033, Maharashtra, India



## CONTENTS

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Meta Data .....	4
1. INTRODUCTION .....	5
2. GENERAL DESCRIPTION OF THE AREA.....	6
2.1 Location and Extent: .....	6
2.2 Physiography, Relief and Drainage:.....	6
2.3 Climate: .....	6
2.4 Geology:.....	11
2.5 Natural Vegetation: .....	11
3. LAND USE AND AGRICULTURE.....	13
3.1 Agricultural crops and cropping pattern:.....	13
3.2 Plantation crops: .....	15
3.3 Horticultural crops: .....	15
4. SOIL SURVEY TECHNIQUES .....	18
5. THE SOILS .....	19
6. SOIL SURVEY INTERPRETATIONS FOR LAND USE PLANNING .....	39
6.1 Land capability classification:.....	39
6.2 Land irrigability classification: .....	39
6.3 Problem soils/lands: .....	42
6.4 Suggested Land Use:.....	42
6.5 Land Suitability Classification:.....	42
6.5 Land Suitability Classification: .....	42
PARTICIPANTS .....	51

## LIST OF TABLES

---

Table 1. Climatological data.....	11
Table 2. Land use (1981-82) .....	15
Table 3. Distribution of different crops (1990-91) (Area in ha).....	17
Table 4. Physiography and soils .....	32
Table 5. Soil Taxonomy .....	37
Table 6. Available NPK status at soil series level .....	38
Table 7. Land capability classification .....	43
Table 8. Land irrigability classification.....	45
Table 9. Problem soils .....	47
Table 10. Suggested land use .....	49
Table 11. Soil site suitability evaluation for different crops. ....	50

## LIST OF FIGURES

---

Fig. 1: Location map.....	7
Fig. 2: Physiography.....	8
Fig. 3: Block Diagram Showing Landform Features of Jorhat District, Assam. ....	9
Fig. 4: Ombrothermic diagram,Jorhat District, Assam. ....	10
Fig.5: Geology Map.....	12
Fig. 6: Land use (1981-82) Jorhat District, Assam.....	14
Fig.7: Area of major crops (1990-91) Jorhat Distric, Assam. ....	16
Fig. 8 Solis of Jorhat District .....	20
Fig.9: Slope.....	21
Fig.10: Parent Material .....	22
Fig.11: Soil Depth .....	23
Fig.12: Surface Drainage .....	24
Fig.13:Soil Erosion.....	25
Fig.14: Surface Texture .....	26
Fig.15: Flooding .....	27
Fig.16: Particle Size Class .....	28
Fig.17: Soil Reaction (pH) .....	29
Fig.18: Soil Series Association.....	30
Fig.19 : Taxonomy .....	31
Fig. 20: Land capability.....	40
Fig. 21: Land irrigability .....	41
Fig. 22: Land Use/ Land Cover .....	94

## Soils of Jorhat District (Assam) for Land Use Planning

### Meta Data for Soil Reports of Jorhat District, Assam

Sr.No.	Elements	Scheme	Value
1.	Identification Information	Name of the Dataset	Soils of Jorhat District (Assam) for Land Use Planning
		Contents	Soil Survey Reports, Maps and Imagery
		Keywords	Soil Survey Report
		Report/Map Language	English
		Map Scale	1: 250,000
		Survey Year	
		Imprint Year	1993
		Edit Year	-
		Value-addition Year	2013
		Purpose of Value-addition	To Create Interactive Maps and Reports and Disseminate to the End-User Agencies.
		Access Constraints	Permission Required
		Use Constraints	Permission Required
2.	Contact Information	Generating Agency	NBSS & LUP, Nagpur
		Contact Person	Director, NBSS & LUP, Nagpur
		Mailing Address	National Bureau of Soil Survey & Land Use Planning Sankar Nagar P.O. Amarabati Road, Nagpur - 440 033 Maharashtra, India
		City/Locality	Nagpur, Amarabati Road
		Country	India
		Contact Telephone	+91- 712- 2500386, 2500545
		Contact Fax	+91- 712- 2500534
		Contact Email	director@nbsslup.ernet.in
3.	Spatial Domain	Bound Left	93° 57' E
		Bound Right	94°37' E
		Bound Top	27°10' N
		Bound Bottom	26°20' N
		Area/Coverage	2859.3 sq.km
		Projection	UTM
		Datum	WGS 1984
		Unit	Meter
4.	Citation	Administrative Location	State: Assam, District: Jorhat
		Data Prepared By	NBSS & LUP, Jorhat (Regional Centre)
		Associated Project	G.S. Chmnuah
		Associated Value- additions	-
		Associated Publications	-
5.	Storage	Coordinator Value- added Publication	-
		Data Format	PDF/GeoPDF
		Data File Size	
		Data Physical Location	\\GIST6\D:\GeoPDF Mapping Project _2013\Jorhat
6.	Quicklook	Download Location	-
		Graphic file in jpg format	Y
7.	Image Data	Name of the Satellite	Landsat
		Sensor	ETM+
		Date of Image	15 October 2002
		File Format	TIFF
		Spatial Resolution	30 m
		Image Downloaded From	<a href="http://earthexplorer.usgs.gov/">http://earthexplorer.usgs.gov/</a>
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**1.****INTRODUCTION**

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Soil is the basic natural resource for meeting the needs of all living beings on earth. A proper knowledge of soils in respect of their extent, distribution, characteristics and use potential is therefore essential for optimising land use. This is possible through a systematic study of soils and soil resource mapping of the districts in the country. The soil map showing delineation of different soil units help transferring of agro-technology from the site of experimentation (Research Farms) to new sites with similar soil-site characteristics for better agriculture, soil and water conservation and other land use plan. In view of this, a reconnaissance soil survey of the district Jorhat, Assam was undertaken by the Regional Centre, National Bureau of Soil Survey and Land Use Planning (ICAR), Jorhat with the following objectives:

- to prepare a soil resource map of the district on 1:50,000 scale, for delineation of soil series and/or soil series associations with phases within each soilseries associations,
- to characterize the soils and evaluate their problems and potentials,
- to correlate and establish soil series, and classify the soils according to Soil Taxonomy and
- to prepare interpretative maps on soil and land resources of the district based on soil-site characteristics, present land use, inherent soil properties and their limitations for developing optimum land use plans.

## 2.

**GENERAL DESCRIPTION OF THE AREA****2.1 Location and Extent:**

The district is situated between 26°20' N to 27°10' N latitudes and 93°57' E to 94°37' E longitudes and lies in the eastern part of the state of Assam (Fig.1). It is bounded in the north by the North Lakhimpur district, in the east by Sibsagar district, on the south and southeast by Nagaland state and in the west by Golaghat district of Assam. The Jorhat district comprising of two subdivisions viz. Jorhat and Majuli covers a total area of 2859.3 sq.km or 2.86 lakh hectares, Jorhat town is the headquarters of the district and is connected with other parts of the state and country by rail, road and air link.

**2.2 Physiography, Relief and Drainage:**

The area represents a major part of the plains of the Brahmaputra valley at an altitude of about 60 m to 140 m above the mean sea level. Some areas at the south and southeast of the district have low hill ranges. Which are the continuation of the Naga Hills. The altitude of this area ranges from 150 m to 450 m above MSL. The hills are dissected and moderately steep to steeply sloping and forested. The northern part of the valley is flat to nearly level and often subject to moderate to severe flooding where as the other parts have very gentle slopes with impeded drainage and occasionally affected by flood and the area is mostly under paddy. Colluvial and alluvial materials are deposited at the foothill slopes and from the piedmont. Piedmonts and uplands are very gently sloping to gently sloping and dissected. They are mostly under tea cultivation and some parts are under forest. Physiographically the area can be divided into following units viz. (i) moderately steep hills, (ii) upper piedmont, (iii) lower piedmont, (iv) interhill valley, (v) gently sloping upland (dissected), (vi) nearly level to very gently sloping plain (vii) lower flood plain, (viii) lower terrace, (ix) upper terrace, (x) active flood plain, (xi) Bars/ charlands, (xii) Miscellaneous land (Marshed and Swamps, water bodies) (Fig.2).

The hill slopes have normal to excessive relief. In upper piedmont and uplands, relief is normal and in plains it is subnormal to flat or concave. The general slope of the area is from southeast to northwest (Fig.3).

The Brahmaputra is the principal river that mainly drains the area. Its tributaries namely Jhanji, Bhogdoi and Kakodonga originating from the Naga Hills of the Purvanchal Hill ranges flow through the district. These along with a number of streams flowing from the south and southeast merge into the mighty river Brahmaputra in the north of the district.

**2.3 Climate:**

The climate of the area is humid subtropical. The mean annual precipitation (based on 10 years record from 1980-89) is 1950 mm. The mean annual air temperature is 23.5° C. The mean winter (December, January and February) and summer (June, July and August) air temperatures are 17.0° C and 28.7° C respectively (Table 1). The calculated mean annual soil temperature (MAST) is 24.5° C, mean summer soil temperature (MSST) is 26.3° C, mean winter soil temperature (MWST) is 19.5° C and it qualifies for 'hyperthermic' soil temperature regime (Soil Taxonomy, 1975).

The rainfall is well distributed throughout the year, though major portion is received during March to September. Since the rainfall is high in the summer and some rainfall is received occasionally in the winter, the soil moisture control section seldom becomes dry in some parts for more than 90 cumulative days and therefore the area qualifies for ladle soil moisture regime (Fig.4).

The climatic conditions and soil moisture regime favour both Kharif and Rabi cultivation without much supplemental irrigation and in some areas rabi crops are grown in rainfed condition. The low-lying areas are subject to flooding and water logging during rainy season and also qualify for 'aquic' soil moisture regime.

# LOCATION MAP

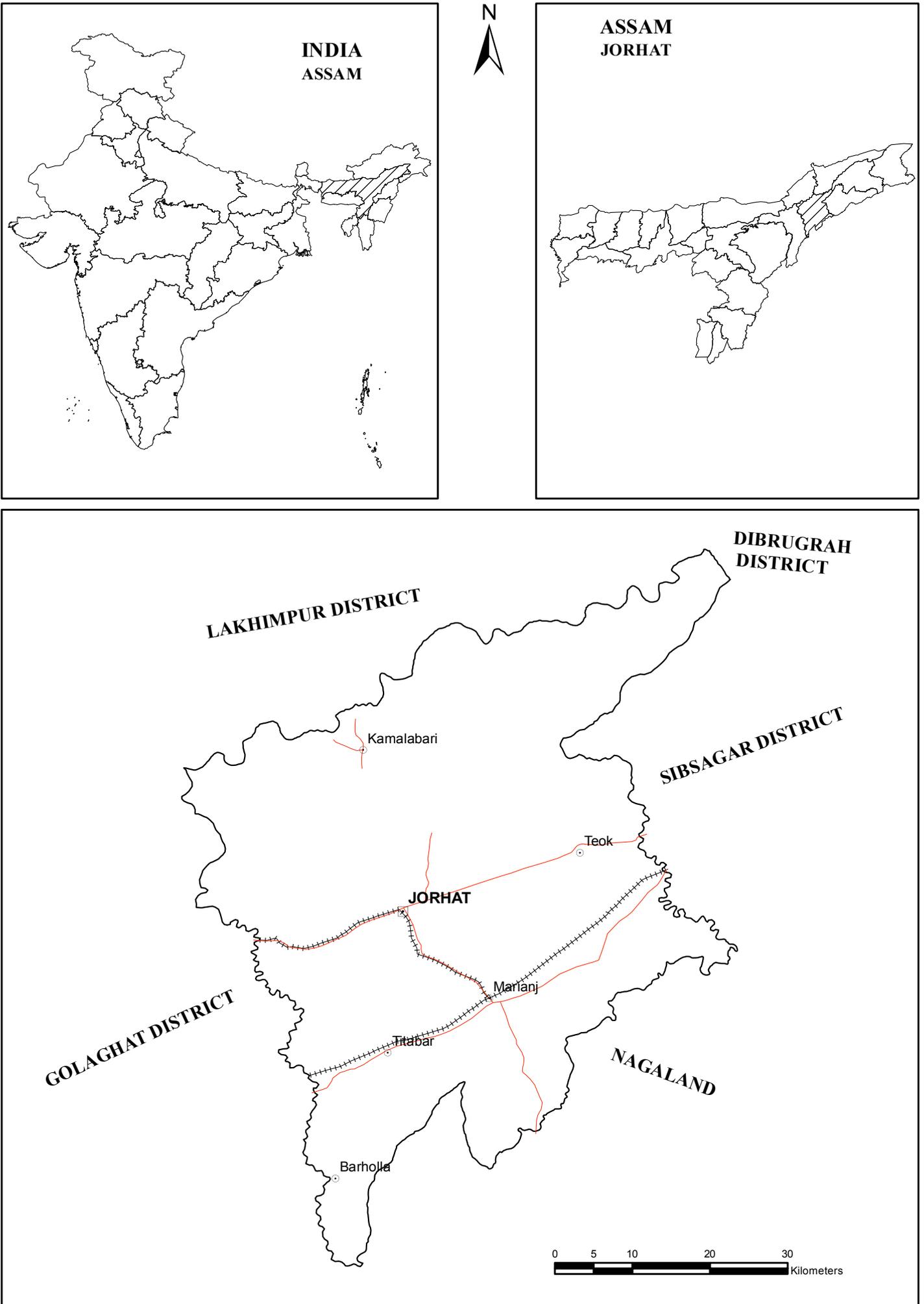
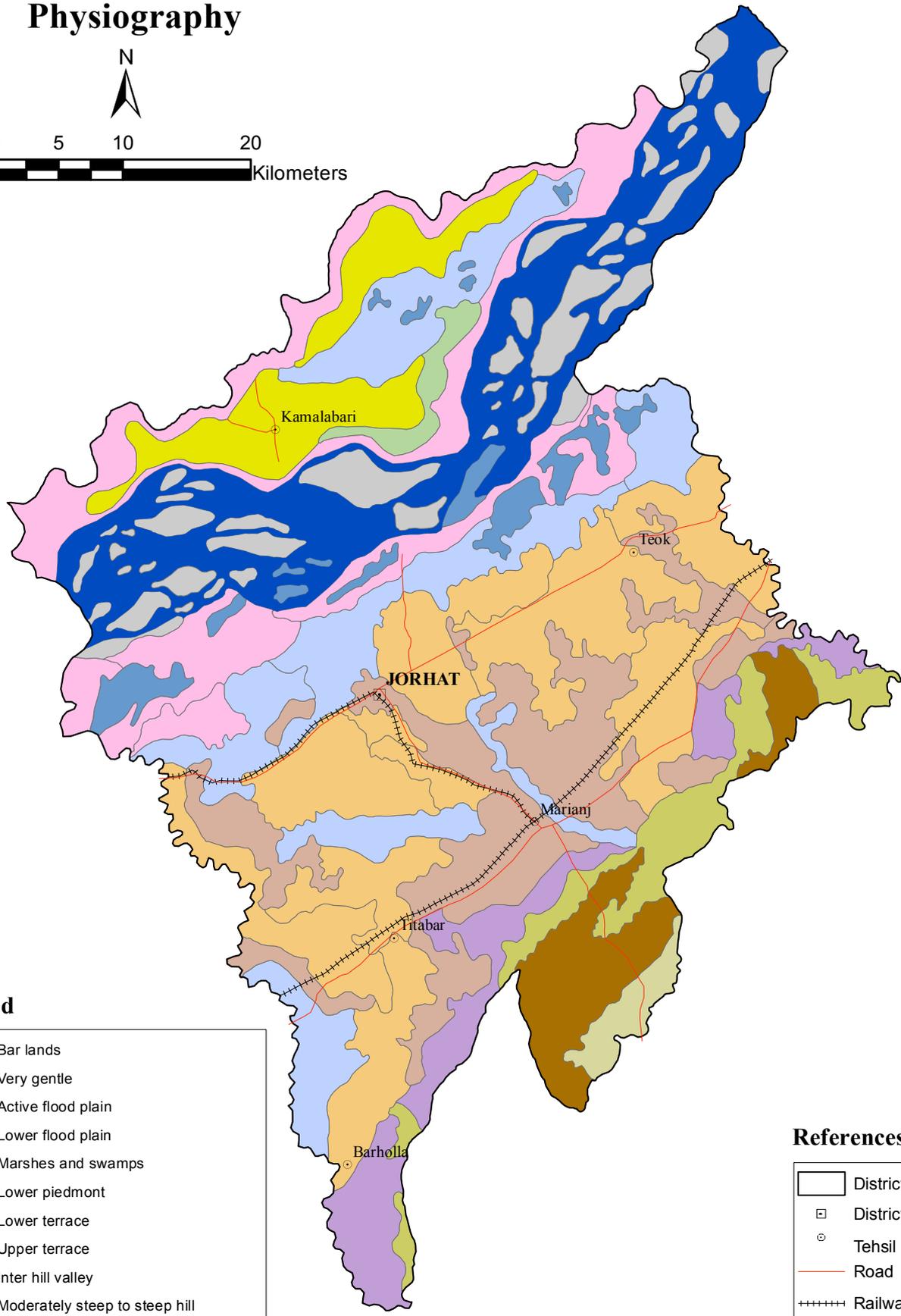
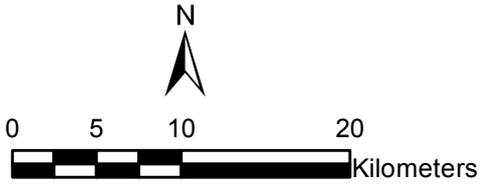


Fig. 1: Location Map

# JORHAT Physiography



## Legend

	Bar lands
	Very gentle
	Active flood plain
	Lower flood plain
	Marshes and swamps
	Lower piedmont
	Lower terrace
	Upper terrace
	Inter hill valley
	Moderately steep to steep hill
	Upper piedmont and undulating upland
	Gently sloping uplands (dissected)
	River

## References

	District Boundary
	District HQ
	Tehsil HQ
	Road
	Railway
	Drainage



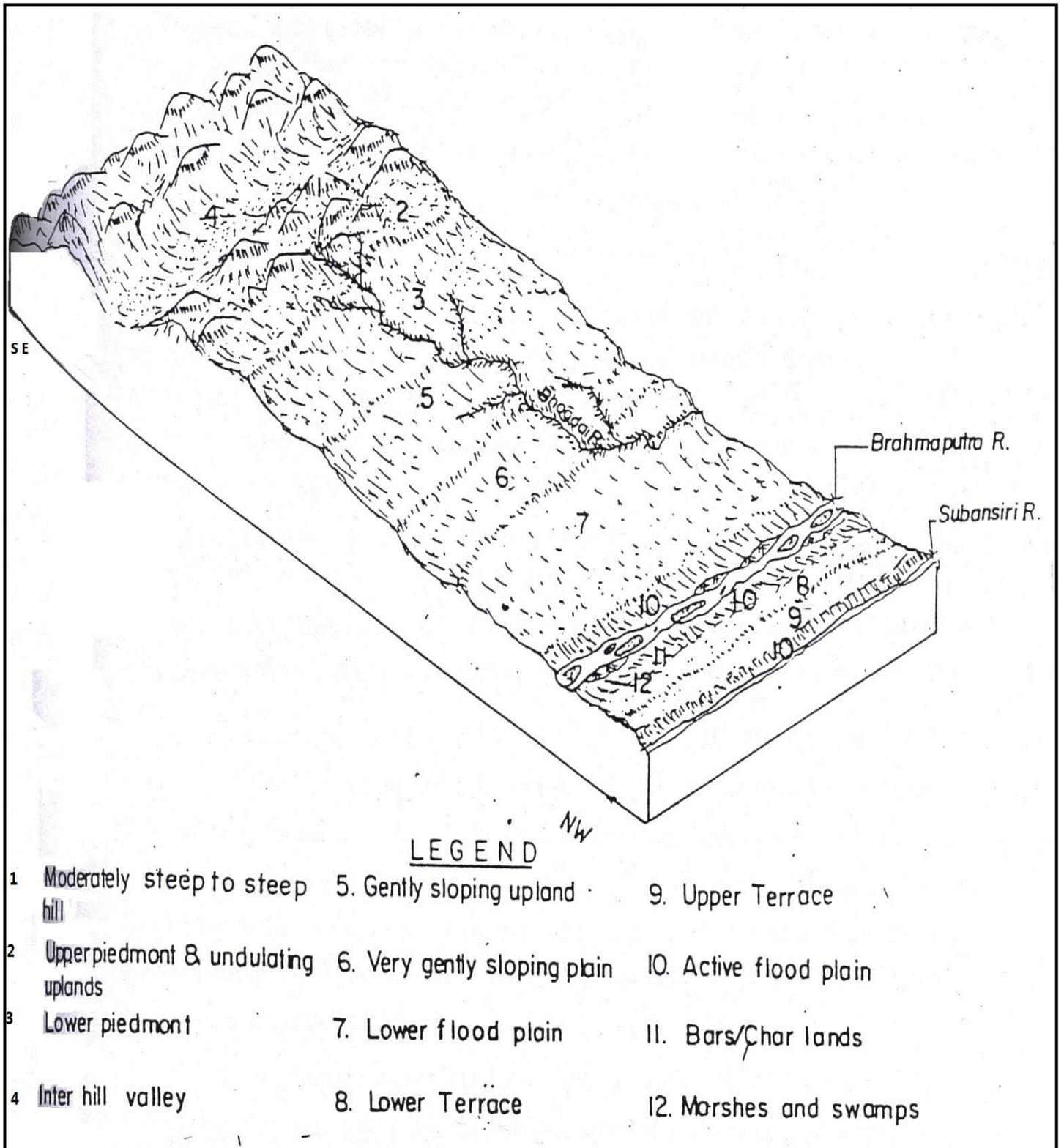


Fig. 3: Block Diagram Showing Landform Features of Jorhat District, Assam.

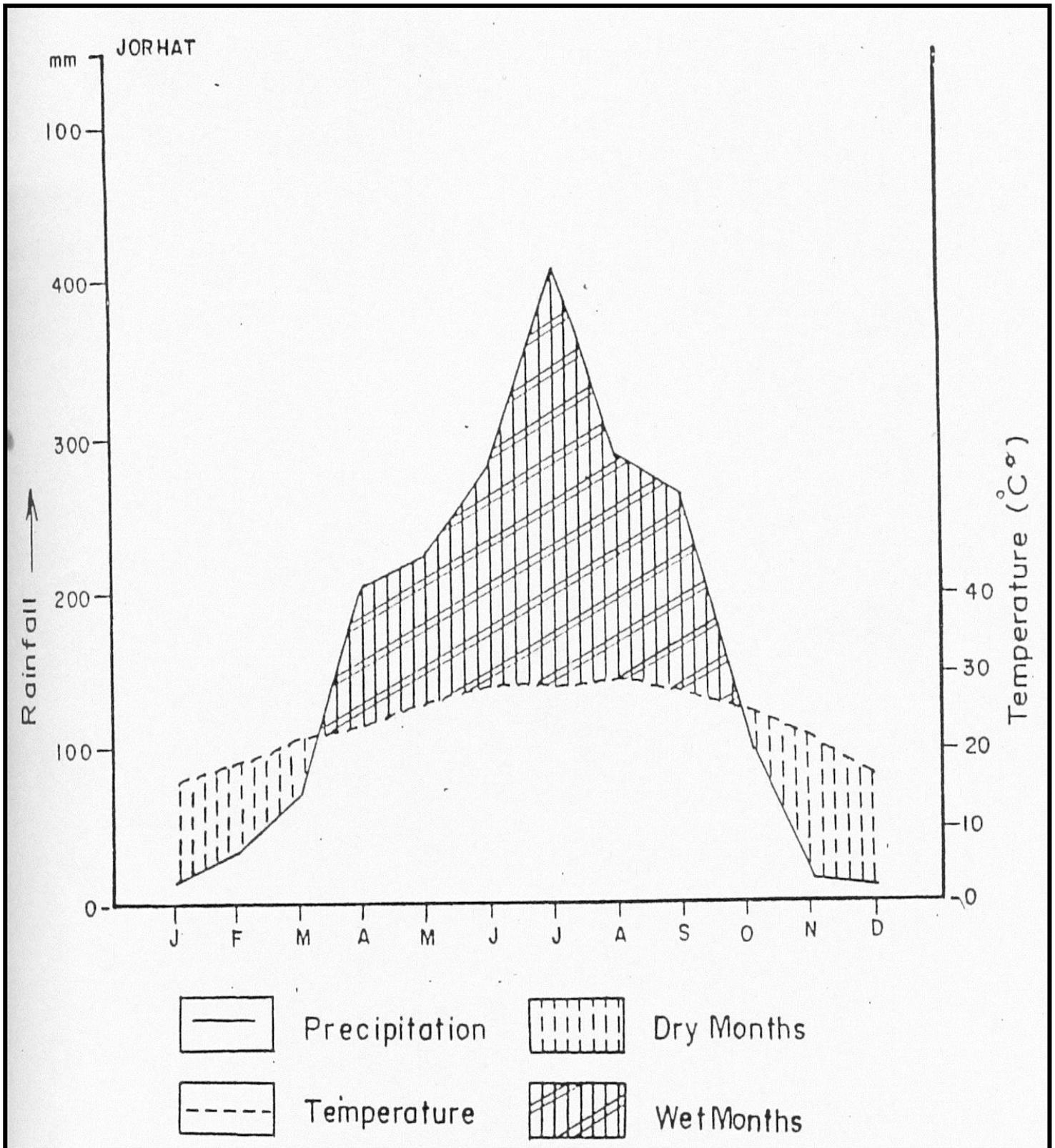


Fig. 4: Ombrothermic diagram, Jorhat District, Assam

**Table 1. Climatological data**

Station: Tocklai, Jorhat; 26°47'N 94°12'E.

Elevation: 95.5m above MSL. (Based on observations from 1980-1989)

Monthly average		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual average
Temp.	Max.	22.7	23.7	26.8	27.6	30.2	32.2	31.8	32.8	30.8	29.5	27.2	23.6	28.2
	Min.	9.7	12.1	16.5	19.4	22.1	25.0	25.2	25.7	24.5	21.3	15.3	10.0	18.9
°C.	Mean.	16.2	17.9	21.6	23.5	26.1	28.6	28.5	29.2	27.6	25.4	21.2	16.8	23.5
Rainfall (mm)		18.3	35.8	71.5	205.9	223.8	284.9	409.5	290.1	266.3	112.4	16.4	14.9	1950
Number of rainy days		3	7	11	18	18	20	26	21	20	12	3	4	163
Relative Humidity (%)	Max.	95	93	91	91	91	90	92	92	93	94	95	96	93
	Min.	55	51	54	64	71	71	75	74	75	72	59	59	65

Source: Tocklai Experimental Station, Tea Research Association, Jorhat,

**2.4 Geology:**

Most part of the district is covered by alluvium deposited by the river Brahmaputra and its tributaries. The older alluvium mainly of the Pleistocene period (less than 1 million years) consists of reddish to brownish sandy clay with coarser particles of sand and newer alluvium consists of sand, silt and clay along the plains of the Brahmaputra River.

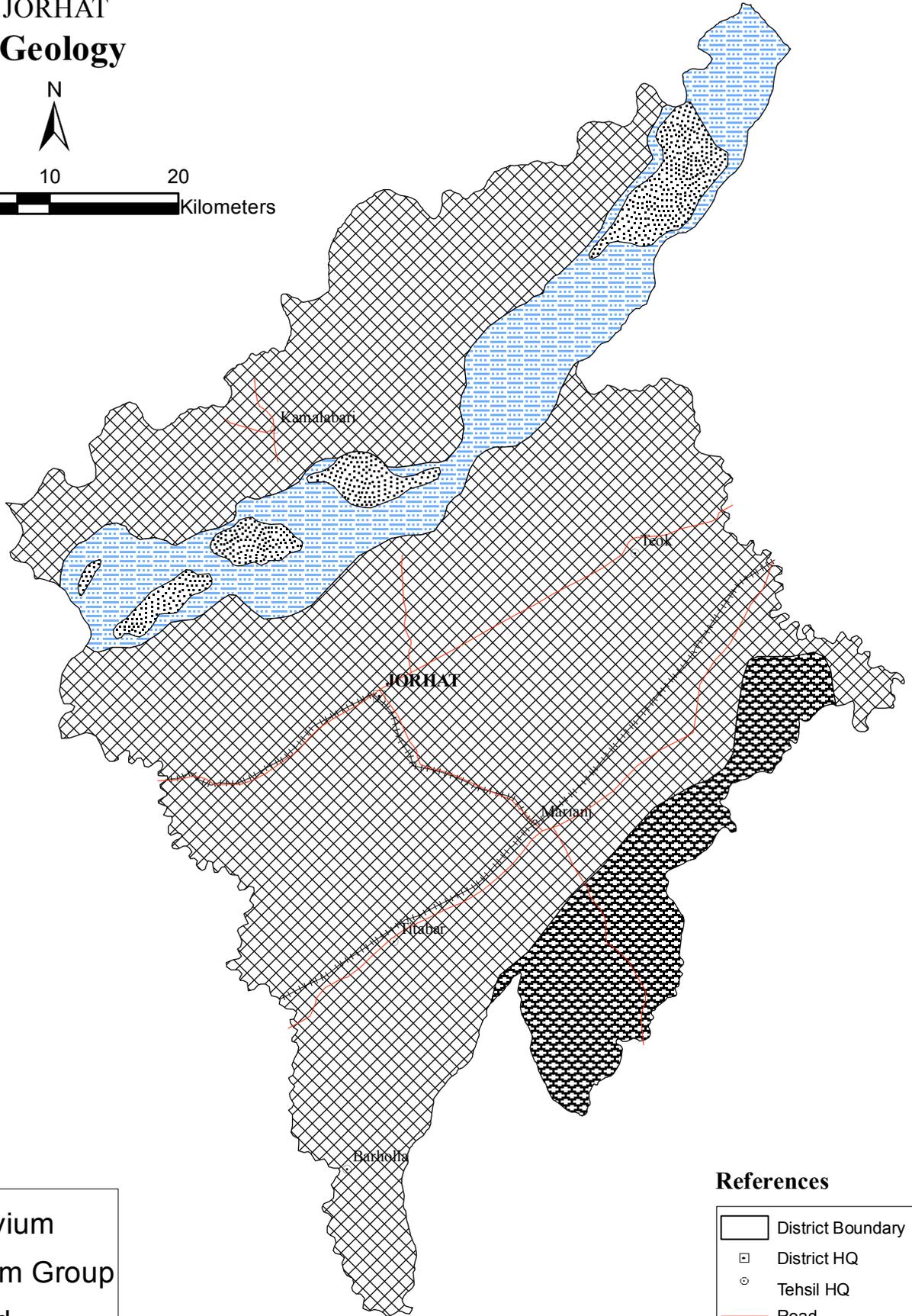
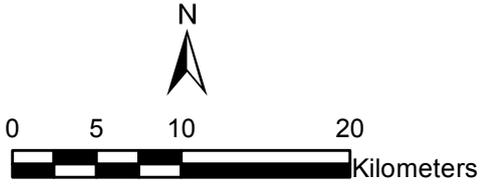
There is only a thin strip along the eastern boundaries of the district, where rocks belonging to Tipam groups of sedimentary rocks of Tertiary period consists mainly of coarse to gritty, ferruginous sandstones and shales (GSI, 1973) (Fig.5).

**2.5 Natural Vegetation:**

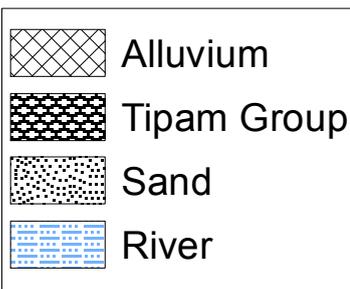
The natural vegetation comprises of different deciduous and evergreen trees, several shrubs and herbs and some grasses. The dominant tree species are: Ajhar (*Lagerstroemia flosreginae*), Bot (*Ficus bengalensis*), Boga Korol (*Alvizzip Procera*), Khokon (*Duabanga sonneratioides*), Nahar (*Mesua ferrea*), Ou tenga (*Dillenia indica*), Sonaru (*Cassia fistula*), Sisoo (*Oalbergiasissoo*), Simolu (*Bombax malabaricum*) and Bamboo (*Bambusa sp.*) etc.

The common shrubs and herbs are: Bon Ogora (*Trinmfalta bartramia*), Dudhbon (*Euphorbia hirta*), Jati bet (*Calamus tenuis*), Dhekia lata (*Stenochloa palustre*) ect. The common grasses grown in the area are Bongooti (*Chrysopogon acientatus*), Duboribon (*Cnodon dact ylon*), Kohua (*Saccharum spontaneum*), Ulu Khre (*Imperata cvlindica*) etc.

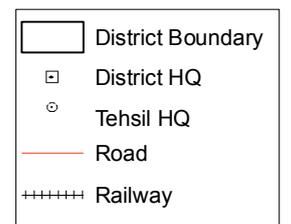
# JORHAT Geology



## Legend



## References



### 3.

## LAND USE AND AGRICULTURE

---

The total geographical area of the district is 2,85,930 ha of which about 12.6% is under forests. The area under land not available for cultivation is 32.7% including land put to non-agricultural uses, which alone accounts for about 25.3%. The other uncultivated land excluding fallow land is 8.0%, while fallow lands both permanent and current, fallows occupy 3.3% area. The net cultivated area is only 43.1%. The major land distributions in the district are given in Table 2 and Fig.5.

### 3.1 Agricultural crops and cropping pattern:

Agriculture is the principal occupation and more than 80% of the total population depends on it. The total cropped area during 1990-91 was 177135 ha of which 53228 ha area is double cropped. Paddy and oil seeds are cultivated on 108210 ha,(56.6%) and 14794 ha (7.7%) respectively. Pulses and spices occupy 1390 ha (0.7%) and 2705 ha (1.4%) respectively. Sugarcane, jute and tobacco together account 1062 ha which is only 0.6% of the area (Table 3 and Fig.6).

The major crops grown are paddy, wheat, mustard, sesamum, blackgram, greengram, lentil, pigeon peas, chillies, turmeric, ginger, sugarcane and others are grown to a minor extent.

Paddy is mostly grown as both Ahu (autumn) and Sall (winter) in kharif season. Ahu is grown by broadcasting in the month of March-April and harvested in June-July. Sall is cultivated by both broadcasting and transplanting in June-August and harvested in December-January. Bao (low land/deep water) paddy is also grown to some areas in kharif season. Boro paddy (summer) is grown in Rabi season to a less extent. Irrigation facilities are very meagre and occasional floods also cause problem of crop failure. The general crop rotations followed in the district are Paddy-wheat, paddy-pulses or oilseeds, paddy-fallow-paddy, pulses-vegetables and major areas are under only one crop, mainly paddy.

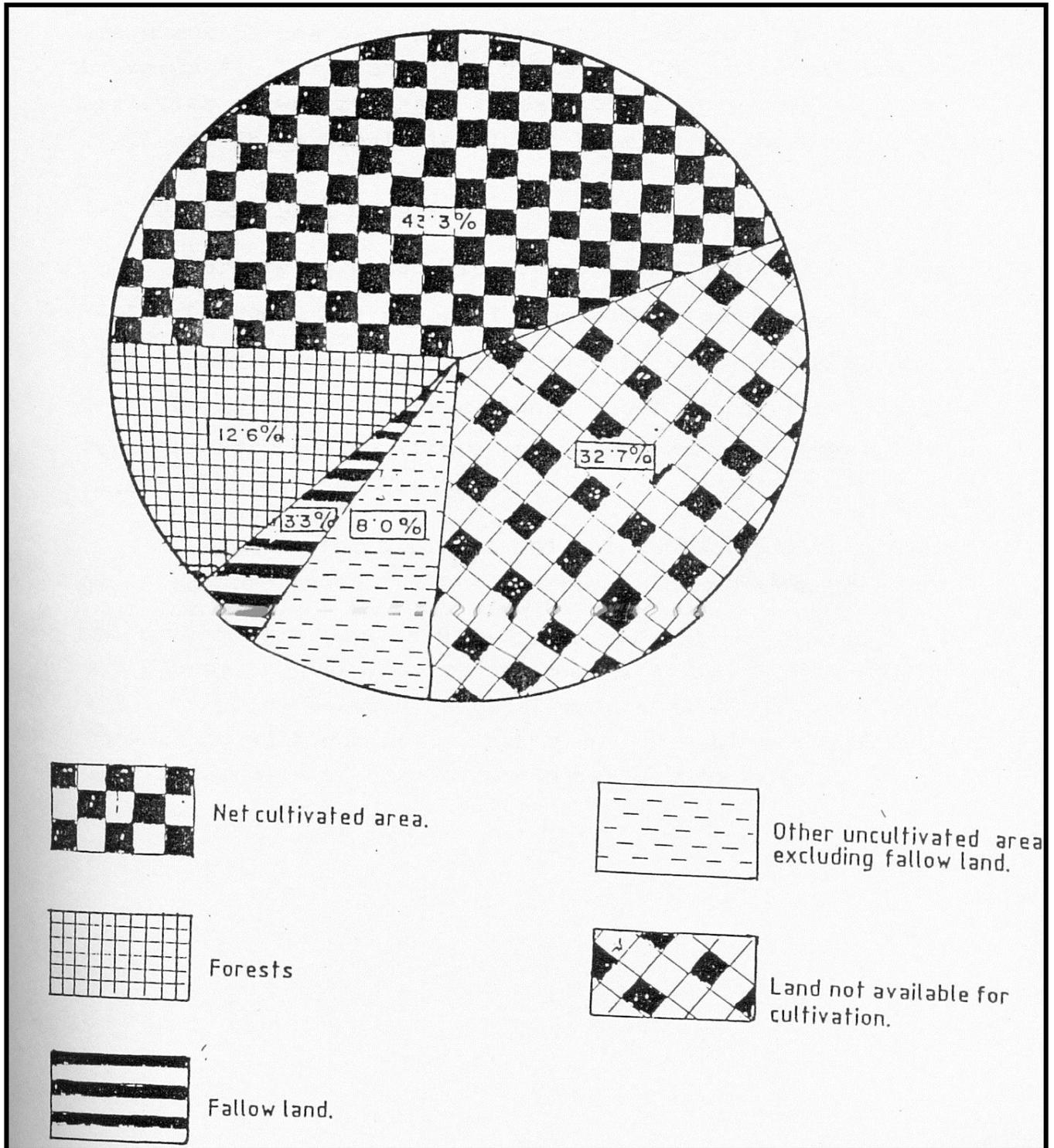


Fig. 6: Land use (1981-82) Jorhat District, Assam.

**Table 2. Land use (1981-82)**

Sl. No	Land use	Area(ha)	% of total geographical area
1.	Total Geographical area	285930	100.00
2.	Forest	36194	12.6
	Land not available for cultivation		
3.	(a) Land put non-agricultural uses	72267	25.3
	(b) Barren and uncultivable land	21136	7.4
	Total	93403	32.7
	Other uncultivated land excluding fallow land		
	(a)Permanent pastures and other grazing land	4406	1.5
4.	(b)Land under misc. trees, crops and groves	9792	3.4
	(c)Cultivable waste land	8823	3.1
	Total	23021	8.0
	Fallow land		
	(a)Fallow land other current fallow	5624	2.0
5.	(b)Current fallow	3781	1.3
	Total	9405	3.3
6.	Net area cultivated	123907	43.3
7.	Area sown more than once (1990-91)	53228	-
8.	Total cropped area (1990-91)	177135	-
9.	Net area irrigated	4023	-

Source: District Agriculture Office, Jorhat.

### 3.2 Plantation crops:

Next to paddy, tea is the dominant crop and planted extensively in the upland and upper piedmont areas. There are about 89 tea gardens in the district, which cover 33889 hectares (17.7%) (Table 3 and Fig.6). The principal tea varieties grown are Assam (broad leaf) Indo-china (medium leaf) and China (small leaf) and hybrids of these varieties.

### 3.3 Horticultural crops:

Variety of vegetable crops is grown both in summer and winter seasons. The reported area under summer vegetables is 4221 ha and winter vegetables cover 10158 ha which together count for 7.5% of the area. Among tuber crops, potato and colocasia are grown extensively and all tuber crops cover 3404 ha (1.8%) (Table 3 and Fig.7).

Varieties of tropical and subtropical fruits are also grown to some extent in the district. The total area covered under various fruits is 8558 ha (4.5%) and the dominant fruits are banana, coconut, arecanut, mango, jckfruit, papaya, orange and pineapple. Besides, several medicinal plants are found gorwing in wild condition in the forests and aromatic grass like citronella is also grown in tea garden areas.

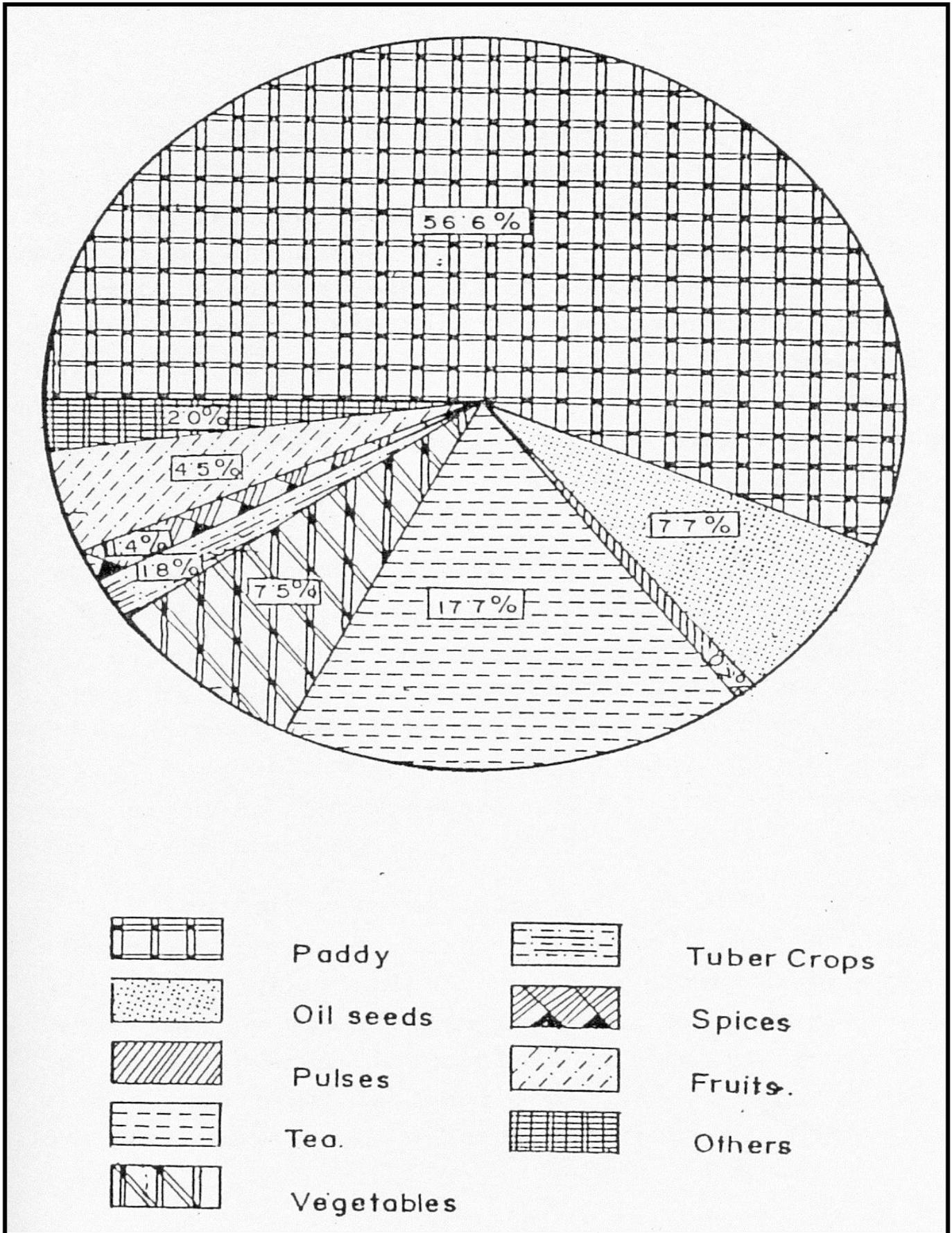


Fig.7: Area of major crops (1990-91) Jorhat Distric, Assam.

**Table 3. Distribution of different crops (1990-91) (Area in ha)**

A. Cereal Crops/Oilseeds/Pulses			B. Plantation crops/cash crops/fibre crops/species		C. Vegetables/Tuber crops		D. Fruits	
Crops		Area	Crops	Area	Crops	Area	Crops	Area
Autumn Paddy (Ahu)	1. HYV	2800	Tea	33889	Cauliflower	891	Banana	1506
	2. Local	14250	Sugarcane	925	Cabbage	1468	Coconut	1652
Winter Paddy (Sali)	1. HYV	38500	Jute	100	Knol khol	1600	Pineapple	156
	2. Local	51500	Tabacco	37	Tomato	712	Orange	224
	3. Deep Water	1060	Onion	243	Brinjal	861	Lime & Lemon	227
			Ginger	636	Pea	2334	Papaya	354
Summer Paddy (Boro)	1. HYV	100	Garlic	136	Carrot	306	Guava	12
Wheat		2705	Chilli	369			Arecanut	1911
			Turmeric	880	Radish	1170	Mango	1125
Mustard		14744	Coriander	355	Spinach	397	Jackfruit	77
Soyabean		50	Cumin	54	Others	419	Lichi	20
Blackgram		840	Others	32	Summer		Plum	3
Greengram		445			Vegetables	4221	Peach	3
Lentil		105			Potato	1986	Pomegranate	1
					Sweet potato	203	Others	21
					Tapioca	190		
					Colocasia	1008		
					YAM	17		

SOURCE: District Agriculture Office, Jorhat and Deputy Director of Economics & Statistics, Jorhat.

## 4.

### SOIL SURVEY TECHNIQUES

---

Reconnaissance soil survey and mapping of Jorhat district were carried out during 1980 to 1985 using 1:50,000/1:63,360 scale Survey of India toposheets as base maps. Physiographic units were delineated after study of landform features on toposheets and by interpretation of aerial photographs. The boundary of physiographic units was verified in the field during actual traverses in soil survey work. The standard soil survey procedure was followed according to the Soil Survey Manual (AIS&LUS, IARI, 1970). Soil profiles were studied in different physiographic units, and auger sampling at frequent intervals were done for confirming the extension of a particular soilseries. Soil series were identified after correlation considering the important differentiating characteristics like depth, texture, horizons, colour and mottles, gravels etc. Other external features viz, slope, drainage, surface texture, surface gravelliness, erosion hazards, present land use that are needed for interpretation were also observed and recorded for interpretation.

The soil-mapping units are the soil series or association of soil series. Each mapping unit consists of one or more major soils with inclusion of one or two minor soils. The soil series of one association may occur in another association but in a different proportion. In the district, 21 soil series were identified and mapped as 26 mapping units (Map 2) and some mapping units have inclusions of other soils (10 or 15%).

## 5.

**THE SOILS**

The soils of the district are the resultant product of interaction of different soil forming factors and climate, vegetation and relief seem to have played the dominant role. Due to this complex interaction of these factors, several kinds of soils are developed which differ distinctly in morphological and physical and chemical properties. Such characteristics formed the basis for identifying and distinguishing the nature of soils and delineating the extent of different soils in the study area.

Brief descriptions of soil series identified in different physiographic positions, along with their taxonomic classification are given in Table 4 and detailed descriptions of their morphology (AIS&LUS, IARI, 1970) and physical and chemical properties (Jackson, 1973 and Black, 1965) of soils are given in the Appendix.

The soils of the district are developed under humid subtropical climate with mean annual rainfall of 1950 mm and mean annual air temperature of 23.5° C. The area receives well distributed and high rainfall from April to September leading to excessive leaching in hill soils and water stagnation and flooding in valley areas, qualifying for both 'Udic' and 'Aquic' soil moisture regime, respectively. The soil temperature is hyperthermic. Although the parent material does not play significant role in soil formation in alluvial deposits the eastern part of the district has soils like Disai (I), Disai (II), Disai (III) and Murmurya developing on ferruginous sandstones, shales and older alluvial parent materials.

Landform or relief have played significant role in the formation of soils in the area. The physiography-soil relationship in the transect (A-B) is illustrated in Fig.8. The soils of the hill ranges are moderately deep to very deep, fine-loamy or coarse textured and gravelly. They are mostly yellowish brown to brownish yellow in colours and exhibit AC horizons or structural/textural 'B' horizons. Soils of upper piedmonts, undulating upland and dissected gently sloping uplands are deep to very deep, coarse-loamy or fine-loamy in texture. They are brown to yellowish brown and occasionally brownish yellow to reddish yellow with reddish brown soft iron nodules. Soils have mostly 'Gabriel epipedon and show AC horizon or structural/ textural 'B' horizons. Soil series like Disai (I), Murmurya, Sildubi, Teok and Sangsoa are examples of such formation, which qualify for Fluventic Dystrochrepts, Typic Uorthents, Dystric Eutrochrepts and Typic Dystrochrepts, respectively.

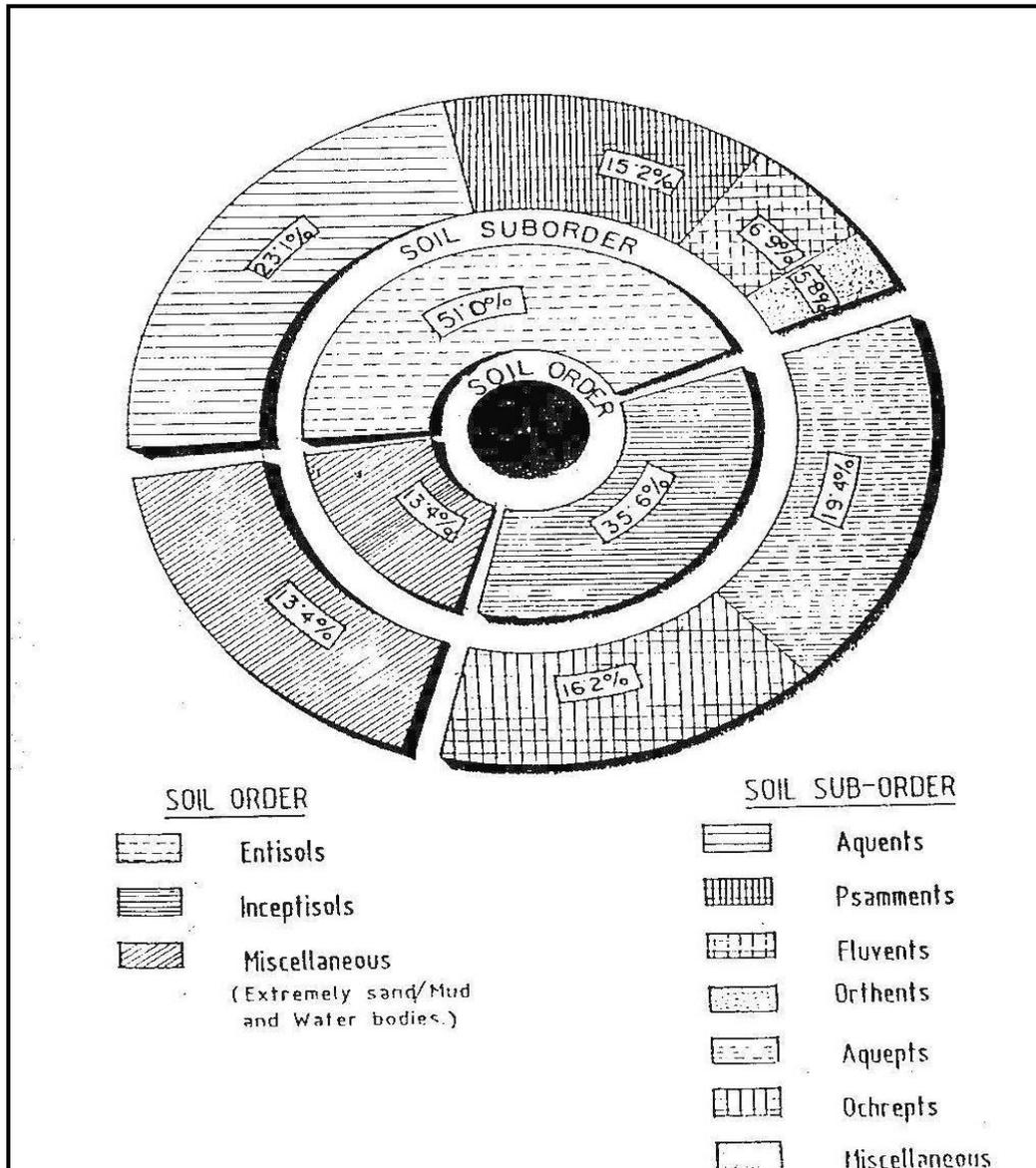
The soils in the valleys and flood plains are generally very deep, coarse-loamy, fine-loamy, clayey and stratified. Mostly they are light gray to gray with yellowish brown to strong brown mottles and occasionally yellowish brown to brown with grayish mottles. Some soils have distinct strong brown to orange red soft iron nodules which reflect seasonal fluctuation of ground water table. Most soils have 'Ochric' epipedon except Pakajara soil with dark soil colour and sufficiently high base status which favours the development of 'Mollic' epipedon, and most of the profiles exhibit the characteristics associated with wetness. Mostly the soils qualify for Typic Haplaquepts (Akahugaon, Napamua gaon, Dohotia, Gajpuria), Aeric Haplaquepts (Bareragaon), Aeric Fluvaquents (Matikhola), Mollic Fluvaquents (Pakajara), Typic Fluvaquents (Nahat Tippania, Ratanpur Kathalkhoa), Typic Haplaquents (Puranimati, Adhakota), Aquic Udifluvents (Lahangaon), Typic Udifluvents (Jankhana) and Typic Udipsamments Marangiagaon.

Soil analysis reveal that sand and silt fractions predominate in soil textural classes with few exceptions. Again the dominance of coarse textured soils in the northern part of the district possibly indicate that the alluvium brought down by the river Srahmaputra is mostly inherited from the quartz bearing parent materials. Usually, the surface layers have higher organic carbon content and the value decreases regularly with depth except in flood plain areas. Soils of the southern bank of the river Brahmaputra are generally strongly acid to medium acid and others is no regular tendency in pH variation with depth. In contrast, soils in the Majuli Subdivision are neutral to mildly alkaline and pH increases regularly with depth. The CEC of most of the soils is rather low and no systematic pattern was observed in its variation with depth. Base status is high in soils of Majuli Subdivision and those adjacent to Brahmaputra suggesting deposition of alkaline earth materials by frequent inundation.

## Soils of Jorhat District (Assam) for Land Use Planning

The identified soils (21 soil series) of the area have been classified according to the Soil Taxonomy (USDA, 1975) (Table 5). The soils of the district mostly belong to 2 orders (Entisols and Inceptisols), 6 Suborders (Aquents, Psamments, Fluvents, Orthents, Aquepts and Ochrepts, 8 great groups (Fluvaquents, Haplaquents, Udipsamments, Udifluvents, Iliorthents, Haplaquepts, Eutrochrepts and Dystrochrepts), 14 subgroups and 19 families.

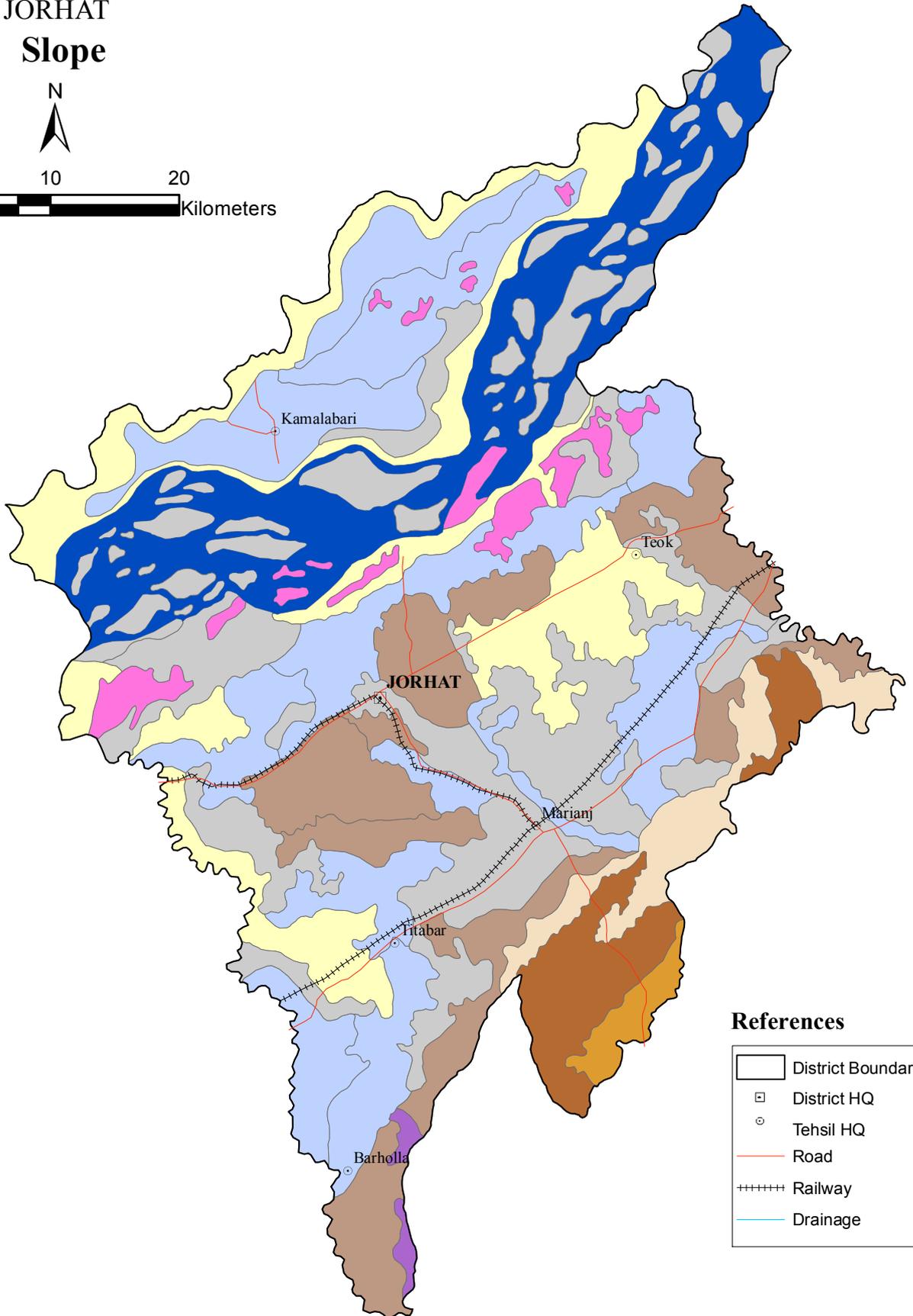
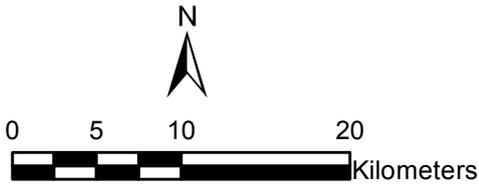
The Fig.8 shows that the Entisols are the dominant soils occupying 51.0% of the total geographical area of the district followed by Inceptisols (35.6%) and the Miscellaneous soils (13.4%).



**Fig. 8 Soils of Jorhat District**

The thematic maps on slope, parent material, soil depth, surface drainage, erosion, surface texture, flooding, particle size class, soil reaction (pH), soil series, and soil taxonomy maps are shown in figure 9 to 19, respectively.

# JORHAT Slope



### References

	District Boundary
	District HQ
	Tehsil HQ
	Road
	Railway
	Drainage

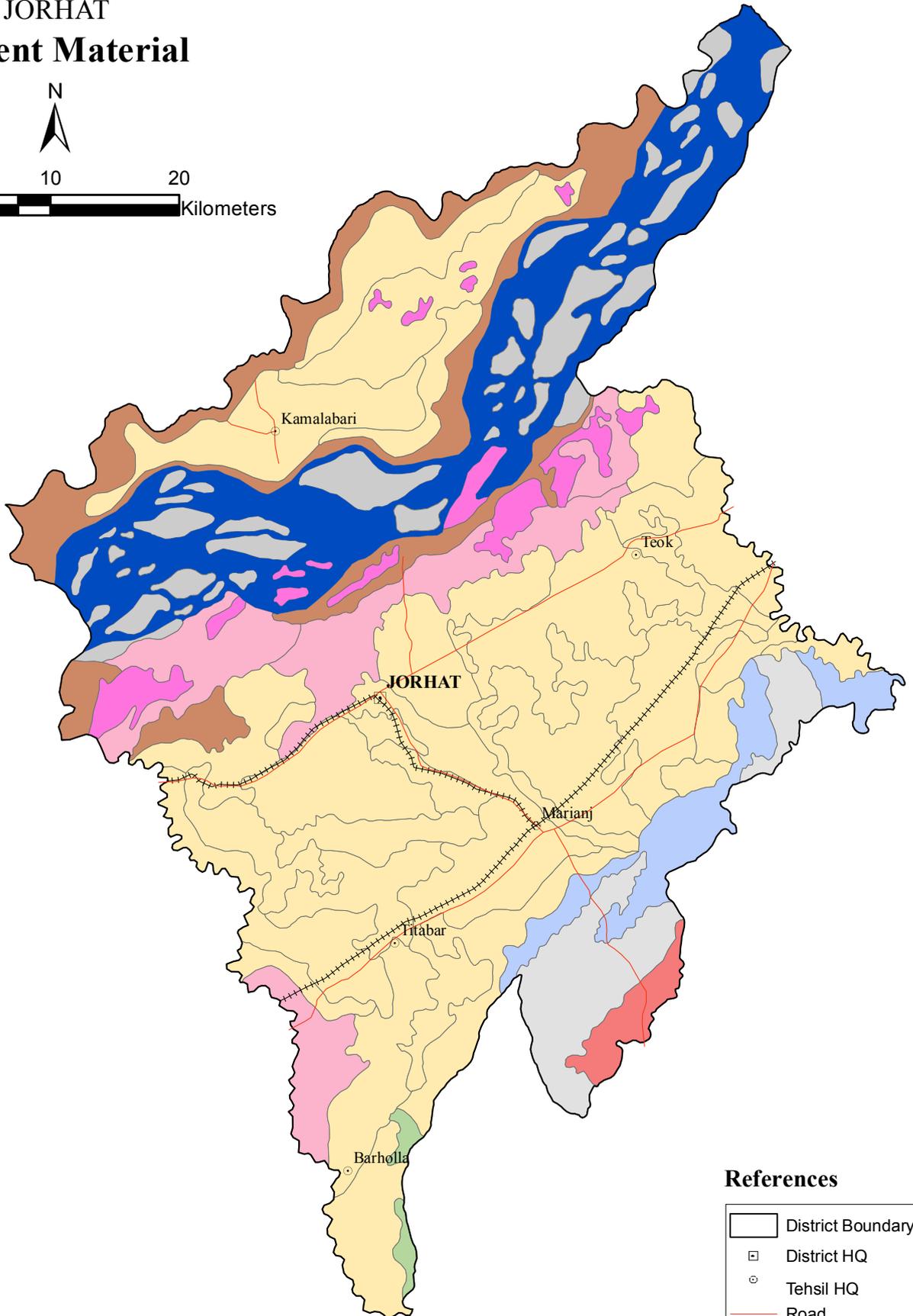
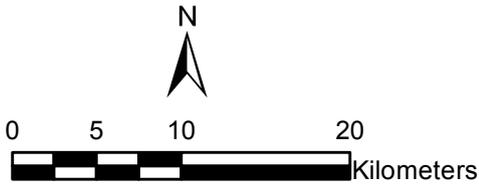
### Legend

	Gently sloping		Moderately sloping-Steeply sloping
	Gently sloping-Very gently sloping		Level to nearly level
	Gently sloping-Moderately sloping-Very gently sloping		Level to nearly level-Very gently sloping
	Very gently sloping		Miscellaneous
	Very gently sloping-Level to nearly level		River



Fig. 9: Slope

# JORHAT Parent Material



### Legend

	Alluvium		Colluvium-Alluvium
	Alluvium-Colluvium		Colluvium-Alluvium-Sandstone shales
	Alluvium-Coarse sediment		Sandstone shales
	Coarse sediment		Miscellaneous
	Coarse sediment-Alluvium		River

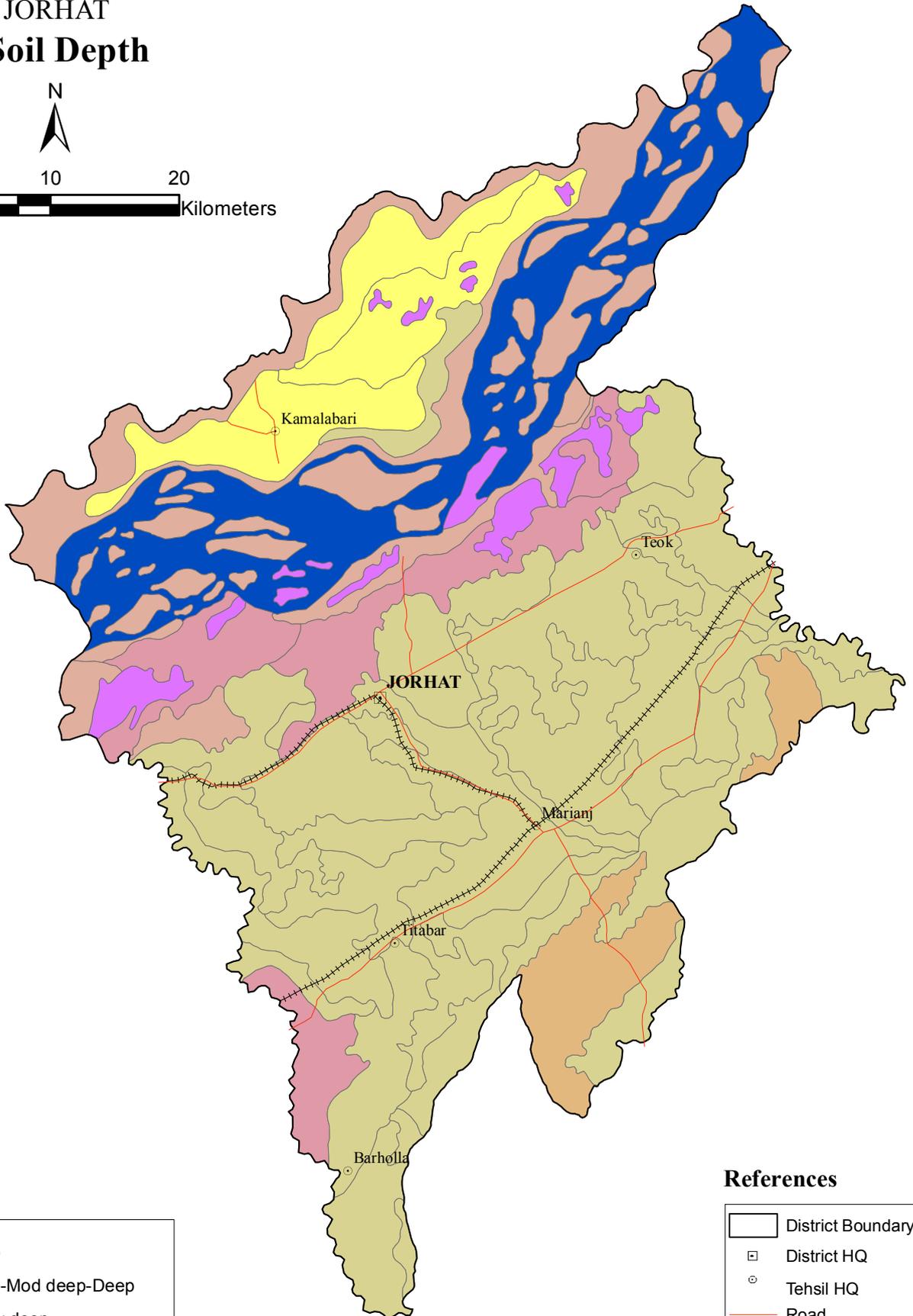
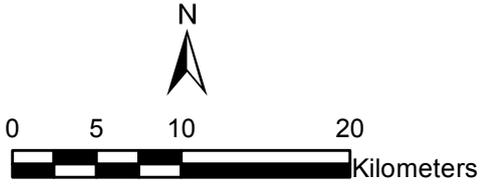
### References

	District Boundary
	District HQ
	Tehsil HQ
	Road
	Railway
	Drainage

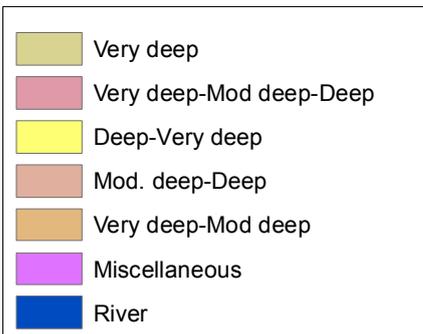


Fig. 10: Parent Material

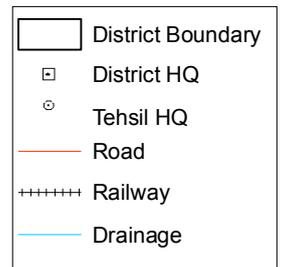
# JORHAT Soil Depth



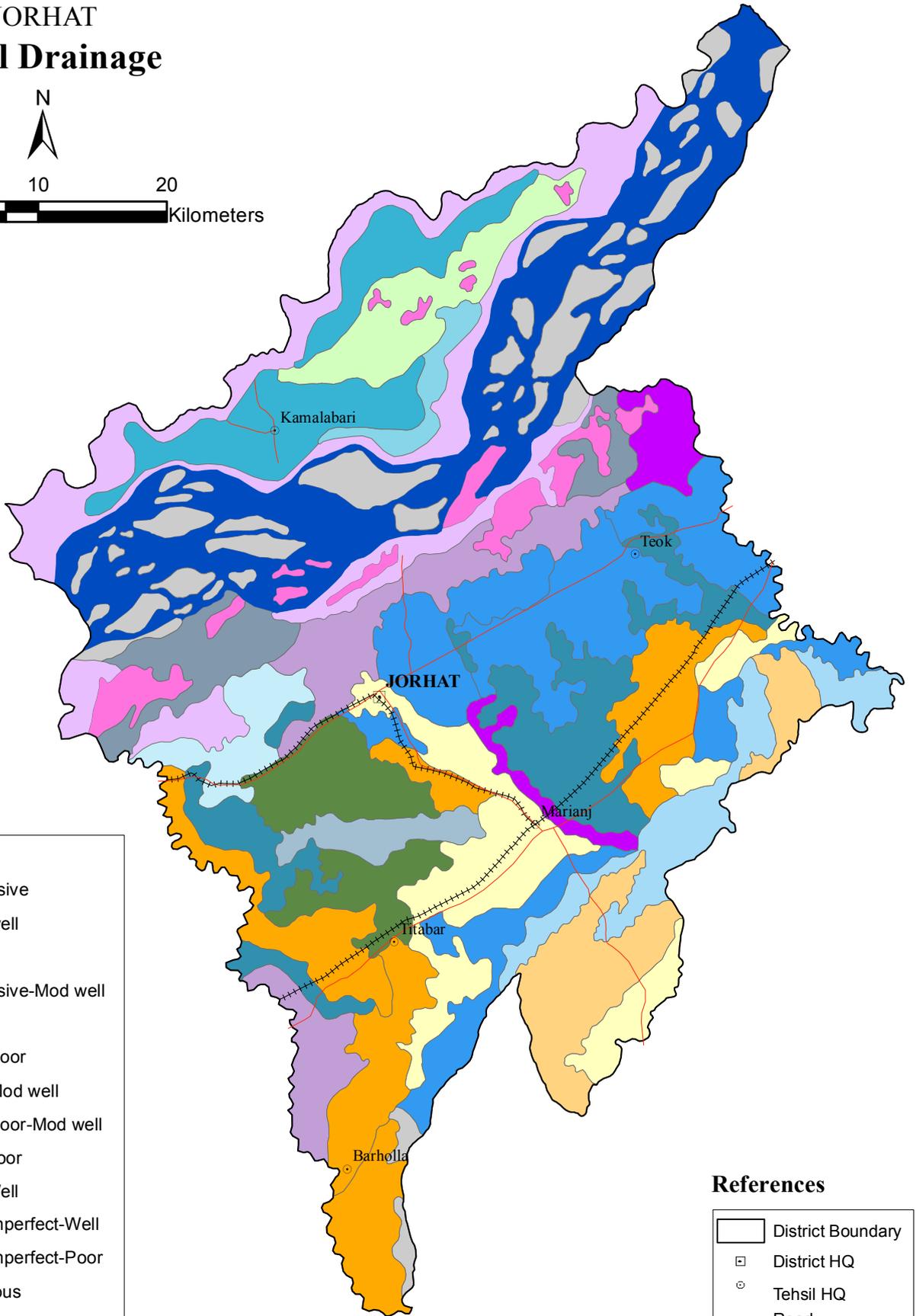
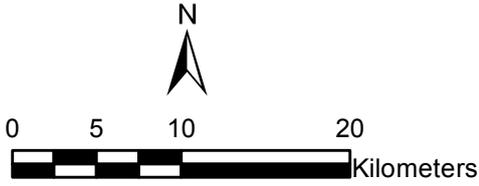
## Legend



## References



# JORHAT Soil Drainage



## Legend

- Well
- Well-Excessive
- Well-Mod well
- Well-Poor
- Well-Excessive-Mod well
- Imperfect
- Imperfect-Poor
- Imperfect-Mod well
- Imperfect-Poor-Mod well
- Mod well-Poor
- Mod well-Well
- Mod well-Imperfect-Well
- Mod well-Imperfect-Poor
- Miscellaneous
- Poor-Mod well
- Poor-Imperfect
- Poor-Imperfect-Poor
- Poor-Mod well-Imperfect
- River

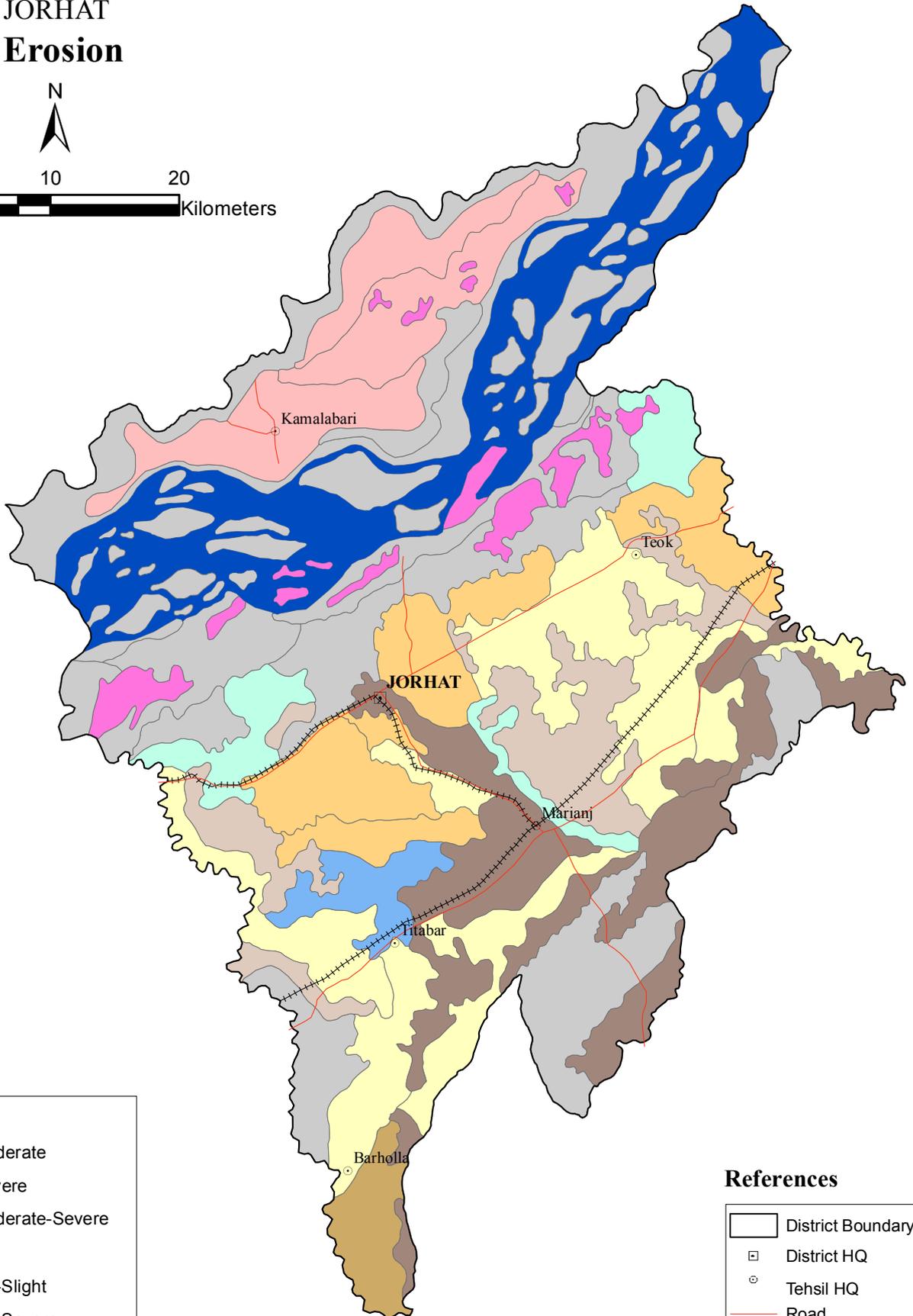
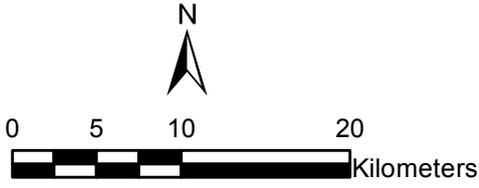
## References

- District Boundary
- District HQ
- Tehsil HQ
- Road
- Railway
- Drainage



Fig. 12: Soil Drainage

# JORHAT Erosion



## Legend

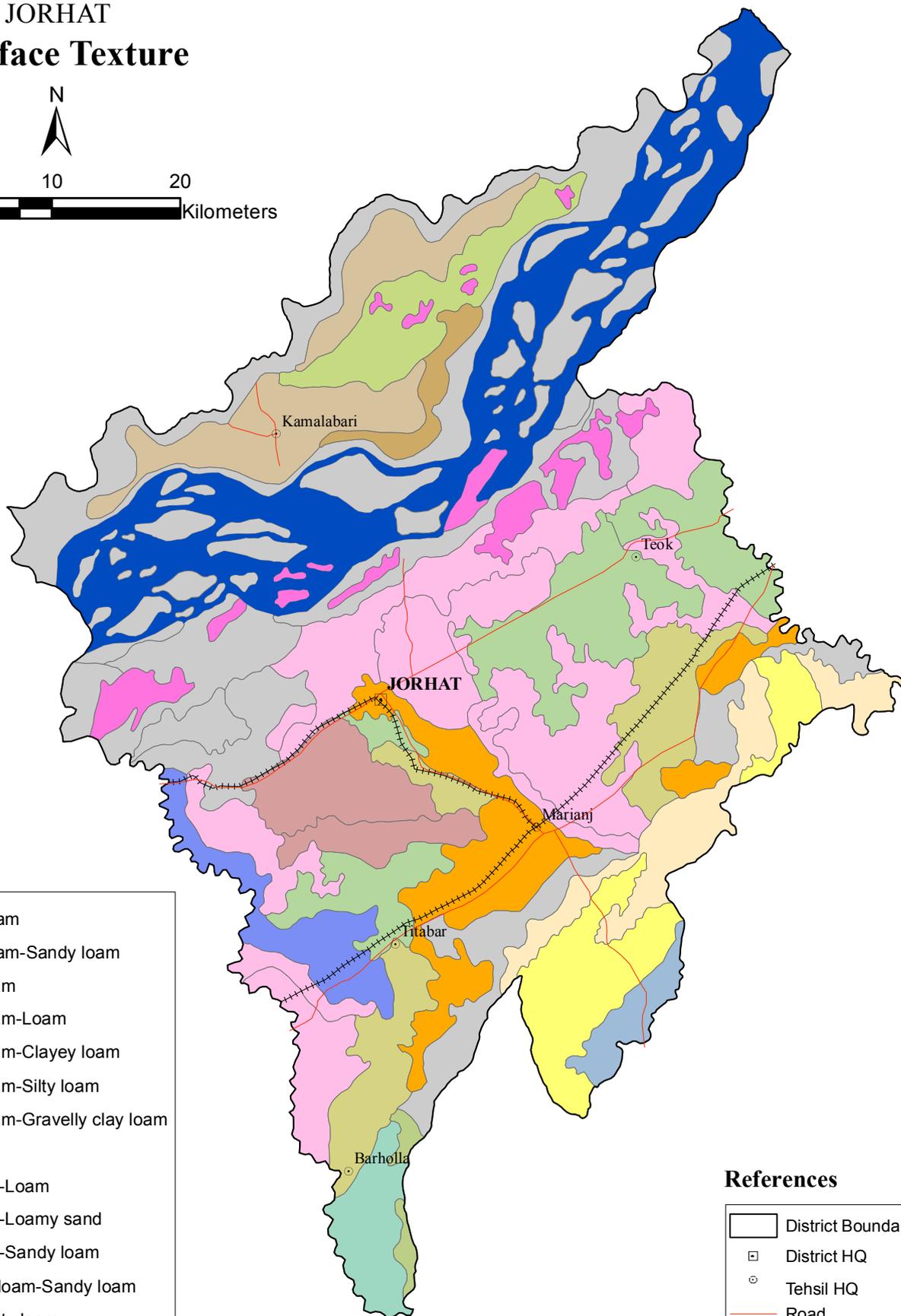
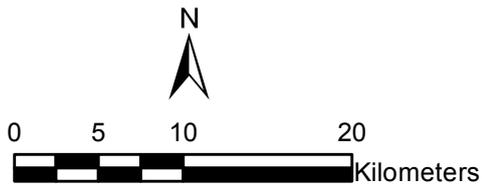
	Slight
	Slight-Moderate
	Slight-Severe
	Slight-Moderate-Severe
	Moderate
	Moderate-Slight
	Moderate-Severe
	Moderate-Severe-Slight
	Severe-Moderate
	Miscellaneous
	River

## References

	District Boundary
	District HQ
	Tehsil HQ
	Road
	Railway
	Drainage



# JORHAT Surface Texture



### Legend

	Clayey loam
	Clayey loam-Sandy loam
	Sandy loam
	Sandy loam-Loam
	Sandy loam-Clayey loam
	Sandy loam-Silty loam
	Sandy loam-Gravelly clay loam
	Silty loam
	Silty loam-Loam
	Silty loam-Loamy sand
	Silty loam-Sandy loam
	Silty clay loam-Sandy loam
	Loamy-Silty loam
	Loamy-Clayey loam
	Loamy sand-Silty loam
	Miscellaneous
	River

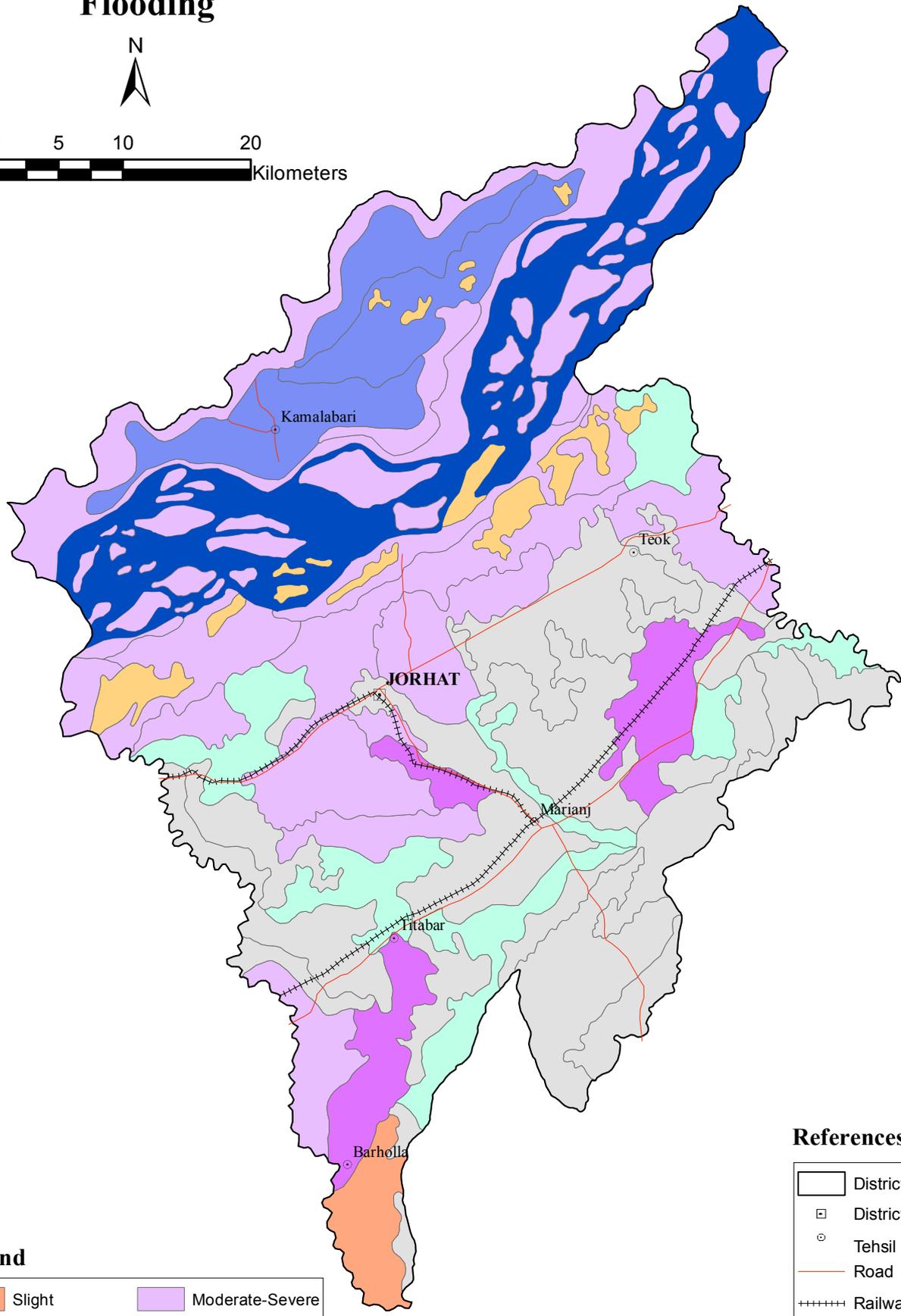
### References

	District Boundary
	District HQ
	Tehsil HQ
	Road
	Railway
	Drainage



Fig. 14: Surface Texture

# JORHAT Flooding



## Legend

	Slight		Moderate-Severe
	Severe		Others
	Slight-Moderate		NA
	Moderate		River

## References

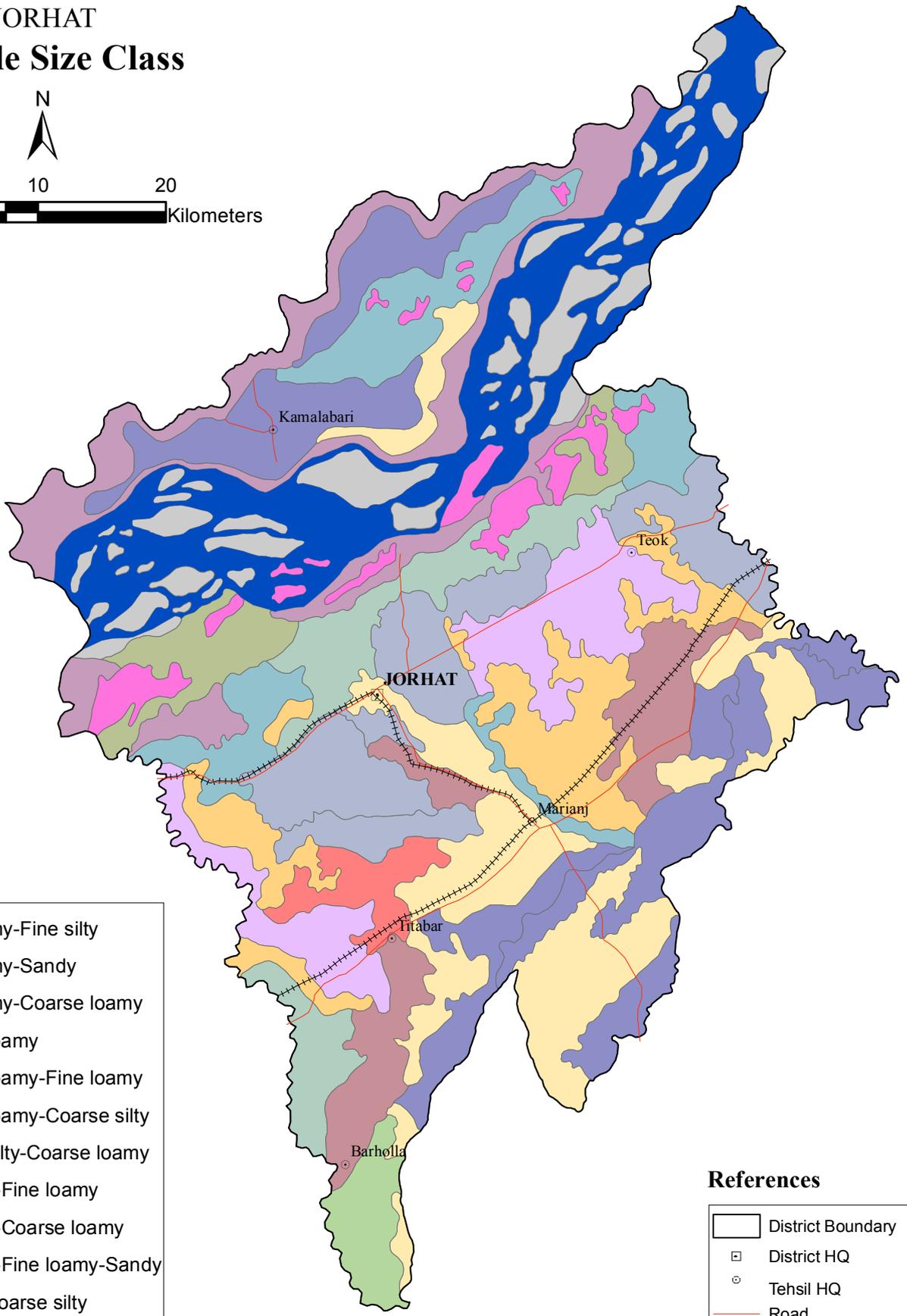
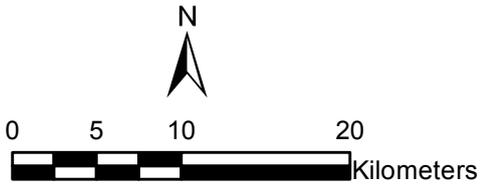
	District Boundary
	District HQ
	Tehsil HQ
	Road
	Railway
	Drainage



Fig. 15: Flooding

# JORHAT

## Prticle Size Class



### Legend

	Fine loamy-Fine silty
	Fine loamy-Sandy
	Fine loamy-Coarse loamy
	Coarse loamy
	Coarse loamy-Fine loamy
	Coarse loamy-Coarse silty
	Coarse silty-Coarse loamy
	Fine silty-Fine loamy
	Fine silty-Coarse loamy
	Fine silty-Fine loamy-Sandy
	Clayey-Coarse silty
	Sandy-Coarse loamy
	Sandy
	Miscellaneous
	River

### References

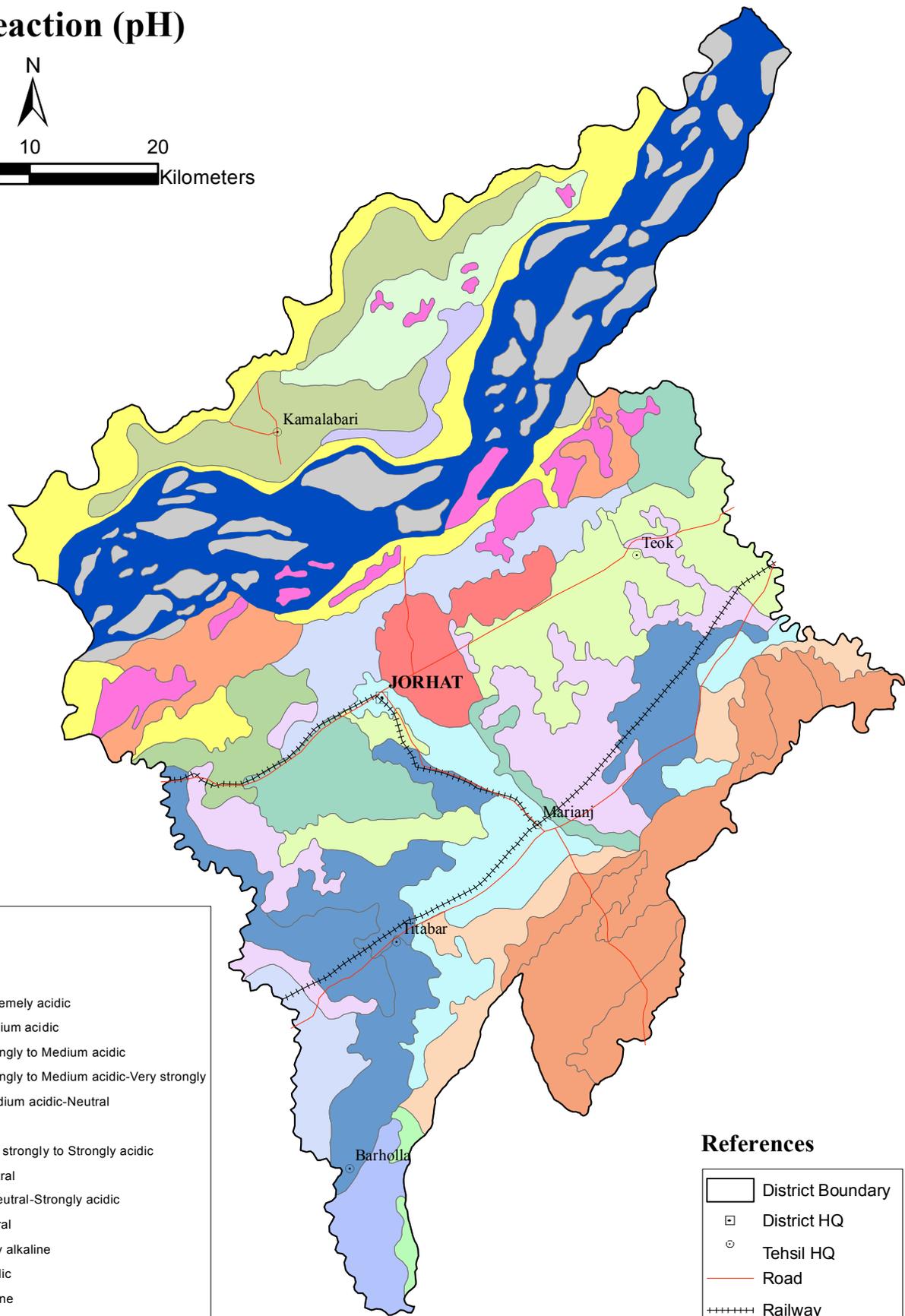
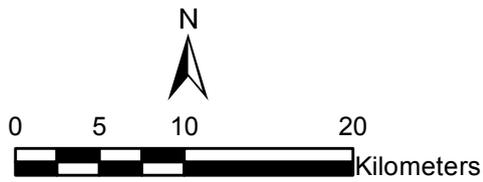
	District Boundary
	District HQ
	Tehsil HQ
	Road
	Railway
	Drainage



Fig. 16: Prticle Size Class

# JORHAT

## Soil Reaction (pH)



### Legend

	Extremely acidic
	Very strongly acidic
	Strongly acidic
	Strongly acidic-Extremely acidic
	Strongly acidic-Medium acidic
	Strongly acidic-Strongly to Medium acidic
	Strongly acidic-Strongly to Medium acidic-Very strongly
	Strongly acidic -Medium acidic-Neutral
	Medium acidic
	Medium acidic-Very strongly to Strongly acidic
	Medium acidic-Neutral
	Medium acidic to Neutral-Strongly acidic
	Slightly acidic-Neutral
	Slightly acidic-Mildly alkaline
	Neutral-Slightly acidic
	Neutral-Mildly alkaline
	Neutral-Inclusion
	Neutral-Medium acidic-Very strongly acidic
	Miscellaneous
	River

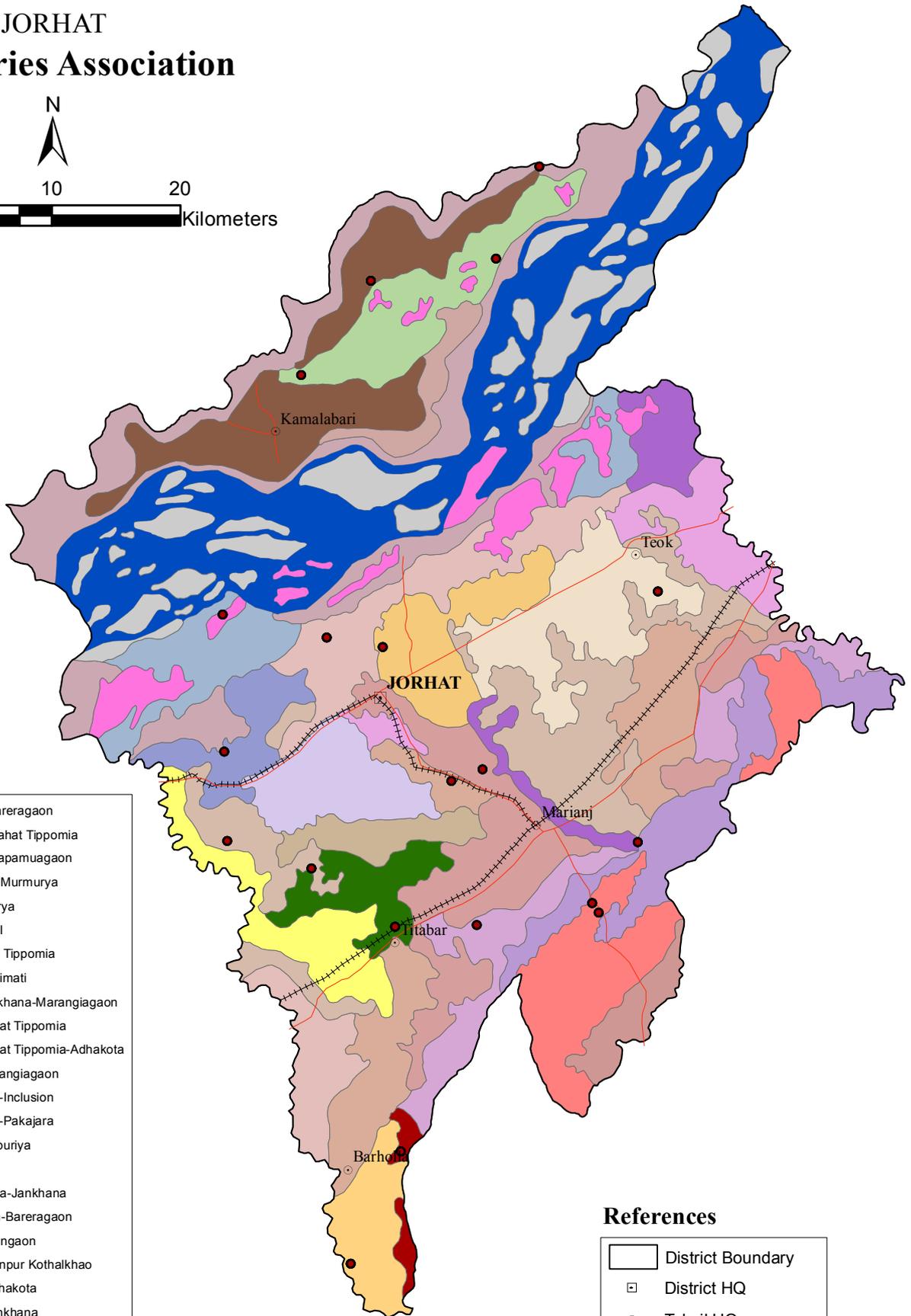
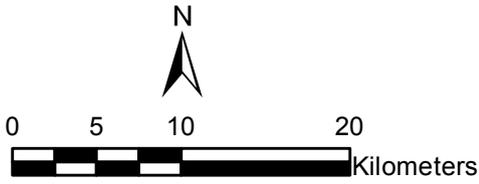
### References

	District Boundary
	District HQ
	Tehsil HQ
	Road
	Railway
	Drainage



Fig. 17: Soil Reaction (pH)

# JORHAT Soil Series Association



## Legend

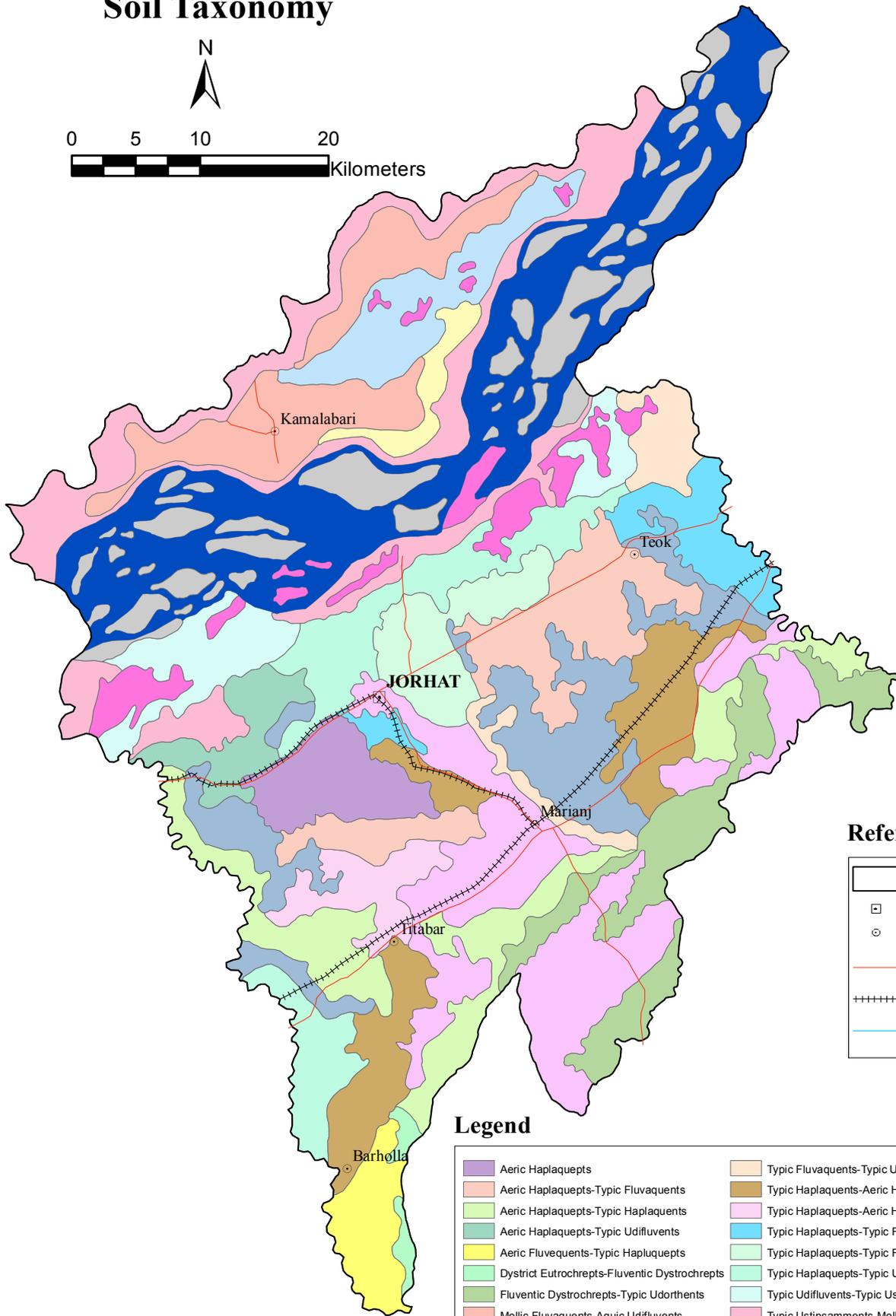
- Akahugaon-Bareragaon
- Bareragaon-Nahat Tippomia
- Bareragaon-Napamuagaon
- Disai I-Disai II-Murmurya
- Disai I-Murmurya
- Disai II-Disai III
- Dohotia-Nahat Tippomia
- Dohotia-Puranimati
- Gajpuriya-Jankhana-Marangiagaon
- Gajpuriya-Nahat Tippomia
- Gajpuriya-Nahat Tippomia-Adhakota
- Jankhana-Marangiagaon
- Marangiagaon-Inclusion
- Marangiagaon-Pakajara
- Matikhola-Gajpuriya
- Miscellaneous
- Nahat Tippomia-Jankhana
- Napamuagaon-Bareragaon
- Pakajara-Lahangaon
- Pakajara-Ratanpur Kothalkhao
- Puranimati-Adhakota
- Puranimati-Jankhana
- Ratanpur Kothalkhao-Lahangaon
- Sangsoa-Teok
- Siladubi-Disai I
- Teok-Murmurya
- River

## References

- District Boundary
- District HQ
- Tehsil HQ
- Profile Site
- Road
- Railway
- Contour
- Drainage
- Watershed Boundary



# JORHAT Soil Taxonomy



### References

	District Boundary
	District HQ
	Tehsil HQ
	Road
	Railway
	Drainage

### Legend

	Aeric Haplaquepts		Typic Fluvaquents-Typic Udifluvents
	Aeric Haplaquepts-Typic Fluvaquents		Typic Haplaquepts-Aeric Haplaquepts
	Aeric Haplaquepts-Typic Haplaquepts		Typic Haplaquepts-Aeric Haplaquepts
	Aeric Haplaquepts-Typic Udifluvents		Typic Haplaquepts-Typic Fluvaquents
	Aeric Fluvaquents-Typic Haplaquepts		Typic Haplaquepts-Typic Fluvaquents-Typic Haplaquepts
	Dystric Eutrochrepts-Fluventic Dystrichrepts		Typic Haplaquepts-Typic Udifluvents-Typic Ustipsamments
	Fluventic Dystrichrepts-Typic Udorthents		Typic Udifluvents-Typic Ustipsamments
	Mollic Fluvaquents-Aquic Udifluvents		Typic Ustipsamments-Mollic Fluvaquents
	Mollic Fluvaquents-Typic Fluvaquents		Typic Udipsamments
	Typic Dystrichrepts-Typic Dystrichrepts		Miscellaneous
	Typic Dystrichrepts-Typic Udorthents		River
	Typic Fluvaquents-Aquic Udifluvents		



Fig. 19: Soil Taxonomy

**Table 4. Physiography and soils**

Physiography	Soil Mapping Symbol	Soil Series Association	Brief description of soil series	Area	
				(ha)	%
1	2	3	4	5	6
Moderately steep to steep hill	1	Disai (II) Disai (III) (65:35)	Disai (II) - Very deep, well drained, brownish yellow, fine-loamy soils with coarse fragments of 5-10 per cent on 10-15% hill slopes having sandy loam surface soils with moderate erosion hazards (TypicDystrochrepts). Disai (III) - Moderately deep, excessively drained, yellowish brown to brownish yellow, grave-ly coarse-loamy soils on 33-50% hillslope having sandy loam surface soils with severe erosion hazards (Typic Udorthents).	12286.3	4.33
Upper piedmonts and undulating upland	2	Disai (I) Disai (II) Murmurya (40:30:30)	Disai (I)- Very deep, well drained, yellowish brown to brownish yellow, coarse -loamy soil on 3-5% slopes having sandy loam surface soil with moderate erosion hazards(Fluventic Dystrochrepts). Disai (II) -As above. Murmurya-Very deep, moderately welldrained, strong brown to reddish yellow, coarse-loamy soils with common reddish biown soft iron nodules on 1-3% slopes having sandy loam sur-face soils with moderate erosion hazards (Typic Udorthents).	10129.7	3.57
	3	Sildubi Disai (I) (60:40)	Sildubi- Very deep, well drained, yellowish brown to brownish yellow, fine-loamy soils on 3-5% slope having loam surface soils with moderate erosion hazards (Dystric Eutrochrepts). Disai valley (I) - As above.	1254.8	0.4
Lower piedmont	4	Matikhola Gajpuria (60:30)	Matikhola-Very deep, imperfectly drained, yellowish brown to light brownish gray,fine-loamy soils with yellowish brown to light yellowish brown mottles on 0-1% slope having loam surface soils with slight erosion and flood hazards (Aerie Fluvaguents). Gaipurie - Very deep,imperfectly drained, light brownish gray to light gray, fine-silty over coarse silty soils with brownish yellow to strong brown mottles on 0-1% slope having silt loam surface	4603.1	1.6

			soils with moderate to severe floodhazards(Typic Haplaghepts). Inclusions - Adhakota series to the extent of 10-15 per cent.		
			Puranimati-Verydeep, imperfectly drained, yellowish brown to strong brwn,coarse-loamy soils with gray to light gray mottles and common soft Fe-Mn nodules on 0-1% slope having sandy loam surface with moderate flood and slight erosion hazards (Aeric Haplaquepts).		
	5	Puranimati Adhakota (60:40)	Adhakota - Very deep, poorly to imperfectly drained, gray to light gray, coarse-loamy soils over sand with yellowish brown to strong brown mottles on 0-1% slope having sandy loam surface soils with high ground water table within one metre and slight erosion hazards (Typic Haplaguents).	9119.0	3.2
Infer hill valley	6	Disai (I) Murmurya (60:40)	Disai (I) - As above. Murmurya - As above	2602.9	0.9
			Sangsoa - Very deep, moderately well drained,brownish yellow, fine silty soils with common soft Fe-In nodules on 1-3A slope having silt loam surface soils with slight to moderate erosion hazards (Typic Dystrochrepts). Teok -		
Gently sloping upland (dissec ted)	7	Sangsoa Teok (60:40)	Very deep, well drained, yellowish brown, fine-loamy soils with strohg brown mottles on 1- 3% slope having sandy loam surface soils with moderate erosion hazards (Typic Dystrochrepts).	20326.0	7.16
			Teok -As above. Murmurya - As above.		
	8	Teok Murmurya (50:50)	Teok -As above. Murmurya - As above.	16387.6	5.77
			Gaipuria - As above. Nahat Tippomia - Very deep,imperfectly to poorly drained, light gray to gray, coarse loamy over coarse silty soils on 0-1% slope having silt loam surface soil with moderate flood and slight erosion hazards (Typic Fluvaguents).		
Very gently		Gajpuria NahatTippomia (60:40)	Gaipuria - As above. Nahat Tippomia – As above. Adhakota - As above.	6585.0	2.3
	10	Gajpuria Adhakota (40:30:30)	Gaipuria - As above. Nahat Tippomia – As above. Adhakota - As above.	7930.7	2.8
	11	Bareragaon Nahat Tippomia	Barerapaon - Very deep, imperfectly drained yellowish	11410.0	4.0

	(70:30)		brown to brown, coarse silty over fine loamy soils with gray to light gray mottles and dark brown common iron nodules on 1-3% slope having silt loam surface soils with slight erosion hazards (Aerie Naplaquepts). Nahat Tippomia - As above.		
	12	Dohotia Puranimati (60:40)	Dohotia - Very deep, poorly to imperfectly drained, gray to dark gray, fine silty soils with yellowish red to strong brown mottles and orange red common iron nodules on 0-1% slope having silty clay loam surface soils with high ground water table within 1.5 metres and moderate to severe flood hazards (Typic Haplaquepts). Puranimati - As above.	7105.9	2.5
	13	Bareragaon Napamuagaon (50:40)	Bareragaon - As above Napamuagaon- Very deep, imperfectly drained, gray, coarse loamy soils with common Fe-Mn nodules on 0-1% slope having loamy sand surface soils with slight to moderate flood and slight erosion hazards (Typic Haplaquepts). Inclusions Dohotia series to the extent of 10 per cent.	5175.1	1.8
	14	Akahugaon Bareragaon (70:30)	Akahugaon - Very deep, poorly drained, gray to light gray, clayey soils with common distinct yellowish brown mottles and dark brown FeMn nodules on 0-1% slope having silt loam surface soils with high ground water table and moderate flood hazards (Typic Haplaquepts). Bareragaon - As above.	4842.5	1.7
	15	Napamuagaon Bareragaon (50:40)	Napamuagaon- As above. Bareragaon - As above. Inclusions - Akahugaon series to the extent of 10-15 per cent.	16452.7	5.8
Lower flood plain	16	Nahat-Tippomia Jankhana (50:40)	Nahat Tippomia - As above Jankhana - Very deep, moderately well to imperfectly drained, yellowish brown to gray, sand over fine loamy soils with light gray mottles on 1-3 slope having sandy loam surface soils with moderate to severe flood hazards (Typic Udifluvents). Inclusions-Marangiagaon series (Typic Udipsamments) to the extent of 10-15 percent.	6321.9	2.2
	17	Gajpuria	Gajpuria - As above.	14155.2	4.99

		Jankhana Marangiagaon (40:30:30)	Jankhana - As above. Marangiagaon - Moderately deep to deep, well drained, dark yellowish brown to light gray sandy soils with grayish mottles on 1-3% slope having sandy loam surface soils with severe flood and moderate to severe erosion hazards ( Typic Udipsamments).		
	18	Puranimati Jankhana (60:40)	Puranimati - As above. Jankhana - As above.	4864.5	1.70
	19	Dohotia Nahat Tippomia (70:30)	Dohotia - As above Nahat Tippomia - As above.	3616.0	1.3
	20	Pakajara Ratanpur Kathalkhoa (50:40)	Pakajara - Deep,poorlydrained,gray to light gray, coarse loamy soils over sand with dark brown mottles on 0-1% slope having sandy loam surface soils with high ground water table within one metre of the surface and severe flood hazards (Mollic Fluvaquents). Ratanpur Kathalkhoa - Very deep, moderately drained, gray to dark yellowish brown, dominantly fine loamy soils with reddish brown to dark brown iron nodules on 1-3% slope having silt loam surface soils with moderate to severe flood hazards (rypio Fluvaquents). Inclusions - Marangiagaon series to the extent of 10 percent	8512.0	2.99
Lower Terrace	21	Pakajara Lahangaon (50:40)	Pakajaraa - As above. Lahangaon - Very deep, moderately well to imperfectly drained, yellowish brown to gray dominantly coarse loamy soils with grayish brown to yellowish brown mottles on 1-3% slope having loam surface soils with moderate to severe flood hazards (Aquic Ndifluvents). Inclusions - Marangiagaon series to the extent of 10-15 percent.	16493.3	5.8
Upper Terrace	22	Ratanpur- Kathalkboa Lahanqaon (60:40)	Ratanpur- Kathalkboa - As above. Lahanqaon - As above.	2760.9	0.9
Active flood plain	23	Jankhana Marangiagaon (50:40)	Jankhana - As above. Marangiagaon - As above. Inclusions- Nahat Tippomia series to the extent of 10 per cent	6433.6	2.2
	24	Marangiagaon Pakajara (60:40)	Marangiagaon - As above. Pakajara - As above.	23686.7	8.3

Bar lands	25	Marangiagaon (80%)	Marangiagaon- As above. Inclusions- Pakajara series to the extent of 15-20 per cent.	22472.3	7.9
Marshes and swamps	26	Miscellaneous	Extremely sand/Mud/Water bodies	6304.7	2.2
River Courses				32044.3	11.2

(N.B. Figures in parenthesis indicate approximate area in percent covered by each series).

Table 5. Soil Taxonomy

Series	Family	Sub-croup	Great group	Suborder Order	Series
Matikhola	Fine-loamy	Aeric Fluvaquents	Fluvaquents		
Pokajara	Coarse-loamy	Mollic Fluvaquents		Aquents	Entisols
NahatTippomia	Coarse-loamy	TypicFluvaquents			
Ratanpur Kathalkhoa	Fine-loamy	TypicFluvaquents			
Puranimati	Coarse-loamy	Aerie Haplaquents	Haplaquents		
Adhakata	Coarse-loamy	Typic Haplaquents			
Marangiagaon	-	Typic Udipsamments	Udipsamments	Psamments	Entisols
Lahangaon	Coarse-loamy	Aquic Udifluents	Udifluents	Fluents	
Jankhana	Fine-loamy	Typic Udifluents			
Disai (III)	Loamy- skeletal	Typic Udorthents	Udorthents	Orthents	
Murmurya	Coarse-loamy				
Bareragaon	Fine-loamy	Aeric Haplaquepts	Haplaquepts	Aquepts	Inceptisols
Naparnuagaon	Coarse-loamy	Typic Haplaquepts			
Dohotia	Fine-silty				
GajpuriaAkahugaon	Fine				
Sildubi	Fine-loamy	Dystric	Eutrochrepts	Ochrepts	
Disai (I)	Coarse-loamy	Fluventic Dystrochrepts	Dystrochrepts		
Disai (II) Teok	Fine-loamy	Typic Dystrochrepts			
Sangsoa	Fine-silty				

The mineralogy is mixed and temperature regime is hyperthermic for most of the soils.

Available NPK status at soil series level is given in table 6.

**Table 6. Available NPK status at soil series**

Soil series	N (kg/ha)	P <sub>2</sub> O <sub>5</sub> (kg/ha)	K <sub>2</sub> O (kg/ha)
Disai (I)	586.0	18.3	121
Disai (II)	635.0	0.8	44
Disai (III)	544.3	4.1	84
Sildubi	514.1	5.3	122
Matikhola	665.3	2.8	64
Adhakata	544.3	16.1	126
Murmurya	483.8	4.0	44
Took	483.8	18.5	118
Sangsoa	574.6	15.4	97
Bareragaon	544.3	15.4	77
Akahugaon	604.8	10.0	67
Napamuagaon	453.6	22.1	50
Dohotia	544.3	5.5	97
Puranimati	453.6	23.1	107
Gajpuria	285.5	8.4	92
Nahat Tippomia	211.7	7.3	81
Jankhana	302.4	11.5	191
Pakajara	756.0	13.5	124
Lahangaon	544.3	5.3	81
Ratanpur Kathalkhoa	362.9	10.3	94
Marangiagaon	272.2	11.5	131

## 6.

**SOIL SURVEY INTERPRETATIONS FOR LAND USE PLANNING**

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Land evaluation for its proper use and management is the next step after mapping of soils. The soil map of the district shows delineations of soil series associations which are distinguished on the basis of differentiating characteristics like colour, mottles, texture, structure, depth, cutans, cracks, drainage etc. These characteristics that influence moisture and nutrient retention qualities of the soils are important to assess management responses and measures needed for growing crops or putting them under other uses. Therefore, the basis of interpretation should be the soil series which make up the mapping units.

Land evaluation has gained popularity in land utilization programme in the recent past. In view of the practical need for exploiting soils of the district for optimum land use planning, the soils are interpreted for land capability and land irrigability classes and suggested land use. The interpretative maps are prepared on 1:250,000 scale and due to the limitations of the scale of maps, the interpretations are also at broad level and are useful in general at district level planning.

**6.1 Land capability classification:**

Land capability classification is an interpretative grouping made primarily for broad agricultural, forestry and non-agricultural uses. Cultivable soils are grouped into class I to IV according to their potentialities and limitations for sustained production of the commonly cultivated crops. Non-cultivable lands are grouped into class V to VIII of which class V is used for grazing, class VI and VII are used for forestry and class VIII land which have maximum limitations may be used for recreation and wild life.

Land capability classes are groups of soils that have the same kind of dominant limitations for agricultural use. Four kinds of the sub-class level are : 'e' for wind or water erosion hazards, 'w' for drainage difficulties, wetness or overflow's for limitations affecting plant growth and 'c' for limitations due to climate.

Land capability classification at subclass level of identified soil series of Jorhat district is done by grouping the soil mapping units into different subclasses or associations of subclasses (Table 7) (Fig.20).

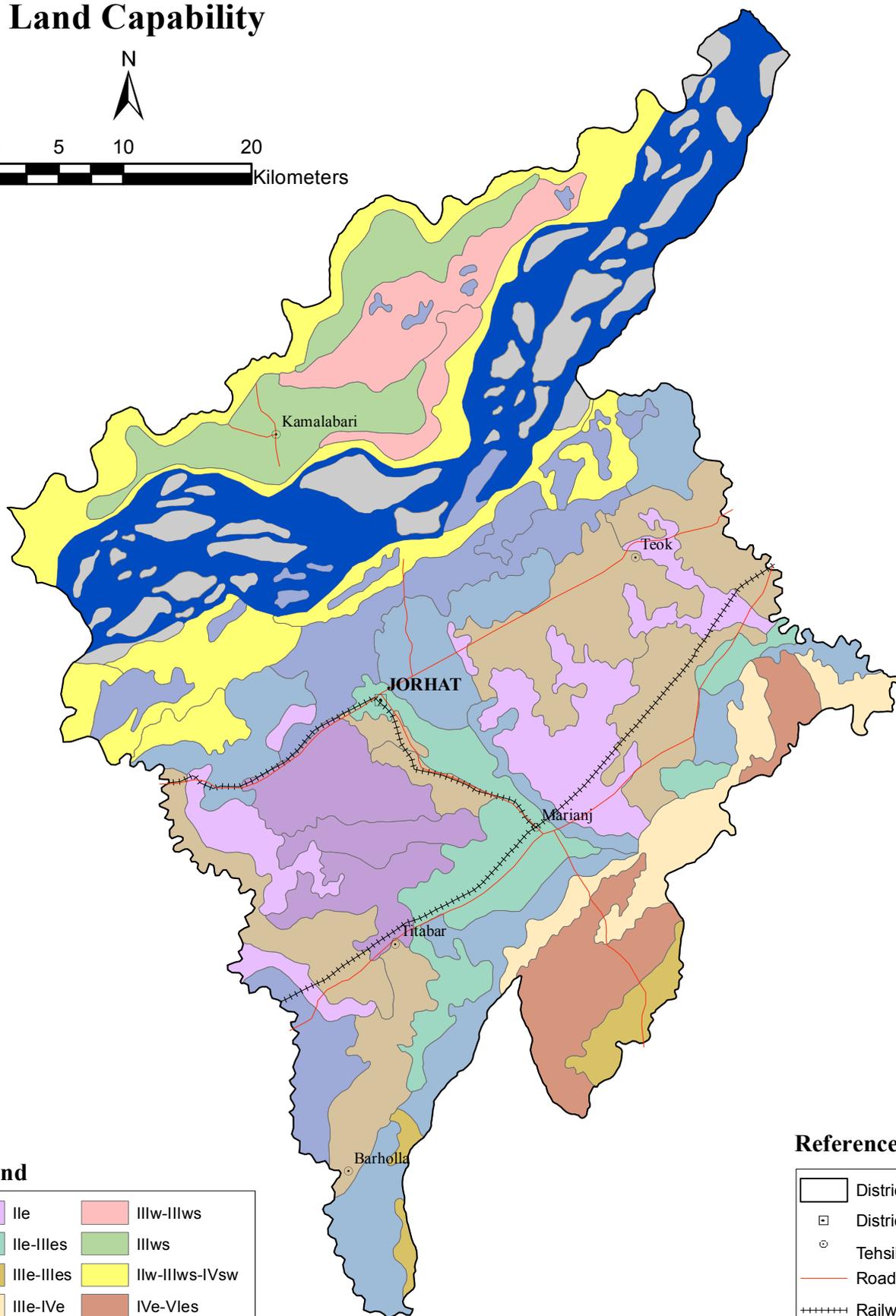
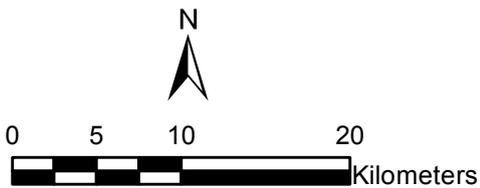
**6.2 Land irrigability classification:**

Only 4023 hectares of the total cropped area excluding tea gardens is under irrigation. The cultivators of the district are mainly dependent on rainfall. Though kharif crops are grown well without much supplemental irrigation, Rabi crops are generally grown in rainfed condition as the irrigation facilities are very meagre and in some village areas, the indigenous methods of irrigation are still in use. The soils of the district are evaluated for irrigation potential so that wherever possible more areas could be brought under irrigation.

Soil irrigability classification is made on the basis of important soil characteristics namely soil texture, depth, available moisture capacity, salinity level, infiltration and permeability. Land irrigability classification is made taking into consideration soil irrigability class, quality and quantity of irrigated waters, drainage requirement, topography and economic conditions. Irrigability class 1 to 5 are assigned to the irrigable lands and class 6 to non-irrigable lands. Irrigability classes are divided into subclasses to indicate the dominant limitations such as 's' for soil, 'd' for drainage and 't' for topography limitations.

Soil mapping units have been grouped into 11 land irrigability subclasses or associations. The land irrigability subclasses or associations have been described in Table 8 and fig. 21.

# JORHAT Land Capability



### Legend

IIE	IIIw-IIIws
IIE-IIIes	IIIws
IIIe-IIIes	IIw-IIIws-IVsw
IIIe-IVe	IVe-VIes
IIw	IVsw
IIIw-Iw	VIIIw
IIw-IIIws	River

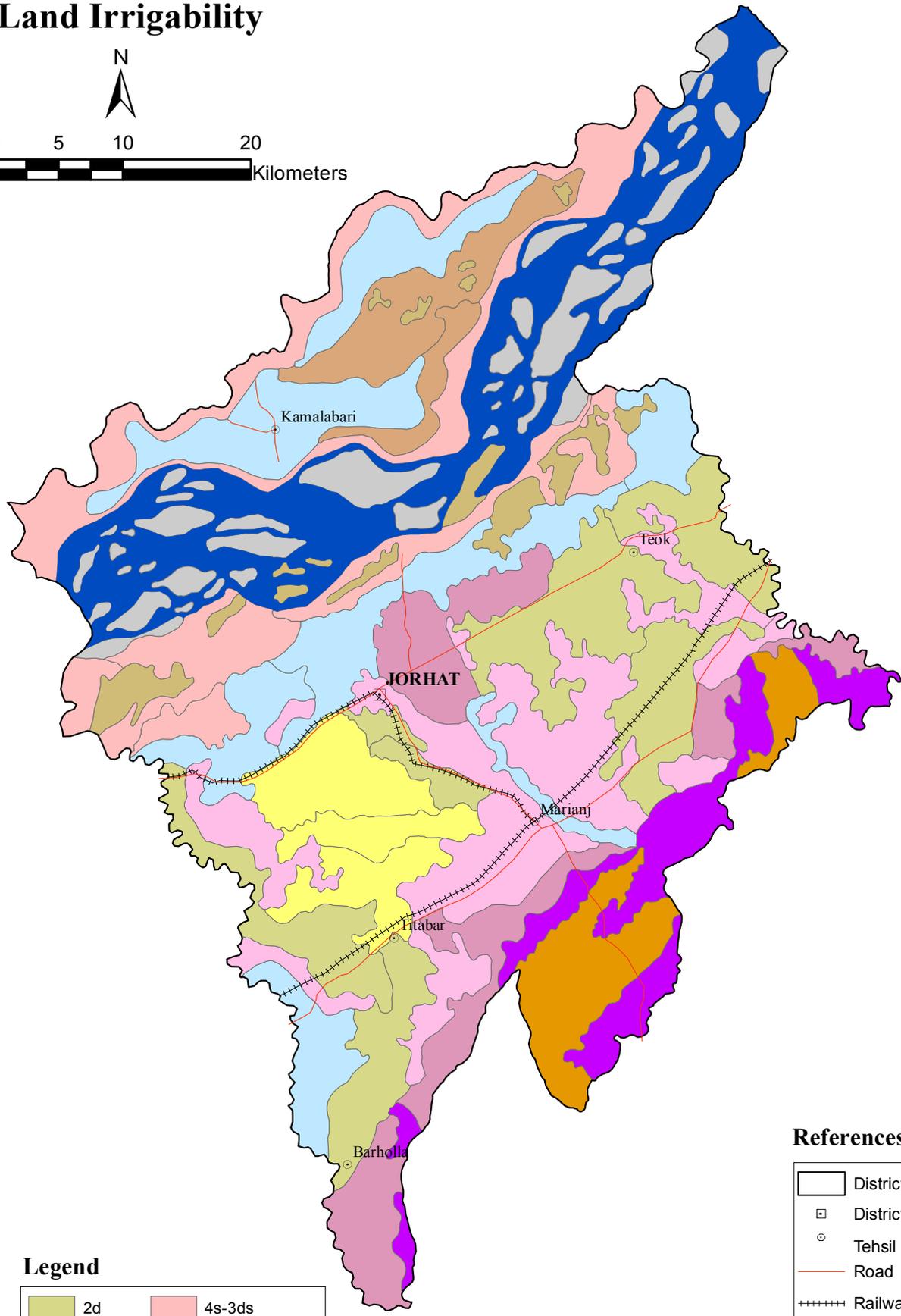
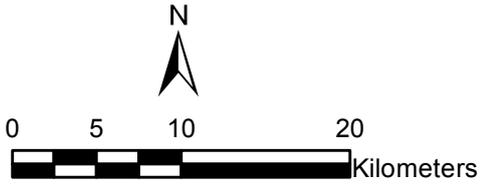
### References

District Boundary
District HQ
Tehsil HQ
Road
Railway
Drainage



Fig. 20: Land Capability

# JORHAT Land Irrigability



### Legend

2d	4s-3ds
3d-3ds	3t
3d-4ds	2t-3t
4d-3d	4t-6st
4ds-3ds	6w
4s	River

### References

	District Boundary
	District HQ
	Tehsil HQ
	Road
	Railway
	Drainage



Fig. 21: Land Irrigability

**6.3 Problem soils/lands:**

Soils with considerable limitations that hinder crop growth and yield are problem soils. The problems encountered in the district are of various nature due to topography, drainage and soil acidity. The soil mapping units have been grouped into different classes based on the intensity of above limitations (Table 9).

**6.4 Suggested Land Use:**

The information as to the extent and distribution of different soils, their inherent characteristics, major crops grown in the district, land capability and irrigability classification and the extent of problem soils and productive soils have been discussed. Based on above interpretation the land use pattern of the district has been suggested for general guidelines for cropping and management (Table 10).

**6.5 Land Suitability Classification:**

It has now been realised that the user agencies generally look forward to the interpretation of the soil maps in terms of their suitability and constraints so as to make the optimum use of the limited land resource.

It is also well known that most of the crops need well drained, moderately fine to medium textured soils, free of salinity and other favourable physical and chemical environments. Soil maps based on several parameters, when interpreted properly it can aid in predicting the behaviour and suitability of soils for growing crops. With this in view an attempt has been made to evaluate the soils of the district for suitability for two important crops namely paddy and tea.

Based on the soil site and physical and chemical characteristics, the mapped soils of Jorhat district were grouped into different suitability classes according to FAO (1975) for paddy and tea. Every soil unit was rated as per limitation technique using site characteristics (Table 4). The limitation degree of two indicates that the crop can still be grown but with a marginal profit. The degree of limitations allocated for each property in respect of each soil unit is as shown in Table 11. The overall suitability of the soils for paddy and tea based on degree and number of limitations for the particular soil series association is given in Table. The soil suitability is assigned in terms of order and class, which are defined below.

**6.5 Land Suitability Classification:**

The land capability classification and land evaluation exercises are undertaken to interpret the suitability of the soils for specified use or to adopt suitable measures to protect from degradation etc.

'Capability' and 'Suitability' have often been confused or even regarded as synonymous. But in fact 'Suitability' refers to a single, clearly defined, reasonably homogenous purpose or practice e.g. paddy cultivation on terraced hill slope under rainfed condition. Whereas 'capability' is often defined in terms of negative limitations, which hinder or prevent some or all activities on the land being considered.

Land suitability evaluation is the process of assessing the suitability of land for a specified kind of use (Dent & Young, 1981). These may be for major kind of land use e.g. rainfed agriculture, livestock production, forestry etc. or land utilization types described in more details e.g. paddy cultivation on terraced hill slope under rainfed condition. The initiative for development of some measures of standardisation of terminology and procedures was initiated by the FAO in the early 1970s through a series of international discussions. These resulted in the landmark innovation of 'Framework' for land evaluation (FAO, 1976) emphasizing planning new land uses, including crop species, cropping system and changing demands in the agricultural sector, especially in the developing countries. The FAO has published guidelines for Rainfed agriculture (FAO, 1983), Irrigated agriculture (FAO, 1985) and Forestry (FAO, 1984). In addition, a workshop was held in which guidelines were discussed for extensive grazing (Siderlus, 1984) and sloping areas (Siderlus 1986).

The FAO, 1985 method contained several key innovations like 'land utilization types' a technical term which replaces the common term 'land use', 'land qualities' (the attributes of the land which directly influence the suitability for one or more uses) which depends on the land characteristics (the attributes of the land which can be

measured or estimated). The land qualities may be edaphic, climatic, agronomic, geographic or related to hazards. The evaluation studies based on the FAO guidelines is one of the widely accepted procedures.

The soil series of Jorhat district have been evaluated for the suitability of different crops using FAO criteria and are depicted in Table 11. It is observed from the study that majority of the soil series are suitable for paddy and moderately suitable for wheat and sugarcane. Banana can be well grown in many of the areas which are now under shrubs and tall grasses. Tea is suitable only in the undulating upland areas. Tea is already being practiced in some of the areas.

**Table 7. Land capability classification**

Land capability subclass	Description	Area	
		(ha)	%
Ile	Good soils on gentle slopes; subject to slight erosion; cultivation with precaution; suited to all climatically adapted crops; mainly includes Sangsoa-Teok (7) series associations.	20326.2	7.1
Ile-IIIes	Good soils on gentle slopes; subject to slight to moderate erosion and soil with minor problems such as coarse texture; cultivation with precaution protecting from erosion as well as conserving irrigation water; suited to all climatically adapted crops; includes Teok-Murmurya (8) series association.	16387.6	5.7
Iiw	Good soils on nearly level to very gentle slopes; subject to occasional overflow or drainage limitations; cultivation with management of excess water and most suitable for paddy; land needs drainage improvement or flood protection; includes Gajpuria-Nahat Tippomia (9), Bareragaon-Nahat Tippomia (11), Bareragaon-Dapamuagaon (13) and Napamuagaon-Bareragaon (15) soil series associations.	39622.8	13.8
Iiw-IIIws	Good soils which are subjected to occasional overflow and wetness problems associated with moderately good soils (IIIws) which are subjected to frequent flood hazards, somewhat water-logging conditions and also coarse textured; most suitable for paddy cultivation and other crops may also be cultivated with careful management of excess water; lands need intensive drainage and flood protection; includes Matikhola-Gajpuria (4), Puranimati-Adhakota (5), Gajpuria-Nahat Tippomia-Adhakota (10), Nahatippomia-Jankhana (16), Puranimati-Jankhana (18) soil series associations.	32839.2	11.5
IIIw-IIw	Moderately good soils, subject to overflow and drainage limitations; cultivation with careful management of excess water and selection of crops adapted to wet condition; lands need intensive drainage; improvement or protection from floodings; includes Dohotia-Puranimati (12), Akahugaon-Bareragaon (14), Dohotia-Nahat-Tippomia (19) soil series associations.	15564.4	5.4
IIIws	Moderately good soils, subject to severe flood hazards or drainage limitations and soil with moderate problems such as sandy and coarse texture; cultivation of crops tolerant to water stagnation like paddy; lands need flood control and conservation of irrigation water during cultivation in flood free season; largely includes Pakajara-Lahangaon (21) soil	16493.3	5.8

	series association.		
IIIw-IIIws	Moderately good soils, moderately wet or subject to moderate to severe flood hazards with soil problems such as coarse texture; cultivation of crops mainly suited to water stagnation like paddy and other crops with careful management of excess water; intensive drainage, improvement or protection from flooding are needed; includes Pakajara-Ratanpur Kathal-khoa (2), Ratanpur-Kathalkhoa-Lahangaon (22) soil series associations.	13326.0	4.6
IIw-IIIws-IVsw	Good soils (IIw) and moderately good soils (IIIws), subjecte to moder- ate to severe flood hazards, drainage limitations and coarse textured associated with fairly good soils (IVsw) which are subjected to severe flood hazards and soil limitations due to sandy texture; most suitable for paddy in Kharif and other crops as well as vegetables may be cultivated in rabi with careful management of excess water; lands need intensive drainage and special attention to flood control; includes Gajpuria-Jankahana-Marangiagaon (17) soil series association.	14155.2	5.0
IIIe-IIIes	Moderately good soils on moderate slopes and undulating uplands; subject to moderate erosion; and soils with problems such as coarse texture and gravels; cultivation with special attention to erosion control and conservation of irrigation water; lands need shaping and bunding for cereals and vegetables; plantation and horticultural crops may be preferred; includes 5ildubi-Disai (I) (3) and Disai (1) Munnurya (6) soil series associations.		
IIIe-IVe	Moderately good soils (IIIe) and moderately steep lands (Lie), subject to moderate to severe erosion hazards; cultivation with special attention to erosion control; IIIe lands need bunding for cultivation of field crops and plantation crops like tea may be preferred; IVe lands need terracing for cultivation and depletion of forest cover to be avoided; includes Disai (I)-Disai (II) - Murmurya (2) soil series association.	10129.7	3.5
IVsw-IIIws	Fairly good lands to moderately good lands with limitations of very wet condition or subject to severe flood hazards and sandy texture of soils; cultivation of crops during flood free season and occasion-al cultivation in rotation with hay or pasture may be preferred; IVsw lands needs intensive drainage special attention to seeding and har-vest dates to minimise crop failure on overflow land and careful selection of crops to overcome soil limitations: includes Jankhana-Marangia gaon (23) and Marangiagaon-Pakajara (24) soil series associations.	30120.3	10.5
IVsw	Fairly good lands, subject to very severe flooding in rainy season and soil limitations due to sandy texture: hazards of crop failure in kharif season is always present and occasional cultivation in rotation with hay or pasture may be preferred specially in rabi season; includes Marangia gaon (25) series.	22472.3	7.9
IVe-VIes	Fairly good lands (IVe) and land not suitable for cultivation (VIes) with problems of severe to very severe erosion hazards and soil limitations due to gravels and stones; IVe lands may be used for horti-cultural crops and grazing or	12286.3	4.3

	forestry may be recommended in VIes lands and also needs complete fire protection; includes Disai (II)-Disai (III) soil series association.		
VIIIw	Marshy and swamp lands; suited only for wild life and recreation; includes soil map unit (26)	6304.7	2.2
	River courses.	32044.3	11.2

**Table 8. Land irrigability classification**

Irrigability subclass	Description	Area	
		(ha)	%
2t-3t	Good lands that have moderate to severe limitations for sustained use under irrigation due to topography with gentle slopes of dissected nature; need land shaping and soil conservation measures; respond to irrigation for climatically adapted crops; includes Sangsoa-Teok (7) and Teok-Murmurya (8) series association.	36713.8	12.8
3t	Lands with severe limitations due to undulating slopes and excess runoff; suitable for adaptable crops with careful management; includes Disai (I)-Disai (II)-Murmurya (2), Sildubi-Disai (I) (3) and Disai (I)-Murmurya (6) series association.	13987.4	4.9
2d	Lands with moderate limitation for sustained use under irrigation due to somewhat unfavourable drainage condition: need surface drainage; includes Gajpuria-Nahat Tippomia (9), Bareragaon-Nahat Tippomia (11), Bareragaon-Napamuagaon (13) and Napamuagaon-Bareragaon (15) series association.	39622.8	13.9
3d-3ds	Lands that have severe limitations due to unfavourable drainage condition and also coarse textured subsoil: need surface drainage; land mainly suitable for paddy and other water logging species; includes Nahat Tippomia-Jankhana (16), Gajpuria-Jankhana-Marangiagaon (17), Puranimati-Jankhana (18) and Pakajara-Lahangaon (21) series association.	41834.9	14.9
3d-4ds	Lands with limitations due to unfavourable to very unfavourable drainage conditions (high ground water table) and coarse textured subsoil, need both surface and subsurface drainage; suitable for paddy and other related crops; includes Matikhola-Gajpuria (4), Puranimati-Adhakota (5) and Gajpuria-Nahat Tippomia-Adhakota (10) series association.	21652.8	7.6
4d-3d	Lands that have severe limitations due to very unfavourable drainage condition (high ground water table); lands need both surface and subsurface drainage; suitable only for paddy; includes Dohotia-Puranimati (12), Akahugaon-Elareragaon (14) and Dohotia-Nahat Tippomia (19) series association.	15564.4	5.4

4ds-3ds	Lands with severe limitations due to very unfavourable drainage conditions (high ground water table and stagnation of water) and also coarse textured subsoil; need both surface and subsurface drainage; suitable for paddy in kharif seasons; includes Pakajara-Ratanpur Kathalkhoa (20) and Ratanpur-Kathalkhoa-Lahangaon (22) series association.	13326.0	4.7
4s-3ds	Lands that are marginal for sustained use under irrigation because of very severe limitations of soils which have unfavourable sandy texture (4s) and 3ds lands have severe limitations due to drainage and soil limitations; includes Jankhana-Marangiagaon (23) and Marangiagaon-Pakajara (24) series association.	30120.3	10.5
4s	Lands with very severe limitations of very unfavourable sandy soil texture for sustained use under irrigation; includes Marangiagaon (25) series.	22472.3	7.9
4t-6t	Lands that have limitations of moderate to severe erosion due to strong slopes (4t) marginally suitable for adaptable crops under careful management, 6t lands are not suitable for sustained use under irrigation due to severe erosion and steep slopes; includes Disai (II)-Disai (III) (I) series association.	12286.3	4.3
6w	Lands not suitable for sustained use under irrigation due to stagnation water throughout the year; occurs in marshes and swamps land, includes soil map unit (26).	6304.7	2.2
	River courses.	32044.3	11.2

**Table 9. Problem soils**

Mapping symbol	Intensity of problem	Soil map unit	Associated problems	Recommendations	Area	
					(ha)	%
W –Wetness W1	Slight to moderate	4,9,11,13	Moderately well to imperfectly drained, fine-loamy to coarse-loamy soils with excess moisture in some parts of the year. Soils are strongly to very strongly acid except soil unit (4) which is medium to slightly acid.	Need surface drainage, suited for water tolerant crops like paddy on low lands and vegetables and climatically adapted cereals on uplands.	27773.3	9.71
W2	Moderate	15,16,17, 18,22	Moderately well to poorly drained, with moderate to severe flooding hazards, fine-loamy to sandy soils. Soils of the soil map units (15, 16, 18) are strongly to slightly acid and the rest are neutral to mildly alkaline.	Need surface drainage and flood control by construction of embankment; suitable to water tolerant crops on low lands in kharif season and vegetables in rabi season with irrigation facilities.	44555.2	15.58
W3	Severe	5,10,12,1 4,19,20,2 1	Imperfectly to very poorly drained, fine to coarse-loamy soils; subject to excessive wetness for most of the year due to high ground water table and seasonal overflow. Soils are very strongly to slightly acid except the soil map unit (20,21) which are neutral to mildly alkaline.	Need both surface and subsurface drainage by construction of discs or 'nulla' etc. Cultivation of wet crops like paddy, and fisheries are recommended.	59672.5	20.87
S-Soils S1	Moderate	23,24	Coarse textured soils, subject to moderate to severe flooding susceptible to crop failure in rainy season. Soils are neutral to mildly alkaline.	Improvement of drainage and flood control need top priority; paddy cultivation is suitable in rainy season and other cereals and vegetables may be grown in rabi season successfully with irrigation facilities and organic manures.	30120.3	10.53
S2	Severe	25	Sandy soils, subject to severe flooding, excessively drained, low water holding capacity. Soils are neutral to mildly	Occasional cultivation of vegetables, oilseeds etc. in rotation with hay or pasture in Lau season; suitable for tall grasses and pasture	22472.3	7.86

			alkaline.	land.		
E-Erosion E1	Slight to moderate	3,7,8	Very deep, well to moderately well drained, fine-loamy, coarse loamy and fine- silty soil with slight to moderate erosion hazards; very strongly to strongly acid soils with low base status.	Cultivation with careful management; suited to tea plantation and all climatically adapted crops except paddy.	37968.6	13. 28
E2	Moderate	2,6	Well drained, fine- loamy to coarse-loamy soils; moderate erosion problem on gentle slopes to undulating upland; very strongly to strongly acid soils.	Cultivation with very careful managements; suited to tea plantation and fruit trees and permanent vegetative or forest cover should be opted.	12732.6	4.4 5
E3	Severe	1	Moderately shallow to deep soils on moderately steep to steep slopes with severe erosion hazards; soils are very strongly acid in reaction.	Soils are marginally suitable for cultivation in lower hill slopes and afforestation and fruit crops may be preferred; permanent forest cover and the timber trees may be grown on steeper slopes.	12286.3	4.3
Marshes and Swamps	Very severe	26	Swamps, water stagnation throughout the year.	Fishery and wild life	6304.7	2.2
River					32044.3	11. 21

**Table 10. Suggested land use**

Mapping symbol	Soil map unit	Major crops suggested		Area	
		Kharif	Rabi	(ha)	%
C-Cultivation	7,8	Highly suitable to tea plantation and moderately suitable to vegetables.	Wheat and all kinds of winter vegetables.	36718.8	12.84
C1					
C2	2,3,6	Tea and fruit crops, maize, pulses and social forestry.	Wheat, potato, ginger, chillies, winter vegetables and banana .	13987.4	4.89
C3	4,11,13,15,17,18,22	Suitable for paddy cultivation.	Wheat, potato, mustard, peas, cabbage	59421.5	20.78
C4	5,9,10,12,14,16,19,20,21	Suitable for paddy cultivation.	Paddy and other cereals crops may be grown with good drainage facilities.	72579.4	25.38
C5	23,24	Deep water paddy.	Wheat, potato, mustard, linseed, pulses and vegetables.	30120.3	10.53
G-Grassland and pasture	25	Suitable for tall grasses and shrubs.	Mustard, linseed, pulses and vegetables.	22472.3	7.86
F-Forestry	1	Limited cultivation on moderately steep slopes, restricted grazing and forestry with plantation of fruits and timber species on steep slopes.		12286.3	4.3
MS-Marshes and Swamps	26	Fisheries, tall grasses, recreation and wild life.		6304.7	2.21
River				32044.3	11.21

**Table 11. Soil site suitability evaluation for different crops.**

Soil series	Physical suitability class				
	Paddy	Wheat	Sugarcane	Banana	Tea
Disai -I	S2	S3	S3	S2	S3
Disai - II	S3	S2	S2	S3	S2
Disai - III	N1	S3	N1	S3	N1
Murmurya	S2	N1	S2	S2	S2
Teok	S2	S2	S3	S2	S2
Sangsoa	S3	S3	S2	S1	S1
Sildubi	S1	S1	S1	S2	N1
Matikhola	S1	S2	S1	S1	N1
Adhakota	S2	S3	S3	S2	N1
Bareragaon	S2	S3	S2	S2	S3
Akahugaon	S2	N1	S3	S2	N1
Dohotia	S3	N1	S3	S2	S3
Napamuagaon	S3	S3	N1	N1	N1
Puranimati	S2	S3	S1	S1	S3
Gajpuria	S1	S3	S2	S2	N1
Jankhana	S2	S3	S3	S2	N1
Nahat Tippomia	S1	S3	N1	S1	S3
Pakajara	S2	S2	S3	S3	N1
Ratanpur	S1	S3	S1	S1	N1
Lahangaon	S1	S3	S1	S1	N1
Maragiagaon	S2	S3	S2	S2	N1

\* Physical suitability subclass.

S1 = Highly suitable

S2 = Moderately suitable

S3 = Marginally suitable

N1 = Currently not suitable

N2 = Permanently unsuitable.

## PARTICIPANTS

Principal Investigator:	G.S. Chamuah	Collection and organisation of data, correlation and classification, interpretation and finalisation of report.
Associate :	C.S. Walia	Soil survey and mapping, correlation and classification and soil analysis.
	K.M. Nair	- do -
	D.C. Nayak	Soil survey and mapping, correlation and classification, soil analysis, preparation of soil and interpretative maps and draft report.
	A.K. Maji	Land Evaluation.
	Utpal Baruah	Cartography.
	J. Sehgal	Review and Technical Editing.

**DISAI (I) SERIES**

Disai (I) series is a member of coarse-loamy, mixed, hyper-thermic family of Fluventic Dystrochrepts. The soils have yellowish brown, extremely acid, sandy loam A horizon; brownish yellow to yellowish brown, very strongly acid, sandy loam to sandy clay loam B horizon. They have developed on colluvium/alluvium parent materials in gently sloping upper piedmont plains at an elevation of 100 to 150 m above MSL. The climate is humid subtropical with mean annual air temperature 23.5°C and mean annual rainfall 1950mm. The principal associated soil series are Disai (II), Sildubi and Murmurya which are Typic Dystrochrepts, Dystric Eutrochrepts and Typic Udorthents respectively.

**Typifying pedon:** Disai (I) sandy loam - forested  
Colours are for the moist soil.

- A1 0-14 cm --- Yellowish brown (10YR 5/4) sandy loam: weak fine granular structure; very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine pores; pH 4.4; gradual smooth boundary.
- B1 14-47 cm --- Brownish yellow (10YR 6/6) sandy loam: weak fine subangular blocky structure; friable, nonsticky and nonplastic; common medium roots; many very fine and few medium pores; pH 4, 6; gradual wavy boundary.
- B21 47-91 cm --- Yellowish brown (10YR 5/8) sandy loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common medium roots; common medium pores; pH 4.8; gradual wavy boundary.
- B22 91-120 cm --- Brownish yellow (10YR 6/6) sandy clay loam; moderate medium subangular blocky structure; friable, sticky and slightly plastic; common medium roots; common medium pores; few medium iron nodules are present; pH 4.6.

**Range in characteristics:** The soils are deep to very deep. The estimated MAST is 24.5°C. The MSST is 26.3°C and MWST is 19.5°C. The moisture control section is not dry in any part as long as 90 cumulative days in a year.

The A horizon is 10 to 20 cm thick. The colour of A horizon is in hue 10YR value 4 to 6 and chroma 4 to 6. The texture of A horizon is sandy loam. The B horizon is 60 to 90 cm thick. The colour of B horizon is in 10YR, value 5 to 6 and chroma 6 to 8. The texture of the horizon is sandy loam to sandy clay loam. There are few iron nodules of 2 to 3 mm size present in lower portion of B horizon.

**Competing series and their differentiae:** Murmurya is the competing series, which is darker coloured in hue 7.5YR and slightly coarser textured and is Typic Udorthents.

**Use and vegetation:** Most areas are under forest vegetation and some areas are covered by tea gardens. The common vegetations are Khokon (*Duabang a sonneratioides*) Gomari (*Gmelina arborea*), Nahar (*Mesua ferrea*), Sisoo (*Dalbergia sissoo*) Jati bet (*Calamus tenuis*), Bon Ogora (*Trichmfetta Artramja*), Dhekia late (*Stenochloa palustre*) and common grasses are Kohua (*Saccharum spontaneum*), Dubaribon (*Cynodon dactylon*) etc.

**Drainage and permeability:** Soils are well drained with moderately rapid permeability.

**Distribution and extent:** Extensively occur in upper piedmont plains in the eastern part of Titabor, southeast Jorhat and eastern part of east Jorhat blocks of Jorhat Subdivision. It accounts for 6,114 ha area.

**Type and location:** It is situated at Disai Valley Reserved Forest, P.S. Mariani, District Jorhat, latitude: 26°38'6" N and longitude: 94°23'26" E.

## Soils of Jorhat District (Assam) for Land Use Planning

**Series proposed:** National Bureau of Soil Survey and Land Use planning (ICAR), Regional Centre, Jorhat, May, 1983.

**Interpretation:** The soils are susceptible to moderate erosion hazards. Most areas are under reserved forest and timber trees and fruits may be grown for afforestation as well as soil conservation. Tea plantation and horticultural crops may be done by adopting good soil conservation measures.

**Interpretive grouping:**

Land capability sub-class	-IIIe
Land Irrigability sub-class	-3t
Productivity potential	-Medium

### SOIL ANALYSIS

Soil Series: Disai (I)

Classification: Fluventic Dystrachrepts  
Analysis at: NBSS&LUP (ICAR)  
Regional Centre, Jorhat

Horizon	Depth	Particle-size distribution (Particle diameter in mm. soil separates in %) (2mm)										Coarse fragments (2mm) (% of whole soil)	
		Total			Sand						Slit		
		Sand 2-0.05	Silt 0.05-0.002	Clay 0.002	Very coarse 2-1	Coarse 1-0.5	Medium 0.5-0.25	Fine 0.25-0.10	Very Fine 0.1-0.05	Coarse 0.05-0.02	Fine 0.02-0.002		
A1	0-14	66.1	22.4	11.5	0.6	0.6	17.4	38.5	9.0	15.1	7.3	Nil	
B1	14-47	62.5	25.0	12.5	0.1	0.6	11.8	36.0	14.0	16.7	8.3	Nil	
B21	47-91	57.1	25.4	17.5	0.3	0.4	10.1	33.3	13.0	18.4	7.0	Nil	
B22	91-120	55.0	24.0	21.0	0.2	0.3	10.9	33.0	10.6	17.6	6.4	Nil	

Horizon	Organic Carbon %	CaCO <sub>3</sub> %	pH(1:2.5)H <sub>2</sub> O	E.C.(dSm <sup>-1</sup> )(1:2:5)H <sub>2</sub> O	Exchangeable bases					Extractable acidity	Exch. Al	CEC	Base Saturation %	Ratio CEC/clay
					Ca	Mg	Na	K	Sum					
					cmol(p <sup>+</sup> ) kg <sup>-1</sup>									
A1	0.54	Nil	4.4	Nil	1.1	0.4	0.3	0.1	1.9	1.3	1.0	3.6	52	0.31
B1	0.30	Nil	4.6	Nil	0.8	0.2	0.2	0.1	1.3	1.7	1.3	3.4	38	0.27
B21	0.18	Nil	4.8	Nil	1.0	0.3	0.2	0.1	1.6	1.8	1.6	4.4	36	0.25
B22	0.30	Nil	4.6	Nil	0.8	0.4	0.2	0.1	1.5	2.6	2.3	4.9	30	0.24

**DISAI (II) SERIES**

Disai (II) series is a member of fine-loamy, mixed, hyper-thermic family of Typic Dystrochrepts. Disai (II) soils have yellowish brown, very strongly acid, sandy loam A horizon, brownish yellow to reddish yellow, very strongly acid, clay loam B horizon with few coarse gravels underlain by yellowish brown, very strongly acid, gravelly clay loam C horizon. They have developed over sandstone and shales parent materials in strongly sloping to moderately steep hill slopes at an elevation of 180 to 250 m above MSL. The climate is humid subtropical with mean annual air temperature 23.5°C and mean annual rainfall 1950 mm. The principal associated soil series are Disai (III) which is Typic Udorthents, nisei (I) which is Fluventic Dystrochrepts and Murmurya which is Typic Udorthents.

**Typifying pedon:** Disai (II) sandy loam - forested.

Colours are for the moist soil unless indicated.

A1	0-20 cm	Yellowish brown (10YR 5/6) sandy loam moderate fine granular structure; friable, slightly sticky and slightly plastic; many fine and medium roots; pH 4.6; gradual smooth boundary.
B21	20-55 cm	Brownish yellow (10YR 6/8) clay loam; moderate medium subangular blocky structure; firm, sticky and plastic, common fine and medium roots; pH 4.5; gradual smooth boundary.
B22	55-110 cm	Reddish yellow (7.5YR 6/8) clay loam; moderate medium subangular blocky structure; firm, sticky and plastic, few fine and medium roots; gravels of 2 to 7.5 cm sizes are present and it is about 5-10 per cent by volume; pH 4.5; clear smooth boundary.
C	110-142 cm	Yellowish brown (to YR 5/4) loam; weak medium subangular blocky structure; friable slightly sticky and slightly plastic; 2.5 to 25 cm size gravels and stones about 30-40 per cent by volume are present, pH 4.6.

**Range in characteristics:** The soils are deep to very deep. The estimated MAST is 24.5°C. The MSST is 26.30°C and MWST is 19.5°C. The moisture control section is not dry in any part as long as 90 cumulative days in a year.

The A horizon is 12 to 28 cm thick. The colour of A horizon is in hue 10/11, value 4 to 5 and chroma 4 to 6. The texture of A horizon varies from sandy loam to loam. The B horizon is 70 to 95 cm thick and has clay loam to loam texture. The colour of this horizon is 10YR and 7.5YR, value 5 to 6; chroma 6 to 8 and 5 to 15 per cent gravels are present. The C horizon has colour in hue 10YR, value 5 to 6 and chroma 4 to 8. The texture is loam to sandy loam and there are abundant gravels and stones of size 2.5 to 25 cm which is 25 to 45 per cent by volume.

**Competing series and their differentiae:** Competing series is Sildubi which is slightly lighter in colour, slightly coarser in texture with less gravel in B horizons and is Dystric Eutrochrepts.

**Drainage and permeability:** Soils are well drained with moderate permeability.

**Use and vegetation:** Mostly under forest vegetation and some scattered areas are under jhum cultivation. The common tree species are Khokon (*Duabanga Sanderatinides*), Makori sal (*Schima wallichii*), Prima (*Cadrelatoona*) Sal (*Shorea robusta*), Bamboo (*Bambusa sp.*), Common shrubs are Bon Ogora (*Triumfetta bartramia*), Jati bet (*Calamus*), Dheki late (*Stenochola palustre*), and grasses are Bongooti (*Chrysopogon aciculatus*), Duboribon (*Cynodon dactylgn*), Kohua (*Saccharum spontaneum*) etc.

**Distribution and extent:** Occurs extensively in lower hill slopes in Jorhat and east Jorhat blocks of Jorhat Subdivision. It accounts for 11,025 ha areas.

**Type and locations:** It is situated at Disai Valley Reserved Forest, P.S, Mariani, District Jorhat, latitude: 26°35'57"N and longitude: 94°20'53" E.

## Soils of Jorhat District (Assam) for Land Use Planning

**Series proposed:** National Bureau of Soil Survey and Land Use Planning (ICAR), Regional Centre, Jorhat, May 1983.

**Interpretation:** Soils are susceptible to moderate to severe erosion hazards. The area is under reserve forest and more timber trees or other plant species should be planted to check erosion hazards and jhum cultivation practices should be stopped.

**Interpretive grouping:**

Land capability sub-class	-IVe
Land Irrigability sub-class	-4t
Productivity potential	-Low to Medium

### SOIL ANALYSIS

Soil Series: Disai (II)

Classification: Typic Dystrochrepts  
Analysis at: NBSS&LUP (ICAR)  
Regional Centre, Jorhat

Horizon	Depth	Particle-size distribution (Particle diameter in mm. soil separates in %) (2mm)										Coarse fragments (2mm) (% of whole soil)	
		Total			Sand						Slit		
		Sand 2-0.05	Silt 0.05-0.002	Clay 0.002	Very coarse 2-1	Coarse 1-0.5	Medium 0.5-0.25	Fine 0.25-0.10	Very Fine 0.1-0.05	Coarse 0.05-0.02	Fine 0.02-0.002		
A1	0-20	67.5	14.3	18.2	0.1	0.3	3.1	17.3	46.7	10.9	3.4	Nil	
B21	20-55	45	22.4	32.6	0.2	0.4	1.6	7.9	34.9	19.2	3.2	5.2	
B22	55-110	28.5	37.1	34.4	-	0.1	0.3	2.8	25.3	26.9	10.2	15.6	
C	110-142	35.1	39.4	25.5	1.2	1.9	4.6	3.9	23.5	30	9.4	18.1	

Horizon	Organic Carbon %	CaCO <sub>3</sub> %	pH (1:2:5) H <sub>2</sub> O	E.C.(dSm <sup>-1</sup> )(1:2:5) H <sub>2</sub> O	Exchangeable bases					Extractable acidity	Exch. A1	CEC	Base Saturation %	Ratio CEC/clay
					Ca	Mg	Na	K	Sum					
					cmol(p <sup>+</sup> ) kg <sup>-1</sup>									
A1	0.78	Nil	4.6	Nil	1.7	0.5	0.2	0.1	2.5	4.1	3.4	6.9	36	0.38
B21	0.48	Nil	4.5	Nil	1.8	0.9	0.1	0.1	2.9	6.6	5.9	9.8	30	0.30
B22	0.18	Nil	4.5	Nil	1.5	0.9	0.1	0.1	2.6	8.3	7.4	11.6	22	0.34
C	0.10	Nil	4.6	Nil	1.3	0.4	0.1	0.1	1.9	7.6	6.8	9.8	19	0.38

**DISAI (III) SERIES**

Disai (III) series is a member of loamy-skeletal, mixed, hyperthermic family of Typic Udorthents. The soils have reddish yellow, very strong acid, sandy loam A horizon and yellowish brown to brownish yellow, very strongly acid, gravelly sandyloam C horizon. They have developed over coarse ferruginous sand stones parent material in moderately steep to steep hill slopes at an elevation of 250 to 450 m above MSL. The relief is excessive and subjected to severe erosion. The climate is humid subtropical with mean annual air temperature 23.5°C and mean annual rainfall 1950 mm. The principal associated soilseries is Disai (II) which is Typic Dystrochrepts.

**Typifying pedon:** Disai (III) sandy loam - forested

Colours are for the moist soil unless otherwise indicated.

Al	0-29 cm	Reddish yellow (SYR 6/8) sandy loam, weak fine granular structure; very friable, nonsticky and nonplastic; many fine to medium roots; 2 to 5% gravels of 1 to 2 cm size; pH 4.97 clear smooth boundary.
AC	29-52 cm	Yellowish brown (10YR 5/6) sandy loam; single grain; loose, nonsticky and nonplastic; few fine and common medium roots; 30-40% gravels of 2.5 to 7.5 cm size: pH 4.8: gradual wavy boundary.
C	52-73 cm	Brownish yellow (10YR 6/6) loamy sand; single grain; loose, nonsticky and nonplastic, few medium roots; 60-70% gravels and stones of 2.5 to 25 cm sizes: pH 5.0

**Range in characteristics:** The soils are moderately deep to deep. The estimated MAST is 24.5°C, MSST is 26.3°C and MWST is 19.5°C. The moisture control section is not dry in any part as long as 90 cumulative days in a year.

The A horizon is 11 to 30 cm thick. The colour of A horizon is in hue 7.5YR and 5YR, value 5 to 6 and chroma 6 to 8. The texture of A horizon ranges from sandy loam to loam. The C horizon is 25 to 45 cm thick and has coarse sandy loam to loamy sand texture. The colour is in 10YR and 7.5YR value 5 to 6 and chroma 6 to 8. Abundant coarse fragments of varying sizes (2.5 to 25 cm) are present and by volume it is about 30 to 70 per cent.

**Completing series and their differentiae:** Nil.

**Use and vegetation:** The area is under forest. The vegetations are Bandardima (*Dysoxylum binectariferum*), Bor hingori (*Castanopsis hvstrix*), Meki (*Shorea assamica*), Poma (*Cedrela toone*), Sisoo (*Alberpia sissoo*) and common shrubs are Makhiloti (*Flemingia strobilifera*), Charai thengia (*Leea acuminata*), Dhekialata (*Stenochloepalustre*) etc.

**Drainage and permeability:** Excessively drained with rapid permeability.

**Distribution and extent:** Extensively occur in upper hill slopes of hill ranges in the district. It accounts for 4296 ha.

**Type and location:** It is located at Disai valley reserve forest, P.S. Mariani, District Jorhat, latitude: 26°35'32" N and longitude: 94°21'11" E.

**Series proposed:** National Bureau of Soil Survey and Land Use Planning (ICAR), Regional Centre, Jorhat, May 1983.

**Interpretation:** The soils are susceptible to severe erosion hazards. The area is under reserved forest and extensive afforestation programme should be adopted for soil conservation.

**Interpretive grouping:**

Land capability sub-class	-Vies
Land Irrigability sub-class	-6t
Productivity potential	-Low

**SOIL ANALYSIS**

Soil Series: Disai (III)

Classification: TypicUdorthents

Analysis at: NBSS&LUP (ICAR)

Regional Centre, Jorhat

Horizon	Depth	Particle-size distribution (Particle diameter in mm. soil separates in %) (2mm)										Coarse fragments (2mm) (% of whole soil)
		Total			Sand					Silt		
		Sand 2-0.05	Silt 0.05-0.002	Clay 0.002	Very coarse 2-1	Coarse 1-0.5	Medium 0.5-0.25	Fine 0.25-0.10	Very Fine 0.1-0.05	Coarse 0.05-0.02	Fine 0.02-0.002	
A1	0-29	67.00	18.60	14.40	1.00	1.60	28.30	15.40	20.70	3.10	15.50	3.50
AC	29-52	74.00	16.60	10.40	0.90	1.30	29.10	16.00	26.70	6.70	9.90	26.40
C	52-73	79.50	12.70	7.80	2.10	1.00	37.70	16.10	22.60	3.30	9.40	37.60

Horizon	Organic Carbon %	CaCO <sub>3</sub> %	pH(1:2:5)H <sub>2</sub> O	E.C.(dSm <sup>-1</sup> )(1:2:5)H <sub>2</sub> O	Exchangeable bases					Extractable acidity	Exch. A1	CEC	Base Saturation %	Ratio CEC/clay
					Ca	Mg	Na	K	Sum					
					cmol(p <sup>+</sup> ) kg <sup>-1</sup>									
A1	0.66	Nil	4.9	Nil	2.60	1.10	0.30	0.10	4.10	4	3.2	8.4	49	0.58
AC	0.2	Nil	4.8	Nil	1.20	0.70	0.30	0.10	2.30	3.8	2	6.4	36	0.61
C	0.06	Nil	5.0	Nil	0.70	0.50	0.20	0.10	1.50	2.9	1.8	4.8	31	0.61

**MURMURYA SERIES**

Murmurya series is a member of coarse-loamy, mite, byperthermic family of Typic Udorthents. The soils have le brown, very strongly acid, sandy loam A horizons; strong brown to reddish yellow, very strongly acid, sandy loam horizon. They are developed over alluvium in gently slopi upland and piedmont plain at an elevation of 95 m above MSL. The climate is humid subtropical with mean annual temperature 23.5° C and mean annual rainfall 1950 mm. The principal associated soil series are Teok which is Typic Dystrochrept and Disai (I) which is Fluventic Dystrochrepts.

**Typifying pedon:** Murmurya sandy loam - Tea plantation

Colours are for the moist soil.

- Ap 0-18 cm Pale brown (10YR 6/3) sandy loam; moderate, medium subangular blocky structure; friable, slight sticky and slightly plastic; common medium and manyfine roots; many medium pores; pH 4.6; clear wavyboundary.
- Cl 18-55 cm Strong brown (7.5YR 5/6) sandy loam, weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine to few medium roots; few insect holes and channels; common fine and medium pores; pH 4.7; clear wavy boundary.
- C2 55-105 cm Reddish yellow (7.5YR 6/8) sandy loam, weak medium subangular blocky structure; common medium; reddish brown iron nodules; few medium distinct brownish gray (10YR 6/2) mottles; few fine roots; insect holes; common fine pores; pH 4.8

**Range in characteristics:** The soils are deep to very de, estimated MAST is 24.5°C the MSST is 26.3°C and MWST is19.5°C. The moisture control section does not remain dry in any Part as long as 90 cumulative days in a year. The thickness of surface horizon is about 12-35 an. its colour is in hue value 5 to 6, dhroma 3 to 4. The texture is sandy loam to loam. The thickness of C horizon is about 90-100 cm. Its colour is inhue 10 YR and 7.5YR, value 5 to 6 and chroma 6 to 8, Its texture is sandy loam to loam and structure is weak medium subangular blocky, reddish brown iron nodules are also present.

**Competing series and their differentiae:** Disai (I) is competing series which is lighter in colour in 10YR, relatively finer texture in lower horizons and is Fluventic Dystrochrepts.

**Drainage and permeability:** Moderately well drained with moderate permeability.

**Use and vegetation:** The soils are mostly under tea plantation and pasture land. The most common natural vegetation are Boga Koroï (*Albizzia procera*), Mekai (*Shorea assemipa*), Sal (*Shorearobusta*), Sisoo (*Dalbergiasisoo*): Akon (*Calotropis gigantea*), Ghontakorna(*Crotalaria striata*), Jati bet (*Calamus tenuis*), Kohua (*Saccharum spontaneum*), Duboribon (*Cynodpri dcotylon*) etc.

**Distribution and extent:** Extensive in upper piedmonts and gently sloping uplands in Titabor, Jorhat and east Jorhat blocks of Jorhat district. It accounts for 12,273 ha area.

**Type location:** Murmurya Tea Estate, P.S. Mariani, DistrictJorhat, latitude: 26°42"N, longitude: 94°17'E.

**Series proposed:** National Bureau of Soil Survey and Land Use Planning (ICAR), Regional Centre, Jorhat, November, 1981.

**Interpretation:** Murmurya soils are medium acid and are suitable for tea plantation. The soils have, however, low moisture and nutrient retention capacity. Pulses, vegetables and other rainfed can also be grown with limiting of soils.

**Interpretive grouping:**

Land capability sub-class	-IIIes
Land Irrigability sub-class	-3t
Productivity potential	-Medium

**SOIL ANALYSIS**

Soil Series: Murmurya

Classification: TypicUdorthents

Analysis at: NBSS&LUP (ICAR)

Regional Centre, Jorhat

Horizon	Depth	Particle-size distribution (Particle diameter in mm. soil separates in %) (2mm)										Coarse fragments (2mm) (% of whole soil)
		Total			Sand					Slit		
		Sand 2-0.05	Silt 0.05-0.002	Clay 0.002	Very coarse 2-1	Coarse 1-0.5	Medium 0.5-0.25	Fine 0.25-0.10	Very Fine 0.1-0.05	Coarse 0.05-0.02	Fine 0.02-0.002	
Ap	0-18	60.50	21.30	18.20	-	-	9.10	33.70	17.70	13.30	8.00	Nil
C1	18-55	53.20	34.60	12.20	-	-	12.60	18.30	22.30	20.00	14.60	Nil
C2	55-105	62.90	25.60	11.50	-	-	18.70	23.00	21.20	19.00	6.60	Nil

Horizon	Organic Carbon %	CaCO <sub>3</sub> %	pH(1:2:5)H <sub>2</sub> O	E.C.(dSm <sup>-1</sup> )(1:2:5)H <sub>2</sub> O	Exchangeable bases					Extractable acidity	Exch. A1	CEC	Base Saturation %	Ratio CEC/clay
					Ca	Mg	Na	K	Sum					
					cmol(p <sup>+</sup> ) kg <sup>-1</sup>									
Ap	1.15	Nil	4.60	Nil	0.70	0.70	0.20	0.20	1.8	2.10	1.0	6.0	30	0.33
C1	0.38	Nil	4.70	Nil	0.50	0.60	0.20	0.10	1.4	3.10	1.9	5.9	24	0.48
C2	0.25	Nil	4.80	Nil	0.40	0.30	0.20	0.10	1.3	2.60	1.1	5.7	23	0.49

**SILDUBI SERIES**

Sildubi series is a member of fine-loamy, mixed, hyperthermic family of Dystric Eutrochrepts. Sildubi soils have dark brown to dark yellowish brown, neutral to medium acid, loam A horizon; yellowish brown, slightly acid to neutral, loam B horizon. Soils have developed on alluvium/colluvium parent materials in gently sloping to undulating piedmont plains at an elevation of 100 to 125 m above MSL. The climate is humid subtropical with mean annual air temperature 23.5°C and mean annual rainfall 1950 mm. The principal associated soil series is Disai (I) which is Fluventic Dystrichrepts.

**Typifying pedon:** Sildubi loam - fallow land

Colours are for the moist soil unless otherwise indicated.

All	0-15 cm	Dark brown (10YR 4/3) loam; moderate mediumgranular structure tending to subangular blocky structure; friable, sticky and slightly plastic; many fine roots; pH 6.7; gradual smooth boundary.
Al2	15-32 cm	Dark yellowish brown (10YR 4/6) loam; moderate medium subangular blocky structure; friable, sticky and slightly plastic; many fine roots; few earthworm holes are present; pH 5.9; clear wavy boundary.
B12	32-88 cm	Yellowish brown (10YR 5/4) loam; moderatemedium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine roots; few earthworm holes are present; gravels are of 2 cm in diameter and 20 per cent by volume; pH 6.0; gradual wavy boundary.
B22	88-118 cm	Yellowish brown (10 YR 5/6) loam, moderatemedium subangular blocky structure; friable, slightly sticky and slightly plastic; many medium strong brown (7.5YR 5/8) mottlings are present; few fine roots; pH 6.8; gravels 15 to 25 per cent by volume and of 2.5 to 10 cm in size are present.

**Range in characteristics:** The soils are very deep. The estimated MAST is 24.5°C. The MSST is 26.3°C and MWST is 19.5°C. The soil moisture control section is not dry in any part as long as 90 cumulative days in a year.

The A horizon is 15 to 30 cm thick. The colour of A horizon is in hue 10YR, value 4 to 6 and chrome 3 to 6. Its texture is loam to sandy loam. The colour of B horizon is in hue 10YR, value 5 to 6 and chrome 4 to 6. The B horizons have many strong brown (7.5YR5/8) iron mottles and its texture ranges from loam to sandy clay loam. Coarse fragments of size 2.0 to 10 cm are present, which about 10 to 25 percent by volume.

**Competing series and their differentiae:** Competing series are Disai (I) series which is slightly darker in colour, finer textured having more gravels and is Typic Dystrichrepts; Disai (I) series which is also slightly darker in colour but coarser textured and is Fluventic Dystrichrepts.

**Drainage and permeability:** Well drained with moderately rapid permeability.

**Use and vegetation:** Some areas are used for grazing and pastures, most areas are under vegetable cultivation. The most common trees are Ajhar (*Lagerstroemia flosreginae*), Rot (*Ficus bengalensis*), Kolajamu (*Eugeniaambolana*), Dutenga (*Dillenia indica*); Common shrubs are Akon (*Calotropis gugantea*), Hati Bhekuri (*Solanumtorvum*), Ghontakorna (*Crotalaria striate*) and grasses are Biccha bon (*Setaria glauo*), Bongooti (*Chrysppogonaciculatus*) Duboribon (*Cynodon dactylon*), etc.

**Distribution and extent:** Occurs extensively in upper piedmont plains in the southeast part of Titabor block of Jorhat Subdivision. It accounts for only 752 ha area.

**Type and location:** Village Sildubi, P.S, Borholla, District Jorhat, latitude: 26°27'15" N and longitude: 94°10'40" E.

## Soils of Jorhat District (Assam) for Land Use Planning

**Series proposed:** National Bureau of Soil Survey and Land Use Planning, Regional Centre, Jorhat, December, 1985.

**Interpretation:** Soils are susceptible to moderate erosion hazards. Presently vegetables are grown in rained conditions, Pulses, oil seeds and good vegetable crops may be grown with irrigation facilities and contour bunding.

**Interpretive grouping:**

Land capability sub-class	-IIIe
Land Irrigability sub-class	-3t
Productivity potential	-Medium

### SOIL ANALYSIS

Soil Series: Sildubi

Classification: Dystric Eutrochrepts  
Analysis at: NBSS&LUP (ICAR)  
Regional Centre, Jorhat

Horizon	Depth	Particle-size distribution (Particle diameter in mm. soil separates in %) (2mm)										Coarse fragments (2mm) (% of whole soil)	
		Total			Sand						Slit		
		Sand 2-0.05	Silt 0.05-0.002	Clay 0.002	Very coarse 2-1	Coarse 1-0.5	Medium 0.5-0.25	Fine 0.25-0.10	Very Fine 0.1-0.05	Coarse 0.05-0.02	Fine 0.02-0.002		
A11	0-15	38.5	36	25.50	0.50	1.40	16.80	13.1	6.70	20.60	15.40	Nil	
A12	15-32	40.6	33.9	25.50	2.20	2.10	16.10	13.10	7.10	22.30	11.60	Nil	
B21	32-88	44.3	35.7	20.00	5.00	3.50	22.40	9.60	3.80	26.30	9.40	Nil	
B22	88-118	49.1	32.4	18.50	2.90	3.80	17.90	14.50	10.00	24.20	8.20	Nil	

Horizon	Organic Carbon %	CaCO <sub>3</sub> %	pH(1:2:5) H <sub>2</sub> O	E.C.(dSm <sup>-1</sup> )(1:2:5) H <sub>2</sub> O	Exchangeable bases					Extractable acidity	Exch. A1	CEC	Base Saturation%	Ratio CEC/clay
					Ca	Mg	Na	K	Sum					
					cmol(p <sup>+</sup> ) kg <sup>-1</sup>									
A11	1.58	Nil	6.7	0.4	7.6	3.6	0.40	0.90	12.80	0.40	Trace	14.60	88	0.57
A12	0.78	Nil	5.9	0.3	5.6	3.5	0.60	0.90	10.00	0.50	Trace	14.10	71	0.55
B21	0.44	Nil	6.0	0.4	6.1	3.5	0.60	0.10	10.30	0.50	Trace	14.10	73	0.70
B22	0.08	Nil	6.8	0.5	7.2	2.4	0.50	0.10	10.20	0.30	Trace	12.70	80	0.68

**GAJPURIA SERIES**

Gajpuria series is a member of fine-silty, mixed, hyperthermic family of Typic Haplaguepts. Gajpuria soils have light brownish gray, strongly acid, silt loam A horizon and light gray to light brownish gray, medium acid, silty loam to clay loam, brownish yellow mottled B horizon underlain by a lithologically discontinuous yellowish brown, strongly acid, silt loam C horizon. They have developed in alluvium in nearly level to very gently sloping plain at an elevation of 85-90 m above MSL. The climate is humid subtropical with mean annual air temperature 23.5°C and mean annual rainfall 1950 mm. The principal associated soil series are Jankhana which is Typic Udifluvents; Nahat Tippomia, Typic Fluvaquents; Dohotia, Typic Haplaguepts; Adhakata, Typic Haplaquents and Marangia gaon which is Typic Udipsamments.

**Typifying pedon:** Gajpuria silt loam - cultivated

Colours are for the moist soil.

Ap	0-14 cm	Light brownish gray (10YR 6/2) silt loam, puddled; friable, slightly sticky and slightly plastic; many fine and few medium roots; common fine discontinuous pores; pH 5.3; clear smooth boundary.
B1g	14-28 cm	Light brownish gray (10YR 6/2) silt loam; weak fine subangular blocky structure; friable, sticky and slightly plastic; common fine and few medium roots; many medium brownish yellow (10YR 6/8) mottles; common soft iron nodules, common discontinuous impeded pores; pH 5.6; abrupt smooth boundary.
B2g	28-56 cm	Light gray (10YR 7/1) clay loam: moderate medium subangular blocky structure; firm, sticky and plastic; few fine and medium roots; common medium distinct strong brown (7.5YR 5/8) mottles; few soft iron nodules; few fine pores; pH 6.0; abrupt wavy boundary.
HCg	56-100 cm	Yellowish brown (10YR 5/8) silt loam; firm, sticky and plastic; common iron nodules; few fine distinct gray (10YR 6/1) mottles; few fine pores; pH 5.5.

**Range in characteristics:** Gajpuria soils are deep to very deep. The estimated MAST is 24.5°C. The MSST is 26.3°C and MWST is 19.5°C. The moisture control section remains wet during June to September and the soil moisture regime is aquic.

The A horizon is 14-20 cm thick and colour is in hue 10YR, value 5 to 6 and chrome 2 to 3. The texture is loam to silt loam. The B horizon is 36-60 cm thick. The colour is in hue 10YR, value 6 to 7 and chrome 1 to 2. The texture is clay loam to silt loam. The structure is subangular blocky and moderately developed. It is mottled with strong brown to brownish yellow colour and soft iron nodules are common. The C horizon is in hue 10YR, value 5 to 6 and chrome 6 to 8. It is distinctly mottled with gray colour and has soft iron nodules.

**Competing series and their differentiae:** Competing series is Dohotia which is slightly finer texture higher organic matter content. The soils are poorly drained and the ground water table is within 1.5 metres.

**Drainage and permeability:** Imperfectly drained with moderately slow permeability.

**Use and vegetation:** Paddy cultivation covers most of the area. The common vegetation is Bot (*Ficus bengalensis*), Bogori (*Ziziphus Jujube*), Sonaru (*Cassia fistula*), and Bamboo (*Bambusa sp.*), Bon Ogora (*Triumfetta bartramia*), Charai thengia (*Leea acuminata*), Braid (*Leersia hexandra*), Gahoribon (*Borreria articularis*), Uridhan (*HY groryza arstate*) etc.

**Distribution and extent:** Extensive in flood plains and very gently sloping plain of the Brahmaputra valley. It covers western part of Titabor, eastern part of Jorhat, Central Jorhat and east Jorhat blocks of the district. It accounts for 14,169 ha area.

**Type location:** Village Gajpuria, P.S. Jorhat, Assam, latitude: 26°47.20" N. longitude: 94°13'30" E.

## Soils of Jorhat District (Assam) for Land Use Planning

**Series proposed:** National Bureau of Soil Survey and Land Use Planning (ICAR), Regional Centre, Jorhat, January, 1981.

**Interpretation:** Gajpuria soils are imperfectly drained and mostly occur in low-lying areas. These results in water stagnation during rainy season, Rice is common in Kharif; vegetables, oilseeds and pulses can be grown in Rabi season.

**Interpretive grouping:**

Land capability sub-class	-IIw
Land Irrigability sub-class	-3d
Productivity potential	-Medium

### SOIL ANALYSIS

Soil Series: Gajpuria

Classification: Typic Haplaquepts  
Analysis at: NBSS&LUP (ICAR)  
Regional Centre, Jorhat

Horizon	Depth	Particle-size distribution (Particle diameter in mm. soil separates in %) (2mm)										Coarse fragments (2mm) (% of whole soil)
		Total			Sand					Slit		
		Sand 2-0.05	Silt 0.05-0.002	Clay 0.002	Very coarse 2-1	Coarse 1-0.5	Medium 0.5-0.25	Fine 0.25-0.10	Very Fine 0.1-0.05	Coarse 0.05-0.02	Fine 0.02-0.002	
Ap	0-14	16.80	61.00	22.20	-	-	0.90	2.30	13.60	33.50	27.50	Nil
B1g	14-28	19.80	55.00	25.20	-	-	1.00	4.00	14.80	27.60	27.40	Nil
B2g	28-56	22.10	44.80	33.10	-	-	1.40	6.20	14.50	20.40	24.40	Nil
IICg	56-100	14.10	72.80	13.10	-	-	1.00	3.30	9.80	40.70	32.10	Nil

Horizon	Organic Carbon %	CaCO <sub>3</sub> %	pH(1:2.5)H <sub>2</sub> O	E.C.(dSm <sup>-1</sup> )(1:2:5)H <sub>2</sub> O	Exchangeable bases					Extractable acidity	Exch. A1	CEC	Base Saturation %	Ratio CEC/clay
					Ca	Mg	Na	K	Sum					
					cmol(p <sup>+</sup> ) kg <sup>-1</sup>									
Ap	1.24	Nil	5.30	0.10	3.40	1.80	0.10	0.10	5.40	2.10	1.40	9.20	59	0.41
B1g	0.33	Nil	5.60	0.30	4.20	2.60	0.20	0.10	7.10	0.30	0.10	12.40	57	0.49
B2g	0.18	Nil	6.00	0.30	5.80	2.60	0.20	0.10	8.70	0.50	0.20	13.80	63	0.42
IICg	0.30	Nil	5.50	0.10	2.00	0.80	0.10	Trace	2.90	3.10	2.20	7.30	40	0.56

**MATIKHOLA SERIES**

Matikhola series is a member of fine-loamy, mixed, hyperthermic family of Aerie Fluvaquents. Matikhola soils have grayish brown, medium acid to neutral, loam A horizon, grayish brown to light brownish gray, neutral, clay loam C horizon. They have developed on alluvium in level to nearly level piedmont plain at an elevation of 100 to 120 m above MSL. The climate is humid subtropical with mean annual air temperature 23.5 C and mean annual rainfall 1950 mm. The principal associated soil is Gajpuria which is Typic Haplaquepts.

**Typifying pedon:** Matikhola loam - cultivated

Colours are for the moist soil unless otherwise indicated.

Ap	0-16 cm	Grayish brown (10YR 5/3) loam; massive; friable slightly sticky and slightly plastic; many fine and few medium roots; pH 5.6; gradual smooth boundary.
A12	16-33 cm	Grayish brown (10YR 5/2) loam; massive, friable, slightly sticky and slightly plastic; common fine light yellowish brown (10YR 6/4) mottles; few fine and medium roots; pH 6.8; gradual smooth boundary.
Clg	33-54 cm	Grayish brown (10YR 5/2) clay loam; Massive; firm, sticky and slightly plastic; many fine yellowish brown (10YR 5/4) mottles; few fine roots; pH 7.0; clear smooth boundary.
C2g	54-72 cm	Pale brown (10YR 6/3) clay loam; massive; firm, sticky, and plastic; common fine light gray (10YR 6/1) and common medium yellowish brown (10YR 5/6) mottles; pH 6.9; diffuse smooth boundary.
C3g	72-110 cm	Light brownish gray (10YR 6/2) clay loam; massive; firm, sticky and plastic; common distinct yellowish brown (10YR 5/6) mottles; pH 7.1.

**Range in characteristics:** The soils are deep to very deep. The estimated MAST is 24.5°C. The MSST is 26.3°C and MWST is 19.5°C. The soil moisture regime is aquic. The A horizon is 12 to 25 cm thick. The texture is loam to silt loam. The colour of A horizon is in hue 10YR, value 5 to 6 and chroma 2 to 4. The C horizon has colour in hue 10YR, value 5 to 6 and chroma 1 to 3. The texture of C horizon is clay loam to silty clay loam and there are common gray and yellowish brown mottles.

**Competing series and their differentiae:** Competing series is Ratanpur Kathalkhoa which is lighter in texture, lighter in colours, mildly alkaline and is Typic Fluvents.

**Drainage and permeability:** Imperfectly drained with moderately slow permeability.

**Use and vegetation:** Mostly the area is under paddy cultivation. The common natural tree species are Bot (*Ficus bengalensis*), Ou Tanga (*Dillenia indica*), Sonaru (*Cassia fistula*), Bamboo (*Bambusa*): the shrubs and herbs are Hati Bhekuri (*Solanum torvum*), Bhat meteka (*Monochoria vaginalis*) and common grasses are Erali (*Leersia hexandra*), Gahoribon (*Borreria articularis*), Ikora (*Phragmites carka*) etc.

**Distribution and extent:** It occurs mostly in lower piedmont plains in the southern part of Titabor block of Jorhat Subdivision. It accounts for 2,762 ha area.

**Type and location:** Village Matikhola, P.S. Borholla, District, Jorhat, latitude: 26°23'05", longitude: 94°07'45".

**Series proposed:** National Bureau of Soil Survey and Land Use Planning (ICAR) T Regional Centre, Jorhat, December 1985.

**Interpretation:** Matikhola soils have drainage problems and are also affected by seasonal floods. Soils are highly suitable for paddy cultivation and other aquatic species may be grown. Double paddy crops may be grown with proper irrigation and drainage facilities.

**Interpretive grouping:**

Land capability sub-class	-IIw
Land Irrigability sub-class	-3d
Productivity potential	-Medium to High

**SOIL ANALYSIS**

Soil Series: Matikhola

Classification: Aeric Fluvaquents

Analysis at: NBSS&LUP (ICAR)

Regional Centre, Jorhat

Horizon	Depth	Particle-size distribution (Particle diameter in mm. soil separates in %) (2mm)										Coarse fragments (2mm) (% of whole soil)	
		Total			Sand						Slit		
		Sand 2-0.05	Silt 0.05-0.002	Clay 0.002	Very coarse 2-1	Coarse 1-0.5	Medium 0.5-0.25	Fine 0.25-0.10	Very Fine 0.1-0.05	Coarse 0.05-0.02	Fine 0.02-0.002		
Ap	0-16	30	46.5	23.5	-	0.30	5.10	14.50	10.10	20.2	26.3	Nil	
A12	16-33	25.5	48.5	26.0	0.10	0.20	4.90	10.90	9.40	19.1	29.4	Nil	
Clg	33-54	24.5	46.5	29.0	0.10	0.30	8.90	10.4	4.80	18.5	28	Nil	
C2g	54-72	28.3	43.2	28.5	0.20	0.50	6.20	12.00	9.40	16.0	27.2	Nil	
C3g	72-110	27.8	41.7	30.5	-	0.30	8.10	12.90	6.50	16.4	25.3	Nil	

Horizon	Organic Carbon %	CaCO <sub>3</sub> %	pH(1:2.5)H <sub>2</sub> O	E.C.(dSm <sup>-1</sup> )(1:2.5)H <sub>2</sub> O	Exchangeable bases					Extractable acidity	Exch. A1	CEC	Base Saturation%	Ratio CEC/clay
					Ca	Mg	Na	K	Sum					
					cmol(p <sup>+</sup> ) kg <sup>-1</sup>									
Ap	0.9	Nil	5.1	Nil	3.80	1.60	0.30	0.10	5.80	1.3	0.3	8.50	68	0.36
A12	0.56	Nil	6.8	Nil	5.80	3.20	0.40	0.10	9.50	0.2	Trace	11.60	82	0.45
Clg	0.26	Nil	7.0	Nil	7.40	4.10	0.40	0.10	12.00	0.3	Trace	13.50	89	0.45
C2g	0.11	Nil	6.9	Nil	7.80	4.80	0.40	0.10	13.10	0.2	Trace	14.70	89	0.51
C3g	0.18	Nil	7.1	Nil	8.50	5.10	0.50	0.10	14.20	0.2	Trace	15.80	93	0.50

**PURANIMATI SERIES**

Puranimati series is a member of coarse-loamy, mixed, hyperthermic family of Aeric Haplaquents. They have gray to dark gray, strongly to medium acid, sandy loam to loam A horizon and yellowish brown to strong brown, medium acid, sandy loam C horizons which are mottled with gray to light gray colour. They have developed in recent alluvium on nearly level to very gently sloping lower flood plain of the river Brahmaputra at an elevation of 85 m above MSL. The climate is humid subtropical with mean annual air temperature 23.5°C and mean annual rainfall 1950 mm. The principal associated soil series are Jankhana, Adhakota and Dohotia which are Typic Udifluvents, Typic Haplaquents and Typic Haplaquepts, respectively.

**Typifying pedon:** Puranimati sandy loam - cultivated

Colours are for the moist soil.

Ap	0-18 cm	Gray (10YR 5/1) sandy loam; puddled; friable, nonsticky and nonplastic; yellowish brown to brown rust specks of decomposing roots; common medium and many fine roots; common fine and medium pores; pH 5.3; abrupt smooth boundary.
Al2	18-35 cm	Strong brown (7.5YR 5/8) loam; massive; friable, sticky and slightly plastic; few medium distinct gray (10YR 6/1) mottles: common soft fine nodules; common fine and medium roots; common fine pores; pH 5.9: abrupt smooth boundary.
IIC1g	35-83 cm	Yellowish brown (10YR 5/8) sandy loam; massive tending to blocky structure; friable, slightly sticky and slightly plastic; common medium distinct light gray (10YR 7/1) mottles; common soft fine Fe-Mn nodules; common fine and few medium roots; common fine and few medium pores: pH 5.6; clear smooth boundary.
IIC2g	83-125 cm	Strong brown (7.5YR 5/8) sandy loam; massive; friable, nonsticky and nonplastic; common medium distinct light gray (10YR 7/1) mottles; many dark brown fine Fe-Mn nodules; few fine roots; common fine and few medium pores; pH 5.8.

**Range in characteristics:** The soils are very deep. The estimated MAST is 24.5°C. The MSST is 26.3°C and MWST is 19.5°C. The moisture control section remains wet from May to September and therefore, the soil moisture regime is aquic. Surface soil colour is gray to grayish brown in hue 10YR, value 4 to 5 and chroma 1 to 2; texture is sandy loam to silt loam. The colour of subsoil ranges from brown to yellowish brown in hue 10YR and 7.5, value 5 to 6 and chroma 6 to 8; texture is dominantly sandy loam. The subsoil is distinctly mottled with gray to light gray (10YR 6/1 to 7/1) colour characterised with orange red Fe-Mn nodules. The structure is massive.

**Competing series and their differentiae:** Competing series is Nahat-Tippomia which is slightly coarser in texture, lighter in colour in 10YR, absence of soft iron manganese nodules which is Typic Fluvaquents.

**Drainage and permeability:** Imperfectly drained with moderate permeability.

**Use and vegetation:** The soils are mostly under paddy and pasture land. The most common natural vegetation are Dot (*Ficus bengalensis*) Bogori (*Zizyphus jujube*), Kolajamu (*Eugenia Jambolana*) Bamboo (*Eambusa tulda*); Charai thengia (*Leea acuminata*) Ghontakarna (*Cmtalaria striate*); Bongooti (*Chrysopogon aciculatus*), Gahoribon (*Borreria articularis*) etc.

**Distribution and extent:** Extensive in lower flood plain of the Brahmaputra in the north-west Jorhat block of Jorhat Subdivision. It accounts for 11,232 ha area.

**Type location:** Village Puranimati, P.S. Jorhat, District Jorhat, Assam, latitude: 26°44'25"N, longitude: 94°5'45" E.

## Soils of Jorhat District (Assam) for Land Use Planning

**Series proposed:** National Bureau of Soil Survey and Land Use Planning (ICAR), Regional Centre, Jorhat, February, 1981.

**Interpretation:** Puranimati soils have problems of drainage, acidity and are susceptible to flooding. Rice is commonly grown in the Eharif; Mustard and wheat can be grown in rabi season.

### Interpretive grouping:

Land capability sub-class	-IIw
Land Irrigability sub-class	-3d
Productivity potential	-Medium

### SOIL ANALYSIS

Soil Series: Puranimati

Classification: Aerie Haplaquent

Analysis at: NBSS&LUP (ICAR)

Regional Centre, Jorhat

Horizon	Depth	Particle-size distribution (Particle diameter in mm. soil separates in %) (2mm)										Coarse fragments (2mm) (% of whole soil)
		Total			Sand					Slit		
		Sand 2-0.05	Silt 0.05-0.002	Clay 0.002	Very coarse 2-1	Coarse 1-0.5	Medium 0.5-0.25	Fine 0.25-0.10	Very Fine 0.1-0.05	Coarse 0.05-0.02	Fine 0.02-0.002	
Ap	0-18	70.50	14.80	14.70	-	-	13.30	15.60	41.60	6.20	8.60	Nil
A12	18-35	34.40	43.50	22.10	-	-	8.90	9.40	16.10	13.30	30.20	Nil
IIC1g	35-83	68.70	20.70	10.60	-	-	12.30	17.50	38.90	10.20	10.50	Nil
IIC2g	83-125	71.30	18.90	9.80	-	0.50	16.00	19.40	35.40	13.40	5.50	Nil

Horizon	Organic Carbon %	CaCO <sub>3</sub> %	pH(1:2.5)H <sub>2</sub> O	E.C.(dSm <sup>-1</sup> )(1:2.5)H <sub>2</sub> O	Exchangeable bases					Extractable acidity	Exch. A1	CEC	Base Saturation%	Ratio CEC/clay
					Ca	Mg	Na	K	Sum					
					cmol(p <sup>+</sup> ) kg <sup>-1</sup>									
Ap	0.95	Nil	5.30	0.20	1.00	0.30	0.10	0.20	1.60	1.10	0.70	4.10	39	0.28
A12	0.30	Nil	5.90	0.40	1.80	1.70	0.10	0.20	3.80	2.30	1.50	3.90	55	0.31
IIC1g	0.21	Nil	5.60	0.40	1.70	0.50	0.10	0.10	2.40	1.80	0.90	3.80	63	0.38
IIC2g	0.16	Nil	5.80	0.50	1.70	0.70	0.10	0.10	2.60	0.90	0.50	3.90	66	0.40

**ADHAKOTA SERIES**

Adhakota series is a member of coarse-loamy over sandy, mixed, hyperthermic family of Typic Haplaquents. Adhakota soils have gray, very strongly to strongly acid, sandy loam A horizon, It is underlain by a lithologic discontinuous layer of sand which is gray and intensively mottled due to high ground water table. The soils are developed in alluvium in dissected piedmont plain, having 0-1% slope at an elevation of 70-95 meters above MSL. The climate is humid subtropical with mean annual air temperature 23.5°C and mean annual rainfall 1950 mm. Principal associated soil series are Matikhola, Aeric Fluvaquents and Puranimati which is Aeric Haplaquents.

**Typifying pedon:** Adhakota sandy loam - cultivated

Colours are for the moist soil.

Ap	0-15 cm	Gray (10YR 5/1) sandy loam; puddled; friable, slightly sticky and slightly plastic; yellowish brown (10YR 6/6) rusty specks of decomposing roots; many fine and medium roots; common fine and medium pores; pH 4.6; clear smooth boundary.
Al2g	15-58 cm	Gray to light gray (10YR 6/1, 10YR 7/1) sandy loam, weak medium subangular blocky structure, medium distinct strong brown (7.5YR 5/8) mottles; common fine and few medium roots; few fine pores, pH 5.1; abrupt wavy boundary.
.Cg	58-94 cm	Gray (10YR 6/1) sand; single grain; loose, nonsticky and nonplastic; common fine distinct strong brown (7.5YR 5/8) mottles; few fine roots; common medium and few coarse pores; pH 6.5.

**Range in characteristics:** The soils are deep to very deep. The estimated MAST is 24.5°C. The MSST is 26.3°C and MWST is 19.5°C. The soil moisture regime is aquic and remains wet during April to September, The thickness of surface horizon is 14 to 19 cm. Its colour is in hue 10YR, value 5 to 6 and chrome 1 to 3. The texture is sandy loam. The thickness of subsurface horizons is 40-50 cm. Its colour is in 10YR, value 6 to 7 and chroma 1 to 2. The texture is loam to sandy loam and subangular blocky structure. It is distinctly mottled with strong brown colour. The C horizon is loamy sand to intensively mottled and gray in colour.

**Competing series and their differentiae:** Competing series is Puranimati which is also coarse-loamy but differs by absence of sand layer in control section.

**Drainage and permeability:** Imperfectly drained with moderate permeability.

**Use and vegetation:** Paddy is mostly cultivated. The common natural vegetation are Boga Koro ( *Albizia Procera* ), Kolajamu ( *Eugenia Jambolana* ), Sonaru ( *Cassia fistula* ): Akon ( *Calotropis gigantea* ), Bhat meteka ( *onochorla vaqinalis* ), Ponownoa ( *Peperonia pellucta* ), Bongooti ( *Chryson ogon aciculatus* ) Erali ( *Leersia hexandra* ), Ikora ( *Phragmites Karka* ) etc.

**Distribution and extent:** Extensive in dissected piedmont plains in the east and central Jorhat, southeast part of Titaboi blocks of Jorhat district. It accounts for 6,487 ha area.

**Type and location:** Village Adhakota, P.S. Marian, District Jorhat, Assam, latitude: 26°35'50"N, longitude: 94°15'40" E.

**Series proposes:** National Bureau of Soil Survey and Land Use Planning (ICAR), Regional Centre, Jorhat, December, 1981.

**Interpretation:** Adhakota soils are imperfectly to poorly drained due to high ground water table and subject to overflow during rainy season and the soils are suited only to rice during kharif season. Other crops may be grown in Rabi season with artificial drainage.

**Interpretive grouping:**

Land capability sub-class	-IIIws
Land Irrigability sub-class	-4ds
Productivity potential	-Medium

**SOIL ANALYSIS**

Soil Series: Adhakota

Classification: Typic Haplaquents

Analysis at: NBSS&LUP (ICAR)

Regional Centre, Jorhat

Horizon	Depth	Particle-size distribution (Particle diameter in mm. soil separates in %) (2mm)										Coarse fragments (2mm) (% of whole soil)	
		Total			Sand						Slit		
		Sand 2-0.05	Silt 0.05-0.002	Clay 0.002	Very coarse 2-1	Coarse 1-0.5	Medium 0.5-0.25	Fine 0.25-0.10	Very Fine 0.1-0.05	Coarse 0.05-0.02	Fine 0.02-0.002		
Ap	0-15	60.50	26.50	13.00	-	-	19.50	17.00	24.00	18.90	7.60	Nil	
Al2g	15-58	60.70	24.40	14.90	-	-	27.80	12.20	20.70	18.70	5.70	Nil	
Cg	58-94	95.50	2.10	2.40	-	-	88.70	4.30	2.50	1.30	0.80	Nil	

Horizon	Organic Carbon %	CaCO <sub>3</sub> %	pH(1:2:5)H <sub>2</sub> O	E.C.(dS m <sup>-1</sup> )(1:2:5)H <sub>2</sub> O	Exchangeable bases					Extractable acidity	Exch. A1	CEC	Base Saturation %	Ratio CEC/clay
					Ca	Mg	Na	K	Sum					
					cmol(p <sup>+</sup> ) kg <sup>-1</sup>									
Ap	0.72	Nil	4.60	Nil	1.20	0.90	0.30	0.10	2.50	1.20	0.50	4.80	52	0.37
Al2g	0.21	Nil	5.20	0.20	1.20	0.60	0.20	Trace	2.00	1.70	0.90	5.30	38	0.35
Cg	0.01	Nil	6.50	0.40	0.30	0.20	0.20	0.10	0.80	0.10	0.10	1.10	72	0.46

**SANGSOA SERIES**

Sangsoa series is a member of fine-silty, mixed, hyperthermic family of Typic Dystrochrepts. Sangsoa soils have yellowish brown, strongly acid, silt loam A horizon and brownish yellow, strongly acid, silty clay loam to silt loam B horizon and light gray, strongly acid, loam C horizon. The soils are formed in alluvium in dissected gently sloping uplands at an elevation of about 90-95 m above MSL. The climate is humid subtropical with mean annual air temperature 23.5°C and mean annual rainfall 1950 mm. The principal associated soil series is Teok which is Typic Dystrochrepts.

**Typifying pedon:** Sangsoa silt loam - Tea plantation

Colours are for the moist soil unless otherwise indicated.

- Ap 0-13 cm Yellowish brown (10YR 5/6) silt loam; moderate medium granular structure: friable, slightly sticky and plastic; common medium and many fine roots; common medium pores; pH 5.4: gradual wavy boundary.
- B1 13-25 cm Brownish yellow (10YR 6/8) silty clay loam; moderate medium subangular blocky structure; firm; sticky and plastic; medium few soft red iron nodules; few krotovinas (2-3 an diameter); few coarse, common medium and fine impeded roots; common coarse and medium pores; pH 5.2 gradual wavy boundary.
- B2 25-88 cm Brownish yellow (10YR 6/8) silt loam: moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; common soft iron-manganese nodules: common fine distinct strong brown (7.5YR 5/8) mottles; few fine roots; common medium and coarse pores pH 5.2; gradual wavy boundary.
- C 88-103 cm Light gray (10YR 7/2) loam; massive butting to blocky structure; friable, slightly sticky and slightly plastic; common medium distinct strong brown (7.5YR 5/8) mottles; common fine soft iron manganese nodules: few fine and medium pores; pH 5.3.

**Range in characteristics:** Sangsoa soils are very deep. The estimated MAST is 24.5°C. The MSST is 26.3°C and MST is 19.5°C. The moisture control section is not dry in any part as long as 90 cumulative days in a year. The thickness of A horizon is 13-18 cm. Its colour is in hue 10YR, value 5 to 6 and chroma 4 to 6. The texture is silt loam to loam. The B horizon is 45-80 cm thick. The colour is in hue 10YR, value 5 to 6 and chroma 6 to 8. Texture is silty loam to silty clay loam and fine to medium soft iron manganese nodules are common. The colour of C horizon is in hue 10YR, value 6 to 7 and chroma 2 to 3 and texture is loam to silt loam. Mottlings of brown to strong colour are also common.

**Competing series and their differentiae:** Competing series is Teok which is slightly lighter coloured and finer textured in lower depth and is also Typic Dystrochrepts.

**Drainage and permeability:** Moderately well drained with moderate permeability.

**Use and vegetation:** The soils are usually under Tea plantation. The most common natural vegetation are Ajhar (*Lagerstroemia Flosreginae*), Hoge Korot (*Albizia procera*), Kolajamu (*Eugenia jambolana*), Bamboo (*Bambusa tulda*); Akon (*Calotropis glgantea*), Hati Bhekuri (*Solanum toryum*), Bongooti (*Chrysopogon aciculatus*), Duboribon (*Cynodon dactylon*) etc.

**Distribution and extent:** Extensive in north-west Jorhat, central Jorhat, east Jorhat blocks of Jorhat district. It accounts for 12,196 ha area.

**Type location:** Village Sangsoa, P.S. Jorhat, District Jorhat, Assam. Latitude: 26°40'45" N, longitude: 94°51'10" E.

## Soils of Jorhat District (Assam) for Land Use Planning

**Series proposed:** National Bureau of Soil Survey and Land Use Planning (ICAR), Regional Centre, Jorhat, February, 1981.

**Interpretation:** Sangsoa soils are strongly acid and suitable for tea plantation. Vegetables and other Rabi crops can also be grown. They are susceptible to erosion.

### Interpretive grouping:

Land capability sub-class	-Ile
Land Irrigability sub-class	-3t
Productivity potential	-Medium

### SOIL ANALYSIS

Soil Series: Sangsoa

Classification: Typic Dystrichrepts  
Analysis at: NBSS&LUP (ICAR)  
Regional Centre, Jorhat

Horizon	Depth	Particle-size distribution (Particle diameter in mm. soil separates in %) (2mm)										Coarse fragments (2mm) (% of whole soil)
		Total			Sand					Slit		
		Sand 2-0.05	Silt 0.05-0.002	Clay 0.002	Very coarse 2-1	Coarse 1-0.5	Medium 0.5-0.25	Fine 0.25-0.10	Very Fine 0.1-0.05	Coarse 0.05-0.02	Fine 0.02-0.002	
Ap	0-13	22.90	52.00	25.10	-	-	0.60	1.20	21.10	29.40	22.60	Nil
B1	13-25	17.00	49.80	33.20	-	-	2.00	3.20	11.80	23.70	26.10	Nil
B2	25-88	31.00	50.00	19.00	-	-	1.10	5.40	24.50	29.20	20.80	Nil
C	88-103	44.00	39.00	17.00	-	-	2.80	9.60	31.60	22.80	16.20	Nil

Horizon	Organic Carbon %	CaCO <sub>3</sub> %	pH(1:2 :5)H <sub>2</sub> O	E.C.(dS m <sup>-1</sup> )(1:2:5) H <sub>2</sub> O	Exchangeable bases					Extractable acidity	Exch. A1	CEC	Base Saturation %	Ratio CEC/clay
					Ca	Mg	Na	K	Sum					
					cmol(p <sup>+</sup> ) kg <sup>-1</sup>									
Ap	1.26	Nil	5.40	Nil	2.50	0.5	0.20	0.10	3.30	2.10	1.40	7.90	42	0.31
B1	0.42	Nil	5.20	Nil	1.80	0.50	0.10	0.10	2.50	2.80	2.00	9.40	27	0.28
B2	0.22	Nil	5.20	Nil	1.20	0.50	0.10	0.10	1.90	3.20	2.70	6.40	31	0.32
C	0.14	Nil	5.30	Nil	1.00	0.30	0.10	0.10	1.50	3.60	3.00	5.80	26	0.34

**TEOK SERIES**

Teok series is a member of fine-loamy, mixed, hyperthermic family of Typic Dystrochrepts. Teok soils have dark brown, extremely acid, sandy loam A horizon and yellowish brown, extremely acid sandy loam to loam B horizon underlain by a lithologically discontinuous brownish yellow, extremely acid, sandy clay loam C horizon. They have developed in alluvium in dissected gently sloping uplands at an elevation of 85 m above MSL. The principal associated soil series are Munnurya, Typic Udorthents and Sacgsoa, Typic Dystrochrepts.

**Typifying pedon:** Teok sandy loam - Tea plantation

Colours are for the moist soil.

- |      |           |  |
|------|-----------|--|
| Ap   | 0-11 cm   | Dark brown (10YR 4/3) sandy loam; weakmedium granular structure/ friable, nonsticky and non-plastic; many medium, common fine and few coarse roots, common fine and medium pores; pH 4.2; clear smooth boundary.   |
| B11  | 11-28 cm  | Yellowish brown (10YR 5/4) sandy loam; weakmedium subangular blocky structure; friable, nonsticky and nonelastic; common fine, few medium and coarse roots; many fine and common medium pores: pH 4.1; gradual smooth boundary.  |
| B12  | 28-69 cm  | Yellowish brown (10YR 5/6) loam; moderatemedium subangular blocky structure; friable, slightly sticky and slightly plastic: few medium distinct strongbrown (7.5YR 5/8) mottles; few fine and medium roots; common fine and few medium pores; pH 4,1; gradual smooth boundary. |
| IIC1 | 69-115 cm | Brownish yellow (10YR 6/6) sandy clay loam;massive; firm, sticky and plastic: common medium distinct strong brown (7.5YR 5/8) mottles; few fine roots; few finepores; pH 4.1.  |

**Range in characteristics:** The soils are very deep. The estimated MAST is 24.5°C. The MSST is 26.3°C and MWST is 19.5°C. The moisture control section is not dry in any part as long as 90 cumulative days in a year. The thickness of A horizon is 11-18 cm. Its colour is in hue 10YR, value 3 to 4, chroma 3 to 4. Texture is sandy loam to loam. The thickness of B horizon is 55-70 cm and its colour is in hue 10YR, value 5 to 6 and chroma 4 to 6. Texture is fine sandy loam to loam and it is distinctly mottled with strong brown colour. The colour of C horizon is in hue 10YR, value 5 to 6 and chroma 6 to 8 and common distinct strong brown mottles are present. The texture is clay loam to sandy clay loam.

**Competing series and their differentiae:** Sangsoa is the competing series which is slightly darker coloured and coarser textured and is Typic Dystrochrepts.

**Drainage and permeability:** Moderately well to well drained with moderate permeability.

**Use and vegetation:** The soils are mostly under tea plantation. The common natural vegetation are Nahar (*Mesuaferrea*), Sonaru (*Cassia fistula*), Boga Korai (*Albizia procera*), Moj (*Albizia lucida*), Makhiloti (*Flemingia strobilifera*), Dhekia lata (*Stenochloa pAIustre*), Duboribon (*Cynodon dactylon*), Bongooti (*Chrysopogon aciculatus*) etc.

**Distribution and extent:** Extensive in gently sloping uplands in north-west Jorhat, central and east Jorhat blocks of Jorhat Sub-division. It accounts for 16,324 ha area.

**Type location:** Teok tea garden, P.S. Teok, District Jorhat, latitude: 26°49'47" N, longitude: 94°06'30" E.

**Series proposed:** National Bureau of Soil Survey and Land Use Planning (ICAR), Regional Centre, Jorhat, February, 1981.

## Soils of Jorhat District (Assam) for Land Use Planning

**Interpretation:** The soils have good air-water relationship. They are highly base unsaturated and may respond to liming. The soils are well suited to tea plantation; vegetable crops may also be grown with liming of soils.

**Interpretive grouping:**

Land capability sub-class	-Ie
Land Irrigability sub-class	-2t
Productivity potential	-Medium

### SOIL ANALYSIS

Soil Series: Teok

Classification: Typic Dystrochrepts  
Analysis at: NBSS&LUP (ICAR)  
Regional Centre, Jorhat

Horizon	Depth	Particle-size distribution (Particle diameter in mm. soil separates in %) (2mm)										Coarse fragments (2mm) (% of whole soil)
		Total			Sand					Slit		
		Sand 2-0.05	Silt 0.05-0.002	Clay 0.002	Very coarse 2-1	Coarse 1-0.5	Medium 0.5-0.25	Fine 0.25-0.10	Very Fine 0.1-0.05	Coarse 0.05-0.02	Fine 0.02-0.002	
Ap	0-11	78.00	12.80	9.20	-	-	7.90	43.70	21.4	2.90	9.90	Nil
B11	11-28	65.00	26.70	8.30	-	-	9.20	25.60	30.2	11.90	14.80	Nil
B12	28-69	56.50	26.70	16.80	-	-	4.10	24.70	27.7	14.10	12.60	Nil
HC1	69-115	50.00	18.80	31.20	-	-	4.40	17.10	28.5	8.40	10.40	Nil

Horizon	Organic Carbon %	CaCO <sub>3</sub> %	pH(1:2:5)H <sub>2</sub> O	E.C.(dS m <sup>-1</sup> )(1:2:5)H <sub>2</sub> O	Exchangeable bases					Extractable acidity	Exch. A1	CEC	Base Saturation %	Ratio CEC/clay
					Ca	Mg	Na	K	Sum					
					cmol(p+) kg <sup>-1</sup>									
Ap	1.38	Nil	4.20	Nil	0.50	0.10	0.10	0.20	0.90	2.80	1.50	4.10	22	0.44
B11	0.44	Nil	4.10	Nil	0.30	0.20	0.10	0.10	0.70	2.20	1.80	3.50	20	0.42
B12	0.40	Nil	4.10	Nil	0.10	0.50	0.10	0.10	0.80	3.10	2.60	4.70	17	0.28
HC1	0.29	Nil	4.10	Nil	0.50	0.10	0.10	0.10	0.80	4.60	3.90	6.80	12	0.22

**NAHAT TIPPOMIA SERIES**

Nahat Tippomia series is a member of coarse-loamy, mixed hyperthermic family of Typic Fluvaquents. The soils have gray to light gray, strongly to medium acid, loam A horizon and light gray to gray, strongly acid, silt loam to sandy loam C horizons, They are developed on alluvium in lower level flood plain and very gently sloping plains at an elevation of 85-90 m above MSL. The climate is humid subtropical with a mean annual temperature of 23.5°C and a mean annual rainfall of 1950 mm. The principal associated soil series are Jankhana, Typic Udifluvents; Gajpuria, Typic Haplaquepts; Bareragaon, Typic Haplaquepts, and Dohotia, Typic Haplaquepts.

**Typifying pedon:** Nahat Tippomia silt loam - cultivated

Colours are for the moist soil.

Ap	0-11 cm	Gray (10YR 5/1) silt loam; puddled; friable, slightly sticky and slightly plastic; many fine roots; common fine pores; pH 5.0; clear smooth boundary.
Al2g	11-33 cm	Light gray (10YR 7/2) silt loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; many fine and few medium roots; common fine and medium pores; pH 6.0, abrupt smooth boundary.
Clg	33-75 cm	Gray (10YR 6/1) sandy loam; weak fine sub-angular blocky structure, friable, nonsticky and nonplastic; few fine roots; few fine pores; pH 5.1, clear smooth boundary.
C2g	75-120 cm	Light gray (10YR 7/1) silt loam; massive friable, sticky and slightly plastic; few fine pores; pH 5.1.

**Range in characteristics:** The soils are very deep. The estimated MAST is 24.5°C. The MSST is 26.3°C and MWST is 19.5°C. The soil moisture regime is aquic as the moisture control section rains wet for a considerable period.

The thickness of A horizon is 14-35 cm. The colour is in hue 10YR, value 5 to 7 and chroma 1 to 2. The structure is massive to weak subangular blocky and texture is dominantly silt loam to loam. The colour of C horizon is in hue 10YR, value 6 to 7 and chroma 1 to 2. The texture is sandy loam to silt loam. It is mostly massive in structure.

**Competing series and their differentiae:** Puranimati is the competing series which is redder in colour in 7.5 YR, coarser texture in lower depth of control section, which is Aeric asplaquents.

**Drainage and permeability:** Imperfectly drained with moderate permeability.

**Use and vegetation:** The soils are mostly under paddy cultivation. The common natural vegetation are Nahar (*Mesua ferrea*), Sisoo (*Dalbergia sissoo*), Kolajamu (*Eugenia jambolana*), Bamboo (*Bambusa balcoos*), Akon (*Calot-romls gigantea*), Hati Bhekuri (*Solarium torvum*), Bon Ogora (*Triumfelta bartramia*); Duboribon (*Cynodon dactylon*), Ikora (*Phragmites karka*) etc.

**Distribution and extent:** Extensive in Titabor, north-west Jorhat, central Jorhat and east Jorhat blocks of Jorhat district. It accounts for 13,326 ha area.

**Type location:** Village Nahat Tippomia, P.S. Jorhat, latitude: 26°48'N, longitude: 94°26'E.

**Series proposed:** National Bureau of Soil Survey and Land Use Planning (ICAR), Regional Centre, Jorhat, December, 1980.

## Soils of Jorhat District (Assam) for Land Use Planning

**Interpretation:** Nahat Tippoia soils are poorly drained, strongly acid and are subject to frequent floods. Rice is common in kharif season; vegetables, oilseeds and pulses can be grown in Rabi season.

### Interpretive grouping:

Land capability sub-class	-IIw
Land Irrigability sub-class	-2d
Productivity potential	-Medium

### SOIL ANALYSIS

Soil Series: Nahat-Tippomia

Classification: Typic Fluvents

Analysis at: NBSS&LUP (ICAR)

Regional Centre, Jorhat

Horizon	Depth	Particle-size distribution (Particle diameter in mm. soil separates in %) (2mm)										Coarse fragments (2mm) (% of whole soil)
		Total			Sand					Silt		
		Sand 2-0.05	Silt 0.05-0.002	Clay 0.002	Very coarse 2-1	Coarse 1-0.5	Medium 0.5-0.25	Fine 0.25-0.10	Very Fine 0.1-0.05	Coarse 0.05-0.02	Fine 0.02-0.002	
Ap	0-11	33.00	56.20	10.80	-	1.00	15.70	1.10	15.20	37.40	18.80	Nil
A12g	11-33	32.70	58.00	9.30	-	0.50	14.70	9.00	8.50	37.10	20.90	Nil
C1g	33-75	70.80	21.50	7.70	-	1.10	23.10	10.10	36.30	12.30	9.20	Nil
C2g	75-120	14.10	75.20	10.70	-	-	4.00	6.00	37.30	37.30	37.90	Nil

Horizon	Organic Carbon %	CaCO <sub>3</sub> %	pH(1:2:5)H <sub>2</sub> O	E.C.(dS m <sup>-1</sup> )(1:2:5)H <sub>2</sub> O	Exchangeable bases					Extractable acidity	Exch. A1	CEC	Base Saturation %	Ratio CEC/clay
					Ca	Mg	Na	K	Sum					
					cmol(p <sup>+</sup> ) kg <sup>-1</sup>									
Ap	0.99	Nil	5.00	Nil	1.20	0.50	0.10	0.20	2.00	1.30	0.70	4.90	41	0.45
A12g	0.16	Nil	6.00	Nil	1.70	1.30	0.10	0.10	3.20	0.30	0.10	4.60	69	0.49
C1g	0.17	Nil	5.10	Nil	1.50	0.70	0.10	0.10	2.40	1.30	0.60	4.20	57	0.54
C2g	0.37	Nil	5.10	Nil	1.80	0.60	0.10	0.10	2.60	1.40	0.30	4.80	54	0.45

**BARERAGAON SERIES**

Bareragaon series is a member of fine-loamy, mixed, hyper-thermic family of Aerice Haplaquepts. The soils have gray, strongly acid, silt loam A horizon, and yellowish brown to brown, strongly acid, silt loam to loam B horizon which is distinctly mottled with gray colour. They have developed in the alluvium in nearly level flood plain at an elevation of 90 m above MSL. The climate is humid subtropical with a mean annual rainfall of 1950 mm and a mean annual temperature of 23.5°C. The principal associated soil series are Akahugaon, Typic Haplaquepts; Nahat Tippomia, Typic Fluvaquepts; Napamuagaon, Typic Haplaquepts and Dohotia which is Typic Haplaquepts.

**Typifying pedon:** Bareragaon silt loam – cultivated

Colours are for the moist soil unless otherwise indicated.

Ap	0-14 cm	Gray (10YR 6/1) silt loam; puddles; firm, sticky and plastic; common strong (7.5YR 5/8) colour of decomposing roots; common fine and medium roots; less than 1 cm wide cracks; common fine and few medium pores; pH 5.2; gradual wavy boundary.
B1g	14-49 cm	Yellowish brown (10YR 5/6) silt loam; moderate medium angular blocky structure; friable, sticky and slightly plastic; common coarse distinct gray (10YR 6/1) mottles; few fine soft iron manganese nodules; common fine and few medium and common fine pores; pH 5.5; gradual wavy boundary.
B12g	49-80 cm	Brown (7.5YR 5/2) clay loam; moderate coarse angular blocky structure; firm, sticky and plastic; common coarse distinct light gray (10YR 7/1) mottles; common dark brown soft fine iron manganese nodules; few fine roots; pH 5.4; gradual wavy boundary.
Cg	80-102 cm	Brown (7.5YR 5/2) clay loam; massive; firm, sticky and plastic; few fine pores, pH 5.2.

**Range in characteristics:** Bareragaon soils are very deep. The estimated MAST is 24.5°C. The MSST is 26.3°C and MWST is 19.5°C. The soil moisture regime is aquic.

The Ap horizon is 14 to 20 cm thick. The colour is in hue 10YR, value 5 to 6 and chroma 1 to 3. The texture is silt loam to silty clay loam. The thickness of B horizon is 50-75 cm. It is in hue 10YR and 7.5YR and value 5 to 6 and chroma 2 to 6. The texture is silt loam to clay loam. Soft iron manganese nodules are common in B horizons. The colour of C horizon is in hue 10YR and 7.5YR, value 4 to 5 and chroma 1 to 2. Texture is clay loam to silt loam.

**Competing series and their differentiae:** Competing series is Gajpuria which is slightly coarser in texture, lighter in colour in 10YR, slightly high in organic matter, less acidic and is Typic Haplaquepts. Dohotia is also competing series which is lighter in colour in 10YR, having high ground water table and is Typic Haplaquepts.

**Drainage and permeability:** Imperfectly drained with slow permeability.

**Use and vegetation:** The soils are mostly under paddy cultivation. The common vegetation are Ajhar (*Lagerstroemia flosreginae*) Bondordima (*Dysoxylum binectariforme*), Ou Tanga (*Dillenia indica*), Bon Ogora (*Triumfelta bartramia*) Bhat Meteka (*Monochoria vaginalis*); Biccha bon (*Setaria elauca*), Erali (*Leersia hexandra*), Ikora (*Phamires carka*), Kahua (*Saccharum spontaneum*) etc. Distribution and extent: Extensive in Titabor and Jorhat blocks of Jorhat district. It accounts for 16,964 ha area.

**Type location:** Village Bareragaon, P.S. Titabor, District Jorhat, Assam, latitude: 26°36'20" N, longitude: 94°12'E.

## Soils of Jorhat District (Assam) for Land Use Planning

**Series proposed:** National Bureau of Soil Survey and Land Use Planning (ICAR), Regional Centre, Jorhat, January 1981.

**Interpretation:** Bareragaon soils are strongly acid, slow in permeability and subject to overflow during rainy season. They are suited to rice in kharif, and wheat, pulses and oilseeds in Rabi season.

Interpretive grouping:

Land capability sub-class	-IIw
Land Irrigability sub-class	-2d
Productivity potential	-Medium

### SOIL ANALYSIS

Soil Series: Bareragaon

Classification: Aeric Haplaqupts  
Analysis at: NBSS&LUP (ICAR)  
Regional Centre, Jorhat

Horizon	Depth	Particle-size distribution (Particle diameter in mm. soil separates in %) (2mm)										Coarse fragments (2mm) (% of whole soil)
		Total			Sand					Slit		
		Sand 2-0.05	Silt 0.05-0.002	Clay 0.002	Very coarse 2-1	Coarse 1-0.5	Medium 0.5-0.25	Fine 0.25-0.10	Very Fine 0.1-0.05	Coarse 0.05-0.02	Fine 0.02-0.002	
Ap	0-14	16.90	55.80	27.30	-	-	1.00	2.60	13.30	35.70	20.10	Nil
B11g	14-49	16.10	62.00	21.90	-	-	1.00	2.50	12.60	37.50	24.50	Nil
B12g	49-80	22.80	48.10	29.10	-	-	2.90	5.20	14.70	25.40	22.70	Nil
Cg	80-102	25.60	46.00	28.40	-	-	1.80	4.80	19.00	26.40	19.60	Nil

Horizon	Organic Carbon %	CaCO <sub>3</sub> %	pH(1:2:5)H <sub>2</sub> O	E.C.(dSm <sup>-1</sup> )(1:2:5)H <sub>2</sub> O	Exchangeable bases					Extractable acidity	Exch. A1	CEC	Base Saturation %	Ratio CEC/clay
					Ca	Mg	Na	K	Sum					
					cmol(p <sup>+</sup> ) kg <sup>-1</sup>									
Ap	0.77	Nil	5.20	Trace	2.00	0.90	0.10	0.10	3.10	2.10	0.90	8.90	35	0.35
B11g	0.25	Nil	5.50	Trace	2.60	1.20	0.10	0.10	4.00	0.50	0.20	7.10	56	0.32
B12g	0.21	Nil	5.40	Trace	2.60	1.60	0.10	0.10	4.40	1.20	0.80	9.20	48	0.32
Cg	0.13	Nil	5.20	Trace	1.80	1.20	0.10	Trace	3.10	1.80	1.00	8.40	37	0.30



## DOHOTIA SERIES

Dohotia series is a member of fine-silty, mixed, hyperthermic family of Typic Heplaquepts. They have gray, strong acid, silt loam to silty clay loam A horizon; light gray, strongly acid; silt loam B horizons underlain by reddish yellow, strongly acid, silt loam C horizon. The soils have developed in alluvium and occur on nearly level to very gently sloping plains of the Brahmaputra River at an elevation of 85 m above MSL. The climate is humid subtropical with mean annual air temperature 23.5 C and mean annual rainfall 1940 mm. The principal associated soil series are Puranimati, Typic Haplaquepts and Nahat Tippania which is Typic Fluvaquepts.

**Typifying pedon:** Dohotia silty clay loam - cultivated

Colours are for the moist soil unless otherwise indicated.

Ap	0-14 cm	Gray (10YR 5/1) silty clay loam; massive, firm, sticky and plastic; common medium and many fine roots; common strong brown rusty specks (7.5YR 5/8) of decomposing roots; PH 5.1; clear smooth boundary.
Al2	14-29cm	Gray (10YR 6/1) silt loam; weak medium subangular blocky structure; firm, sticky and plastic; common fine distinct yellowish red (5YR 5/8) mottles; common fine orange red iron nodules; few medium and common fine roots; pH 5.4; clear wavy boundary.
B1g	29-72cm	Light gray (10YR 7/1) silty loam; weak medium subangular blocky structure; firm, sticky and plastic; common medium distinct strong brown (7.5YR 5/6) mottles; common orange red soft iron nodules; few fine roots; pH 5.3; clear wavy boundary.
Clg	72-120cm	Dark reddish gray (10YR 6/2) silt loam; massive, fine, sticky and plastic; many coarse distinct reddish yellow (7.5YR 6/8) mottles; few fine roots; pH 5.4

**Range in characteristics:** The soils are deep to very deep. The estimated MAST is 24.5°C. The MSST is 26.3°C and MWST is 19.5°C. The soil moisture control section remains wet during the monsoon season (May to September) and therefore the soil moisture regime is aquic. The A horizon is about 14 to 30 cm thick. Its colour ranges from gray to light brownish gray in hue 10YR, value 5 to 6 and chrome 1 to 2. The texture is silty clay loam to loam. The colour of B horizon is in hue 10YR, value 5 to 7 and chrome 1 to 2. The texture is dominantly silt loam to loam. The structure is weak subangular blocky.

The B horizon has distinct mottlings of strong brown to yellowish red. The iron nodules are common in B horizon. The colour of C horizon is in hue 10YR, value 5 to 6 and chrome 2. The texture is silt loam to loam and its structure is massive.

**Competing series and their differentiae:** Gajpuria is the competing series, which is coarser in texture at lower depth, less in organic matter content which is also Typic Haplaquepts.

**Drainage and permeability:** Imperfectly to poorly drained with moderately slow to slow permeability.

**Use and vegetation:** Soils are mostly under paddy cultivation. The common vegetation are Ajhar (*Lagerstroemia flosreginae*), Boga Koroi (*Albizia nrccara*), Sonaru (*Cassia fistula*), Bamboo (*Bambusa sp.*); Bhat Meteka (*Monochoria vaginalis*), Ponownoa (*Peperomia pellucide*); Bongooti (*Chrysopogon acientatus*) Erali (*Leersia Hexandra*), Ikvra (*Phragmites karka*) etc.

**Distribution and extent:** Extensive in Jorhat and northwest block of Jorhat subdivision. It accounts for 7314 ha area.

**Type location:** Village Dohotia, P.S. Jorhat, District Jorhat, latitude: 26°2'30" N, longitude: 94°7.45" E.

## Soils of Jorhat District (Assam) for Land Use Planning

**Series proposed:** National Bureau of Soil Survey and Land Use Planning (ICAR), Regional Centre, Jorhat, January, 1981.

Interpretation: Dohotia soils are imperfectly drained, highly acid and subject to occasional flooding and have high ground water table. Rice is commonly grown in kharif season; wheat, pulses, vegetables can be grown in Rabi season with provisions of good drainage system and soil amelioration for soil acidity.

### Interpretive grouping:

Land capability sub-class	-IIIw
Land Irrigability sub-class	-4d
Productivity potential	-Medium

### SOIL ANALYSIS

Soil Series: Dohotia

Classification: Typic Haplaqupts

Analysis at: NBSS&LUP (ICAR)

Regional Centre, Jorhat

Horizon	Depth	Particle-size distribution (Particle diameter in mm. soil separates in %) (2mm)										Coarse fragments (2mm) (% of whole soil)
		Total			Sand					Slit		
		Sand 2-0.05	Silt 0.05-0.002	Clay 0.002	Very coarse 2-1	Coarse 1-0.5	Medium 0.5-0.25	Fine 0.25-0.10	Very Fine 0.1-0.05	Coarse 0.05-0.02	Fine 0.02-0.002	
Ap	0-14	18.70	53.30	28.00	-	-	0.30	7.10	11.30	25.90	27.40	Nil
A12g	14-29	16.60	58.10	25.30	-	-	0.60	8.00	8.00	31.90	26.20	Nil
B1g	29-72	20.60	59.40	20.00	-	-	0.80	9.30	10.50	31.90	27.40	Nil
C1g	72-120	19.10	57.40	23.50	-	-	0.40	8.30	10.40	30.00	27.40	Nil

Horizon	Organic Carbon %	CaCO <sub>3</sub> %	pH(1:2 :5)H <sub>2</sub> O	E.C.(dS m-1)(1:2:5) H <sub>2</sub> O	Exchangeable bases					Extractable acidity	Exch. A1	CEC	Base Saturation %	Ratio CEC/clay
					Ca	Mg	Na	K	Sum					
					cmol(p+) kg-1									
Ap	1.33	Nil	5.10	Nil	1.10	1.50	0.20	0.10	2.90	3.20	2.80	10.90	26	0.39
A12g	0.60	Nil	5.40	Nil	1.60	1.20	0.10	0.10	3.00	2.30	2.00	10.70	28	0.42
B1g	0.50	Nil	5.30	Nil	1.20	2.00	0.10	0.10	3.40	3.00	2.50	10.10	34	0.50
C1g	0.35	Nil	5.40	Nil	1.00	1.80	0.10	0.10	3.00	3.70	3.10	12.30	24	0.52

**NAPAMUAGAON SERIES**

Napamuagaon series is a member of coarse-loamy, mixed, hyperthermic family of Typic Haplaquepts. The soils have gray, strongly acid, loamy sand A horizon and light gray, very strongly acid, sandy loam B horizon. They are developed in alluvium on very gently sloping plain at an elevation of 85m above MSL. The profile shows mottlings of brown colour with iron manganese nodules. The climate is humid subtropical with a mean annual air temperature of 23.5°C and mean annual rainfall of 1950 mm. The principal, associated soil series is Bareragaon which is Aerie Haplaquepts.

**Typifying pedon:** Namapamuagaon loamy sand - cultivated

Colours are for the moist soil

Ap	0-21 cm	Gray (10YR 5/1) loamy sand; puddled; friable, nonsticky and nonplastic; common fine and few medium roots; common fine pores; pH 5.2; clear smooth boundary.
Bllg	21-53 cm	Light gray (10YR 7/1) sandy loam; weak medium subangular blocky structure; friable, slightly sticky and nonplastic; common medium distinct strong brown (7.5YR 5/8) mottles; many dark brown Fe-Mn nodules; common fine roots; pH 4.5; clear smooth boundary.
312g	53-123 cm	Light gray (10YR 7/1) sandy loam; weak subangular blocky structure; friable, slightly sticky and slightly plastic; many medium distinct strong brown (7.5YR 5/8) mottles; few fine roots; many medium soft Fe-Mn nodules; few fine medium pores; pH 4.4.

**Range in characteristics:** N apamua soils are very deep. The estimated MAST is 24.5°C. The MSST is 26.3°C and MWST is 19.5°C. The moisturd control section remains wet during May to September and therefore the soil moisture regime is aquic.

The thickness of surface horizon is 15 to 21 cm. Its colour is in hue 10YR, value 5 to 6 and chroma 1 to 2. The texture is loamy sand to sandy loam. The thickness of B horizon is 80 to 110cm. Its colour is in hue 10YR, value 6 to 7 and chroma 1 to 2. Its texture is sandy loam to loam. Mottles of strong brown colour are distinct. The structure is weak subangular blocky.

**Competing series and their differentiae:** Competing series is Puranimati which is slightly coarser textured, redder in colour. in. 7.5YR with gray mottles and it is Aerie Haplaquepts.

**Drainage and permeability:** Imperfectly drained with moderate permeability.

**Use and vegetation:** The soils are mostly under paddy cultivation. The common vegetation are Ajhar (*Lagerstroemia fosreginae*), BogaKoroi (*Albizia procera*), Bamboo (*Bambusa so.*); Bon Ogora (*Triumfetta bartramia*), Ponownoa (*Peperomia pellucida*); Erali (*Leersia hexandra*) Gahoribon (*Borreria articularis*), Ikora (*Phragmites karka*) etc.

**Distribution and extent:** Extensive in nearly level to very gently sloping plain of Jorhat, Titabor and east Jorhat blocks of Jorhat district. It accounts for 8,652 ha area.

**Type location:** Village Napamuagaon, P.S. Mariani, District Jorhat, latitude: 26°41'43" N and longitude: 94°15'35" E.

**Series proposed:** National Bureau of Soil Survey and Land Use Planning (ICAR), Regional Centre, Jorhat, December, 1981.

**Interpretation:** Napamua soils have problems of drainage and acidity. They are suitable for rice in kharif; pulses, oilseed and vegetables can be grown in rabi season with artificial drainage and liming of soils.

**Interpretive grouping:**

Land capability sub-class	-IIIw
Land Irrigability sub-class	-2d
Productivity potential	-Medium to low

**SOIL ANALYSIS**

Soil Series: Napamuagaon

Classification: TypicHaplaqupts  
 Analysis at: NBSS&LUP (ICAR)  
 Regional Centre, Jorhat

Horizon	Depth	Particle-size distribution (Particle diameter in mm. soil separates in %) (2mm)										Coarse fragments (2mm) (% of whole soil)
		Total			Sand					Slit		
		Sand 2-0.05	Silt 0.05-0.002	Clay 0.002	Very coarse 2-1	Coarse 1-0.5	Medium 0.5-0.25	Fine 0.25-0.10	Very Fine 0.1-0.05	Coarse 0.05-0.02	Fine 0.02-0.002	
Ap	0-21	71.40	20.40	8.20	-	-	20.30	30.30	20.80	19.60	0.80	Nil
B11g	21-53	71.20	17.00	11.80	-	-	28.80	20.40	22.00	12.80	4.20	Nil
B12g	53-123	68.90	19.00	12.10	-	-	25.80	30.10	13.00	11.80	7.20	Nil

Horizon	Organic Carbon %	CaCO <sub>3</sub> %	pH(1:2.5)H <sub>2</sub> O	E.C.(dS m <sup>-1</sup> )(1:2.5)H <sub>2</sub> O	Exchangeable bases					Extractable acidity	Exch. A1	CEC	Base Saturation %	Ratio CEC/clay
					Ca	Mg	Na	K	Sum					
					cmol(p <sup>+</sup> ) kg <sup>-1</sup>									
Ap	0.62	Nil	5.20	Nil	0.20	0.50	0.20	0.10	1.00	1.30	0.70	3.10	32	38.00
B11g	0.14	Nil	4.50	Nil	0.10	0.30	0.10	0.10	0.60	3.60	2.50	5.70	10	48.00
B12g	0.11	Nil	4.40	Nil	0.10	0.20	0.10	0.10	0.50	4.70	3.40	6.00	8	50.00

**AKAHUGAON SERIES**

Akahugaon series is a member of fine, mixed, hyperthermic family of Typic Haplaquepts. Akahugaon soils have gray, strongly acid, silt loam A horizon and yellowish brown, very strongly acid, clay loam to clay B horizon underlain by yellowish brown, strongly acid, clay loam C horizon. They are developed in alluvium in nearly level to very gently sloping plains of the Brahmaputra valley. The climate is humid subtropical with a mean annual temperature of 23.5°C and a mean annual rainfall of 1950 mm. Principal associated soil series is Bareragaon which is Aeric Haplaquepts.

**Typifying pedon:** Akahugaon silt loam - cultivated

Colours are for the moist soil unless otherwise indicated.

- Ap 0-20 cm Gray (10YR 6/1) silt loam; puddled; firm, sticky and plastic; common strong brown (7.5YR 5/8) rusty specks of roots; common medium and many fine pores; pH 5.2; clear smooth boundary.
- B1lg 20-48 cm Gray (10YR 6/1) silty clay loam; strong medium subangular blocky structure; firm, sticky and plastic; common medium distinct yellowish brown (10YR 5/8) mottles; common dark red to brown Fe-Mn nodules; common fine and few medium roots; few fine pores; pH 5.1; gradual smooth boundary.
- B12g 48-62 cm Light gray (10YR 7/1) clay; strong, medium subangular blocky structure; very firm, sticky and plastic; many medium yellowish brown (10YR 5/8) mottles; few fine roots; few fine pores; pH 5.1; gradual smooth boundary.
- Cg 62-100 cm Light gray (10YR 7/1) clay loam, massive; firm, sticky and plastic; many medium yellowish brown (10YR 5/8) mottles; few fine pores; pH 5.0.

**Range in characteristics:** The soils are very deep. The estimated MAST is 24.5°C. The MSST is 26.3°C and the MWST is 19.5°C. The soil moisture control section remains wet during the monsoon season (May to September).

The thickness of A horizon is 16 to 20 cm. Its colour is in hue 10YR, value 5 to 6 and chrome 1 to 2. The texture is silt loam to loam and structure is massive due to puddling. The thickness of B horizon is 70 to 80 cm. The colour of B horizon is in hue 10YR, value 5 to 7 and chrome 1 to 2. Texture is silty clay loam to clay. Mottlings of yellowish brown colour and variable quantities of dark brown to dark red iron-manganese nodules are common. The colour of C horizon is in hue 10YR, value 6 to 7 and chrome 1 to 2. Texture is silty clay loam to clay loam and yellowish brown to strong brown mottles are present.

**Competing series and their differentiae:** Competing series is Dohotia which is coarser in texture, weak subangular blocky structure and is also Typic Haplaquepts.

**Drainage and permeability:** Poorly drained with slow permeability.

**Use and vegetation:** Soils are mostly under paddy cultivation. The moist common vegetation found in the area are Khokon (*Duabanga sonneratioides*), Sonaru (*Cassia fistula*), Nahar (*Mesua ferrea*), Ou Tenga (*Dilleniaindica*), Mohhilati (*Plemingia strobilifera*) Bon Ogora (*Triumfetta bartramia*); Biccha bon (*Setaria glauca*), Nol (*Arundo donax*) etc.

**Distribution and extent:** Extensive in nearly level to very gently sloping plains of Brahmaputra valley in the Titabor block of Jorhat Subdivision. It accounts for 8,327 ha area.

**Type location:** village Akahugaon, P.S. Rowriah, Jorhat, Assam. Latitude: 26°39'5" N, longitude: 94°8'45" E.

## Soils of Jorhat District (Assam) for Land Use Planning

**Series proposed:** National Bureau of Soil Survey and Land Use Planning (ICAR), Regional Centre, Jorhat, January, 1981.

**Interpretation:** Akahugaon soils are poorly drained which adds to the problems of soil moisture air relationship. They are slow in permeability and subject to stagnation of water during rainy season and also have high ground water table. They are highly suited to rice in kharif, and wheat, pulses and vegetables can be grown in Rabi season with liming of soils.

### Interpretive grouping:

Land capability sub-class	-IIIw
Land Irrigability sub-class	-4d
Productivity potential	-Medium

### SOIL ANALYSIS

Soil Series: Akahugaon

Classification: TypicHaplaqupts  
Analysis at: NBSS&LUP (ICAR)  
Regional Centre, Jorhat

Horizon	Depth	Particle-size distribution (Particle diameter in mm. soil separates in %) (2mm)										Coarse fragments (2mm) (% of whole soil)
		Total			Sand					Silt		
		Sand 2-0.05	Silt 0.05-0.002	Clay 0.002	Very coarse 2-1	Coarse 1-0.5	Medium 0.5-0.25	Fine 0.25-0.10	Very Fine 0.1-0.05	Coarse 0.05-0.02	Fine 0.02-0.002	
Ap	0-20	22.90	52.70	24.40	-	-	0.60	7.40	14.90	22.20	30.50	Nil
B11g	20-48	15.60	49.00	35.40	-	-	1.70	3.90	10.00	22.60	26.40	Nil
B12g	48-62	23.60	35.00	41.40	-	-	1.10	2.60	19.90	14.10	20.90	Nil
Cg	62-100	32.40	32.40	35.20	-	-	1.70	3.00	27.70	16.60	15.80	Nil

Horizon	Organic Carbon %	CaCO <sub>3</sub> %	pH(1:2.5)H <sub>2</sub> O	E.C.(dSm <sup>-1</sup> )(1:2.5)H <sub>2</sub> O	Exchangeable bases					Extractable acidity	Exch. A1	CEC	Base Saturation %	Ratio CEC/clay
					Ca	Mg	Na	K	Sum					
					cmol(p <sup>+</sup> ) kg <sup>-1</sup>									
Ap	0.88	Nil	5.20	Nil	1.80	0.90	0.10	0.20	3.00	1.80	1.30	6.10	49	0.25
B11g	0.42	Nil	5.10	Nil	1.80	0.40	0.10	0.10	2.40	4.20	2.50	8.40	29	0.24
B12g	0.32	Nil	5.10	Nil	1.40	0.60	0.10	0.10	2.20	4.50	2.80	9.60	23	0.23
Cg	0.19	Nil	5.00	Nil	1.10	0.30	0.10	0.10	1.60	4.10	3.20	7.90	20	0.22

**JANKHANA SERIES**

Jankhana series is a member of sandy over fine-loamy, mixed, hyperthennic family of Typic Udifluvents. The soils have gray, medium acid, sandy loam A horizons; light gray, neutral, loamy sand C horizons and light gray to gray, medium acid, loam to clay loam IIC horizons. The soils have developed in alluvium in nearly level to very gently sloping active flood plain at an elevation of 85-90 m above MSL. The climate is humid subtropical with a mean annual air temperature of 23.5°C and a mean annual rainfall of 1950 mm. Principal associated soil series are Marangiagaon which is Typic Udipsammets; Puranimati, Aeric Haplaquents and Nahat Tippomia, Typic Fluvaquents and Gajpuria which is Typic Haplaquepts.

**Typifying pedon:** Jankhana sandy loam - cultivated

Colours are for the moist soil.

Ap	0-13 cm	Gray (10YR 6/1) sandy loam; puddled; friable, nonsticky and nonplastic; few medium and many fine roots; common yellowish brown (10YR 5/4) rusty specks of roots; pH 5.7; clear smooth boundary.
Cl	13-28 cm	Light gray (10YR 7/1) loamy sand; massive; very friable, nonsticky and nonplastic; few medium faint yellowish brown (10YR 5/6) mottles; common fine roots; common medium pores; pH 6.8; abrupt smooth boundary.
C2	28-40 cm	Brown to strong brown (7.5YR 5/4,5/6) loamy sand; massive; very friable, nonsticky and non-plastic, many medium distinct light gray (10YR 7/1) mottles; common fine roots; common medium and few coarse pores; pH 6.9; abrupt smooth boundary.
IIC3g	40-78 cm	Light gray (10YR 7/1) clay loam; massive friable, sticky and plastic; common medium distinct yellowish brown (10YR 5/6) mottles; few fine roots; few fine pores; pH 6.3; clear smooth boundary.
IIC4g	78-120 cm	Gray (10YR 5/1) loam; massive; friable and sticky; common medium and fine pores; pH 6.4

**Range in characteristics:** The soils are very deep. The estimated MAST is 24.5°C. The MSST is 26.3°C and MWST is 19.5°C. The moisture control section is not dry in any part for as long as 90 cumulative days in a year.

The A horizon is 13 to 20 cm thick. Its colour is in hue 10YR, value 5 to 6 and chroma 1 to 2, texture is sandy loam to loamy sand. The colour of C horizon is in hue 10YR to 7.5YR, value 5 to 7 and chroma 1 to 6 and texture is loamy sand to sand and that of IIC horizon is in hue 10YR, value 5 to 7 and chroma 1 and the texture is clay loam to sandy loam. Yellowish brown mottlings are abundant in subsoils.

**Competing series and their differentiae:** Competing series are Lahangaon and Nahat Tippomia. Lahangaon soils are slightly more coarser in texture, mildly to moderately alkaline, which is Aquic Udifluent. Nahat Tippomia soils are also more coarser in texture in lower depth, more acidic, which is Typic Fluvaquents.

**Drainage and permeability:** Imperfectly drained with moderate permeability.

**Use and vegetation:** The area is mostly under paddy cultivation. The common natural tree species are Ajhar (*Lagerstroemia flosreginae*), Hot (*Ficus bengalensis*) Sonaru (*Cassia fistula*) Bamboo (*Bambusa sp.*); the common shrubs and the herbs are Makhiloti (*Flemingia strobilifera*), Bhat Meteka (*Monochoria vaginalis*); the grasses are Nol (*Arundo donax*), Kush bon (*Desmostachya bipinnata*), Gahoribon (*Sorreria articularis*) etc.

**Distribution and extent:** Extensive in active flood plains and mostly occurs in North-West Jorhat, Western part of Titabor and central Jorhat blocks of Jorhat Subdivision. It accounts for 11,937 ha area.

## Soils of Jorhat District (Assam) for Land Use Planning

**Type location:** Village Jankhana, P.S. Jorhat, District Jorhat, Assam, latitude: 26°48'15" N, longitude: 94°11'4" E.

**Series proposed:** National Bureau of Soil Survey and Land Use Planning (ICAR), Regional Centre, Jorhat, February 1981.

**Interpretation:** Jankhana soils are subject to overflow during rainy season. The crops adapted to wet condition like paddy are grown in rainy season. Crops like mustard, pulses, oilseeds and vegetables may be grown in flood free season. Flood control may assure the crops.

### Interpretive grouping:

Land capability sub-class	-IIIw
Land Irrigability sub-class	-3ds
Productivity potential	-Medium

### SOIL ANALYSIS

Soil Series: Jankhona

Classification: Typic Udifluvents

Analysis at: NBSS&LUP (ICAR)

Regional Centre, Jorhat

Horizon	Depth	Particle-size distribution (Particle diameter in mm. soil separates in %) (2mm)										Coarse fragments (2mm) (% of whole soil)
		Total			Sand					Silt		
		Sand 2-0.05	Silt 0.05-0.002	Clay 0.002	Very coarse 2-1	Coarse 1-0.5	Medium 0.5-0.25	Fine 0.25-0.10	Very Fine 0.1-0.05	Coarse 0.05-0.02	Fine 0.02-0.002	
Ap	0-13	72.30	15.00	12.70	-	-	33.10	15.70	23.50	5.80	9.20	Nil
C1	13-28	81.10	11.20	7.70	-	-	78.80	0.20	4.10	5.30	5.90	Nil
C2	28-40	78.50	13.00	8.50	-	-	49.50	14.70	14.30	5.50	7.50	Nil
IIC3g	40-78	31.00	39.20	29.80	-	-	1.60	2.50	26.90	18.10	21.10	Nil
IIIC4g	78-120	31.40	44.00	24.60	-	-	5.40	7.20	18.80	19.00	25.00	Nil

Horizon	Organic Carbon %	CaCO <sub>3</sub> %	pH(1:2.5)H <sub>2</sub> O	E.C.(dSm <sup>-1</sup> )(1:2.5)H <sub>2</sub> O	Exchangeable bases					Extractable acidity	Exch. A1	CEC	Base Saturation %	Ratio CEC/clay
					Ca	Mg	Na	K	Sum					
					cmol(p <sup>+</sup> ) kg <sup>-1</sup>									
Ap	0.63	Nil	5.70	0.20	1.50	0.90	0.20	0.20	2.80	0.60	0.40	5.20	54	0.41
C1	0.12	Nil	6.80	0.40	0.80	0.80	0.10	0.10	1.80	0.10	Trace	2.20	82	0.29
C2	0.18	Nil	6.90	0.40	1.30	0.80	0.10	0.10	2.30	Trace	Nil	2.80	82	0.33
IIC3g	0.43	Nil	6.30	0.30	3.60	2.80	0.10	0.10	6.60	0.40	0.30	8.80	75	0.29
IIIC4g	0.68	Nil	6.40	0.30	3.40	2.00	0.10	0.10	5.60	0.40	0.20	7.40	75	0.30

**MARANGIAGAON SERIES**

Marangiagaon series is a member of mixed, hyperthermic family of Typic Udipsamments. The soils have dark gray, neutral, sandy loam A horizon over a dark yellowish brown to light gray, mildly alkaline, sandy C horizon. They have developed from recent coarse sediments deposited due to overflow of Erahmaputra river and its tributaries at an elevation of 75 m above MSL. They occur on nearly level to very gently sloping active flood plain. The climate is humid subtropical with a mean annual air temperature of 23.5°C and a mean annual rainfall of 1950 mm. The principal associated soils series are Rakajara, which is Mollic Fouvauquents; Jankhana, Typic Udifluvents; Gajpuria, Typic Haplaquepts.

**Typifying oedon:** Marangiagaon sandy loam - fallow land

Colours are for the moist soils.

- |    |           |  |
|----|-----------|--|
| A  | 0-15cm    | Dark gray (10YR 4/1) sandy loam; weak fine subangular blocky structure; friable, nonsticky and nonplastic, common fine and few medium roots; common medium and coarse pores; pH 7.2; abrupt irregular boundary.                          |
| Cl | 15-56 cm  | pale yellowish brown (10YR 4/4) sand; single grain; loose, nonsticky and nonplastic; common fine roots; common medium distinct grayish brown (10YR 5/2) and few fine light gray (10YR 7/1) mottlings; pH 7.4; abrupt irregular boundary. |
| C2 | 56-125 cm | Light gray (10YR 7/1) sand; single grain; loose, nonsticky and nonplastic; common medium distinct dark yellowish brown (10TR 4/4) mottlings; pH 7.4  |

**Range in characteristics:** The soils are moderately deep to deep. The estimated MAST is 24.5°C. The MSST is 26.3°C and MWST is 19.5°C. The soil moisture control is not dry in any part as long 90 cumulative days in a year.

Surface soil colour ranges from gray to dark gray in hue 10YR, value 4 to 6 and chroma 1 to 2, texture loamy sand to sandy loam. Subsoil colour is yellowish brown to dark yellowish brown in hue 10YR, value 4 to 5 and chroma 4 to 6, texture is loamy sand to sand. Common distinct grayish brown to light gray mottles and dark brown iron nodules are present.

Competing series and their differentiae: Nil

**Drainage and permeability:** The soils are well drained with high permeability.

**Use and vegetation:** The soils are mostly under upland crops like mustard, peas and sometimes under Ahu (Autumn) paddy. Some areas are under full of tall grasses.

**Distribution and extent:** Most extensively occurs along both sides of Brahmaputra river and the northern part of Majuli subdivision. It accounts for 43,473 ha area.

**Type and location:** Village Marangiagaon, Subdivision- Majuli, District Jorhat, Assam, latitude: 27°2'20" N, longitude: 94°21' 10" E.

**Series proposed:** National Bureau of Soil Survey and Land Use Planning (ICAR), Regional Centre, Jorhat, January, 1982.

**Interpretation:** Marangiagaon soils are severely affected by floods in rainy season, therefore kharif crops are not generally grown. In winter, however, some vegetable crops can be grown with irrigation as the available moisture capacity of the soils is low.

**Interpretive grouping:**

Land capability sub-class	-IVws
Land Irrigability sub-class	-4s
Productivity potential	-Low

**SOIL ANALYSIS**

Soil Series: Narangiagaon

Classification: TypicUdipsamments

Analysis at: NBSS&LUP (ICAR)

Regional Centre, Jorhat

Horizon	Depth	Particle-size distribution (Particle diameter in mm. soil separates in %) (2mm)										Coarse fragments (2mm) (% of whole soil)	
		Total			Sand						Slit		
		Sand 2-0.05	Silt 0.05-0.002	Clay 0.002	Very coarse 2-1	Coarse 1-0.5	Medium 0.5-0.25	Fine 0.25-0.10	Very Fine 0.1-0.05	Coarse 0.05-0.02	Fine 0.02-0.002		
A1	0-15	53.00	40.10	6.90	-	1.10	3.90	13.80	35.10	38.00	2.10	Nil	
C1	15-56	84.00	13.00	3.00	-	-	10.20	25.70	48.10	12.20	0.80	Nil	
C2	56-125	95.50	3.30	1.20	-	4.70	12.40	28.10	50.30	2.80	0.20	Nil	

Horizon	Organic Carbon %	CaCO <sub>3</sub> %	pH(1:2:5) H <sub>2</sub> O	E.C.(dSm <sup>-1</sup> )(1:2:5) H <sub>2</sub> O	Exchangeable bases					Extractable acidity	Exch. A1	CEC	Base Saturation %	Ratio CEC/clay
					Ca	Mg	Na	K	Sum					
					cmol(p <sup>+</sup> ) kg <sup>-1</sup>									
A1	2.15	0.40	7.20	0.70	3.10	1.30	0.30	0.20	4.90	Nil	Nil	5.10	96	0.74
C1	0.89	0.60	7.40	0.60	1.10	0.40	0.40	0.10	2.00	Nil	Nil	2.00	98	0.67
C2	18.00	0.80	7.60	0.90	0.30	0.20	0.30	0.10	0.90	Nil	Nil	0.90	99	0.75

**PAKAJARA SERIES**

Pakajara series is a member of coarse-loamy over sandy, mixed, hyperthermic family of Mollic Fluvaquents. The soils have very dark gray, slightly acid, sandy loam A horizon over gray to light gray, neutral, loam C horizon underlain by coarse textured layers. The soils are gleyed below the surface layer. They have developed from alluvium on sand deposits and occur in low land with a slope less than 1% at an elevation of 60 m above MSL. The climate is humid subtropical with a mean air temperature of 23.5°C and a mean annual rainfall of 1950 mm. The principal associated soil series are Ratanpur-Kathalkhoa, Lahangaon and Marangiagaon, which are Typic Fluvaquents, Aquic Udifluvents and Typic Udipsamments, respectively.

**Typifying pedon:** Pakajara sandy loam - cultivated

Colours are for the moist soils.

Ap	0-18 cm	Very dark gray (10YR 3/1) sandy loam; massive; friable, nonsticky and nonplastic; many fine and common medium roots; many medium fine pores; pH 6.6: clear smooth boundary.
Clg	18-59 cm	Gray (10YR 5/1) loam; weak medium subangular blocky structure; friable, sticky and plastic; many medium distinct dark brown (10YR 4/3) mottlings; many dark brown and soft round iron nodules; common fine and few medium roots; common medium and fine pores: pH 7.2; abrupt irregular boundary.
C2g	59-72 cm	Light gray (10YR 6/1) sand; single grain; loose, nonsticky and nonplastic; few fine roots; pH 7.4; abrupt irregular boundary.
C3g	72-105 cm	Gray (10YR 5/1) loamy sand; massive; very friable, nonsticky and nonplastic; many medium faint (10YR 4/2) mottlings; many dark brown soft iron nodules; pH 7.4

**Range in characteristics:** Pakajara soils are very deep. The estimated MAST is 24.5°C The MSST is 26.3°C and MWST is 19.5°C. The soil moisture regime is aquic as the soil remains wet during May to September. The surface soil colour ranges from very dark gray to gray in hue 10YR, value 3 to 5 and chroma 1 to 2; texture is loamy sand to sandy loam. Subsoil colour ranges from light gray to gray in hue 10YR, value 5 to 7 and chroma 1; texture sandy loam to sand. There are many distinct dark brown mottlings and many dark brown soft iron nodules are also present.

**Competing series and their differentiae:** Competing series are Lahangaon and Nahat Tippomia. Lahangaon soils are finer textured, slightly darker coloured; contain slightly higher organic matter which is Aquic Udifluvents. Nahat Tippomia soils are also finer textured; contain less organic matter, acidic in nature which is Typic Fluvaquents.

**Drainage and permeability:** Soils are poorly to imperfectly drained with a moderately high permeability.

**Use and vegetation:** Mostly under low land paddy or under aquatic vegetation. The natural vegetation consists of trees like Simolu (*Bambax malabaricum*), Ajhar (*Lagerstroemia flosreginae*), Bamboo (*Bambusa ER.*) and grasses like Ulu Kher (*Imperata cylindrica*) Erali (*Leersia hexandra*) etc. are found.

**Distribution and extent:** Extensive in low land of flood plains of Majuli Subdivision. It accounts for 26,376 ha area.

**Type location:** Village Pakajara, Subdivision Majuli, District Jorhat, Assam; latitude: 26°58'55" N and longitude: 94°11'45" E.

**Series proposed:** National Bureau of Soil Survey and Land Use Planning (ICAR), Regional Centre, Jorhat, January, 1982.

## Soils of Jorhat District (Assam) for Land Use Planning

**Interpretation:** Pakajara soils are poorly drained and are susceptible to severe floods which need drainage and flood control measures and are suitable for Paddy (deep water) and other aquatic species.

**Interpretive grouping:**

Land capability sub-class	-IIIws
Land Irrigability sub-class	-3ds
Productivity potential	-Low to medium

### SOIL ANALYSIS

Soil Series: Pakajara

Classification: Mollic Fluvaquants  
Analysis at: NBSS&LUP (ICAR)  
Regional Centre, Jorhat

Horizon	Depth	Particle-size distribution (Particle diameter in mm. soil separates in %) (2mm)										Coarse fragments (2mm) (% of whole soil)	
		Total			Sand						Slit		
		Sand 2-0.05	Silt 0.05-0.002	Clay 0.002	Very coarse 2-1	Coarse 1-0.5	Medium 0.5-0.25	Fine 0.25-0.10	Very Fine 0.1-0.05	Coarse 0.05-0.02	Fine 0.02-0.002		
Ap	0-18	70.8	14.60	14.60	-	-	22.60	16.00	32.20	9.90	4.70	Nil	
C1g	18-59	41.00	46.80	12.20	-	-	4.40	5.60	31.00	36.00	10.80	Nil	
C2g	26-72	94.70	3.10	2.20	-	-	37.80	38.40	20.50	0.10	3.00	Nil	
C3g	72-105	77.70	19.60	3.70	-	-	5.40	23.70	47.60	18.60	1.00	Nil	

Horizon	Organic Carbon %	CaCO <sub>3</sub> %	pH(1:2:5)H <sub>2</sub> O	E.C.(dSm <sup>-1</sup> )(1:2:5)H <sub>2</sub> O	Exchangeable bases					Extractable acidity	Exch. A1	CEC	Base Saturation %	Ratio CEC/clay
					Ca	Mg	Na	K	Sum					
					cmol(p <sup>+</sup> ) kg <sup>-1</sup>									
Ap	2.25	Trace	6.60	0.60	2.40	0.60	0.30	0.20	3.50	Trace	Nil	5.10	69	0.35
C1g	0.58	Trace	7.20	0.80	2.10	0.70	0.40	0.20	3.40	Trace	Nil	4.50	76	0.37
C2g	0.38	Trace	7.40	0.70	0.80	0.20	0.30	0.20	1.50	Trace	Nil	1.60	93	0.73
C3g	0.23	Trace	7.40	0.60	0.80	1.20	0.20	0.20	2.40	Trace	Nil	2.60	98	0.70

**RATANPUR-KATHALKHOA SERIES**

Ratanpur-Kathalkhoa series is a member of fine-loamy, mixed, hyperthermic family of Typic Fluvaquents. The soils have gray, neutral silt loam A horizon and gray, loam, mildly alkaline C horizon. They have developed on alluvium at an elevation of 80-85m above MSL.

They occur on the nearly level to very gently sloping upper terraces. The climate is humid subtropical with mean annual air temperature 23.5°C and mean annual rainfall 1950 mm. The principal associated soil series are Pakajara, Mollic Fluvaquents and Lahangaon which is Aquic Udifluvents.

**Typifying pedon:** Ratanpur-Kathalkhoa silt loam - cultivated

Colours for the moist soils unless otherwise indicated.

- |      |   |
|------|---|
| Ap   | 0-20 cm Gray (10YR 6/1) silt loam; massive; friables lightly sticky and slightly plastic; many fine and medium roots; common rusty specks of yellowish brown (10YR5/6); less than 2 cm wide polygonal cracks; common fine and few medium pores; pH 7.2; abrupt smooth boundary.     |
| Al2g | 20-52 cm Gray (10YR 5/1) silt loam; weak medium subangular blocky structure; firm, sticky and plastic; common fine, few medium roots: common reddish brown soft iron nodules; common fine pores: pH 7.6; clear smooth boundary.   |
| Clg  | 52-125 cm Gray (10YR 5/1) loam; weak medium subangular blocky structure; firm sticky and plastic; common medium dark brown soft distinct dark yellowish brown (10YR 4/4) mottlings; common medium dark brown soft iron nodules; few fine roots: many fine and medium pores; pH 7.8. |

**Range in characteristics:** Soils are deep to very deep. The estimated MAST is 24.5°C. The MSST is 26.3°C and MWST is 19.5°C. The soil moisture regime is aquic as the soil remains wet during the monsoon period.

The colour of surface soil ranges from dark gray to gray in hue 10YR, value 4 to 5 and chroma 1; texture is loam to silt loam. Subsoil colour varies from gray to light gray in hue 10YR, value 5 to 6, chroma 1 to 2; texture loam to silty clay loam with reddish brown iron nodules.

**Competing series and their differentiae:** Pakajara is the competing series which is coarser textured, contains less organic matter and is Mollic Fluvaquents.

**Drainage and permeability:** The soils are imperfectly to poorly drain with moderate permeability.

**Use and vegetation:** Generally under Ahu paddy (*Autumn*), other crops like pulses, mustard, vegetables are grown in rabi season. The natural vegetation are Bamboo (*Sambusa so.*), Nahar (*Mesua ferrea*), Kolajamu (*Eugenia ambolana*), Jati bet (*Calamus tenuis*) and the common grasses are Duboribon (*Cynodon dactylon*), Erali (*Leersia hexandra*), Gahoribon (*Borreria articularie*) etc.

**Distribution and extent:** Extensive in the upper terraces in central part of Majuli subdivision. It accounts for 5,881 ha areas.

**Type location:** Village Ratanpur-Kathalkhoagaon, Subdivision Majuli, District Jorhat, Assam; latitude: 27° 51'45"N and longitude: 94°23'50"E.

**Series proposed:** National Bureau of Soil Survey and Land Use Planning (ICAR), Regional Centre, Jorhat, January, 1982.

## Soils of Jorhat District (Assam) for Land Use Planning

**Interpretation:** The soils are fine-loamy in texture and imperfectly to poorly drained due to high ground water table and flooding. As a result, they are suited to rice during kharif mustard, pulses and wheat can be grown in winter season with proper drainage facilities.

### Interpretive grouping:

Land capability sub-class	-IIIw
Land Irrigability sub-class	-3d
Productivity potential	-Medium

### SOIL ANALYSIS

Soil Series: Ratanpur-Kathalkhoa

Classification: TypicFluvaquants

Analysis at: NBSS&LUP (ICAR)

Regional Centre, Jorhat

Horizon	Depth	Particle-size distribution (Particle diameter in mm. soil separates in %) (2mm)										Coarse fragments (2mm) (% of whole soil)
		Total			Sand					Slit		
		Sand 2-0.05	Silt 0.05-0.002	Clay 0.002	Very coarse 2-1	Coarse 1-0.5	Medium 0.5-0.25	Fine 0.25-0.10	Very Fine 0.1-0.05	Coarse 0.05-0.02	Fine 0.02-0.002	
Ap	0-20	36.00	52.70	11.30	-	-	4.30	6.00	25.70	42.20	10.50	Nil
A12g	20-52	13.90	59.30	27.50	-	-	0.40	0.60	12.20	38.50	20.80	Nil
C1g	52-125	53.20	31.10	15.70	-	-	12.20	11.80	29.20	16.80	14.30	Nil

Horizon	Organic Carbon %	CaCO <sub>3</sub> %	pH(1:2.5)H <sub>2</sub> O	E.C.(dSm <sup>-1</sup> )(1:2.5)H <sub>2</sub> O	Exchangeable bases					Extractable acidity	Exch. A1	CEC	Base Saturation %	Ratio CEC/clay
					Ca	Mg	Na	K	Sum					
					cmol(p <sup>+</sup> ) kg <sup>-1</sup>									
Ap	1.72	0.04	7.20	2.00	5.80	2.50	0.40	0.30	9.00	Nil	Nil	9.20	98	0.81
A12g	1.63	0.06	7.60	1.20	10.20	5.60	0.40	0.20	16.4	Nil	Nil	16.60	99	0.60
C1g	0.81	0.07	7.80	1.00	6.40	3.00	0.50	0.20	10.1	Nil	Nil	10.20	99	0.65

**LAHANGAON SERIES**

Lahangaon series is a member of coarse-loamy, mixed, hyperthermic family of Aquic Udifluvents. The soils have dark gray, mildly alkaline, loam A horizon over yellowish brown, mildly alkaline, sandy loam (occasionally loamy sand) C horizon underlain by lithologically discontinuous, mildly to moderately alkaline, loam to silt loam C horizons. They formed in recent alluvium and occur on the river terrace with usually 1-3% slope at an elevation of 70-80 m above MSL. The climate is humid subtropical with a mean annual air temperature of 23.5°C and a mean annual rainfall of 1950 mm. The principal associated soils are Ratanpur-Kathalkhoa and Pakajara which are Typic Fluvaquents and Mollie Fluvaquents, respectively.

**Typifying pedon:** Lahangaon loam - cultivated

Colours are for the moist soil.

- Ap 0-31 cm Dark gray (10YR 4/1) and dark yellowish brown (10YR 4/4) loam; puddled; friable, slightly sticky and slightly plastic; many medium and fine roots; many fine and few medium pores; pH 7.4; clear broken boundary.
- Cl 31-49 cm Yellowish brown (10YR 5/4) sandy loam; weak fine subangular blocky structure; friable, nonsticky and nonplastic; common fine roots; few medium distinct grayish brown (10YR 5/2) mottlings; many medium and few coarse pores; pH 7.7; abrupt smooth boundary.
- C2g 49-71 cm Light gray (10YR 7/1) loamy sand; single grain; loose, nonsticky and nonplastic; common medium distinct yellowish brown (10YR 5/4) mottlings; pH 7.7; abrupt smooth boundary.
- II C3g 71-116 cm Gray (10YR 5/1) loam; weak medium sub-angular blocky structure; friable, sticky and slightly plastic; few fine roots; common medium distinct yellowish brown (10YR 5/6) mottlings; common fine pores; pH 7.9; abrupt smooth boundary.
- II C4g 116-150 cm Yellowish brown (10YR 5/6) silt loam; massive; friable; slightly sticky and slightly plastic; common fine distinct gray (10YR 5/1) mottlings; pH 7.8

**Range in characteristics:** The soil is very deep. The estimated MAST is 24.5°C. The MSST is 26.3°C and MWST is 19.5°C. The soil moisture control section is wet during May to September and it qualifies for 'aquic' moisture regime.

Colour of the surface soil is in hue 10YR, value 4 to 5 and chroma 1. Texture is sandy loam to loam. Subsoil colour is in hue 10YR, value 5 to 7, chrome 1 to 6; texture ranges from loamy sand to sandy loam and many distinct yellowish brown and gray mottlings are present. The depth of stratified and layer varies from 20 to 50 cm.

**Competing series and their differentiae:** Competing series is Pakajara which is coarser textured, contains less organic matter and is Mollic Fluvaquents.

**Drainage and permeability:** The soils are moderately well to imperfectly drain with moderate permeability.

Use and vegetation: Paddy and other upland crops like mustard and pulses are grown in kharif and Rabi season. The common vegetation are Simolu (*Bambax malabaricum*), Bogor (*Zizyphus lujuba*), Bamboo (*Bambusa sp.*) and grasses like Ulu Kher (*Imperata*), Biringa (*Vetiveria zizanioides*); Ikora (*Phragmites karka*) etc. are found.

**Distribution and extent:** Extensive in central part of Majuli subdivision. It accounts for 7,701 ha area.

**Type location:** Village Lahangaon, Subdivision Majuli, District Jorhat, Assam; latitude: 27°2'20" N and longitude: 94°15'30" E.

## Soils of Jorhat District (Assam) for Land Use Planning

**Series proposed:** National Bureau of Soil Survey and Land Use Planning (ICAR), Regional Centre, Jorhat, January, 1982.

**Interpretation:** Lahangaon soils are susceptible to flooding, so the crops adapted to wet conditions may be grown in rainy season. Upland crops like pulses, oilseeds, wheat and vegetables may be grown in flood free season. Contour bunding needed to the yield of Rabi crops significantly.

**Interpretive grouping:**

Land capability sub-class	-IIIws
Land Irrigability sub-class	-3ds
Productivity potential	-Medium

### SOIL ANALYSIS

Soil Series: Lahangaon

Classification: AquicUdifluvents

Analysis at: NBSS&LUP (ICAR)

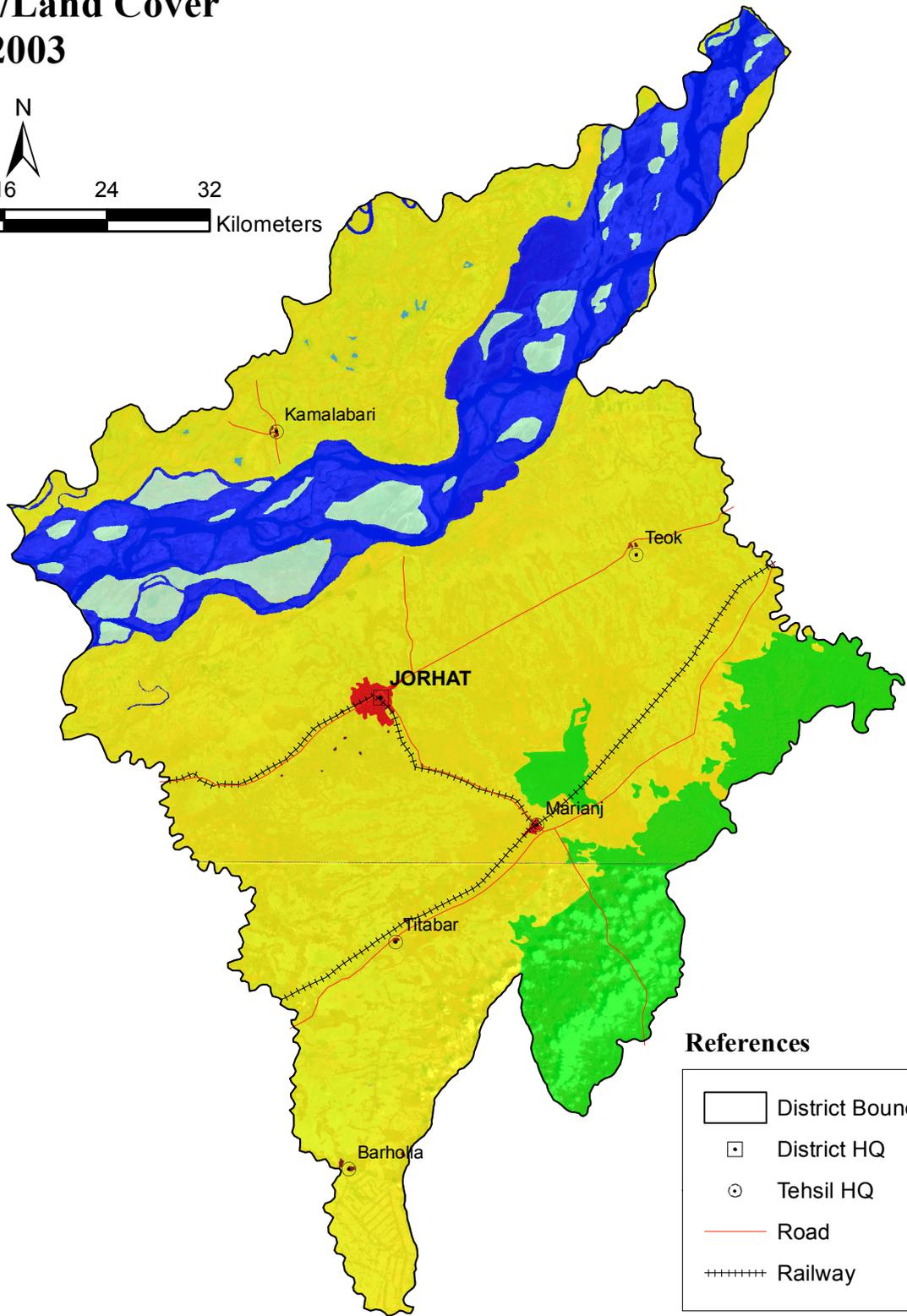
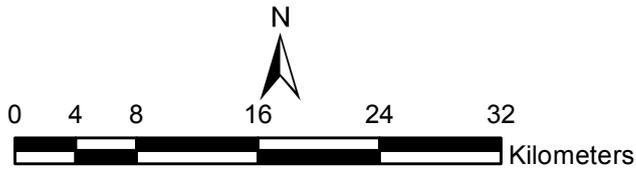
Regional Centre, Jorhat

Horizon	Depth	Particle-size distribution (Particle diameter in mm. soil separates in %) (2mm)										Coarse fragments (2mm) (% of whole soil)
		Total			Sand					Slit		
		Sand 2-0.05	Silt 0.05-0.002	Clay 0.002	Very coarse 2-1	Coarse 1-0.5	Medium 0.5-0.25	Fine 0.25-0.10	Very Fine 0.1-0.05	Coarse 0.05-0.02	Fine 0.02-0.002	
Ap	0-31	50.50	35.60	13.90	-	-	8.50	10.40	31.60	22.60	13.00	Nil
C1g	31-49	48.00	45.80	6.20	-	-	0.40	3.80	43.80	41.70	4.10	Nil
C2g	49-71	81.90	14.60	3.20	-	2.40	30.00	33.00	16.50	11.30	3.30	Nil
IIC3g	71-116	50.80	32.70	16.80	-	-	9.70	10.80	30.30	22.50	9.90	Nil
IIC4g	116-150	26.20	61.60	12.20	-	-	-	5.40	20.80	54.20	11.40	Nil

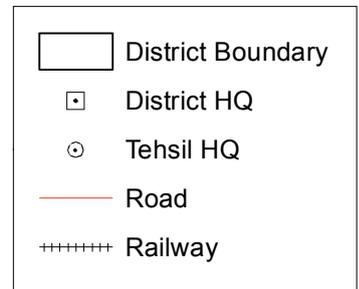
Horizon	Organic Carbon %	CaCO <sub>3</sub> %	pH(1:2.5)H <sub>2</sub> O	E.C.(dSm <sup>-1</sup> )(1:2.5)H <sub>2</sub> O	Exchangeable bases					Extractable acidity	Exch. A1	CEC	Base Saturation %	Ratio CEC/clay
					Ca	Mg	Na	K	Sum					
					cmol(p <sup>+</sup> ) kg <sup>-1</sup>									
Ap	1.94	0.03	7.40	1.90	4.00	2.10	0.50	0.30	6.90	Nil	Nil	7.00	98	0.50
C1g	0.97	0.08	7.70	1.80	2.30	1.30	0.40	0.20	4.10	Nil	Nil	4.30	95	0.69
C2g	0.62	0.08	7.70	1.60	1.50	0.50	0.20	0.10	2.30	Nil	Nil	2.40	96	0.68
IIC3g	0.58	0.08	7.90	1.80	4.30	2.10	0.60	0.30	7.30	Nil	Nil	7.40	99	0.44
IIC4g	0.46	0.06	7.80	2.00	4.10	1.90	0.20	0.20	6.40	Nil	Nil	6.50	99	0.53

# JORHAT

## Land Use/Land Cover 2003

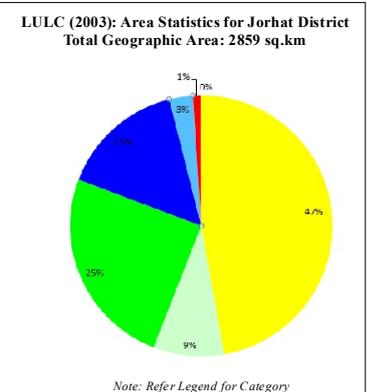


### References



### Legend

Classes	Area [sq.km]	Classes	Area [sq.km]
Agriculture		Water	
Agriculture, Cropland	1350	Wetlands/Water Bodies, Reservoir/Lakes/Ponds	83
Grass	249	Wetlands/Water Bodies, River/Stream/Canals	438
Builtup			
Built-up, Rural	1		
Built-up, Urban	28		
Forest			
Forest, Deciduous	710		



Data Source: Landsat ETM+ Satellite data of Kharif (2003) and Rabi (2003), SRTM DEM, Existing Soil Maps & Reports (NBSS & LUP), and other Statistical Data

Fig. 22: Land Use/Land Cover 2003